Trans Mountain Expansion Project

Spreads 3&4A

Project Specific Safety Plan

Document # 01-13283-SG-M000-PL-HSE-0001 R4

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	Approved by TMEP	Pages Revised	Issued Type
4	E. Kibambe 2020-09-22	G. Roda 2020-09-22	M. Granger 2020-09-22	S.D. Ayres Oct 07, 2020	Various	Issue for Use
3	E. Kibambe 2020-05-27	G. Roda 2020-05-27	M. Granger 2020-05-27	S.D. Ayres 2020-05-29	Various	Issue for Use
2	E. Kibambe 2019-05-07	J. Hoard 2019-05-07	M. Granger 2019-05-07	N. Dunning 2019-08-14	Various	Issue for Use

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No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
1	PSSP	2.4	18	None	Added Steep Slope Supervisor responsibilities		09/22/2020
2	PSSP	3.2	26	ATV Training	Removed ATV		09/22/2020
3	PSSP	4.6	39	None	Adherence to the LSLP Steep Slope Safety Plan and TMEP HSMP Section 57 Working on Steep Slope.	Added as per TMEP comments	09/22/2020
4	PSSP	4.6	40	20 lb.	10 lb. fire extinguishers shall be in all office trailers, the warehouse and throughout the camp facility		09/22/2020
5	PSSP	4.8	42	None	Person under the age of 18 years are not permitted on the project		09/22/2020
6	PSSP	5.7	47	None	The use of electronic devices while driving or operating equipment on-site is prohibited. Refer the LSLP Driving Safe Work Practice. Without exception, a spotter must be used when whenever a heavy commercial vehicle is backing up.		09/22/2020
7	PSSP	5.11	51	None	A qualified rigger will visually inspect all rigging equipment. Workers are not permitted to place hands on the bevel when setting pipe. Tag lines must be used to control the load	Added as per TMEP comments	09/22/2020

No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
8	PSSP	5.12	52	N/A	Taglines are the only method permitted for workers to guide the pipe on TMEP project. LSLP will request a MOC prior to using other alternatives of controlling the pipe	Added as per TMEP comments	09/22/2020
9	PSSP	5.14	52	Towing equipment of proper size (winch cat) is available to assist the pipe truck on ROW.	Towing equipment of proper size (winch cat) is available to assist the pipe truck on ROW in accordance to the LSLP Steep Slope Safety Plan and TMEP HSMP Steep Slope Section;	Added as per TMEP comments	09/22/2020
10	PSSP	5.15	52	None	Equipment operators must maintain visual contact with riggers and the foreman and must use industry-recognized hand signals. If visual contact cannot be guaranteed, radio communication can be used once this variance is documented and approved by the foreman.		09/22/2020
11	PSSP	5.19	56	N/A	For more details on the steep slope, refer to the LSLP Steep Slope Safety Plan in Appendix I and the TMEP HSMP Steep Slope Section. Where discrepancies exist, the HSMP will take precedence.		09/22/2020
12	PSSP	6.3	57	None	Defective or damaged chains, slings, cables, or components must be tagged and removed	Added as per TMEP comments	09/22/2020

No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
					from service immediately. Hooks, rings, links, or any coupling device must have a rating equivalent or greater than the chain, sling or cable to which it is affixed. Never use makeshift links or coupling devices. All chains, slings and cables must have an identification tag attached showing its load rating and limitations		
13	PSSP	6.15	64	Long pants and sleeved shirt	Long pants and long-sleeved shirt. Class 2 level 2 high visibility safety vests.		09/22/2020
14	PSSP	7.0	70	None	Added Fall Protection Program	Added Fall Protection Program reference	09/22/2020
15	PSSP	Appendix A	73			Updated contact list	09/22/2020
16	PSSP	Appendix B	75		Updated Steep Slope Sections	Updated Project Hazard Assessment	09/22/2020
17	PSSP	Appendix C			Updated Steep Slope Supervisor CQS	Updated Training Matrix	09/22/2020
18	PSSP	Appendix G			Updated referenced regulation and site-specific contacts.	Updated Fire Mitigation Plan	09/22/2020

1.0 DEFINITIONS AND ACRONYMS

AHJ	Authority Having Jurisdiction	
ALARP	As Low As Reasonably Practicable	
ANSI	American National Standards Institute	
CAPP	Canadian Association of Petroleum Producers	An association representing the upstream Canadian oil and natural gas industry.
CER	Canada Energy Regulator	
CSA	Canadian Standards Association	
EPP	Environmental Protection Plan	
ERP	Emergency Response Plan	
FA	First Aid	
FLHA	Field Level Hazard Assessment	A process of hazard identification, assessment, and control / mitigation in the planning of work to be conducted by all personnel involved in performing a task. It is conducted in the “field” at the work face.
FMP	Fatigue Management Program	
FOPS	Falling Object Protective Structure	
HAZOP	Hazard and Operability	
HMSP	Health and Medical Services Plan	
HS&E	Health, Safety, & Environment	
JHAs	Job Hazard Assessment	An element of the Work Management Process which describes the various tasks associated with completing a job and the controls utilized to reduce the inherent risks associated with the job tasks to as low as reasonably practicable (ALARP).

LOPA	Layers of Protection Analysis	
LOTO	Lock-Out Tag-Out	
LSLP	Ledcor Sicim Limited Partnership	
MOC	Management of Change	
MOP	Maximum Operating Pressure	
MOTI (requirements)	Ministry of Transportation and Infrastructure	
MTC	Mobile Treatment Center	
OHS	Occupational Health and Safety	
PCST	Pipeline Construction Safety Training	
PHA	Project Hazard Assessment	The method of identifying known and anticipated hazards based on scope of work plans, as-built drawings, anticipated weather conditions, environmental considerations, and equipment. It is the first step in the Ledcor hazard assessment and control process.
COR	Certificate of Recognition	
PPE	Personal Protective Equipment	
PPM	Parts Per Million	
PSSP	Project Specific Safety Program	A comprehensive program which defines how the project will meet or exceed LSLP, client, and Regulatory HS&E requirements.
QA	Quality Assurance	
ROPS	Roll Over Protection Structure	
ROW	Right of Way	
SIL	Safety Integrity Level	
SWP	Safe Work Practice	A governing document that outlines the foundation for the safe execution of a specific type of work or task by providing a mandatory

		set of minimum standards and guidelines for the work to be done. They are commonly referred to as the “do’s and don’ts” around a task.
TCP	Traffic Control Plan	
TMEP	Trans Mountain Expansion Project	
TMP	Traffic Management Plan	
TMPL	Trans Mountain Pipeline	
TWA	Time-Weighted Average	
UTV	Utility-Terrain Vehicle	

2.0 PLAN OVERVIEW AND GENERAL REQUIREMENTS

The purpose of this Project Specific Safety Program (PSSP) is to provide instruction to Ledcor Sicim Limited Partnership (LSLP) employees on their duties and responsibilities related to the development, communication and implementation of the LSLP Project Specific Safety Plan specific to the Trans Mountain Pipeline Expansion Project (TMEP), its drawings and specifications.

The Project Specific Safety Program must be reviewed by:

- Each Supervisor on the project
- Project Manager
- Superintendents
- HS&E personnel
- All subcontractors
    - All subcontractors are required to sign the PSSP acknowledgement form which states they have read, understood and that they will adhere to the requirements.

Whenever the scope of work changes substantially from the original assessments, the Project Manager and Project Superintendent will review the need to update relevant sections of the PSSP to reflect the changed conditions or work processes. Any revisions to the PSSP must be distributed to all subcontractors on site.

In preparation of the creation of this Project Specific Safety Plan, the LSLP Project Hazard Assessment Checklist was completed by:

- Project Manager
- Superintendent
- HS&E Representative

2.1 HEALTH AND SAFETY POLICY

THINK SAFETY™
WORK SAFELY

HEALTH, SAFETY & ENVIRONMENTAL POLICY

LEDCOR is committed to protecting and maintaining the health and safety of our employees, workers, clients and members of the public.

LEDCOR management, supervision, employees and workers are responsible to:

- Maintain a safe and healthy workplace. We believe all incidents are preventable. Our goal is ZERO incidents.
- Implement Ledcor's Health, Safety and Environmental Standards that comply with applicable occupational health, safety and environmental legislation and standards.

LEDCOR is committed to the continual improvement of our Health, Safety and Environmental controls to facilitate the planning and execution of safe and productive work through THINK SAFETY, WORK SAFELY™.

LEDCOR is committed to working in a spirit of consultation and cooperation with all workers in the implementation of the Health, Safety and Environmental Standards, and supporting all workers in their right to work in a safe and healthy workplace. This includes their right to know, their right to participate and their right and obligation to refuse unsafe work.

LEDCOR ensures that relevant competency-based training, job-specific safe work processes, operation and maintenance procedures, and personal protective equipment are made available to management, supervision, employees and workers to prevent incidents.

LEDCOR is committed to protecting the environment.

Dave Lede
Chairman & CEO

Ron Stevenson
President

Date: January 2020

2.2 LEGAL STANDARD

The major applicable legal standards are listed but this is not intended to be an exhaustive list of all applicable legal requiremetns that may apply to the scope of work with which LSLP must comply.

Canada:

- Government of Canada Explosives Act (R.S.C., 1985, c. E-17)
- National Standard of Canada Standard CAN/BNQ 2910–510/2015 entitled Explosives — Quantity Distances
- Canada Labor Code Part II
- Canadian Environmental Assessment Act, 2012.
- National Safety Code for Motor Carriers
- Pipeline Safety Act
- Pipeline Damage Prevention Regulations
- Minister of Natural Resources, Report on Best Available Technologies
- Canadian Nuclear Safety Commission
- Nuclear Safety and Control Act

Canada Energy Regulator

- Canada Energy Regulator Onshore Pipeline Regulations

Provincial

- BC Security Act
- British Columbia Security Services Act.
- OHS Regulation
- Employment Standards Act
- Workers Compensation Act
- Hazardous Products Act
- British Columbia Ministry of Transport and Infrastructure
- BC Ministry of Forests Lands and Natural Resource Operations Regulations.
- BC Wildfire Act General Regulation
- BC Fire Protection Act
- BC Ministry of Transportation and Infrastructure
- B.C. Reg. 70/2012 O.C. 190/2012, Public Health Act Industrial Camps Regulation.

Other

CSA Standard Z662 — Oil and Gas Pipeline Systems

CSA Z246.1-13 Petroleum and Natural Gas Industry Systems

2.3 GOALS AND OBJECTIVES

See Ledcor Document # **CON-HSE-TAR-RF-004** - **2020 Leading Indicators Calendar.**

The Leading Indicator Calendar sets the project goals and expectations for participation. Our goal is 100% compliance to our Leading Indicator Program.

2020 Leading & Lagging Indicator Calendar
Ledcor Pipeline Limited

THINK SAFETY™
WORK SAFELY

Ledcor Pipeline Limited HS&E Objectives

- "Strengthen our current processes through employee engagement, ongoing measurement, verification & continuous improvement."

Leading Indicator Activities	Workers	JOHSC	HS&E Coordinators	Supervision (Foreman)	Eng, Quality & Env. Coord.	Project Leadership	Senior Leadership
HS&E Planning Activities *Attend, Participate, Lead Toolbox Meetings*	Participate in All	-	Participate 4/week	Lead 1/day	Participate 1/month	Participate 1/week	Participate 1 per 60 days
Safety Meetings *Attend, Participate, Lead*	Participate in All	-	Participate in All	Participate in All	Participate in All	Lead All	Participate 1 per 60 days
Worksite Inspections *Conduct Worksite Inspections*	-	1/monthly	Conduct 2/week and review all	Conduct 1/week	Conduct 1/week	Conduct 1/week	Conduct 1 per 60 days
Focused Inspections *Conduct focused inspections on critical tasks*	-	-	Conduct 1/month	-	-	-	-
FLHA Quality Reviews *Conduct and sign FLHAs*	-	-	Review & Sign 10/day	Review & Sign All	-	Review & Sign 10/week	-
Worksite Observations *Complete WSOs*	-	-	Conduct 2/week	Conduct 2/week	Conduct 1/month	Conduct 1/week	Conduct 1 per 60 days
Corrective Action Log *Review of Action Items – Closure/Effectiveness*	-	Review in JOHSC	Review All	Review as Required	-	Review Log 1/week	-
Incident Investigations *Participation and Incident Level*	-	Review in JOHSC Participate where required	Lead All	Participate in All	-	Participate in All	Review All Level A&B Flashes
Incident Review Meetings *Participation and Incident Level*	-	-	Lead All	Participate in All	-	Participate in All	Participate in all Level A & B Incident Investigations
Emergency Response Drills	• Minimum every 3 months						
HS&E Perception Survey	• Minimum of 1 per Year						
Gold Flag Audit	• Minimum 1 every 6 months						
Core Safety Training Completion (Mandatory)	100% Completion of Core Safety Training - Identify Core HS&E Training being measured: • Review & Sign PSSP Acknowledgement • Supervisor Interactive Development Session (Seminar) • Leadership for Safety Excellence (where provincially applicable) • DriveSAFE program • Pipeline Construction Safety Training (PCST) • Ground Disturbance for Supervisors Level 2 (GDL2) • Standard First Aid – Level C CPR						

Lagging Indicator Targets	TRIF	FAIF	VIF	LCIF
Ledcor Pipeline Limited	0.75	3.0	3.0	15.0
Subcontractor	-	-	-	-
Total	0.75	3.0	3.0	15.0

Total Recordable Injury Frequency (TRIF)

$$\frac{MA + LTI + RWC \times 200{,}000\ Hours}{Hours\ Worked}$$

Loss Control Incident Frequency (LCIF)

$$\frac{FA + MA + LTI + RWC + PD + Env + Security + MVI \times 200{,}000\ Hours}{Hours\ Worked}$$

Definitions

- **Senior Leadership Team:** Consists of but is not limited to: Senior VP's, VP's, Directors, General Managers, Operations Managers, Quality Control Managers, Environmental Managers, Project Sponsors and HS&E Directors/Managers.
- **Project Leadership Team:** Consists of but is not limited to: Project Managers, Superintendents and HS&E Leads.
- **Lead:** Responsible for successful completion of that activity.
- **Conduct:** Lead or Co-lead, to do or carry out an activity.
- **Participate:** Help in preparation, attend and when appropriate speak up to help achieve the objective of that activity.
- **Review:** Understand the expectation around the activity - Provide support and feedback, help determine corrective actions when applicable.

2.4 ROLES AND RESPONSIBILITIES

The terms of reference in this section of the manual are written to clearly identify the areas of responsibility and accountability related to incident prevention for the following parties:

- Prime Contractor
- Project Manager
- Superintendent
- Supervisors
- HS&E Manager
- First Aid Personnel
- Security
- Project Workers
- Visitors
- Subcontractors

Prime Contractor

The Prime Contractor for this project is: Ledcor Sicim Limited Partnership. (LSLP)

As the Prime Contractor, LSLP is responsible for:

- Establishing and maintaining a safety management system that ensures compliance with all applicable governing Acts, codes, and regulations.
- To provide and maintain a safe work environment and promote the health and safety of all LSLP employees, client representatives, third party personnel, company assets, as well as the public, environment, and communities in which the work is being performed ensuring that the activities of employers, workers and other persons at the workplace relating to occupational health and safety are coordinated.
- Coordinate, organize, and monitor work on the project to ensure reasonable and practical controls are in place to effectively eliminate or mitigate the safety, health, environmental and security hazards for executing the work scope.
- Ensure that first aid services, equipment and supplies required by any WorkSafe BC First Aid Regulations are available at the work site.
- Maintain a list of names of persons designated to supervise the workers of every employer at the project.

Senior Project Manager

- Ensures implementation of the LSLP Health Safety and Environmental Program
- Ensures a Project Specific Safety Plan (PSSP) is developed, accessible to project Supervisors, kept current and reviewed / understood by project and subcontractor supervisory personnel.
- Ensures a designated Project Superintendent is knowledgeable of LSLP Health, Safety and Environmental Program and Policies.
- Communicates directly with client / owner management personnel, as appropriate with respect to health, safety and environmental issues and concerns.

- Ensures reviews of project leading indicator reports (site inspections, Toolbox Talks, Safety meetings) and lagging indicator reports (incident investigations) and makes recommendations as required.
- Participates in weekly safety meetings when possible and per business unit leading indicator requirements.
- Coordinates and expedites any specialized safety equipment that may be required on the job site.
- Ensures appropriate pre-job safety / work planning processes occur with LSLP personnel, subcontractors, and owner / client representatives.

Project Superintendent

- Responsible and accountable for the implementation of the LSLP Health, Safety & Environmental Program, and this Project Specific Safety Program on their site.
- Identifies to project subcontractors, visitors, owner and/or client and project Supervision/Foremen that participation in the LSLP safety orientation and fulfilling their responsibilities as identified within this PSSP and the LSLP HS&E Program in full is mandatory.
- Accountable to the Project Manager for the safe performance of personnel and equipment operation on the project.
- Implements this Project Specific Safety Program and ensures a clear understanding of safety responsibilities and specific duties of each Supervisor.
- The Superintendent must be knowledgeable as to the duties of and be responsible for complying with all applicable WorkSafe BC regulations and any other regulatory requirements.
- Ensures that a documented Project Hazard Assessment is completed prior to the commencement of the project.
- Ensures that subcontractor and company Supervisors conduct daily tailgate meetings, which incorporate the review of hazards and safety issues related to that day's work.
- Ensures that a monthly safety meeting is held with LSLP, subcontractor, and supervisory personnel.
- Ensures a LSLP and site-specific safety orientation program for new or transferred employees and subcontractors is in place and operating effectively. The orientation will include but is not limited to issuance of job instruction/safety instruction, and personal protective equipment.
- Ensures the Mentorship Program has been fully implemented with all new to site employees, following the Program's criteria. This includes initial assessment, assignment of a competent mentor, completion of regular and periodic documented performance reviews and final graduation from the program.
- Monitors that the maintenance processes are effective.
- Ensures all near miss, injury, occupational illness, equipment/property damage, security and environmental release incidents are reported, investigated to determine causes and corrective actions are developed and implemented.
- Ensures that incident reports are completed with participation from the immediate area or crew Supervisor.
- Reviews and signs off all investigation reports.
- Ensures that investigation reports are made available to the client and any government or regulatory agency, as required.

- Reviews project incident summary reports and takes appropriate action.
- Ensures that the modified work program is made available to any worker who has sustained injury and has received physician approval to participate in the program.
- Fulfills their requirements under their business unit leading indicator activity requirements.
- Ensures front line supervisors are fulfilling their leading indicator activity requirements for their business unit,
- Instills by action, example and training, a sincere safety attitude through all supervisory personnel and employees.

Supervisor

- The LSLP and subcontractor Supervisors shall be responsible for the direct supervision and safety of their crew. They are accountable to the Project Superintendent for the performance of personnel through safe work planning, safe work practices and job procedures.
- Follow all rules and regulations as presented by the Project Specific Safety Program, including LSLP and any client safety orientation. This should include the requirements of the owner and regulatory body, including any WorkSafe BC requirements.
- Understands this Project Specific Safety Plan.
- Ensures all employees and subcontractors under their supervision participate in the LSLP and project safety orientation prior to working on site.
- Leads the compliance with established safety work processes and work methods. The Supervisor's role is the education, training, mentoring, and coaching of his workforce.
- Takes disciplinary action necessary for non-compliance with LSLP Values, and workplace rules.
- Conducts a tailgate meeting with their crew each day at the start of the shift and records the meeting on the daily tailgate document or similar.
- Follows business unit leading indicator requirements including conducting regular inspections of the worksite for unsafe practices and conditions.
- Ensures prompt corrective action to eliminate potential causes of incidents or "near miss" situations.
- Completes an Incident Report, ensuring that all incidents are investigated, and corrective action is taken to prevent re-occurrence. Copies of this report are provided to the Project Superintendent or designate.
- Attends and participates in weekly project safety meetings with their crew.
- Works in co-operation with the HS&E organization and other project supervisory personnel in determining safe practices.
- Informs their employees of the hazards associated with their job and provides the training in the safe work practices required to do the job.
- Ensures that required safety equipment and protective devices are provided and maintained in accordance with manufacturer's specifications.
- Ensures that new hire employees are enrolled and participate in the LSLP Mentorship Program.
- Makes certain that all injured persons (regardless of the severity of the injury) are referred to the appropriate first aid or medical facility and that advanced medical aid (off site) is provided, commensurate with the injured person's needs.
- Ensures the established housekeeping standards are upheld.

- Monitors crews and work areas for changes in conditions and potential hazards.

Steep Slope Supervisors

The Steep Slope Supervisor must possess good oral and written communication skills along with a strong understanding of and commitment to process safety.

The Steep Slope Supervisor must have a recognized ability to successfully engage, include and mentor a diverse workforce while taking every opportunity to champion a safety culture driven by the safety values required to achieve the project goal of zero incidents, every day.

Ensure Steep Slope Work Plans are developed prior to working on applicable Steep Slopes.

- Support and implement Site Specific Steep Slope Work Plans.
- Complete daily pre - work steep slope documentation as required by this Steep Slope Safety Plan.
- Communicate crew member's responsibilities and ensure work crew safety.
- Enforce the Steep Slope Work Plan requirements while working on Steep Slopes.
- Perform competency assessments to ensure crew members are qualified to perform the work assigned in a safe manner.
- Conduct daily toolbox talks with crew members and ensure that Field Level Hazard Assessments
- (FLHAs) are completed to ensure all crew members understand hazards associated with the steep slope work, and mitigation measure requirements.
- Communicate safety concerns and considerations to crew members prior to introducing a new process, procedure, equipment, or material to the workplace.
- Verify and ensure that crew members are adequately trained for assigned work tasks prior to beginning work. Do not allow workers to work on tasks without training and competency.
- Ensure that reliable communication devices are available prior to and during slope activities and operations.
- Relay crew member steep slope concerns/considerations to the project management team.
- Understands Steep Slope Work Plan and how to implement
- Recognizes when adjustments are needed, acts to implement
- Communicates effectively with all personnel
- Maintains safety first and not production-only attitude
- Evidence of pre-planning, adequate time to effect required amendments, not in a hurry to start job.
- Accurate hazard identification and correct measurement / assessment of hazards.

Health and Safety Manager

- The Health and Safety Manager is responsible for assisting with the development, implementation, sustainment and use of this Project Specific Safety Plan.
- Assists in leading the improvement in project performance and assists the project with compliance to company expectations.

- Works with the project leadership team on the compliance to and effective execution of leading indicator requirements and ensures LSLP Contractors Incident Management process is followed.
- Administer all rules and regulations as presented by owner and/or client and LSLP Project Specific Safety requirements, as well as the requirements of the WorkSafe BC Regulation and other authorities having jurisdiction.
- Accountable for assessing and reviewing the adequacy and effectiveness of the Project Safety Plan, with input from Project Management and the owner's Construction Manager.
- Accompanies owner and/or client representatives as well as government Health & Safety Officers during project safety inspections.
- Supports the incident management process, including response/attending to the incident, Flash Reporting, incident investigation and client reporting.
- Assists with determining cause and developing corrective actions along with any Safety Alert reporting.
- Ensure the incident is classified per LSLP and the owner's Incident Management Classification Guidelines.
- Develops the Emergency Response Plan (ERP) for the project.
- Leads and assists with safety seminars and Safety related training.
- Maintains current knowledge of safety literature, regulations, and codes of practice.
- Reviews incident summary reports and other statistical gathering systems to keep informed of the project safety performance and ensures appropriate action is taken when trends are unfavorable.

Safety Coordinator/Administrator

- Conducts LSLP specific safety orientation for all new employees including LSLP, owner and client representatives, their related subcontractors as well as all visitors associated with the project.
- Supports the incident management process including response/attending to the incident, submitting the Flash Report, assist with the incident investigation and reporting, determining cause and developing corrective action.
- Ensure the incident is classified as per LSLP and the Owner's Incident Management Classification Guidelines.
- Assist with arrangements to have necessary corrections implemented immediately.
- Oversees and supports Subcontractor incident investigations, analysis, and preparation of incident reports.
- Observes and documents the administration of any approved Subcontractor's Safety Program being implemented on the project.
- Posts safety bulletins, safety posters and safety rules and regulations and maintains notice boards.
- Ensures the project is following the Contractors Subcontractor Management Program, including any Subcontractor HS&E reporting.
- Monitors the following of the business unit leading indicator calendar, including worksite inspections, worksite observation card, toolbox talks and weekly safety meetings.
- Supports operations with the development, training in and use of relevant JHAs and SWPs.

- Prepares descriptions of identified unsafe conditions and follows up that steps are being taken to correct these conditions to prevent reoccurrences.
- Leads and assists with safety and seminars or safety related training.
- Maintains current knowledge of safety literature, regulations, and codes of practice.

Senior Environmental Manager

- Understands the applicable environmental legislation, regulatory requirements, and the various environmental plans.
- Plans, implements, and maintains systems to monitor compliance to all environmentally related requirements.
- Ensures environment and education training occurs in accordance with the project training matrix and the needs of project personnel.
- Engage in Management of Changes if there are changes in design and/or schedule.

First Aid Personnel

Qualified and competent person(s) as per the BC First Aid Regulation, OHS Guidelines Part 3 *G3.14 to 3.20 First aid guidelines for employers* shall be assigned to provide such first aid service as may be required.

The person(s) appointed to this position shall possess a First Aid Class 3 or equivalent Certificate with a Transport endorsement in accordance with Part 3 of the OH&S Regulations of British Columbia and shall be readily available to administer first aid as necessary.

First Aid Personnel Shall:

- Follow all rules and regulations as presented by the project specific safety orientation, as well as the requirements of the owner and the applicable WorkSafe BC regulations.
- Administer first aid as necessary.
- Maintain a first aid log in accordance with regulatory requirements.
- Maintain all first aid related equipment and supplies, vehicles, including the Mobile Treatment Center, for cleanliness and organization and ensure that all required supplies are fully stocked, available and easily accessible. The MTC checklist shall be employed for this purpose. First aid supplies listed on the B.C. OH&S Regulation tables will be used as a minimum requirement guide.
- Requisition all first aid supplies and equipment in advance of any perceived need.
- Assist in coordinating the transportation of injured employees to the closest advanced medical treatment center or hospital.
- Provide health education materials or instruction to on-site project personnel as directed by the Physician Assistant or others.
- Performs all duties in a professional and ethical manner.

Security Lead (LSLPSL)

The LSLPSL is accountable to ensure the Project Specific Security Plan is implemented upon field deployment of construction personnel and the project security team. The LSLPSL will ensure that improvements to the project specific security plan will be based on updated threat/risk assessments and

overall continuous improvement to ensure its accuracy. The LSLP Security Lead reports to the LSLP Security Advisor.

Designated Security interface to the project. All security related events shall be reported to the project HS&S manager and investigated in keeping with the owner's Incident Management Classification Guidelines.

Security Program And Personnel Responsibilities

Prior to the start of the work, a documented project threat risk assessment will be conducted regarding the duties of security personnel and such documentation will be submitted to the Project Health and Safety Manager.

The LSLP project security group is led by the Ledcor Sicim Limited Partnership's Security Lead and all project personnel are subject to the requirements of the Project Security Plan

The communication procedure must be in place for, and have been reviewed by, all security personnel.

- The Procedure is to address Occupational Health and Safety requirements of 'Working Alone' legislation, Section 4.20.1 of the *OHS Regulation of B. C*.
- This procedure shall include a variety of checks and balances to ensure redundancy.

Security Personnel Shall:

- Follow all rules and regulations of the owner and/or client in addition to WorkSafe BC Regulations.
- Participate in the project specific safety orientation.
- Security Personnel are expected to report to the Project Health and Safety Manager through the Security Manager of any hazardous conditions, practices or suspicious behavior that they witness.
- Maintain a log of all security checks.
- Not permit any unauthorized personnel to enter the worksite, office, warehouse, or camp areas without permission from the Project Manager or designate.
- Maintains basic security training certifications (BST) as required.
- Conducts all related activities in an ethical and professional manner.

Project Worker Rights And Responsibilities

- All project workers have the right to know of the hazards associated with their work. They must complete the LSLP site specific safety orientation prior to commencing field work on the project.
- All project employees must be appropriately oriented towards the project specific safety expectations, inclusive of all company, owner and/or client requirements and be made aware of any project specific safety hazards.
- Workers have the right and responsibility to refuse any unsafe work as per OHS Regulation Section 3.12, Procedure for Refusal and Section 3.13, No Discriminatory Action.
- Employees shall follow Safe Work Procedures and shall take an active role in protecting themselves and their co-workers.
- Workers are expected to report to their Supervisor, any hazardous condition, practice and behavior in their work areas.

- If any worker is injured on the job and requires medical attention, the worker is entitled and required to participate in the company program and must inform the attending Physician that a Modified/Restricted Work Program is available.
- All injuries, no matter how minor, must be reported.

Visitor's Responsibilities

Visitors are responsible to cooperate with the LSLP Health, Safety, Security and Environment programs to ensure the safeguarding of their own health and safety while at the worksite as well as that of project employees.

All visitors must:

- Prior to any other activity, report to the LSLP project security office and obtain permission for entry onto the project site.
- All visitors shall participate in the Visitor Orientation and complete the visitor orientation sign-on. While on site all visitors must be accompanied by a competent person who has participated in the project specific safety orientation.
- Wear approved personal protective equipment, including safety glasses with side shields (ANSI Z87.1-2003/4, and BC OH&S Regulations Part 8), side-impact rated hard hat, safety boots with a minimum 6 inch upper and high visibility vest or clothing with such marking on both the front and back.
  - All PPE must meet applicable CSA/ANSI standard.
  - These PPE requirements are mandatory while in active construction areas, even if the visitor is not intending on exiting the vehicle in which they are traveling.
  - PPE brought to site by the visitor must be checked and approved by project staff before being allowed on site.
- Comply with WorkSafe BC regulations, owner and/or client rules and LSLP Safety Program Requirements.
- Report any unsafe acts or conditions to a LSLP Supervisor.
- Report any injuries sustained on the site to a LSLP Supervisor.

Subcontractor Responsibilities

Subcontractors are contractually obliged to ensure compliance with and enforce the rules and regulations as presented in this PSSP with both their own employees and their Subcontractor workforce.

- Subcontractors and their own subcontractors must have this Project Specific Safety Plan reviewed prior to arrival at the project.
- All subcontractors will provide LSLP with a signed Project Specific Safety Plan Acknowledgement Form (See Section 7.0) as confirmation of their commitment to the LSLP project HS&E expectations as outlined in the PSSP.

Suppliers Responsibilities

Suppliers are directed to provide tools and equipment to the Project that meet all legislated requirements and standards as well as manufacturers' specifications. Suppliers shall ensure that all tools, appliances, equipment, materials, or hazardous materials that they supply comply with all applicable legislation, regulations, and codes.

2.5 HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONTROLS

See Ledcor Document # **CON-HSE-HAZ-PGM-001 - Hazard Assessment Program.**

The hazard assessment process is used to identify, assess, eliminate, or control hazards during the life cycle of the project by effectively reducing the risk of injury or loss.

Listed below are elements of the hazard assessment process that will be utilized by LSLP over the course of this project.

These elements include but are not limited to:

- Project Hazard Assessment (PHA)
- Job Hazard Assessment (JHA)
- Field Level Hazard Assessment (FLHA)

Project Hazard Assessment (PHA) (Appendix A)

At the commencement of the project, the LSLP Project Hazard Assessment will be completed. The Project Manager, Project Superintendent, and Safety Manager / Lead / Coordinator will conduct this assessment.

Plans, drawings, and schedules may be referred to in order to ensure that the project scope and complexity may be understood.

- Potential Hazards will be considered, and measures put in place to eliminate or control associated risks.
- Emergency planning for locations, response times and routes to and from the nearest Hospital, Fire and Police locations will be determined.
- A list of equipment to be used on the project will be reviewed. Related risks identified, and control measures implemented for all equipment.
- All utilities, both above ground and buried, including gas, electricity, storm sewer, communications, etc. will be identified and marked on drawings.
- All risks (environmental and otherwise) will be identified and control measures implemented when working in proximity to watercourses.
- The Project Hazard Assessment will be kept on file and in the project office.
- Copies will be made available for individual review on request.

Job Hazard Assessment (JHA)

The JHA is a work site job planning technique conducted by project supervision to identify hazards of planned work and determine hazard elimination, control, or mitigation.

It is a living document that can be modified when new hazards are identified.

- The JHA focuses on the relationship among work activities, tools, equipment, and the work environment at the work site level.

A JHA may be prepared by project supervision with assistance from a Safety Coordinator when a high-risk job or task is to be performed and there are no relevant safe work practices or job procedures available.

- During the project, certain activities may increase the risk to workers or property.

- High risk activities and activities which are new to crews and seldom performed must be evaluated using the JHA process.

It will be the responsibility of the Superintendent or crew foreman to ensure a JHA is completed and reviewed with the crew prior to beginning any activity that is deemed hazardous in nature.

Completion of the JHA requires that controls be developed, discussed, and explained to the crew at a pre-job meeting prior to commencing work.

In addition to reviewing a JHA for the work task, a Field Level Hazard Assessment (FLHA) must be completed at the workface.

Field Level Hazard Assessment (FLHA)

When workers arrive at a work site or as conditions change while performing a task/job, hazards may be identified that were not foreseen during the work planning stage. FLHAs are a tool for workers at a work site to record any recognized hazards associated with the work/task, known as “Here and Now Hazards.”

- FLHA’s are to be completed daily as a minimum standard and updated as the task or conditions change.
- LSLP will be utilizing the Energy Wheel FLHA’s where the hazard identification focus is on energy that can cause harm at the workface.
- It is the responsibility of the Supervisor to ensure that FLHA cards are completed and reviewed periodically throughout the shift.
- Upon completion of the FLHA all feasible hazard controls listed are to be implemented and employed.

Considerations that must be factored into any FLHA include, but are not limited to:

- Skills needed to perform the job and expertise available.
- Health monitoring results - noise, chemical/biological, radiation and air quality.
- Corporate and industry incident statistics.
- Government regulations.
- Coordination between other crews.
- Communication barriers - blind spots, noise.
- Physical workloads imposed by the job.
- Schedules or time restraints.
- Environmental factors such as weather and soil conditions.

FLHA cards may be completed by either a single individual or a group of individuals completing the same task, at the same location.

- It is the responsibility of the Supervisor to review and sign off the FLHA at the end or completion of each shift or work task and turn it in to the safety team for review, action, and filing.
- Information gathered via FLHA cards will be used for trending and incident prevention purposes as part of the Leading Indicator process.

Hazard Controls

Once hazards are identified and assessed, appropriate controls must be designed and implemented. The Hierarchy of Controls will be used to respond to hazards in the most appropriate manner possible.

- Elimination
- Substitution
- Engineering
- Administration
- Personal Protective Equipment

Safe Work Permits

All personnel involved in the Work Permitting process will be properly trained in the necessary steps to follow regarding meeting the expectations and requirements of any LSLP or client driven Safe Work Permitting process.

- Including client facilities, confined space entry, hot work, LOTO, and ground disturbance.
- Prior to the task beginning, the content and responsibilities presented by the permits will be reviewed in full of the crew that is to be engaged in the applicable task or activity.
- If a site or work area experiences an emergency, all safe work permits will be considered void unless LSLP has been otherwise instructed in advance by the client or permitting authority.

3.0 PLANNING, IMPLEMENTATION AND CHECKING

3.1 MANAGEMENT OF CHANGE (MOC)

See Ledcor Document # **CON-HSE-MOC-FM-001 - HS&E Management of Change Request Form.**

Changes to technology, equipment, standards, procedures, and organizational changes may be made in accordance with the appropriate corporate or regional MOC procedure.

MOC procedures also address permanent and temporary modifications and include the granting of occasional waivers.

Should LSLP identify the need for an MOC, they will document the reason and justification for the change as well as the wording of any proposed standard or specification and submit to TMEP for consideration.

Information to be submitted with the MOC:

- Reason for change
- Authority for approving the change
- Analysis of implications created by the change
- Acquisition of required work permits required to conduct the change
- Documentation of the change process
- Communication of change to affected parts of the organization
- Time limitations
- Qualification and training of personnel affected by the change

3.2 TRAINING, COMPETENCY AND EVALUATION

In addition to the project specific orientation, other training required for project staff will be dependent on the job description, the scope of work being undertaken, the work group they are assigned to, and the complexity of the tasks they will perform.

Training requirement and the mode of delivery of the training will be defined by the Project Leadership Team and LSLP Senior Management for the project and documented within this PSSP.

Training will be performed by the project Health and Safety Manager, Lead, Coordinator or by an approved 3rd party training provider.

A project personnel training matrix has been developed include, but not limited to the following:

- PPE
- Pipeline Construction Safety Training (PCST) required for all project personnel
- Supervisor Safety Training (Supervisors Only)
- Drug & Alcohol Program
- Mentorship Program
- Field Level Hazard Assessment
- Disability Management
- Incident Investigation
- Worksite Observation Card
- Frontline Leadership HS&E Roles and Responsibilities
- Leadership for Safety Excellence (supervisory personnel)
- BC Occupational First Aid Level 1 or equivalent accepted in BC
- Ground Disturbance Level II
- Security Awareness Training
- Wildlife Awareness
- H2S Awareness
- Avalanche Awareness

In addition to the training requirements listed above, various positions will require additional training. Other job specific training requirements includes, but is not limited to:

- Traffic Control Person Training for those whose duties may include controlling traffic. Section 18.4. (1) of the B.C. OH&S Regulation requires third party training provider.
- UTV Training
- Chainsaw Operations
- H2S Alive

Refer to Appendix C of this PSSP which outlines the project training plan.

Ledcor Pipeline Online Orientation

In addition to having completed the minimum pre-access requirement such as PCST and Ground Disturbance Level 2, all project personnel, including subcontractors must complete the Ledcor Pipeline HS&E Online Orientation housed at the following link:

https://www.bistrainer.com/index.cfm?action=learner.Invitation&form.fldInvitationCode=101858332

The Ledcor Pipeline HS&E orientation covers a range of topics, including Ledcor's commitments to health, safety, and environment, potential hazards and risks you may encounter in the workplace, and site expectations for you as an employee, subcontractor, visitor, or client.

The topic cover in the Ledcor Pipeline HS&E Orientation include:

- Module 1 (Welcome to Ledcor Pipeline)
- Module 2 (Legislation and Responsibilities)
- Module 3 (Hazard Management, FLHA Training, Worksite Inspection and Observation Program)
- Module 4 (Incident Management)
- Module 5 (General Workplace Rules)
- Module 6 (Equipment Operation & Working Around Equipment)
- Module 7 (Ledcor Policies & Programs; DriveSafe, ATV/UTV Safety, Drug & Alcohol, EAP)
- Module 8 (Survey, Excavation, Safe Excavation Entry, Overhead Powerline)
- Module 9 (Environment)
- Module 10 (Code of Conduct)
- Module 11 (Conclusion)

Site Specific Safety Orientation

Following the completion of pre-access requirements, prior to any worker beginning work on site they are required to successfully complete the project site specific safety orientation. Contents of the orientation will be adjusted to ensure the requirements of CMSTQ of the HSMP Appendix C are fully covered.

The orientation will include a review that covers (at minimum) the topics of:

- Project Overview,
- Rights and Responsibilities
- Project Specific Program (Mentorship, FLHA Energy Wheel, Ground Disturbance, Safe Driving)
- Project Specific Rules & Requirement (PPE, Workplace Rules, TMEP Life Saving Rules, Disciplinary Action)
- Pipeline Job Safety
- Incident Reporting & Management
- Emergency Preparedness
- Specific Awareness Program (Housekeeping, Hand Safety, H2S, Asbestos)
- Diversity Awareness, Harassment, Violence, Bullying
- Security
- Safety Commitment
- Environmental Awareness
- Knowledge based assessment

To verify that a prospective project participant understands the LSLP Health, Safety, Security and Environmental expectations and requirements for working on that site the orientation will include a knowledge-based assessment which shall be kept on the employees personnel file.

- If the minimum allowable passing score is not achieved, the prospective employee will not be allowed to begin work until he/she has attended a second orientation session and has achieved a passing grade on the knowledge-based assessment.
- If language or literacy is an issue, the knowledge-based assessment can be presented verbally by one of the HS&E resources on site.

Operator Competency

The experience, work history and qualifications of workers and equipment operators will be considered prior to them being assigned specific activities at the work site.

- All operators must participate in LSLP or their respective subcontracted company's documented competency assessment process.
- The LSLP Operator Competency program requires all heavy equipment operators to have their competencies assessed and documented.
- Based on this evaluation process, operators will be assigned duties commensurate with their abilities.
- This is the responsibility of the direct supervisor of that operator

3.3 COMMUNICATION

See Ledcor Document # **CON-HSE-COM-SP-001 - Toolbox Talks**

Toolbox Meetings

Prior to the beginning of each shift the crew Supervisor will conduct a Toolbox Meeting with their crew.

The toolbox meetings should briefly discuss the following:

- The scope of work to be performed for the day,
- Any potential hazards associated with the work or the worksite,
- Protective measures taken or to be taken to deal with the hazards identified.
- Any changes that may be known to be occurring at the site, and other pertinent information, LSLP employees and subcontractors are encouraged to participate in the Ledcor Stretching The Limit program Document # **LED-HSE-WMT-PGM-006** at the end of toolbox meetings in effort to minimize musculoskeletal injuries.
- These meeting must be documented and signed by all those in attendance.

A record is to be maintained as part of the project records files.

- All LSLP employees, subcontractors, and vendors are expected to attend Toolbox Meetings.
- Subcontractors may conduct their own Toolbox talk, but it must be done under the supervision of an LSLP Supervisor.

Weekly Safety Meeting

- Once a week all site Supervisors, including subcontractors will meet to review safety aspects of the project. See Ledcor Document # **CON-HSE-COM-SP-002 - Safety Meetings.**
- These meetings will follow a detailed agenda which may topics such as incident reviews, lessons learned, leading, and lagging indicators, identified trends, and safety procedure review.
- The meetings are an integral component of the Safety Management Program helping to bring complete focus and attention to the current conditions of the job site.
- Owner representation is strongly urged, as these weekly supervisory safety meetings are devoted to improving the safe working conditions of the project.
- A discussion by Owner and Contractor key personnel ensures that safety issues are kept up front and are of foremost importance throughout the duration of the project.

- On the day of the safety meeting, each Supervisor will take the information shared in the Supervisors Weekly Safety Meeting, and conduct the toolbox talk with their crew focusing on the issues covered.

HS&E Stewardship Meeting

See Ledcor Document # **CON-HSE-COM-SP-004 - HS&E Stewardship Meeting**

Once a week, the Project Leadership Team along with the HSE Manager or representative will meet to discuss HS&E matters as it relates to the project.

Such items can include but are not limited to:

- Leading Indicator and Trending Update
- HS&E Initiatives or Program Update
- Client initiatives for the project related to safety, training, and awareness.
- Subcontractor Safety Management
- Training Report of done and planned
- Camp Safety Report
- Incident statistics and trending, Health, Injury, Damage, Security, Environmental
- Investigation Review
- Review Corrective Action Logs
- Report on Emergency Response Plans or Drills
- Project HS&E Statistical Summary/ Safety performance review
- Objectives set for the following week.

Communication with the Public

If approached by a member of the public with general enquiries into specific work being conducted, on a day to day basis, workers are permitted to discuss, within their area of expertise, their immediate tasks. Inquiries from the public into work as part of the general Project must be referred to info@transmountain.com or by calling 1-866-514-6700. The public can also be directed to www.transmountain.com for general Project information. Business cards are available from TMEP Project Discipline Leads for field personnel to distribute to the public as required. See example below.

Trans Mountain Media Relations

Email media@transmountain.com
Toll-Free 1 855 908-9734
Landline 1.604.908.9734

General Inquiries

Email info@transmountain.com
Toll-Free 1 866 514-6700

Communication with the Media

All communication with the media regarding the Project shall be conducted by or through the TMEP Media Relations team. Media inquiries should be directed to media@transmountain.com or 1-855-908-

9734. This contact information is also available on the TMEP business cards which can be obtained from the TMEP Project Discipline Leads.

External Communication

External communication to government agencies, aboriginal groups, and the public regarding health and safety shall take place as per the following:

- Reporting to appropriate Government Authorities will be as per The Project Specific ERP and EPP
- Communication to Aboriginal groups will take place through an established process through the TMEP Aboriginal Engagement Team and LSLP Indigenous Relation Lead; and communication to affected public will be as per the Project Construction communications Plan (CCP).

3.4 DOCUMENT CONTROL AND RECORDS MANAGEMENT

All records shall be recorded and maintained in correlation with the LSLP project file system.

Ledcor file system Document # **CON-PMT-PI-RF-001**

- Injury or illness records shall be made and maintained for all injury or illness events.
- Incident investigation reports Document # **CON-HSE-IIR-FM-001.** An incident shall be Flash reported as defined by LSLP Contractors Flash reporting guide and logged within the LSLP Incident Management System (IMS).
- All incidents shall be reported to the designated client representative immediately. A preliminary incident investigation report will be completed and forwarded to the Owner or designate - as a minimum, within 24 hours of a 'minor' event and within 48 hours of a 'major' event.
- Inspection Reports Document # **CON-HSE-INS-FM-001.** All inspection reports shall be reviewed by and signed by an appropriate LSLP Supervisor, and shall be filed on site.
- Safety meeting records Document # **CON-HSE-COM-SP-002.** All safety meeting records will be reviewed and filed on site.
- Training records. Records of formal training undertaken on the project will be kept on file at the LSLP site office and forwarded to the LSLP Training Coordinator for centralized document retention purposes.
- Orientation records **CON-HRM-ATR-FM-003 – Training Attendance Sign-In Sheet** records all employees receiving orientation and will be kept on file at the LSLP site office for the duration of the project.

3.5 SAFETY STATISTICS

Safety Statistics as outlined below will be maintained by the LSLP Field Office and submitted to TMEP.

Weekly Report

LSLP will submit the following statistical information on a weekly basis to TMEP using the LSLP statistical reporting form (see appendix F).

- Number of 'labour-hours' worked – LSLP employees and all subcontractors
- Number of Lost Time injuries.
- Number of Medical Aid & Restricted Work injuries
- Number of First Aid injuries

- Number of Near Miss incidents.
- Number of Motor Vehicle Incidents
- Total of all incidents (including property and equipment damage, environmental).
- Number of Safety Meetings
- Number of Worksite Inspections
- Number of Toolbox Talks
- Number of FLHA Cards
- Number of site visits from Regulatory Health & Safety Officers

Monthly Report

LSLP will submit the following statistical information on a monthly basis to TMEP using ISN monthly reporting.

- Number of 'labour-hours' worked – LSLP employees and all subcontractors
- Number of Lost Time injuries.
- Number of Medical Aid & Restricted Work injuries
- Number of First Aid injuries.
- Number of Near Miss incidents.
- Number of Motor Vehicle Incidents
- Total of all incidents (including property and equipment damage, environmental).
- Number of Safety Meetings.
- Number of Worksite Inspections
- Number of Toolbox Talks
- Number of FLHA Cards
- Number of Worksite Observation Cards
- Number of site visits from Regulatory Health & Safety Officers.
- Vehicle kilometres driven (LSLP and subcontractors)

Quarterly Report

Vehicle usage reports including the number of vehicles being used on average and their types.

This includes:

- ALL vehicles to and from the worksite by origin (from camp, hotel, town, etc.)
- Number of vehicles being used on the worksite using public roads
- Number of vehicles in camp

3.6 INSPECTION, MEASUREMENT AND MONITORING

See Ledcor Document # **CON-HSE-INS-SP-001 - Worksite Inspections**

Purpose

- To provide a system to identify and remove hazards from the workplace and thereby prevent incidents.
- To provide documentation to evaluate supervisory staff.

- To provide a system to evaluate employees safe work standards.

The project leadership team, including Health and Safety Manager, Safety Lead and Safety Coordinator, Senior Project Manager and Superintendent along with project support staff (Project Coordinators, Quality Control, Engineering personnel, etc.) shall conduct periodic and regularly scheduled formal and informal audits and inspections of both LSLP and Subcontractor work areas.

- The findings will be documented, and all observations captured on a Corrective Action log.
- Any items requiring corrective actions will have the action clearly defined, prioritized, and assigned to a LSLP person for the actions to be completed.
- The findings and observations shall be communicated to workers during tailgate meetings and through safety bulletins posted in conspicuous locations accessible to all workers.
- The LSLP Contractors Inspection format will be followed.

Implementation

Informal Inspections (Non-Documented)

Will be conducted on an ongoing basis by all supervisory staff.

Any deficiencies noted will be rectified as soon as practicable on an ongoing basis.

Supervisors are to make a notation in their journal (or similar) as to any deficiencies which are observed during the informal inspection process or the observations can be documented using the Worksite Observation Card.

Formal Inspections (Documented)

Will be conducted as outlined in the Leading Indicator program and will engage the work group to participate in the inspection.

All noted deficiencies will be rectified as soon as practical by the appropriate crew foreman upon notification.

- Findings of inspections will be logged, a due date for estimated completion recorded and signed off when the rectification is completed.

Pre-Mobilization Equipment Inspection

Prior to mobilizing any equipment on the project, a pre-mobilization inspection must be completed by a certified mechanic to ensure all equipment is fit for the purpose. See Ledcor pre-mobilization checklist Document # **CON-EQU-OT-FM-002** for reference.

Daily Equipment Inspection

Prior to operating any equipment, the operator must complete the daily equipment checklist to ensure that equipment is in good working order. Defective equipment must be reported to the supervisor to ensure timely maintenance or repair is conducted.

Gold Standard Audit

See Ledcor Document # **LED-HSE-AUD-SP-001 - Gold Standard HSE Audit Procedure**

LSLP internal audits use a system of performance indicators (leading and lagging) to measure the operation of a project's HS&E management system.

Achieving LSLP HS&E standards for leading indicators will ensure improved performance against lagging indicators.

The Gold Standard Audit will include:

- Review of training received by Supervisors and workers
- Review of compliance to and effectiveness (quality) of the various Leading Indicator activities
- A formal HS&E program review (following a defined protocol)
- Review of lagging indicator results
- Review of various HS&E related documents, forms and reports
- Site inspection and observation tour
- Interviews of key project personnel

3.7 INCIDENT REPORTING AND INVESTIGATION

See Ledcor Document # **CON-HSE-IIR-PGM-001 - Incident Investigation Program**

In addition to the 10D-S Ledcor investigation form, all incidents will submit using the **TMEP CSM 001** form. See Appendix report

Purpose:

To provide a detailed analysis of each incident to assist in the determination of cause to use the analysis to implement corrective actions and prevent reoccurrence.

Incident response includes but is not limited to:

- The implementation of the corrective actions
- Emergency response,
- Required notifications, (corporate, client, regulatory, legal, etc.)
- Preservation of evidence,
- Incident investigation etc. to eliminate further loss,

Implementation:

All persons who may be required to facilitate, investigate, or assist with an investigation will be trained and proven competent or who will be under the direct supervision of a competent investigator.

All incidents and near miss events will be investigated by a Supervisor with assistance of a Safety Coordinator.

LSLP shall cooperate with the owners and all other parties who have the legal jurisdiction to investigate, given the facts of the incident.

Notification, investigation, documentation, and follow-up for all incidents will be reported following normal guidelines and approvals.

Notification:

For all level incidents, a preliminary report is due to TMEP within 24 hours after an incident. The final completed incident investigation report is to be submitted to TMEP within 48 hours after the incident.

3.8 SAFETY STAND DOWNS

Safety Stand Downs can be called by Senior Project Management and may occur as deemed necessary by project activities/conditions such as:

- Serious Incidents
- Other news that needs to be communicated to the work force personally and quickly.

4.0 HEALTH AND SAFETY PROGRAMS

4.1 AVALANCHE PREPAREDNESS

Construction will occur in some areas that are identified as posing potential avalanche hazards.

These areas were broadly identified in an Avalanche Risk Assessment completed by Trans Mountain (available to Contractors as guideline).

Table A1-2 on page 34 of the Trans Mountain Health and Safety Management Plan for the project. #01-13283-GG-0000-PL-RPT-0013_1_IFI outlines the Avalanche Risk Assessment locations.

Prior to the start of work in an avalanche risk area, LSLP will create a written Avalanche Safety Program that meets the requirements of BC OHS Section 4.1. Appendix K of this PSSP.

The Plan will address the risk of an avalanche as a general hazard and ensure that mitigation is in place within the Avalanche Safety Program.

The regulation requires that before any work can be conducted in an area that may pose an avalanche risk, that a written Avalanche Safety Plan be developed and implemented.

The Avalanche Safety Plan will be developed by a qualified person and include measures to eliminate the risks associated with an avalanche.

In situations where the hazard cannot be eliminated, the avalanche safety plan must include measures to reduce the risk, such as:

- Having a qualified person monitor weather and snow, at considered effective intervals.
- Area closures or other measures as specified in the Avalanche Safety Program.
- Safe work procedures to be followed when working in potential avalanche areas.
- All workers working in an avalanche risk area must be provided information and training.
- Workers must comply with the procedures.

4.2 DAMAGE PREVENTION (GROUND DISTURBANCE)

Ground disturbance is any work operation or activity that results in a disturbance or displacement of soil or cover to the depth >30 cm unless over a known buried utility or inside the 2m safety hot zone in which case a disturbance to any depth is considered a ground disturbance. Ground disturbance includes but is not limited to: auguring, backfilling, blasting, boring, clearing, digging, driving (fence posts, bars, rods, pins, anchors, or pilings), drilling, excavating, grinding and milling of asphalt/ concrete, land levelling/grading, peat removing, ploughing to install underground infrastructure, quarrying, seismic

exploration, soil loading, stump removal, topsoil stripping, trenching, tree planting, sign installation, and tunneling.

Note that equipment crossing over underground infrastructure may be considered a “ground disturbance” activity as per provincial or federal regulations. For the purposes of the definition of “ground disturbance” in this PSSP, mobile equipment, including light vehicles, crossing the existing TMPL is considered a ground disturbance. Crossing of 3rd Party underground infrastructure is also considered a ground disturbance by the TMEP unless expressly stated it is not by the 3rd Party underground infrastructure’s owner.

All personnel associated with buried utilities and ground disturbance will be trained and competent.

- All buried utilities within 5 metres of the proposed ground disturbance area will be exposed by hand digging or with the use of a hydro-vac.
- All exposed buried utilities will be guarded to prevent damage.
- All exposed buried utilities will be inspected by the utility owner prior to back filling.

The guiding document on this project includes the below:

See Document # **CON-HSE-WMT-PGM-004 – Ledcor Pipeline Ground Disturbance Program**

See TMEP Document # **01-13283-TMEP-MP 3120 R3 Pipeline Construction Specifications Section 3.2** and **TMEP HSMP - APPENDIX D Damage Prevention Plan**

4.3 DISCIPLINARY ACTION

This program is in accordance with all labor agreements and regulatory conditions.

It is LSLP policy that all employees be trained in proper safe work practices. Employees are expected to follow and adhere to all aspects of this LSLP Safety Program. The close observance of all jurisdictional and owner and/or client rules and regulations will be monitored at all times.

TMEP Life Saving Rules

LSLP is committed to maintain a safe and healthy workplace by implementing TMEP Life Saving Rules on the project. The TMEP Life Saving Rules was developed from Energy Safety Canada's Life Saving Rules and the Damage Prevention rules. All project workers, contractors, subcontractors must commit to working safely and following TMEP's Life Saving Rules. The TMEP Life Saving Rules are as follow:

	Life Saving Rule	Description	Icon / Graphic
7	Driving	Follow safe driving rules.	
8	Hot Work	Control flammables and ignition sources.	
9	Safe Mechanical Lifting	Plan lifting operations and control the area.	
10	Fit for Duty	Be in a state to perform work safely.	
11	Damage Prevention	Plan ground disturbance activities and control the area.	
6	Bypassing Safety Controls	Obtain authorization before overriding or disabling safety controls.	

General Safety Rules

Employees who engage in any of the following activities may be subject to disciplinary action, up to and including removal from the worksite:

- Conducted by an employee that exhibits a general disregard for the health and safety of any person on the worksite, or member of the public.
- Failure to abide by rules or conditions set out by the Owner/Client.
- Harassment or disrespectful behaviour.
- Wearing clothing that is inappropriate for work or wearing clothing that contains offensive slogans or images.
- Insubordination towards Ledcor Supervisors.

- Misrepresentation of qualifications or falsification of records or reports.
- Failure to wear the provided Personal Protective Equipment (PPE), where required.
- Unauthorized removal or disengagement of any safeguard, locks, tags or other protective devices.
- Riding in the back of trucks or on any equipment not designed to carry passengers.
- Possession or use of unauthorized drugs or alcohol, and/or reporting for work while impaired by drugs, alcohol, or other influencing factors. · Smoking in areas of the worksite that are not designated as per the Smoking Policy.
- Engaging in horseplay, fighting, or gambling at the worksite.
- Possession of firearms or other implements considered to be weapons in the worksite.
- Causing deliberate damage to company property.
- Theft of company property or personal belongings from the worksite

Any additional rules specific to the project will be communicated to all employees during orientation.

If there is an infraction of these rules, regulations or the Ledcor Health, Safety & Environmental Program, the following disciplinary action will be taken:

Minor Infraction

Definition: Any infraction of company, government, corporate, or client rules that does not have the potential to cause serious damage or injury:

- 1st offense verbal warning
- 2nd offense verbal warning and letter to personnel file
- 3rd offense time off without pay or termination
- 4th offense termination

Major Infraction

Definition: Any infraction of company, government, corporate, or client rules or legislation that does have the potential to cause serious damage or injury:

- 1st offense time off without pay or termination
- 2nd offense termination

4.4 FATIGUE MANAGEMENT

See Ledcor Document #**CON-HSE-WMT-PGM-005** - **Fatigue Management Program**

The purpose of the Fatigue Management Program (FMP) is to ensure that all management, supervisory personnel, and employees understand the factors that influence and effect of fatigue on a person's ability to safely perform their job.

The objective is to educate and recommend appropriate and proactive methods of effectively dealing with and managing worker fatigue as it can impact the worker's ability to perform physical and mental tasks.

All LSLP employees are required to receive Fatigue Management education.

This educational awareness will consist of some or all following aspects, dependent upon the employee's responsibilities.

- What is Fatigue?
- Signs, symptoms, and consequences of fatigue, some of which are:
  - Tiredness, depression, susceptibility to illness, irritability, and digestive problems
- Effects of fatigue:
  - Slowed mental and physical reaction
  - Failing to respond to stimuli and changes in surroundings
  - Flawed logic and judgement
  - Inability to concentrate
  - Increased memory errors, including forgetfulness
  - Reduced motivation
  - Decreased vigilance
  - Increased tendency for risk taking
- Roles and Responsibilities
- Preventative methods for dealing with fatigue:
  - Working more slowly
  - Asking for assistance
  - Checking work more thoroughly
  - Postponing critical tasks
  - Ensure adequate rest between work shifts
  - Stay hydrated
- Reporting procedures
- Monitoring methods
- Program review processes
- Completion of the “Fatigue Awareness Program – Employee Checklist”

In the absence of specific Federal Standards or BC standards, Contractors will follow the Alberta Employment Standards Code, which includes the requirement for one day of rest per week or a maximum of twenty-four (24) consecutive days of work followed by four (4) consecutive days off.

Workers, other than those exempt by regulation, are not permitted to work beyond 12 hours/day including operation of a motor vehicle for work purposes prior to and after work shifts.

4.5 FIT FOR WORK

See Ledcor Document # **LED-HSE-SYS-PCY-006 - Drug and Alcohol Policy**

All workers must arrive for their shift "fit for work" including being well rested, maintaining appropriate nutritional standards, free of the effects of drugs or alcohol and with their mind focused on their task.

- It is the worker's responsibility to notify the worker's Supervisor of any new medications, prescription or over the counter medication, that may affect a worker's ability to safely perform their work.
- All work on the TMEP is deemed safety sensitive but risk sensitive by Ledcor Drug and Alcohol program 2018 definition.
- If testing is conducted based upon suspicion, the worker under suspicion, must be removed from service pending test results.

The possession or consumption of alcohol, illicit drugs, or the misuse of prescription or “over-the-counter” drugs is strictly prohibited on LSLP premises and work sites.

Based on reasonable cause, LSLP reserves the right to conduct lawful searches for alcohol, drugs, drug paraphernalia or other contraband on LSLP premises and work sites.

- In addition, all project personnel shall provide a urine or other sample taken prior to arriving on the project that shows negative for the presence of illicit or illegal drugs or the presence of alcohol. Samples shall be provided prior to employment.
- Personnel whose samples do not reflect a negative result will not be employed by nor shall remain in in the employ of LSLP.
- All personnel directly involved in an incident are subject to post-incident testing.

The Drug and Alcohol Program sets forth requirements and expectations regarding maintaining a safe work environment. The Drug and Alcohol Program includes, the Duty to Accommodate, providing substance abuse treatment and return to work program.

The misuse of alcohol and drugs are a potentially serious Health, Safety and Security problem on a project.

- LSLP expects and requires that all employees assist in maintaining a work environment that is free from the impairment of alcohol and drugs.

Subcontractors to LSLP must meet or exceed the provisions of the above

For more information regarding this program, refer to the current Doc # **LED-HSE-WMT-PGM-001 - Drug and Alcohol Program.**

4.6 FOREST FIRE PREVENTION AND MITIGATION

Reference: B.C. Wildfire Act General Regulation

The B.C. Wildfire Act requires persons conducting an industrial activity or a prescribed activity (s. 7) on forest or grass land or within one kilometer of forest land or grass land to conduct fire hazard assessments and abate if required.

Prior to the start of work LSLP will develop a Fire Hazard Mitigation Plan that will include a designated Supervisor as a Fire Boss. This position can be any person best suited by position, background or duties to take charge of the fire preparation activities, and who will ensure:

- All permits, training, equipment, supplies, processes, and other requirements pertaining to fire prevention, response and awareness are in place and in good working order.
  - Workers receive basic instruction on the initial steps to take in case of a wildfire, including reporting them.
  - The TMEP Regulatory Compliance Team contact is notified as soon as practical after contingency measures have been implemented in the event of a fire.
  - Construction equipment is inspected periodically to reduce the build-up of debris in areas which could pose a fire hazard.
  - Adherence to the LSLP Steep Slope Safety Plan and TMEP HSMP Section 57 Working on Steep Slope.
  - The fire scene is inspected and direct measures to control suppression implemented.

- The transportation of fire suppression equipment and personnel to the fire scene is authorized and organized, subject to consideration of the behavior of the fire, the safety, training, and fitness of personnel, and the availability of equipment.
- The removal of explosive or flammable materials, vehicles, etc. to a safe location is organized.
- The continuation of fire suppression efforts until the fire is extinguished continues until otherwise notified or until relieved by the agency having jurisdiction.
- All embers are extinguished and that the burn area is monitored for smoldering material for a length of time that ensures there is no further danger of the fire re-staring. The use of infrared scanning equipment may be used to detect any residual hot spots. All work will be restricted during extreme fire hazard periods unless an exemption, variance, permit or other authorization from a recognized regulatory agency has been obtained. In such cases, all worker training, equipment, and other requirements will be met prior to the work starting.

See **Appendix G** of this PSSP for reference.

Firefighting Equipment

- All vehicles and equipment shall be equipped with a 20-lb. fire extinguisher. UTV can utilize a 5 lbs fire extinguisher.
- 2- 20-lb fire extinguishers shall be at all fuel storage areas, and compressed gas cylinder storage areas with “NO SMOKING” signs posted.
- 10 lb fire extinguishers shall be in all office trailers, the warehouse and throughout the camp facility
- Portable water delivery system and hand tool (Pulaski’s, shovel) to carry out fire suppression work will be with every crew or on every project vehicle depending on activity and risk.
- Smoking shall be in designated areas only
- In the event of a Fire, the Emergency Response Plan shall be initiated

4.7 OCCUPATIONAL HEALTH PROGRAM

Respiratory Protection

- See Ledcor Document # **CON-HSE-WMT-PGM-009 – Respiratory Protection Program**
- All workers employed on LSLP projects who are exposed to potential hazards associated with airborne contaminants are required to participate and comply with a project specific respiratory protection program, which includes receiving proper fit testing, instruction, and training on:
- Responsibilities
- Training
- Use of Respirators
- Respirator Selection
- Dual Cartridge Respirators/Filters
- Qualitative or quantitative Pressure Fit-Testing
- Inspection and Cleaning
- User Cooperation and Monitoring
- Complete records will be kept on each workers personnel file.

- All workers required to wear respiratory protection must be clean-shaven where the respirator contacts the face to ensure a proper seal is maintained.

Noise

Noise Induced Hearing Loss is the number one occupational illness.

- LSLP will periodically monitor noise levels throughout this project.
- All results of testing shall be kept onsite.
- Results of noise monitoring will be communicated to workers.

Hearing Conservation Program

- See Ledcor Document # **CON-HSE-WMT-PGM-010 – Hearing Conservation Program**
- CSA/ANSI approved hearing protection must be worn when the noise level in a work area exceeds the exposure limit of 85 dB. In addition, on this project, a hearing conservation program is to be implemented when workers may be exposed to levels equaling 85 dB or higher over an eight-hour time weighted average.
- Dual protection will be required when workers may be exposed to levels equaling 105 dB or higher. This needs to line up with Ledcor supplementary program on Hearing Conservation, which states that “any” exposure above 85 dB requires single and any exposure above 105 dB requires dual protection. The TWA are for inclusion in a program of hearing monitoring, etc.
- Noise hazard/hearing protection requirement signs must be posted in and around facilities where the permissible occupational exposure noise levels may be exceeded.
- Evaluations will be done on a regular and periodic basis of specific tasks or task areas to determine the level of hearing protection required.

Airborne Contaminants

Airborne contaminants such as vapours, dust, and fumes, among others, are to be included as a risk to be considered as each crew goes through the FLHA each day and at the start of a new task or as the crew enters a new work area.

- An evaluation of work scope and worksite environment by the Safety Coordinator will be performed on a regular basis, depending on the work situation, to determine if airborne contaminants exist.

LSLP Health And Medical Services Plan (HMSP)

LSLP will develop a HMSP that will complete the TMEP Camp health Medical Services Plan that will ensure that local health service providers are not overburdened.

LSLP will ensure that the MHSP includes:

- The identity of necessary protocols (e.g. patient transfer) and management for predictable impacts to health and emergency services in local communities.
- Allowance for the Project to be self-sufficient to the greatest possible extent but make provision for trauma care in collaboration with TMEP provided clinics, local health care providers and, otherwise, generally promote good health protocols to project personnel.
- Relevant contact information and communication protocols with local health services.

- Requirements for medical personnel onsite.
- Medical emergency response protocols (for different scenarios such as a medical emergency, automotive incident or other casualty, toxic exposure, etc.).
- Communications in a medical emergency.
- Health promotion programming.
- Incident investigation.

4.8 WORKERS MENTORSHIP PROGRAM

See Ledcor Document # **CON-HSE-EDU-SP-003** - **Mentorship Program.**

During Project Orientation, the Safety Coordinator and project supervisory personnel will identify all new workers who fulfill the requirements for entry into the LSLP Mentorship Program.

- They will be assigned a mentor by the crew Supervisor and approved by the Project Superintendent.
- The mentor will provide periodic and regular assessments of the workers' progress to both the Supervisor and Safety Coordinator.
- The mentor will recommend the worker for graduation from the Program when the worker shows consistent safe and professional work practices.
- All personnel identified at orientation as needing mentorship as per the LSLP Mentorship Program will be identifiable with a green hand sticker placed on their hard hat until graduation from the program.
- Person under the age of 18 years are not permitted on the project.

4.9 MODIFIED/RESTRICTED WORK

See Ledcor Document # **LED-HSE-SYS-PGM-018.- Occupational Injury or Illness Management Standard**

The Modified/Restricted Work Program is available for all LSLP employees who have suffered an injury or illness related to or sustained while in the performance of his or her duties.

Purpose:

To promote a return-to-work philosophy that reduces the potential for the duration and/or severity of time loss injuries.

Responsibility:

- The Project Superintendent is responsible for the overall operation of the program.
- The Safety Coordinator and Manager of Health and Wellness (Head Office position) are responsible for the administration of the program at the field level.
- The Worker is responsible for informing their physician that modified work is available and, with the physician's approval, participate in the program.

Modified/Restricted Work Available:

- The work that an injured worker can safely perform will be negotiated with the worker, the Doctor, and the Supervisor, keeping in mind the physical capabilities of the worker based on the injury and the recovery schedule. Assigned work must be of a useful and meaningful nature.
- The following are samples of work that may be available:
  - Site security
  - Site maintenance
  - Warehouse assistant
  - Parts runner
  - Participate in training courses
  - Review and support of development of SWPs, JHAs, etc.

4.10 SAFE DRIVING PROGRAM

See Ledcor Document # **LED-HSE-WMT-PGM-003. – DriveSafe Program**

Vehicle Policy / DriveSAFE Program

LSLP values workplace safety and ensures that Authorized Vehicle Operators work in a safe environment, including being committed to incident-free driving. All project personnel

Vehicle Operators

All vehicle operators are responsible for the vehicle's safe operation and condition. Vehicle operators are responsible for:

- Providing and maintaining a current driver's license
- Facilitating the collection and review of your driver's abstract (Motor Vehicle Record)
- Conducting regular inspections of the vehicle (Daily Inspection)
- Conducting a pre-use 360 circle check inspection and adhering to the cone policy
- Ensuring the proper storage and securement of any transported items or material
- Ensuring the wearing of seatbelts by all vehicle occupants
- Driving with due care and attention and according to the conditions of the road and weather
- Taking every possible precaution to avoid collisions or incidents
- Reporting all incidents, losses, damage, and program violations related to Ledcor business to their supervisor immediately.

All vehicles operated on Ledcor business will be operated in accordance with applicable traffic laws and in a courteous and safe manner. Failure to do so may result in disciplinary actions up to and including termination of employment

Following orientation, all personnel expected to operate or spot on the project, must complete the LSLP Spotter Competency and review the Spotter SWP. Only those deemed competent will receive the spotter trained sticker identifying them and must be worn on their hardhat. Personnel who have not participated in the competency and training are not permitted to spot on the project.

See Ledcor Document # **CON-HSE-WMT-FM-017 – Spotter Competency Assessment** and

Document # **CON-HSE-WMT-SWP-032 – Spotter Safety SWP**

Vehicle requirements

All project vehicles will be equipped with the following as a minimum:

- Fire extinguisher (20 lbs for light and heavy-duty vehicles, 5 lbs on UTV)
- Buggy whip that extends at least 2.5 m (8 ft) in height measured from the ground.
- Backup alarm on all vehicles over 907 kb (1 ton).
- First Aid Level 1 Kit
- Spill Kit
- ERP of Flash Card
- Fire fighting hand tool (Pulaski, shovel)
- Backpack pump
- Cone

Smoking

There is to be no smoking in any LSLP owned or leased equipment or vehicles.

Smoking is not permitted while refueling or around fuel storage areas, compressed cylinder (propane) areas, nor is it permitted within site office trailers where exposure to secondhand smoke is a possibility. Smoking will also not be permitted within any client facility, valve station, or any sour environments.

Smoking is only allowed at project designated locations. No smoking shall be allowed within 15 meters of any hot line excavation.

Cell Phone Use

It is the policy of LSLP to provide a safe and healthy work environment for its employees, contractor employees and members of the public. The policy is intended to ensure the safe manner in which an employee may use a cellular phone and/or electronic device, whether the device is issued by LSLP or owned by the employee.

As part of the TMEP Project policies, all hands-on cellular devices are PROHIBITED to be used while operating a vehicle or equipment.

Sending text messages, operating electronic devices with headphones, such as iPods and MP3 players, is always prohibited while driving or operating heavy equipment.

Vehicle Preventative Maintenance Program

All routine maintenance of LSLP vehicles will be the responsibility of the employee assigned to operate that vehicle. Each day, a formal inspection of each vehicle will be performed and documented by the operator of each vehicle. Deficiencies noted on the inspection form will be addressed by the site mechanic as soon as possible. If a serious deficiency is noted during any inspection; or at any time during the course of the project, the operator will remove the vehicle from service immediately until necessary repairs have been completed.

4.11 SCHOOL AND PLAYGROUND ZONES

To limit traffic exposure to students during construction (heavy loads), LSLP and Trans Mountain will implement mitigating measures to reduce the impact during school hours:

- School and playground zone speed limits will be strictly adhered to.

- Barricades and other safety measures will be installed as required to prevent children for entering construction areas.
- Stress to all employees at orientation the importance of adhering to all traffic signs, and regulations when driving or working within a school zone.
- Limit heavy load traffic during school times when students are arriving and departing to allow for ease of school bus and other school related traffic flow through the school zone:
  - 8:00 to 9:30 am
  - 2:30 to 4:00 pm

See the LSLP Project Specific Traffic Management Plan for further information.

4.12 WORKING ALONE

LSLP, its contractors and sub-contractors will take required precautions to eliminate the need for workers to work alone on this project. For work situations requiring Working Alone, LSLP and all subcontractors must develop a Working Alone Plan which meet or exceed Part 4 of the WorkSafeBC regulations prior to allowing any workers to work alone. Working Alone is defined as:

- Working alone is when assistance is not readily available in the event of an injury, illness, or emergency, and when working at, or travelling to, an isolated location.

4.13 WORKPLACE CONDUCT (HARASSMENT, VIOLENCE, AND BULLYING)

See Ledcor Document # **LED-HSE-SYS-PCY-003 – Prevention of Harassment and Violence Policy**

HARRASSMENT – See Ledcor HR Harassment Free Policy and Procedure – Canada.

Refer to **WorkSafe BC Bullying and Harassment** for additional resources.

This Policy and Procedure addresses:

- Identification of issues that may be considered workplace violence such as:
  - Threatening behavior towards others,
  - Including threats made verbally or in writing (e.g., e-mails, texts, social media postings),
  - Intentional bullying or harmful teasing,
  - Aggressive behavior in the workplace,
  - Intentional damage of property belonging to others.
- Employee training, to ensure employees can properly identify and report all incidents of harassment or violence, method of reporting incidents of workplace violence, harassment and bullying.
- Commitment to follow-up on all reports of workplace violence, harassment, and bullying.

All claims of harassment or violence are to be investigated and documented by the contractor management.

5.0 CONSTRUCTION STANDARDS

5.1 BLASTING

- Only individuals with a valid Blaster's Certificate handle and detonate explosives.

- All blasting shall be performed according to BC blasting requirements specified in WorkSafe BC, Regulation, Part 21, Blasting Operations and the LSLP Blasting plan.
- To protect residents and the public blasting crews shall place appropriate signage and barricades to restrict entry into the blasting area.
- Care will be taken to prevent damage to nearby structures, such as overhead power lines, strung pipe, as well as underground facilities such as, the existing in-service TM pipeline, gas lines, water lines, and data transmission lines.
- Blast mats must be used when in proximity to any structure of facility that may be impacted by fly rock.
- All required permits will be obtained by the Contractor.
- A potential hazard exists when the pipeline route crosses or parallels electrical transmission lines.
- A Hazard Assessment must be completed for blasting activities begin at any new location or when site conditions have changed to where a new hazard is present.
- Proper techniques and protection will be employed when blasting in locations, where the pipeline route parallels or crosses an electrical transmission corridor because there is a

Suspension Of Blasting Operations

Blasting operations will be suspended because of existing adverse weather conditions, such as, high winds, snow, pending electrical storm; or dry conditions.

Safe Blasting Requirements

- All moving equipment, including trucks, used close to electrical blasting operations shall be grounded.
- Mobile radio transmitters, cellular phones shall be kept well away from areas of the electrical blasting operations and signs shall be posted to have all transmitters near the site turned off.
- Drill holes shall not be left loaded overnight unless approved by the TMEP onsite Management.

5.2 BRIDGE INSTALLATION

Due to the numbers of variables regarding bridge installation, if a bridge needs to be installed it will, therefore, require a specific safe work plan (JHA) to ensure all safety and environment issues have been considered and appropriate mitigation plans put in place.

Upon completion of installation and throughout bridge use, deck and bridge area must be kept clean to prevent foreign materials (solid, etc.) from entering water-way below.

- Side rails to prevent traffic from sliding off bridge deck must be in place.
- Workers may cross bridge in center only.
- Appropriate signage and ramp to be in place prior to opening bridge to traffic.
- Bridge must be secured with blocking, rigging or hoist equipment prior to bolt up.
- Bridges shall have a load rating established and clearly marked in accordance with provincial regulation.

5.3 BORES AND DIRECTIONAL DRILLING

Refer to **TMEP's Damage Prevention Program**.

Safety Considerations For Boring And Directional Drilling

- A Hazard Assessment must take place before boring or horizontal drilling activities start.
- Barricades and signage to be erected along with flashing lights to ensure public is aware of ongoing work activities.
- Concrete barricades to be erected at all public road crossings as per MOTI Standards.
- Bell holes must be appropriately sloped per OH&S regulatory requirements unless other effective means are in place such as trench boxes or shoring.
- Workers must stay a minimum of 1.8 m (6 ft.) away from an operating auger.

5.4 BRUSHING AND CLEARING

Before starting any brushing or clearing activities, Contractors shall assess the ROW and perform a JHA. Hazard mitigation will be determined by the specific findings of the JHA. Subcontractors conduct these activities must submit the safe work practice, procedure, and applicable steep slope work plans for review prior to starting the work.

5.5 DANGER TREES

If there are any suspected danger trees, the Contractor shall have them inspected by a certified Dangerous Tree and Wildlife Tree Assessor.

- Training records for workers felling trees are required for BC workers.
- Employees must have and produce training records relative to the work they are required to perform.

Guidelines For Felling Trees

The ROW must be assessed for danger trees and be removed by a competent tree faller.

- All tree faller must have a certified faller certificate from BC Forest Safety Council or Enform.
- Competency certificates must be retained by the employer.
- Fallers must move away to a predetermined safe zone, when a tree starts to fall.
- All vehicles and equipment must be parked a minimum of 100 m (330 ft.) from the falling area.
- All equipment working in area must have Roll-Over Protection System (ROPS) and Falling Object Protection System (FOPS); screens and roll-cages.
- Clear and concise hand signals must be used between workers.
- To protect the environment all chain saw fueling must be done inside drip trays or on top of absorbent pads.
    - Fueling is not allowed within 100 m (330 ft.) of a water course.

5.6 CAMPS

- Camps are considered separate worksites from the facilities and pipeline construction worksites and are not be under the prime contract responsibility of LSLP.
- Camps will meet all regulatory requirements pertaining to occupancy, health/medical, hygiene, fire protection, muster points, and provide for an overall safe, quality experience for camp residents.

- All required camp safety, security, health, and environment plans, or combinations thereof will be submitted for acceptance by the camp contractor.
- Camps are subject to regular audits for safety compliance by TMEP safety personnel.

5.7 CONSTRUCTION VEHICLE TRAFFIC

An appropriate traffic control system and procedures will be implemented and communicated to all personnel as per the site-specific Traffic Management Plan (TMP) and Traffic Control Plan (TCP).

Trained traffic control persons will be provided at specific locations and road accesses for the delivery of large equipment and machinery.

Other hazard warning signs will be installed as per MOTI requirements at locations where they are needed as per applicable Traffic Control Plans

The use of electronic devices while driving or operating equipment on-site is prohibited. Refer the LSLP Driving Safe Work Practice.

Without exception, a spotter must be used when whenever a heavy commercial vehicle is backing up.

Driving In Residential Areas

Driving in residential areas will be avoided as much as possible.

Residential streets must not be used as a shortcut to the worksite.

If residential streets must be used to access the worksite, workers must consider the following:

- Watch for traffic signs, be aware that they can sometimes be obstructed by trees or parked vehicles.
- Pay attention to and obey all posted speed zones, especially playground and school zones.
- Watch for children playing on the streets or riding bikes; and
- Limit distractions, such as, tuning the radio.

Gravel Trucks / Delivery Trucks

- Must be escorted onto site and off site if the driver has not received site orientation.
- Drivers who do not have the proper PPE shall remain in the cab of their vehicle.
- No person shall attempt to slam the tailgate of a dump box shut with their hands.
- Drivers are not permitted to drive away from the dump site with the box still in the air; it must be fully lowered after dumping the load.
- Drivers of trucks with a gross weight over 5,500 kg (12,000 lbs.) working in the upstream oil and gas industry are required to be certified in an Enform or equivalent driver course per BC OHS Part 23.22.

Crossing/Working On Or Adjacent To Roads, Or Railways.

The Contractor shall not conduct any work, load, or unload equipment / material where a hazard is created to traffic, trains or the public, unless adequate traffic control measures are used to control or stop the approaching traffic and prevent damage to road surfaces.

Flag persons must be present to control traffic for any vehicles or equipment that are:

- Backing or unloading equipment on main access roads or facility roads; or
- Backing out onto main access roads, or facility roads.

All flagging personnel shall wear appropriate high visibility clothing, carry approved paddles and must be adequately trained in accordance with the appropriate regulatory jurisdiction.

5.8 GRADING

Grading along the ROW will vary from only topsoil stripping in some areas to extensive cuts and fills in other areas.

Before the ROW is graded Contractors must verify that:

- All underground utilities are marked.
- TMEP crossing agreements are in place.
- Grading requirements in EPP and Environmental Alignment Sheets are followed.

Please refer to Appendix C Ground Disturbance Program for further details.

5.9 HOT WORK

The scope of Spread 3 & 4A does not include work within a TM facility. For hot work at pipeline crossings or other locations/conditions where there could be a risk of fire, precautions to be taken may include:

- Atmospheric testing showing that the atmosphere does not contain a flammable substance.
- The area is free of or is suitably isolated from flammable and combustible materials.
- Flammable liquids and vapors are isolated by:
  - Ensuring that open drains within 15 m (50 ft.) have a cover and water seal; and
  - Ensuring that all potential flammable vapor sources located with 15 m (50 ft.) of the worksite are isolated (e.g., sample points, vents).
- Record atmospheric test results on the FLHA at the start of the hot work, after any breaks and at any time when the work has stopped for more than 20 minutes.
- When hot work (welding, cutting, grinding) is to be performed in areas that are within 15 m (50 ft.) of any flammable or combustible material, fire blankets, welding blinds, must be used to contain all sparks produced during the hot work process.
  - All hot work must stop if sparks are seen leaving the contained area. In this case, additional precautions must be put in place to contain sparks.
  - Fire blankets should be installed in such a manner that they extend well above the site where welding, cutting, etc. is being done.
- Fire extinguishers must be readily available
- Following completion of the task or at the end of the day, a designated crew member must remove any equipment that poses a risk to site safety and store it in a non-hazardous area.
- If a fire watch was required (check permit), the fire watch shall remain on the site at least 60 minutes after completion of work and shall check the site again four hours after completion of the hot work.

5.10 HYDRO TEST

TMEP will provide the Contractor with the pipeline hydrostatic testing specifications to be followed.

Test pressures, test durations and other technical specifications will be included in the specifications.

- A Hydrostatic Test Plan (Plan), based on TMEP specifications, will be developed 14 to 30 days in advance of the hydrostatic test and submit it to TMEP for approval.
- The Plan will include the identification of key roles and responsibilities which must be filled by competent personnel, such as:
  - Test Manager/Supervisor,
  - Pump Operator, Mechanic,
  - Measurement and Testing Engineer,
  - 2 technicians to assist with recording test readings and periodically checking test header for leaks.
- Identification of records required to support the success of the tests (Canadian Standards Association [CSA] Z662 8.5.7).

In addition to the General Plan a job specific Hydrostatic Test Safety Plan (JHA) will be submitted for each test section.

- Both Plans must be approved by TMEP before the start of the hydrostatic tests.
- All hydrostatic test equipment and components are to be checked to assure they are in good condition, pressure rated and certified before use. This may include:
  - Pressurizing pumps,
  - Interconnecting pressure piping and fittings, test manifold, gauges, and fittings.

Contractors shall have available the necessary safety equipment, e.g., portable fire extinguishers, first aid kits, lighting, whip checks, sandbags, shovels, barriers, and other safety equipment as identified in their site-specific safety plan.

Hydrostatic test warning signs are to be posted on public roads one day before the start of test at access roads/trails to the ROW.

- Signs shall be placed by the Contractor per municipal guidelines and federal/provincial regulatory requirements.
- Additional signs will be placed adjacent to the highway at ROW entrances.
- These signs will remain in place the test section of the pipeline is no longer under pressure
- Contractors may be required to barricade roads and trails that intersect and cross the pipeline to prevent them from being driven over during filling and pressure.

Safety Considerations During The Hydrotest

Listed below are the minimum safety standards for hydrostatic testing of new pipeline systems.

- The safety zone around the test will be maintained at 30 m (100 ft.), along the length of the pipeline.
- Only necessary equipment and personnel are to be allowed in this zone when the pipe is under pressure.

- The signs shall read:

DANGER PIPELINE UNDER PRESSURE TEST

- Figure 9 Hydrotest Signage (Contact Information to be included)
- ROW work is prohibited during pressure testing.
- All unnecessary workers and equipment will stay out of the safety zone when the pipeline is pressured to strength and leak test pressure; workers and equipment may return when the pipeline is de-pressured and the hydrostatic test complete.
- Equipment required for the test is allowed in this zone, e.g., instrumentation, and pumps.
- The pipe cannot be visually inspected when the pressure is equal to or greater than 100% of the specified minimum yield strength (SMYS) of the pipe. (CSA-Z662 8.2.5).
- Once pressure is below 100% of SMYS the pipe can be visually inspected.
- The TMEP standard is very specific on inspection of piping while under test and must be followed.
- Safety around piping under test is critical.
- No visual inspection is permitted within 15 meters (50 feet) of the pipe while the test pressure exceeds 115% of MOP.
- Adequate lighting for night work, in accordance with the appropriate regulatory jurisdiction shall be provided.

5.11 PIPE BENDING

Bending crews will be required to follow the safety guidelines listed below.

- Bending machine operators shall conduct a daily pre-use inspection and ensure all findings are included in the equipment logbook.
- A qualified rigger will visually inspect all rigging equipment, including slings and tag them out of service or destroy them, if it meets OH&S rejection criteria. Refer to WorkSafe BC – Part 15, AB OH&S - Part 21.
- Workers are not permitted to place hands on the bevel when setting pipe.
- A 2 m exclusion zone from the bending machine and mandrel must be follow by all personnel.
- Only one worker will be designated as the person who can give hand signals.
- Any worker can give a stop signal in case of an emergency.
- Only workers involved in pipe bending are permitted in the area.
- Tag lines must be used to control the load.
- Hearing protection is required when working in the pipe bending area.
- Refer to LSLP Pipe Handling SWP

5.12 PIPE HANDLING

Pipe is loaded and transported by trains and trucks from the place of manufacture, to a stockpile. The pipe is then loaded and transported by the Contractor to the pipeline ROW.

The Contractor shall ensure:

- Appropriate lifting equipment is used to handle and move pipe, including:
  - Pipelayers.
  - Track hoes.
  - Boom trucks; and
  - Cranes.

Safety Considerations When Loading / Unloading Using Grapples And Hooks

- Use tag lines to maneuver the pipe.
- Use a properly designed pipe hook to prevent damage to the pipe coating.
- Consider using protective sleeves to protect pipe from damage.

Unloading / Loading Pipe From Trucks

- Inspect the site and conduct a FLHA.
- Ensure that all workers are clear when cutting steel bands or releasing chains or straps.
- Workers must ensure that hooks are securely affixed in the ends of the pipe before it is raised.
- Refer to LSLP Pipe handling Safe Work Practice
- All slings, hooks, cables, and tag lines must be inspected daily by the operator; defective equipment must not be used.
- Rigging equipment, including slings, will be visually inspected, and tagged out if deficiencies are found.
- Tension shall be maintained on the rigging and not removed until the load is secure.
- Secure pipe by blocking or use other approved method.
- Taglines are the only method permitted for workers to guide the pipe on TMEP project. LSLP will request a MOC prior to using other alternatives of controlling the pipe.

5.13 RAILROAD WORK

Where work is undertaken within the railway Right-of-Way, workers must follow the Owner's safe work procedures for working on railway property which may include:

- Specific requirements as dictated in the crossing agreement (where applicable)
- For work on CN property, workers must complete an online safety orientation which can be found at the following link http://contractororientation.com/

5.14 STRINGING

The Supervisor shall ensure that:

- The load is properly secured, and pipe coating is protected.
- Towing equipment of proper size (winch cat) is available to assist the pipe truck on ROW in accordance to the LSLP Steep Slope Safety Plan and TMEP HSMP Steep Slope Section; and
- Means (bulkheads) are available to protect the driver if the load shifts.
- Edging of skids when stringing pipe joints is not permitted.

Induced voltage presents a hazard when stringing pipe in proximity to high voltage power lines. See the Project Quality Assurance (QA) requirement for pipe handling regarding the avoidance of damage to pipe coating

Loading And Unloading Skids From Skid Sloop

- Workers must remain on the side of the sloop
- Workers are not permitted between the sloop and the tow cat during movement.
- Riding on the skid sloop is prohibited.

5.15 LOWERING IN PIPE

The Supervisor is responsible for directing the crew in lowering pipe into the ditch.

- All direction will come directly from the Supervisor or his/her delegate.
- All Lowering-in equipment, side-booms or pipe layers must be inspected daily before use, using a checklist and the inspection noted in the equipment Logbook.
- All side-booms must have ROPS.
- Equipment operators must maintain visual contact with riggers and the foreman and must use industry-recognized hand signals. If visual contact cannot be guaranteed, radio communication can be used once this variance is documented and approved by the foreman.

Developed lowering in plans must be followed.

Safety Considerations For Lowering-In Pipe

- All equipment must not encroach closer than a minimum of 1 m (3 ft.) from the edge of the ditch.
- Workers are prohibited from walking under suspended loads, and from being in the ditch when pipe is being hoisted or lowered.
- All rigging must be inspected before use and worn slings discarded.
- Equipment operators must maintain visual contact with workers and Supervisors.
- Operators must refer to manufacturer's load chart to ensure hoisting is done within specifications.
- Safety latches are required on all boom hooks except when ditch entry is prohibited due to poor condition. On approval of the Supervisor, safety latches may be taped back for single lifts only.
- The ditch may be entered to remove rigging after the pipe has been set in the ditch once the ditch is deemed safe and all appropriate safety precautions taken as per OH&S Regulations.
- If the pipeline parallels or crosses high voltage power lines non-conductive slings shall be used.

5.16 TIE INS

Construction of the TMEP will involve several tie-ins, such as tying-in the TMPL to the new pipeline segments.

TMEP will develop the welding procedures for tying-in the TMPL.

- LSLP procedures will be used to tie-in new facilities with consideration to TMEP procedures.

Tie-in activities to piping systems that are in-service shall be detailed in a job plan under the direction of a Trans Mountain Construction representative.

The Contractor shall dig, and slope bell holes to allow for welding operations.

- If bell holes cannot be constructed to OH&S regulatory requirements trench boxes or shoring shall be provided.

Safety Consideration For Tie-Ins:

- Prior to the start of work a FLHA will be conducted and communicated to all workers at the Tailgate Meeting.
- Workers must not place any body part between pipe ends during pipe alignment.

Tying Into Existing TMPL

Tying into the existing TMPL pipeline requires a Safe Work Permit from TMPL operations of which the Lock Out Tag Out procedure will be initiated.

The existing TMPL line is coated with coal tar pipe coating which contains 10% to 25% asbestos by weight.

- Prior to work being conducted on exiting TMPL where coating will be removed, LSLP will:
  - Adhere to the WorkSafe BC Notice of Project (NOP) Requirements. See WorkSafe BC Section 20.2.1
  - LSLP will submit in the NOP to the Board at a minimum of 48 hours before the work begins. See link below to complete the NOP
- All workers working on the existing TMPL must review and acknowledge the requirements outlined in the Ledcor Asbestos Code of Practice and Removal of Coal Tar Coating JHA.

5.17 WEIGHT INSTALLATION

Some segments of the LSLP project will require buoyancy control at larger watercourse crossings and wetlands.

A variety of techniques will be considered during the work planning stage to determine the best available to control buoyancy including continuous concrete coating, screw anchors and bag weights given the circumstances of each site.

SAFETY CONSIDERATIONS FOR TRANSPORTING WEIGHTS

- Conduct a Tailgate Meeting and FLHA before unloading weights.
- Weights must be secured using chains or ratchet straps.
- Weights must be hoisted only at approved lifting points.
- Weights must be assessed prior to moving to ensure equipment and components can safely unload them.
- Ensure rigging is in good condition prior to hoisting weights. Only approved and certified rigging may be used.

5.18 WORKING ON SLOPES/STEEP SLOPES

See LSLP Steep Slope Safety Plan – Appendix I and applicable steep slope work plans.

Some of the LSLP project will require that Contractors operate equipment and perform work on steep slopes.

Planning

During the Access Clearing Grade Planning, LSLP will perform a site assessment of slopes to determine degree of slope and possible soil conditions and develop Steep Slope Work Plans as per LSLP Steep Slope Safety Plan and the latest approved HSMP Steep Slope section. See Appendix I of the PSSP.

Hazards Associated With Working On Steep Slopes

- Equipment operators are unable to see ground support workers (ground support workers working in operator's blind spot).
- Rigging Failure (improper rigging, or component failure).
- Miscommunication between workers.
- Equipment failure including booms, cables, winches, and hydraulics.
- Equipment, loss of traction due to soil conditions, e.g., wet, frozen, unstable rock.
- Excavator instability due to changing forces when swinging.
- Ground conditions for ground personnel.
- Instability due to vertical and horizontal slopes.

Table 5 indicates when Contractors are required to develop site specific procedures for working on slopes.

STEEP SLOPE PROCEDURE REQUIREMENTS

Class	Color Code	Slope	Assessment	Requirement
Unclassified	**None**	**5° – 15°** **8% - 27%**	• Assessment by supervisor to confirm if any anchoring is required.	• Typical construction methodology when no anchoring is needed, similarly to when no slope is identified. • JHA required if anchoring is required.
A	**Green**	**15° – 21°** **28% - 40%**	• Assessment by competent steep slope assessor.	• Steep Slope Work Plan. • Use of typical engineer drawing for anchoring as required.
B	**Blue**	**21° – 25°** **40% - 45%**	• Assessment by competent steep slope assessor	• Steep Slope Work Plan including anchoring plan. • Use of typical engineer drawing for anchoring.
C	**Orange**	**25° - 30°** **45% - 58%**	• Engineer hazard/ risk assessment •	• Site Specific Steep Slope Work Plan including anchoring plan. • Site specific engineer drawing required for anchoring.
D	**Red**	**30° - 35°** **58% - 70%**	• Engineer hazard/ risk assessment	• Steep Slope Work Plan including anchoring plan. • Site specific engineer drawing required for anchoring. • No wheeled vehicles allowed on slope of 30° or more.

Class	Color Code	Slope	Assessment	Requirement
E	Black	35° and above >70%	• Engineer hazard/ risk assessment	• Steep Slope Work Plan including static anchoring after clearing. • Site specific engineer drawing required for anchoring. • No wheeled vehicle allowed.

GUIDELINES FOR WORKING ON STEEP SLOPES

- All work must be done parallel to the slope, never across the slope.
- Read the Equipment Operator's Manual, review lift capacities; lift capacities will decrease on slopes or soft ground, verify in Operator's Manual.
- Ensure decreased lift capacities are factored in when lifting on slopes for: lifting pipe, excavators lifting soil and material.
- Perform equipment checks, to minimize equipment failure, prior to working on slopes:
  - Lubricant and fluid levels may be different than for work on flat ground,
  - Ensure proper level for slopes,
  - Check operational controls, such as, brakes, counter-weight movement,
  - Adjust the equipment seat to ensure maximum operator stability,
  - Ensure all items in the equipment cab are secure, e.g., lunch boxes, tools.
- Conduct a JHA and Tailgate Meeting, review:
  - Hand signals - ensure that all crew members have received proper training and are aware of and understand all hand signals,
  - Ground workers shall not work between equipment on steep slopes due to potential equipment or rigging failure,
  - Ground workers must stay at least 0.6 m (2 ft.) from any moving part of equipment, e.g., counterweight or boom, pipe,
  - Ground workers must never place themselves under suspended loads,
  - Ground workers must stay in the operator's view at all times,
  - Avoid leaving equipment unattended on a steep slope,
  - If the equipment must be left unattended ensure that:
    - All loads are lowered.
    - The park brake is fully engaged.

5.19 ANCHORING

Hazards associated with anchoring are:

- Improper calculations as to the type, size, and weight of anchoring equipment,
- Improper selection cables and shackles,
- Improper positioning of anchoring equipment,
- Failure of components.

If anchoring of equipment is necessary, it must be ensured a procedure is in place that specifies:

- The equipment to be used,
- Proper cable sizes
- Proper shackles,
- Location of anchor point,
- Method of attaching anchor point to winching equipment,
- Location / position of anchoring equipment.

For more details on the steep slope, refer to the LSLP Steep Slope Safety Plan in Appendix I and the TMEP HSMP Steep Slope Section. Where discrepancies exist, the HSMP will take precedence.

6.0 SAFE WORK REQUIREMENTS

6.1 ASBESTOS

See Ledcor **Document # CON-HSE-WMT-SWP-037 - Asbestos Safe Work Practice**

Any asbestos work requires a Notice of Project be filed with WorkSafe B.C. Only persons trained and certified as competent to work with asbestos are permitted to be a part of this work crew.

General Requirements

- There shall be no eating, drinking, smoking, or chewing in work area.
- The designated asbestos work area boundary shall be identified by placing barricades, fences and/or signage around the work area to restrict access.
- Only persons wearing protective clothing and equipment shall enter a work area where there is an asbestos dust hazard.
- Remove material by way of hand tools, using methods to best reduce the potential for fragmenting the asbestos (avoid creating asbestos ‘dust’).
- Avoid, as best as may be reasonably achieved, standing downwind of asbestos ‘dust’.
- Frequently during the removal work and immediately upon completion of the work, dust and waste containing asbestos shall be cleaned up and placed in an asbestos disposal bag.
- Do not use compressed air for cleaning, including clothing, tools, personnel or other.

6.2 BURNING

See the LSLP Environment Management Plan and Fire Mitigation Plan – Appendix G for the controls and systems regarding the burning of debris during pipeline construction.

When burning, all necessary precautions to avoid starting a forest fire will be in place.

Precautions include:

- The Supervisor will ensure that:
  - Burn piles are not a hazard to underground facilities or above-ground structures.
  - Burn permits will be obtained for all burns, but especially in the spring, summer or fall.
  - Burn sites are carefully selected to ensure it is positioned at a location that has the least risk of the fire spreading.
  - Fires are always monitored:
    - Fire Watch has appropriate communication equipment to summon help if required.

    - Fire Watch has adequate equipment, such as, shovel and water supply to extinguish small fires.
  - Wind conditions and smoke or burn debris is not a hazard to the public or workers.
  - Signage shall be in place when required to alert travelling public.

6.3 SLINGS AND CABLES

See Ledcor Document No. **IND-HSE-WMT-PGM-003 – Hoisting & Rigging Program**

Use of lifting chains is prohibited on LSLP projects without the prior approval of Senior Management.

Defective or damaged chains, slings, cables, or components must be tagged and removed from service immediately. Hooks, rings, links, or any coupling device must have a rating equivalent or greater than the chain, sling or cable to which it is affixed. Never use makeshift links or coupling devices. All chains, slings and cables must have an identification tag attached showing its load rating and limitations.

Slings

The following practices will be followed when using slings:

- Slings damaged or defective will be removed from service.
- Slings will not be shortened with knots or bolts or other makeshift devices.
- Sling legs will not be kinked.
- Slings will not be loaded beyond their rated capacity.
- Slings used in a basket hitch will have the loads balanced to prevent slippage.
- Slings will be securely attached to their loads.
- Slings will be padded or protected from the sharp edges of loads.
- Suspended loads will be kept clear of obstructions.
- All employees will be kept clear of loads about to be lifted and/or suspended loads.
- Hands or fingers will be kept clear of loads and not placed between the load and the strap.
- Shock loading will not be allowed.
- Slings will not be removed while loads are resting on the sling.

Wire Rope Slings

Wire rope slings will be removed from service when the following conditions are present:

- There are ten randomly distributed broken wires in one rope lay or five broken wires in one strand in one rope lay.
- Wear or scraping on one-third the original diameter of outside individual wires.
- Kinking, crushing, bird caging, or any other damage resulting in distortion of the wire rope structure.
- Evidence of heat damage.
- Hooks opened more than 15 per cent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.
- Corrosion of the rope or end attachments.

Synthetic Web Slings

Synthetic web slings will be removed from service when any of the following conditions are present:

- Signs of acid or caustic burns
- Signs of melting or charring of any part of the sling surface
- Snags, punctures, tears, or cuts
- Broken or worn stitches
- Distortion of fittings

6.4 CONFINED SPACE

See Ledcor Document # **CON-HSE-WMT-PGM-001. – Confined Space Program**

Anyone entering a workspace that falls within the parameters of a confined space will perform a hazard assessment, followed by the application of the Ledcor Confined Space Procedure.

6.5 ELECTRICAL SAFETY AND OVERHEAD POWER LINES

See Ledcor Document # **CON-HSE-WMT-SWP-005. – Overhead Power Line Safety SWP**

The guidelines provided by WorkSafe BC OHS Regulations for maintaining minimum safe distances must be followed.

At all times, workers shall maintain minimum clearance distances unless alternative regulatory acceptable procedures are put in place.

- Safe limits of approach will be further identified by using goal-post style of overhead cable guards and signage, which will be installed on paths or roads on both sides of an overhead utility to provide a physical indicator of when a load is too high to travel under safely.
- In urban areas, the use of a dedicated spotter and signal system in a written procedure is an acceptable substitute for goal posts.

6.6 EXCAVATIONS, TRENCHING AND SHORING

Refer to Part 20 of the B.C. Health and Safety Regulation in addition to the Ledcor Documents on Excavation, Trenching and Shoring.

Adequate protective systems such as benching, sloping, or shoring when the excavation sides of a trench are more than 1.2m deep and intended for worker entry will be installed.

A B.C. registered Professional Engineer will design any protective systems needed for excavations over 6.1m (20 ft.) deep or that are otherwise unable to be constructed to meet regulatory requirements

The PE/P Eng. design documentation will be kept onsite to be available for inspection.

An LSLP employee who has been deemed competent in excavations will conduct daily excavation inspections prior to anyone entering an excavation using the Safe Excavation Entry Checklist form found at the end of the Ground Disturbance Plan in Appendix D of this document, a copy of which will be kept at the site of the excavation.

- If the inspection shows the excavation to not be safe for workers to enter, the unsafe condition will be mitigated prior to resuming work.

A secured ladder, ramp, or other means of egress will be provided within (7.6m) of all workers in a trench that exceeds 1.2m in depth and/or when using a trench box.

- Ladders must extend a minimum of 3 feet (1 m) above the edge of the excavation.

The Hazard Assessment will determine if there is a potential for the excavation to contain a hazardous atmosphere and what atmospheric monitoring (e.g. O2, LEL, H2S, CO), will have be conducted prior to a worker entering an excavation that exceeds 1.2m in depth.

Excavated material must be placed at least 1 m from the edge of the excavation.

If walkways are provided over excavations, they must be able to support the weight of the traffic, guardrails, and toe boards.

- Every crossover must have engineering design documentation and meet regulatory design standards.
- Toe boards will be installed on any walkways where workers are working below the walkway.
- Excavations will be secured to keep vehicles and unauthorized personnel out.
- High visibility fencing material placed 1.2m from the edge of the excavation, when possible, will be used to warn of the danger in high profile/vehicular traffic areas.

Before excavating equipment can be used for material lifting, the operator must ensure:

- A Lifting Capacity Chart is readily available for the equipment being used;
- The weight of the material to be lifted is known;
- The machine is equipped with an approved (factory supplied) lifting point, e.g., a welded plate with an eye or a bolted-on hook with a safety latch;
- An Engineering Certification dated within the previous 12 months that certifies the lift point and its method of attachment (i.e., bolts, welds) is available;
- The lifting point is visually inspected before each lift.
- Bolts used to attach hooks or other attachment points must be rated higher than the lifting capacity of the excavating equipment.
- Slings should be connected to the lift point using a clevis or shackle.
- Slings or the clevis or shackle are not to be placed in a hook that does not have a suitable safety latch.
- Slings are not to be placed on a hook with sharp edges, which could damage or cut the sling.
    - Damaged slings shall be taken out of service immediately.
    - Unattended hooks must be lowered to the ground or blocked in position.

6.7 FALL PROTECTION

LSLP will follow the applicable legislated fall arrest requirements of WorkSafe B. C. Occupational Health and Safety Regulation Part 11 (1) (a) and the Canadian Occupational Health and Safety Regulation 12.10 (1)

On this project the fall protection/restrain will be required when there is a potential of a fall by worker at height of 1.83 m (6ft.)

If there is a conflict between the LSLP standard, applicable regulations or Trans Mountain requirements, the most stringent will apply.

The fall protection plan will be kept available at the work site and will be reviewed with workers before work with a risk of falling begins.

The plan will be updated when conditions affecting fall protection change.

A competent person will oversee fall protection compliance.

Any deviation from the requirements of the Fall Protection Plan is cause for disciplinary action.

See Ledcor Document # **CON-HSE-WMT-PGM-007 Fall Protection Program.**

6.8 FLOORS, ROOF AND WALL OPENINGS

- LSLP will prevent falls from roofs, wall, and floor openings by ensuring proper safeguards are in place.
- Guarding and covers should be removed only after other means of protection are in place.
- When installing or removing guarding and covers falling hazards must be protected by alternative means throughout the process.
- Installation of a standard railing is required for floor perimeter and wall opening protection.
- Hydrovac cover will be a minimum of ¾ inch.

Key Requirements

- Wire rope used as top rail or/mid-rail must be ½" / 1.27 cm in diameter with at least three J-type fist-grip.
- Wire rope clamps at each connection and turn buckles every 100' / 30.4m.
- Use thimbles where the wire rope is connected.
- For construction work performed on low sloped roofs (less than 4:12 pitch), or work areas within 25' / 7.6m of an unprotected edge, a warning line system may be used as alternative protection.
- Stair railings must be constructed similar to a standard railing, but the vertical height must be 34-36" / 86.3-91.4cm from the top rail to the surface tread in line with the face of the riser, at the forward edge of the riser.
- Floor opening covers must be used for openings greater than 2" / 5cm and capable of supporting the maximum intended load and installed to prevent incidental displacement.
- During construction, Contractor must provide temporary stairs on structures that are two or more floors or more than 20' / 6.1m high until permanent stairways are in place.
- Runways must be guarded by use of standard railing, or the equivalent, on open sides above ground level.
- A toe-board will be installed on each exposed side of a runway when tools, machine parts, or materials are likely to be used.

6.9 HOUSEKEEPING

See Ledcor Document **# CON-HSE-WMT-SWP-019 – Housekeeping Safety SWP**

- Good housekeeping is mandatory**.**
- Work areas must be kept neat, clean, and orderly.
- If a Contractor's work area is not kept clean, the Company may have the area cleaned and charge the cost to the Contractor.

- The Company may also stop work until the area has been cleaned.

Key Requirements

- Work areas, passageways, fire exits, fire lanes, and stairs in and around the buildings and structures will always be kept clear of debris.
- All tools and equipment will be properly returned and safely stored after use.
- Walkways will be kept free of dangerous depressions, obstructions, and debris.
- Work areas will be cleaned daily, and debris disposed of in bear/animal proof dumpsters, or off site in accordance with environmental requirements.
- All unused material and equipment will be removed at the completion of the project.

6.10 H2S

During normal construction activities, it is unlikely that LSLP personnel will be exposed to H2S though precautions for potential exposure to H2S should always be observed.

Potential exists for exposure during events such as a pipeline rupture, leak, or other abnormal condition.

Although the risk of a pipeline leak is low, LSLP and its' contractors will address the possibility and include the proper response procedure in the project orientation.

- All workers on Greenfield facilities, such as the LSLP project, are required by TMEP to be made aware of H2S hazards and properties.

6.11 LADDERS

See Ledcor Document # **CON-HSE-WMT-SWP-002. – Portable Ladder Safety SWP**

Ladders must comply with CSA Standard Can 3-Z11-M81 (R2001) portable ladders, and ANSI Standard A14.5-2000 portable reinforced plastic ladders.

Key Requirements

- Metal ladders are prohibited for electrical work.
- Stepladders must be fully opened when in use and safety latches on extension ladders must be fully engaged.
- Always face the ladder when climbing or descending**.**
- When working, face the ladder with both feet securely on the rungs**.**
- Never stand, step, or sit on the top of a step ladder, straddle the ladder, work on leaned stepladders, or work with two people on the same ladder.
- LSLP will ensure ladders are:
  - Inspected before each use.
  - Ladders with broken or missing rungs, broken or split side rails, are without legible load ratings, or damaged components will not be used**.**
- Defective ladders will be tagged out of service and removed from job site.
- Must extend 3' / 0.9m above the upper landing surface.
- Must be secured to prevent slippage
- Workers must use the three-point contact rule while working or climbing on a ladder

- Barricades or guards will be positioned for areas impacted by ladder use.
  - Areas include, but are not limited to, passageways and doorways.
- Ladders must meet maximum load ratings.

6.12 LEAD IN CONSTRUCTION

Under no circumstances will any LSLP employee or subcontractor on TMEP install, remove, disturb, or handle Lead surfaces or materials without proper instruction and training. All Lead risk assessment, abatement, cleanup, and disposal activities will be conducted by a competent (i.e. Certified Industrial Hygienist, Registered Occupational Hygienist, or experienced with Lead abatement while working under an approved HSE program that clearly defines the Lead abatement procedure) Contractor or Client Representative.

- When there is a potential hazard of Lead exposure, all personnel at risk will receive Lead Awareness Training on how to identify potential sources of Lead and what to do when it is present. The location(s) of potential Lead will also be communicated.
- A competent person will conduct a Lead risk assessment before any abatement activity. During the risk assessment, surface and/or air monitoring must be used to determine potential Lead exposure.
- If Lead abatement is deemed necessary, the Construction Manager will determine notification of appropriate provincial workplace health and safety agencies within the timeframe required by legislation. Supervisors must notify all workers of the presence of Lead.
- The Construction Manager is responsible to ensure controls are implemented to reduce the risk of Lead exposure to workers to as low as reasonably practicable. Personal protective equipment is considered the last line of defense and should be used in addition to engineered and administrative controls.
- A documented procedure must be followed for removing, disposing, disturbing, or handling Lead in any way.
- Based on the hazard assessment looking at potential exposure concentrations, time exposed, and distance from the source, the frequency of air sampling shall be determined to ensure workers are not exposed to lead above the occupational exposure limit of 0.05 mg/m^3.
- Air monitoring shall be conducted as per OHSA standard 1910.1025 for Lead.
- The Construction Manager must ensure an exposure control plan is developed if workers are or may be exposed to Lead in excess of 50 percent of the occupational exposure limit (OEL = 0.05 mg/m^3), or if exposure through any route of entry could cause elevated blood levels.
- All areas with Lead must be identified with signage that indicates
  - Lead is present,
  - Only authorized persons may enter the area, and
  - Eating, drinking, and smoking are prohibited in the area.
- All workers who will be exposed, or potentially exposed, to Lead must be instructed and trained in;
  - The hazards and safe handling of Lead,
  - The written work procedures to be followed,
  - The correct operation and use of any required engineering controls and personal protective equipment,
  - Personal hygiene and decontamination procedures, and

- The purpose and significance of health monitoring.

All Lead removed during abatement activities must be adequately contained and labelled. Any Lead waste and dust must be cleaned away promptly.

6.13 LIGHTING

See Ledcor Document # **PCA-Light Plant-FRM**

LSLP shall ensure that adequate lighting is available to do work safely, both inside and outside buildings.

- Sufficient lighting will be available for office trailers, tool cribs, security and general grounds.
- Workers involved in the setup and teardown of light plants must complete the light plant practical competency assessment.
- Only utilize personnel with sufficient experience in the proper towing procedures and techniques to safely transport light plants.
- Every attempt will be made to use light towers that have double walled protection system to prevent spills, all other models must have a spill try placed underneath.

6.14 LOCK OUT/TAG OUT

See Ledcor Document **# CON-HSE-WMT-PGM-002 – Lockout Tagout Program**

- Guidelines and safeguards must be in place to protect all parties against unexpected energy release.
- LSLP personnel will Lockout and/or Tagout any energy isolating device when performing maintenance or service/repair of equipment. If an energy-isolating device is not capable of being locked out and a tag provides equal protection, tagout is acceptable.
- LSLP will supply all required materials, equipment, and training for their workers to comply with this requirement.
- The Contractor shall discuss the proposed lock and tag locations with the TMEP Representative before proceeding with the work.

Key Requirements

- LSLP shall follow applicable JHA and/or Work Permit requirements before performing the work.
- LSLP shall adhere to all warnings including:
  - Unauthorized removal of lockout/tagout devices is prohibited.
  - Unauthorized operation or servicing of equipment is prohibited.
- Only LSLP authorized employees may service or perform maintenance on equipment where hazardous energy must be/is being controlled.
- Each authorized employee shall have personal Lockout/Tagout device(s), on the equipment or on a satellite lockbox over which they shall maintain exclusive control. When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.
- LSLP shall follow specific Company procedures (O&M's) when working on Company equipment.

- LSLP shall follow their own Lockout/Tagout procedures prior to working on equipment during new construction.

6.15 PERSONAL PROTECTIVE EQUIPMENT (PPE) AND WORK CLOTHING

Refer to document # **CON-HSE-WMT-SWP-001 - Personal Protective Equipment SWP**

This is the last line of defense to protect workers from the risk of injury.

- PPE is to be selected with respect to hazards present.
- Workers must be trained on the proper use, care, and limitations of the equipment.
- All PPE shall meet ANSI or CSA standards, also see Part 8 of the BC OH&S Regulation, required approvals, and shall be marked as such by the manufacturer.
- Standard personal protective equipment for this project will include:
  - CSA Z94.1-92 Type 2 Class E Side impact rated hard hats:
  - Safety footwear with a minimum 6” upper
  - Long pants and long-sleeved shirt.
  - Safety eyewear with integrated or approved side shields:
    - Dark, clear, or appropriately ‘shaded’ and / or foam backed safety eyewear will be utilized as required in response to the identified hazard or client requirement
  - Class 2 level 2 high visibility safety vests
  - Work gloves appropriate to the task
  - Respirators as required by task
  - Hearing protection as required when over 85 dB
  - Face shields as required by task
  - Strings on hooded garment must be removed and not worn when driving a light duty vehicle or operating a piece of equipment.
  - Offensive stickers including such things must be removed:
    1) Extreme political items
    2) Sexist cartoons / statements
    3) Various swearing / inappropriate / offense cartoons

Workers are responsible to ensure that all PPE will be used, maintained, cleaned, and worn as per the manufacturer’s instructions.

- Workers are to return worn or damaged PPE to their Supervisor for exchange or replacement.
- In addition to the above, task specific PPE may be required depending on the task, location, etc. as identified in the JHA or FLHA.

6.16 RADIATION

Only properly trained, qualified personnel can use radiation-producing equipment or materials on Company premises.

- The Contractor must maintain records of all training and qualifications. Radiography technicians must always maintain a copy with them.

- Place radiation warning devices and signs that clearly show the internationally recognized symbol for radiation will be placed around the perimeter of any area which may be affected by radiation.

Key Requirements

- When radiographic equipment is used, the Contractor must ensure the area is clear and all personnel are at a safe distance from the radiation source.
- All dark rooms must have a carbon monoxide monitor/alarm installed.
- Contractor working with equipment that contain radioactive sources must:
  - Not transport, commission, or decommission radioactive material or x-ray producing machines without written permission from the Company
  - Properly secure equipment when work is not occurring, unless otherwise waived by management.
  - Coordinate work activities with project management.
- At no time will personnel be allowed to work in proximity to radioactive material where they risk exposure to the source.
- If the Contractor damages a radioactive source and/or an x-ray producing machine or observes one that may be damaged, they must contact the all applicable contacts immediately.

6.17 RESPIRATORY PROTECTION

See Ledcor **Document # CON-HSE-WMT-PGM-009 Respiratory Protection Program.**

- LSLP has a written respiratory protection program relating to respirator use during work activities.
- Any personnel who will be or will potentially be exposed to hazardous atmospheres or substances in excess of permissible exposure limits will be provided with applicable respiratory protection, training, and supervision.

Key Requirements

- The respiratory protection program includes training, fit testing, fit for work assessments and may require medical clearance depending on project and work conditions.
- For respiratory protection devices that require the use of air purifying cartridges, the cartridges will be tagged or otherwise identified as to time and date of use. The records will be documented and maintained in the LSLP project records.
- Contractors subject to a respiratory protection program must be clean-shaven at all times. Mustaches are permitted, provided a proper seal can be maintained.
- LSLP will designate an individual to perform air monitoring at the premises to ensure personnel are not overexposed.
- This individual will inform workers when respiratory protection is required and continue to monitor the premises to determine if conditions change.

Supplied Breathing Air Use

- LSLP will ensure supplied breathing air sources meet the applicable requirements. In Canada, air must meet the requirements of CSA Z180.1 (Compressed Breathing Air and Systems).

- If compressors are used to supply breathing air, they must have suitable in-line air purifying devices to ensure air quality.
- For oil-lubricated compressors, a high-temperature or carbon monoxide alarm, or both, must be used to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply must be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 5 PPM.
- Compressors will be situated in an area that prevents the taking in of contaminated air.
- Air-purifying devices must be tagged with the most recent date of change-out.

Wildfire Smoke Mitigation

- See Ledcor document – **Wildfire Smoke Mitigation SWP**
- Wildfire smoke is a complex mixture of particles and gases containing hundreds of chemicals. The smoke contains large amounts of fine particulate matter (PM) in the 2.5 µg range (micrograms), as well as gases such as carbon monoxide, carbon dioxide, and nitrogen oxides. Depending on the type of materials burned, which can vary the smoke may also contain sulfur oxides, volatile organic compounds, and other compounds such as hydrocarbons and formaldehyde that are known to be carcinogenic.
- It becomes complicated when measuring impacts related to a wildfire, where the health effects are predominantly based on particulate matter. Particulate matter related to wildfires has been shown to be a major irritant, but it has not been proven to have chronic health effects like industrial air pollution (ozone and nitrous oxides).
- The Occupational Health and Safety Regulation does not provide specific requirements for wildfire smoke. However, the hazard must be treated in a similar manner as other general workplace hazard. LSLP must and will ensure the health and safety of workers in all work.
- LSLP has developed a Safe Work Practice that refers to the Air Quality Health Index (AQHI) as a guide to mitigate smoke/ air quality hazards.

6.18 SCAFFOLD

- Scaffolds must be designed, built, inspected, and tagged by a competent person and must conform to applicable requirements.
- Daily inspections must be conducted by competent personnel and documented before use.
- Lean-to scaffolds and make-shift platforms are prohibited.
- Material may not be stored on scaffolds except if it is being used while on the scaffold**.**
- Material being stored on a scaffold must be placed material over the cross members of the scaffold**.**

Key Requirements

- Contractor must provide a competent person to oversee scaffold erection, inspection and permitting.
- LSLP will ensure scaffolding design and construction provides:
  - A fall arrest system in place for each worker placed more than 1.2m above a lower level;
  - Level footing capable of supporting the loaded scaffold without settling
  - Components that can support at least 4 times the maximum intended load.
- In addition:

  - Wire or fiber rope used for scaffold suspension must be capable of supporting at least six times the intended load
  - All platforms must overlap at least 30.5cm and be secured from movement
- LSLP will provide overhead protection when working on or near scaffolding
- Pole scaffolds must be tied to the building or structure at intervals of no more than 7.6m

6.19 SMALL TOOLS

LSLP personnel will follow the manufacturers' guidelines and guidelines from this section, for using small tools**.** See Ledcor Document # **CON-HSE-WMT-SWP-004 – Hand Tool Safety SWP**

Key Requirements

- Power, air, and hand tools will be kept in good condition. Worn tools will be replaced immediately.
- Cords that are damaged or frayed will be removed from service**.**
- Drive Hoisting/pulling on or otherwise stretching a cord or hose I.e. lowering a tool by the cord or hose, is not permitted.
- Power tools may not be used if safety equipment such as shields, tool rests, hoods, and guards have been removed or rendered inoperative.
- Personnel must wear identified PPE when using tools.
- Electrically powered tools must be grounded by ground-fault-circuit interruption devices.
- The operating pressure of compressed air used for cleaning purposes must be reduced to 30 psi or less.

NOTE: Compressed air must never be used to clean substances from workers clothing or bodies.

6.20 WATER SAFETY

See Ledcor Document # **CON-HSE-WMT-SWP-008** – **Working Near Water and Ice SWP**

Personnel at risk of falling into water where there is a risk of drowning or a risk of sustaining a serious injury must be protected from the fall by using proper fall protection equipment.

Personnel at risk of falling into water where there is a risk of drowning must wear UL 1180 with Canadian Addendum Buoyancy, minimum 150 N (35 pounds force) approved personal floatation devices when they are within 1 meter of the water.

7.0 References

Document #	Document Name
CON-HSE-TAR-RD-004	Pipeline 2020 Leading Indicators Calendar
CON-HSE-HAZ-PGM-001	Hazard Assessment Program
CON-HSE-TAR-SP-001	HSE Document Management Plan
CON-HSE-MOC-FM-001	HSE Management of Change Request Form
LED-HSE-IIR-FM-014	First Aid Record
CON-HSE-EDU-SP-002	Project Orientation
LED-HSE-SYS-PCY-005	Return to Work Policy
CON-HSE-WMT-FM-011	Daily Excavation Safety Inspection Form
CON-HSE-COM-SP-001	Toolbox Talks
LED-HSE-WMT-PGM-006	Ledcor Stretching Program
CON-HSE-COM-SP-004	HSE Stewardship Meeting
CON-PMT-PI-RF-001	Project Filing Index
COM-HSE-IIR-FM-001	Incident Investigation Report – Form 10DS
CON-HSE-INS-FM-001	Inspection Report
CON-HSE-COM-SP-002	Safety Meetings
CON-HRM-ATR-FM-003	Training Attendance Sign-in Sheet
CON-HSE-INS-SP-001	Worksite Inspections **(Appendix F)**
LED-HSE-AUD-SP-001	Gold Standard Audit
CON-EQU-OT-FM-002	Pre-mobilization Equipment Inspection
CON-HSE-IIR-PGM-001	Incident Investigation Program **(Appendix E)**

CON-HSE-COM-SP-004	Ground Disturbance Program
CON-HST-WMT-PGM-005	Fatigue Management Program
CON-HSE-WMT-PGM-007	Fall Protection Program
LED-HSE-SYS-PCY-006	Drug and Alcohol Policy
LED-HSE-WMT-PGM-001	Drug and Alcohol Program
CON-HSE-WMT-PGM-003	Respiratory Protection Programs
CON-HSE-WMT-PGM-010	Hearing Conservation Program
CON-HSE-EPU-SP-003	Mentorship Program
LED-HSE-SYS-PGM-018	Occupational Injury or Illness Management Standard
LED-HSE-WMT-PGM-003	DriveSAFE Program
CON-HSE-WMT-SWP-032	Spotter Safety SWP
CON-HSE-WMT-FM-017	Spotter Competency Assessment
LED-HSE-SYS-PCY-003	Prevention of Harassment and Violence Policy
CON-HSE-WMT-SWP-037	Asbestos SWP
IND-HSE-WMT-PGM-003	Hoisting and Rigging Program
CON-HSE-WMT-PGM-001	Confined Space Program
CON-HSE-WMT-SWP-005	Overhead Power Line Safety
CON-HSE-WMT-SWP-019	Housekeeping Safety SWP
CON-HSE-WMT-SWP-002	Portable Ladder Safety
PCA-Light Plant-FRM	PCA-Light Plant-FRM
CON-HSE-WMT-PGM-002	LOTO Program
CON-HSE-WMT-SWP-001	Personal Protective Equipment SWP

CON-HSE-WMT-PGM-009	Respiratory Protection Program
Wildfire Smoke Mitigation SWP	Wildfire Smoke Mitigation SWP
CON-HSE-WMT-SWP-004	Hand Tool Safety SWP
CON-HSE-WMT-SWP-008	Working Near Water and Ice SWP

8.0 PSSP ACKNOWLEDGEMENT FORM

PSSP

Project: _____

Date: _____

Company: _____

Name: _____

Title: _____

I acknowledge that I have read and understand LSLP's Policies and Procedures as detailed in the LSLP's Project Site Safety Plan (PSSP). I understand that these policies may be revised as the project evolves as well as policies may be added or deleted at the sole discretion of LSLP. I agree to review these policies regularly to keep myself apprised on any changes.

Signature _____

Acknowledgement Form

Appendix A – Project Contact List

TRANS MOUNTAIN EXPANSION PROJECT

Spread 3 & 4A - Valemount to Vavenby, BC

CONTRACTOR CONTACT LIST

Revised: September 28, 2020

Position	First Name	Last Name	Phone	Email
Project Management				
Executive Sponsor	Randy	Daggitt	604-999-3161	Randy.Daggitt@ledcor.com
Project Director	Matt	Granger	780-232-8069	Matt.Granger@ledcor.com
Project Manager	Giuseppe	Roda	780-860-7767	G.Roda@sicim.eu
Construction Management				
Construction Manager				
General Superintendent	Curtis	Berube	780-914-0076	Curtis.Berube@ledcor.com
Mainline Superintendent	Lindsay	Miller	780-385-1257	Lindsay.Miller@ledcor.com
Steep Slope & Stove Pipe Superintendent	Willem	Tamminga	780-224-6754	w.tamminga@sicim.eu
Assistant Superintendent	Lee	Graham	780-288-2276	Lee.Graham@ledcor.com
Bending Engineer Lead	Frankie	Palmiere	587-990-9173	Frankie.Palmiere@ledcor.com
Steep Slope Engineer	Luigi	Miele	825-993-4430	l.miele@sicim.eu
Steep Slope & Stove Pipe Bending Engineer	Umberto	Cantarelli	780-902-1558	u.cantarelli@sicim.eu
Mainline Bending Engineer	Cam	Martin	604-341-9534	cameron.martin@ledcor.com
Equipment Manager	Pellegrino	Pellecchia	780-224-4408	p.pellecchia@sicim.eu
Equipment Coordinator	Giuseppe	Eugenio Ignelzi	587-930-7485	g.ignelzi@sicim.eu
Field Engineer	Riley	Martin	604-314-7675	riley.martin@ledcor.com
Test Pit Foreman	Alex	Jean	780-233-5391	Alex.Jean@ledcor.com
Utility Foreman	Nathan	Prevost	780-619-8759	Nathan.Prevost@ledcor.com
Foreman	Don	Mueller	604-619-5964	don.mueller@ledcor.com
MoTI 1 Foreman	Don	Wood	780-881-6943	Don.Wood@ledcor.com
Creek Preperation Foreman	John	McCourt	780-910-7671	John.McCourt@Ledcor.com
MoTI 2 Foreman	Zac	Cadot	780-913-0466	Zac.Cadot@ledcor.com
Warehouse Foreman	Barry	Steinhbul	780-405-9586	Barry.Steinhubl@ledcor.com
Foreman	Cam	Burns	778-232-5411	cameron.burns@ledcor.com
Trucking Foreman	Glen	Goebel	587-598-8508	Glen.Goebel@ledcor.com
Watercourse Crossing 1 Foreman	Justin	Fankhanel	587-785-5938	Justin.Fankhanel@ledcor.com
Watercourse Crossing 2 Foreman	Masen	Gyori	780-913-5221	Masen.Gyori@ledcor.com
Access Road Heavy Foreman	Jon	Craig	604-230-7381	jon.craig@ledcor.com
Master Mechanic Foreman	Rob	Scharr	780-913-4139	Rob.Scharr@ledcor.com
Fire Boss Foreman	Joseph	Nusse	587-783-2707	joseph.nusse@ledcor.com
Welding Superintendent Foreman	Matt	Smith	604-789-1934	matt.smith4@ledcor.com
Security				
Security Supervisor	Don	Bruce-Fuoco	587-983-4817	Donald.Brucefuoco@ledcor.com
Safety				
Safety Manager	Eddy	Kibambe	780-995-5635	Eddy.Kibambe@ledcor.com
Senior Safety Coordinator	Chris	Nicolas Senior	778-879-7696	christopher.nicholas@ledcor.com
Safety Coordinator	David	Greenlaw	604-908-7859	David.greenlaw@ledcor.com
Safety Coordinator	Colin	Haines	780-913-3586	colin.haines@ledcor.com
Training & Competency Compliance Coordinator	Caitilin	Pickett	780-913-4648	caitlin.pickett@ledcor.com
Safety Adminstrator	Nicole	Toliver	587-985-1256	Nicole.Toliver@ledcor.com
Traffic				
Traffic Manager				
Traffic Supervisor	Francis	O'Quinn	587-646-0492	francis.oquinn@ledcor.com
Traffic Control Coordinator	Ronna	Ryhorchuk	778-874-5001	ronna.ryhorchuk@ledcor.com
Environment				
Environmental Manager	Jesse	Gray	780-983-4465	Jesse.Gray@ledcor.com
Environmental Compliance Lead	Rilee	Chambers	587-589-3547	Rilee.Chambers@ledcor.com
Senior Environmental Coordinator	Darren	Bubela	780-619-3025	darren.bubela@ledcor.com
Senior Environmental Coordinator	Pat	Maxnuk	250-308-8839	pat.maxnuk@ledcor.com
Quality Control				
Quality Manager	Lee	Mitchell	780-886-8895	Lee.Mitchell@ledcor.com
Lead QC Coordinator	Ernest	Drake	780-405-9577	Ernest.Drake@ledcor.com
Document Controller	Leslie	Hutt	587-986-4572	Leslie.Hutt@ledcor.com
Hifi QC Coordinator	Justina	Trach	587-873-7470	Justina.Trach@ledcor.com
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Coating QC Coordinator	Shane	Thompson	TBD	shane.thompson@ledcor.com
Welding QC Coordinator	Jonah	Drake	TBD	jonah.drake@ledcor.com
Engineering				
Senior Project Engineer	Oscar	Romero	825-993-4431	o.romero@sicim.eu
Project Engineer	Ryan	Rideout	780-913-5076	ryan.rideout@ledcor.com
Project Coordinator	Gavin	Morrissey	780-913-1273	Gavin.Morrissey@ledcor.com
Project Coordinator	Cody	Little	780-996-8179	cody.little@ledcor.com
Drafter	Sam	Tarkalam	780-668-0597	samoueil.tarkalam@ledcor.com
Permit Coordinator	Warren	Hrynyk	780-721-3852	Warren.Hrynyk@ledcor.com
Ground Distrubance Manager	Blake	Myren	587-986-1084	Blake.Myren@ledcor.com
Ground Distrubance Coordinator	Randy	McMillan	604-240-5674	Randy.McMillan@ledcor.com
Stakeholder Relations				
Stakeholder Relations Manager	Trev	Ruberry	403-701-0082	Trev.Ruberry@ledcor.com
Employment & Training Coordinator	Tara	Whitney	780-903-5348	Tara.Whitney@ledcor.com
Camp Administrator	Megan	Vanderhorst	250-639-7259	Megan.Vanderhorst@ledcor.com
IT Coordinator	Sheldon	Jones	604-219-3735	sheldon.jones2@ledcor.com
Procurement				
Contracts Manager	Zhanna	Sadokhina	604-790-4804	zhanna.sadokhina@ledcor.com
Senior Contracts Coordinator	Crystal	Uzzell-Modras	587-785-6292	crystal.uzzellmodras@ledcor.com
Purchaser	Nathaniel	Laxten	780-850-3907	nathaniel.laxten@ledcor.com
Project Controls				
Project Controls Manager	Brandon	Teschke	587-575-4037	Brandon.Teschke@ledcor.com
Senior Project Controls Coordinator	Giorgio	Gandini	780-860-1136	G.Gandini@sicim.eu
Project Controls Coordinator	Marco	Candeo	780-399-3923	m.candeo@sicim.eu
Project Controls Coordinator	Barun	Jha	514-730-4750	j.barun@sicim.eu
Scheduler	Brittany	Lemaire	587-645-3773	Brittany.Lemaire@ledcor.com
Finance				
Finance Manager	Brian	Rademacher	780-975-0112	Brian.Rademacher@ledcor.com
Assistant Finance Manager	Joey	McMann	587-987-4775	Joey.McMann@ledcor.com
Finance Lead	Katie	McMann	780-490-4187	Katie.McMann@ledcor.com
Subcontracts Clerk	Tana	David	TBD	
Finance Clerk	Jennifer	Pearson	587-873-3533	Jennifer.Pearson@ledcor.com

Appendix B – Project Hazard Assessment

Project Hazard Assessment (PHA)

Project Name: TMEP Spread 3 & 4A

Project Number: 7015350

Revision: 04

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
1. Mobilize Equipment & Offices (Setup offices, Unloading & loading/unloading of equipment)														
1.1.	Loading and unloading equipment	1. Contamination/introduction of foreign species onto ROW and yard. 2. Suspended loads and workload not balanced and secured (shifting, slipping) 3. Defective rigging devices 4. Inappropriate rigging practice 5. Spotters not utilized. 6. Personnel not following working around or below overhead power line procedure. Goal Posts not set up beneath overhead power lines. Spotters are not equipped with air horns. 7. Miscommunication between operator and spotter. 8. Employees not following preventative maintenance program for tools, equipment and vehicles. 9. Personnel working around equipment (excavators, dozers, skid steer, etc.). Congested work areas. 10. Weather, extreme temperatures (heat/cold). Changing weather conditions (dry to snow/ ice covered road)	3	C	3C	☐	☑	☐	☑	☐	☐	☑	1. All vehicles and equipment must be cleaned and inspected prior to being mobbed to the ROW. 2. Ensure all personnel stay out of hazard area while loads are suspended or in hazards zones while equipment is being unloaded. 3. Ensure personnel have an understanding of safe rigging practices that are involved in loading and unloading activities. 4. Ensure slings and shackles are rated for load to be lifted and free of defects. 5. All employees to adhere to the Ledcor 1m buffer zone and equipment spotting SWP. 6. Adhere to Ledcor Safe Work Practice for Overhead Power Lines. Set up Overhead Power Line markers (goal post) in advance of equipment set up and working on the project. 7. Drivers/Operators will only take instruction from one spotter only but will obey a stop signal from anyone 8. Ledcor HSE Program: Inspect all hand tools, rigging devices, and equipment in accordance with manufacturer specifications before using. Tag out/ lockout if defective. Remove any defective items from service, and report to immediate supervisor. 9. Follow the “thumbs up” procedure when passing by equipment; eye contact, ground attachment or stop equipment /LDV and ensure it is in a locked out, thumbs up from operator in order to proceed. All operators must complete a daily equipment checklist prior to use. 10. Heat stress/frost bite awareness to be part of orientation and supplemental awareness program to be rolled out as seasons changes.	1A

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
		11. Heavy/awkward lifts (overexertion, etc.) 12. Employees not conducting hazard assessments.											11. Use help when lifting heavier and/or awkward loads. Lift within your limits. Avoid repetitive motion activities and utilize micro breaks to rest and recover 12. Review all pertinent SWPs and JHA's for mobilization. Supervisor will ensure SWP's and JHA's related to the scope of work is reviewed and FLHAs are conducted prior to starting work.	
1.2.	Office setup	1. Unqualified subcontractors 2. Wide loads on undivided Highway. 3. Traffic/ congestion on site 4. Mechanical failure of equipment. 5. Working at height. 6. Mixed signals (from crew to operators). 7. Rigging failure. 8. Loads falling off of trailer 9. Shifting load. 10. Being in the line of fire. 11. Poor/limited visibility or communication.	3	B	3B	☐	☑	☐	☑	☐	☐	☑	Trailers required: Ledcor Foreman Trailer, Administration trailer, Safety Trailer, Warehouse, Wash Car, Client Trailers, Client Subs trailers. 1. Subcontractor must be vetted and approved through LSLP subcontractor manager program. 2. Use escort truck with 4-way flashers. 3. Use Spotters to back up loads in congested laydown areas. 4. Perform visual and written pre-use inspections on all equipment. 5. If over 6 ft. worker must utilize a fall protection system. 6. Communication between operators and ground workers. 7. Inspect rigging before use. Maintain safe rigging practices as per Ledcor's Hand Rigging SWP. 8. If load is shifted or uneven, secure to equipment first before unstrapping. Place deck pins in secured. positions on trailer to ensure skids/pallets/loads remain stable on trailer while it is being loaded and off loaded. 9. Ensure wheels are chocked prior to unloading and inspection of rigging. 10. Don't walk under loads (trailers, lifting equipment) 11. Have a designated signal person with radio (if necessary).	1B

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
		12. Poor ground conditions. 13. Weather conditions. 14. Lifting strains, sprain. 15. Inadequate access/ egress off truck.											12. Ensure laydown area is clear of mud, ice or snow and leveled and is of an appropriate size 13. Monitor weather, dress accordingly 14. Use proper mechanics when lifting and use mechanical means to lift. 15. Use step ladders for easy access/ egress	
2. Equipment Crossing and Flagging														
2.1.	Flagging	1. Untrained Flaggers 2. Inadequate Signage/Covered signage 3. Aggressive Motorists 4. Miscommunication	4	B	4B	☐	☑	☐	☑	☐	☑	☑	1. All flag person must be trained per BC OH&S requirements. 2. Signage will be installed as per Ministry of Transport and Infrastructure requirements and the project Traffic Management Plan (TMP). Signs will be covered when not in use and uncovered prior to the crossing. 3. Flaggers will be trained to capture necessary information (license plate numbers); they will always have an escape route and an air horn to alert their crew members if a motorist does not respect the stop signal. 4. Pre crossing preparation meeting will take place with all workers performing the crossing to ensure expectations are clear.	1A
2.2.	Equipment crossing	1. Miscommunication. 2. Public Traffic. 3. Not enough protective tires/mats.	4	C	4C	☐	☑	☐	☑	☐	☑	☑	1. Discuss and verify plan prior to commencing activities. Update FLHA and review with all crew members involved. Pre-establish communication with Operator in case equipment needs to stop in case of vehicle traffic not obeying flaggers stop signs. 2. Stay in position until equipment is clear of the road and the road is free of debris. LSLP will minimize traffic stoppage to 20 minutes per crossing. 3. Plan and ensure enough tires or mats are available to cover the roadway as needed. 4. Ensure all workers understand their part/task in placing geotech material and or tires in place so as to be efficient and minimize the risk of interfering with one another.	1A

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
		4. Congestion of workers when manually placing/removing protective material on/from roadway. 5. Working around heavy equipment. 6. Damage to roadway when placing/removing mats (if used). 7. Line Strike/Fire, no spotters, miscommunication. 8. Potential collision with trains while crossing rail lines.											5. All ground personnel to stay out of danger zone of equipment, when entering danger zone ensure eye contact with operator and confirm entry with thumbs up communication. 6. If mats are to be used, then one signal person is to be in place to direct the equipment operator in placing and removing mats. 7. Ensure powerline warning signage is in place with both voltage and minimum clearance distance identified. Goal posts must be in place. REFER AND REVIEW THE OHP SWP, PRIOR TO ANY CROSSINGS 8. Awareness of train tracks and ROW hazards via project specific orientation for all personnel and owner online orientation for specific personnel completing work on the train tracks ROW.	
3. Completion of One Calls														
3.1.	Completion of One Calls	1. Miscommunication 2. Not completed prior to work commencing. 3. Improper training and competency.	4	C	4C	☐	☐	☐	☑	☐	☐	☐	1. A dedicated ground disturbance coordinator will organize, update and track all “one calls”. 2. Work will not commence until the One Calls have been completed and will be clearly communicated with the project management teams and employees. Reviewed in various JHAs that pertain to ground disturbance. The ground disturbance checklist (as permit) will also be utilized prior to any disturbance of the ground which covers the “One Calls”. 3. All personnel involved in Ground Disturbance activities will have a valid level 2 certificate of training that is in compliance with IRP-17.	0A
4. Exposing Buried Utilities														
4.1.	Pre-task. Setup equipment; truck, wand and vacuum hose	1. Unqualified subcontractor.	3	B	3B	☐	☑	☐	☑	☐	☑	☑	1. Hydrovac subcontractor to be approved through Ledcor subcontractor management. All employees to be competent and to adhere or exceed the Ledcor hydro vac SWP.	1A

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
		2. Miscommunication. 3. Area not marked. 4. Hazards unidentified. 5. Other work activities in area and other workers. 6. Line agreement not in place. 7. Non-compliance with ground disturbance protocols, line strike or excavation of the wrong line. 8. Slips, trips and falls due to icy, muddy or uneven terrain. 9. Congested or tight working area. 10. Inadequate lighting or low light conditions 11. Uncontrolled public traffic. 12. Pedestrians 13. Weather extremes; hot or cold. 14. Overhead hazards such as power lines, trees and overhead structures. Intrusions into swing zone. 15. Truck parked on incline. 16. Hydraulic or fluid leaks.											2. Use clear 3-way communication. Ensure clear instructions are given and understood. 3. If the area is not marked with paint or lath, contact supervisor for further instruction. 4. Complete FLHA at the jobsite. Review as a crew before signing on. Inspect the area before starting. 5. Coordinate work activities with other crews in the area. Review each other's FLHA's and sign. 6. Ensure permission has been granted to expose the line in accordance with the agreement. 7. Ground disturbance checklist must be completed and sign by supervisor, client inspector and all personnel completing this task. 8. Watch your footing, plan your path ahead to avoid ice, mud and uneven ground. Use traction aids for icy conditions. 9. Have equipment and vehicles moved out of the way when possible. No vehicle or equipment to cross over the existing Trans Mountain line. Always be aware of your surroundings. 10. Provide artificial lighting by means of equipment work lights, light plants or head lamps. 11. Set up Traffic Control Persons and signage as required. Ensure proper personnel protective equipment are worn. 12. Block off area so pedestrians may not enter. Allow a safe route around the work area for pedestrians. 13. Dress in layers for cold weather and have extra gear on hand, warm up breaks as needed. In hot weather; pace you work, use sunscreen, drink plenty of fluids, and take micro-breaks as required. 14. Look up and identify any overhead hazards before setting. Reposition truck as possible and away from overhead hazards in FLHA. 15. The goal shall be to position the unit on level ground. If not possible utilize parking brake and wheel chalks.	

PROJECT HAZARD ASSESSMENT (PHA)

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Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs								
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE	Controls (in detail)	Residual Risk Rating
		17. Malfunction of remote or controls. 18. Heavy and awkward lifting of vacuum tubes. 19. Pinch points from pivots, hand tools, doors, clamps and reels. 20. Stored energy when connecting and disconnecting hoses 21. Poor ground conditions unable to support truck weight. 22. Blind spots when maneuvering the truck into position.											16. Keep spill kit stocked and accessible at all times. Ensure fluids used in truck are suitable for the seasonal temperatures. Report all spills that contact the ground. 17. Function test the controls or remote as setting up. Do NOT operate if unsafe. Report malfunctions to supervisor. 18. Use the buddy system when lifting and moving heavy and awkward loads. Stretch prior to work and take micro-breaks as required. 19. Avoid pinch points from pivot joints, hand tools, doors, clamps and reels. Document pinch points on FLHA's 20. Avoid disconnecting/connecting hoses on an angle as this can create kick back 21. Check unknown ground conditions by walking the area prior to bringing in the truck. 22. Utilize a spotter when maneuvering the truck into tight spots. Always use a spotter when backing.	
4.2.	Exposing lines using hydrovac	1. Inadequate training. 2. Congested work area 3. Below ground pressurized piping. 4. Toxic fumes/vapors Flammable/explosive atmosphere weather. 5. Noise/flying debris. 6. Use of vacuum and high-pressure water. 7. Working around overhead power lines.	4	B	4B	☐	☑	☐	☑	☐	☐	☐	1. All personnel involved in Ground Disturbance activities will have a valid certificate of training that is in compliance with IRP-17. 2. Always use a spotter when backing up. 3. Hydrovac to wear gas monitor and FR coveralls when exposing hot lines. 4. Once buried utilities are located, they will be marked on a 2x4 to indicate, depth at the top of the utility and size. 5. Minimum 20 lb. ABC Fire extinguishers on all equipment. 6. Signage around Hydrovac truck at a 15M distance as a warning to others in the area of noise and flying debris. Hydrovac to wear face shield when hydro vacing. When penetrating ground, hydro vac must have face shield down. Hearing protection is to be worn and double hearing protection is to be worn when sound level is above 105dba. 7. All workers will review and acknowledge the Ledcor SWP for working around power lines. Goal posts will be erected with signage. All hydro vac	0A

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		8. Electrical shock. 9. Open holes 10. Operators exposed to potential fall hazards at 6 feet or more.											subcontractors working under or around overhead power lines will submit a SWP for the work to be approved by Ledcor HSE. 8. Verify height of equipment or load prior to working around overhead line. When working near overhead power lines, hydro vac personnel must adhere to the overhead power line safe work practice 9. Open hydrovac holes to be covered using ¾ think plywood and secure using ropes, snow fence. 10. Operators to utilize a fall protection system (fall restraint) when potential of falling into the hole exist.	
5. Clearing														
5.1.	Working on Steep Slopes	1. Unaware of the hazardous terrain 2. Inadequate trained personnel 3. Inadequate equipment/ anchoring 4. Willful operator non-compliance 5. Operator intimidatiom, peer pressure or bullying 6. Steep Slope Work Plan non-compliance	5	B	5B	☑	☑	☐	☑	☐	☑	☐	1. Assessment of terrain and development of Steep Slope Plan prior to starting clearing job. 2. All personnel working on steep slope must be deemed competent as per project steep slope plan. 3. Equipment must be inspected prior to working on steep slope and any task requiring anchoring will be conducted as per engineer steep slope plan. 4. Review of expectation through daily awareness through the daily safety plan discussion. 5. Review of expectation at orientation and continuous monitoring and zero tolerance policy.	
5.2.	Bucking and felling using chainsaw	7. Inadequate trained personnel. 8. Dangerous tree falling. 9. Overhead Powerline 10. Other personnel in close proximity.	4	C	4C	☐	☑	☐	☑	☐	☐	☑	6. All workers who fells a tree must be certified to the BC Faller Training Standard (BCFTS). 7. Prior to clearing activity, a dangerous tree assessor to conduct assessment and mark dangerous tree. 8. No tree falling within 7 m of an overhead powerline. 9. Access to the active falling area to be restricted and minimum 2 trees length radius. Active fall signs must be displayed.	1A

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		11. Injury from using chainsaw inappropriately. 12. First aid coverage. 13. Avalanche risk area											10. All personnel must be trained in chainsaw use, maintenance. NO CHAINSAW in cab of vehicle. 11. Dedicated first aid personnel for clearing crew. All personnel must know location, emergency number of emergency personnel. 12. Avalanche risk area to be identified and mitigation to be implemented by trained personnel including continuous monitoring of identified risk areas.	
5.3.	Mowing, mulching, skidding with heavy equipment.	1. Subcontractor Personnel – Inexperienced operators / labourers. 2. Animal dens. 3. Brush and tree branches causing damage to equipment. Injury to personnel. 4. Heavy Equipment working in close proximity to people/overhead power lines. 5. Mechanical Failure 6. Flying debris. 7. Weather (extreme temperatures (heat), changing weather conditions) 8. Personnel working around equipment (excavators, dozers, etc.). Congested work areas.	4	C	4C	☐	☑	☐	☑	☐	☐	☑	1. Clearing contractor will be used for clearing activities. Contractor will meet or exceed Ledcor Safety Program requirements. Clearing contractor will ensure workers are trained and competent to perform tasks. Ledcor Subcontractor Management Program will be followed Ground Disturbance Level 2 (IRP-17) training is mandatory for all project workers, except for welders and office staff. 2. Must conduct search prior to work activities for animal dens 3. All equipment conducting clearing activities must be equipped with forestry guards. 4. Eye contact and thumbs up between equipment operators and ground personnel. Follow LSLP SWP for working around overhead power lines 5. All equipment to be inspected prior to use in accordance with LSLP preventative maintenance program and defective equipment to be removed from service immediately. 6. Appropriate signage must be in place to warn traffic and ground personnel of mulching operations and possibly flying debris ahead 7. Heat stress/frost bite awareness to be part of orientation and supplemental awareness program to be rolled out as seasons changes. 8. Follow the “thumbs up” procedure when passing by equipment; eye contact, ground attachment or stop	1A

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													equipment /LDV and ensure it is in a locked out, thumbs up from operator in order to proceed. All ground personnel must wear required PPE including high visibility clothing. Be aware of your surroundings	
		9. Employees not following preventative maintenance program for tools, equipment and vehicles.											9. Ledcor HSE Program: Inspect all hand tools, rigging devices, and equipment in accordance with manufacturer specifications before using. Tag out/ lockout if defective. Remove any defective items from service, and report to immediate supervisor.	
		10. Personnel operating chainsaws improperly											10. Employees who operate a chainsaw must have specific training / certifications or be deemed competent by their immediate supervisor. Chainsaw operators will wear appropriate PPE (head, face, and hearing protection, gloves, safety boots, and chain saw pants)	
		11. Venturing outside of ROW boundaries											11. Keep within ROW boundaries - Ensure lathe is clearly marked and visible. If unsure of ROW boundaries DO NOT PROCEED – contact a supervisor. If lathe is displaced or removed, make sure that they are put back in its original location. Utilize surveyors if on site working	
		12. Hotline Encroachments											12. Crossing agreements must be reviewed. Line sweeps will be conducted prior to ground disturbance to avoid hotline encroachment.	
		13. Fire caused from burning slash											13. Burning not permitted on R.O.W without prior authorization. A burning permit must be obtained Local and/or provincial fire regulations must be followed. Continuous safety watch during, and after if required, burning must be in place. Fire suppression equipment (fire extinguishers, shovels, etc.) must be present at burn piles	
		14. Fire caused by equipment in dry conditions											14. In dry weather conditions where mowing, mulching and disking is taking place, there must be a Fire Watch / spotter present and sufficient fire suppression equipment must also be present.	
		15. Slip, Trip and falls coming on and off equipment.											15. 3 point contact climbing on and off the equipment.	

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		16. Noise 17. Uneven/unstable grounds 18. Fueling equipment and vehicles. Fueling vehicles and equipment within 100m of a water course (as required) 19. Spills 20. Heavy equipment rollover 21. Light duty vehicle contact with heavy equipment											16. Subcontractor to adhere or exceed project hearing protection requirement (85 dB). 17. Watch footing. Plan your route. Walk, don't run. 18. Ensuring spill trays and secondary containment is used while fueling. Never fuel within 100m of a water source unless necessary. In such cases a two-person fueling procedure. 19. Spill response equipment will be immediately available onsite. Spill kits are to be carried on all heavy equipment and in all vehicles. All spills will be contained and cleaned up immediately, along with proper notification given to Ledcor and client. Spilled materials and contaminated soil will be properly stored in containers and removed from site. Spill kits must be re-stocked after each use. 20. All heavy equipment must be equipped with roll over protection. 21. Fire extinguishers 20lbs on all vehicles and or equipment. 22. Pre-Operational Inspections prior to use and Equipment 23. **Buggy Whips.** All vehicles (up to and including one ton) on the worksite shall be equipped with a "buggy whip" that measured 8 feet from the ground.	
5.4.	Burning stockpiles	1. Fire started without proper authorization. 2. Potential fire spreading. 3. Equipment burning. 4. Personnel inhaling smoke, sustaining burns.	4	B	4B	☐	☑	☐	☐	☑	☑	☑	1. All burn piles activities will be authorized by the project superintendent once a burn permit from the local municipality have been received. 2. Burn sites to be carefully selected and all fires to be monitored by a fire watch equipped with fire fighting equipment. 3. Equipment to be removed from immediate area when burning is occurring. 4. All unauthorized personnel to be removed from the immediate area and personnel working near the burning area to follow the smoke hazard SWP. The use of Purifying Air Cartridges may be required if smoke exceed specified levels as recommended by Health Canada. See smoke hazards SWP.	

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6. Construction of Right Of Way Access														
6.1.	Building Access Ramps	1. Hotline crossings - Depth of cover not met. 2. Unauthorized ground disturbance work. 3. Ramp washout. 4. Heavy Equipment working in close proximity to people/overhead power lines. 5. Ground personnel in close proximity to equipment. 6. Congested work areas 7. Potential to slide off the ramp or soft edges and poor identification marking. 8. Potential collision with trains while crossing rail lines.	4	C	4C	☑	☑	☐	☐	☑	☐	☑	1. Crossing agreements must be reviewed for depth of cover and the requirements met as stated in the agreement or approved by TMPL PLP or 3rd Party Representative. 2. Ground disturbance checklist/ Foreign line crossing to be completed. Line sweeps will be conducted prior to ground disturbance to avoid hotline encroachment. 3. Use flume pipe as required for proper drainage. 4. Heavy equipment operators will receive a competency review and sign off to operate equipment. Follow Ledcor SWP for working around overhead power lines. 5. Eye contact and thumbs up when working around heavy equipment. 6. Spotters in place when in congested areas. 7. Ramps to be visibly marked with rope and hi-vis ribbon for identification. Ensure the rigging and the equipment can support the load when moving the bridge into position. 8. Awareness of train tracks and ROW hazards via project specific orientation for all and owner orientation for specific personnel completing work on the train ROW.	0A
6.2.	Installing bridges	1. Install bridges as required – heavy lift, bridge won't support the load. 2. Equipment working on slopes. 3. Avalanche risk area	4	C	4B	☑	☑	☐	☐	☐	☐	☑	1. Where bridges must be used, they must have a certification from a professional engineer and a load rating. 2. Work on steep slopes will be conducted as per LSLP Steep Slope Plan. 3. Avalanche risk area to be identified and mitigation to be implemented by trained personnel including continuous monitoring of identified risk areas.	1A

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		4. Trips and slips on uneven and muddy ground. 5. Working near water. 6. Limited work space. 7. Weather conditions. 8. Inexperience or complacency. 9. Pinch point from moving parts on equipment. 10. Poor spotter placement, or spotters standing downhill of equipment. 11. Equipment working on slopes and poor traction 12. Failure of rigging and line of fire.											4. Plan your path of travel and be aware of the terrain. Keep a hand free for balance. 5. Review the rescue plan and have devices in place such as life preservers and personal floatation devices when within 5 meters of the water or it there is opportunity to fall into the water. 6. Use a spotter and good, clear communication. Remove all unnecessary equipment and materials to allow as much space as possible 7. Weather has the possibility of changing conditions of a slope quickly. If conditions degrade, pause the work and discuss with your foremen. Dress in layers and be prepared for the cold. 8. Use experienced operators for slope work or provide supervision as to competency level. Review the work to be completed (Steep slope plan) and ensure FLHA's reflect the work and associated hazards. Keep workers focused and on task. 9. Keep hands and body parts clear of all pinch points on equipment. 10. Spotters to position uphill or level to equipment. If spotters are position downhill to equipment, they must be off to the side an additional 6 meters or greater to keep out of the danger zone if the equipment were to slide down the hill unexpectedly. 11. Inspect ground conditions to ensure adequate traction or provide extra equipment. Avoid jerking and aim for a smooth steady pull. 12. Inspect rigging prior to pulling bridge into position. Look for damaged or degraded slings. Ensure all personnel in the area are positioned back twice the length of the slings in case of a failure.	

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7. Installation of Signage and Goal Posts														
7.1.	Installation of signage	1. Wrong placement of signs. 2. Hitting a foreign line. 3. Confusion with survey staking. 4. Traffic. 5. Road conditions. 6. Blocking traffic. 7. Heavy awkward lifts. 8. Walking long distances carrying a load. 9. Slip, trip and fall hazards when walking on shoulders 10. Windy conditions making holding signs difficult. 11. Overhead lifts 12. Pinch points	4	B	4B	☐	☑	☐	☑	☐	☐	☑	1. Review traffic plan for each location prior to spacing your signs (Each spread has its own sub-Traffic Plan) 2. Always pound signs were survey stakes have been placed marking the designated area. 3. All crew to be educated on survey staking, colours and meanings. The TMEP Spread 3& 4A will be following international survey stake color codes. 4. Long signal times to let traffic behind you know of your intentions to turn. 5. Drive according to road conditions, use 4X4 when necessary. No one ever works alone. At least one person - designated to watch traffic at all times, so that workers may be alerted of any traffic entering their work space 6. Park in an area in which traffic can still flow without disruption and is safest for all workers. 7. Make two-man lifts if necessary and use proper body positioning when lifting. 8. Plan your work accordingly, split the loads and make more trips if necessary. 9. Watch for hidden hazards such as holes and garbage in bar ditch. Wear proper footwear for task. 10. Keep firm grip on signs, carry them low if possible. 11. Avoid lifting overhead, by putting post pounder on post while it is on an angle. 12. Ensure everyone's hands are out of any area that post pounder may come into contact with. While worker is focused on pounding post the other worker is designated to keep a clear line of site with traffic, so they may warn everyone if traffic is entering their work area. Wear gloves appropriate to task as well as the proper tools for the job.	0A

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		13. Sign at wrong height. 14. Signage cover not secured											Communicate to workers holding the sign if you need it moved up or down while bolting. 13. Measure signage and follow all traffic plans that are in place. 14. Covers are to be secured so that they do not fall off and expose the sign during non-work hours, or possible blow off and cause property damage.	
7.2.	Installation of Goal Posts	1. Contact with buried utilities 2. Contact with power line. 3. Goal posts not installed at an adequate distance from power line Incorrect signage & distance 4. Hidden objects and poor ground conditions 5. Pinch points with using the post pounder 6. Noise – pounding in t-post	3	B	3B	☐	☑	☐	☐	☐	☐	☑	1. Ensure the One Call has been completed prior to placing the goal posts into the ground. 2. Ensure adequate distance away from power line unless otherwise specified by the utility owner. 3. Review the LSLP Overhead Power lines SWP prior to the start of work. Goal posts will be erected at least 7m from the powerline. Follow the most stringent requirement for safe limit of approach. 4. Be aware of pinch points and hand placement when using post pounder. Wear proper PPE including gloves. 5. Hearing protection to be required after 85 dBA.	0A
8. Construction of Right Of Way - Grading														
8.1.	Grading	1. Heavy Equipment Operator incompetency 2. Heavy Equipment working in close proximity to people/overhead power lines. 3. Improper Ground Disturbance training and competency. 4. Mechanical Failure 5. Venturing outside of ROW boundaries	3	C	3C	☐	☑	☐	☑	☐	☐	☑	1. Ensure operators have been through a competency evaluation by a credited HEO Assessor and have sufficient experience for the task they are performing. 2. Eye contact and thumbs up between equipment operators and ground personnel. Follow Ledcor SWP for working around overhead power lines. 3. All personnel involved in Ground Disturbance activities will have a valid certificate of training that is in compliance with IRP-17. 4. All equipment to be inspected prior to use in accordance with Ledcor preventative maintenance program and defective equipment to be removed from service immediately.	0A

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		6. Personnel working around equipment (excavators, dozers, etc.). Congested work areas. 7. Slip, Trip and falls coming on and off equipment. 8. Ground conditions along R.O.W. Uneven, rough ground, possible muddy slippery 9. Crossing / working over hotlines 10. Existing TMEP line. 11. Fueling equipment and vehicles. Fueling vehicles and equipment within 100m of a water course (as required) 12. Spills											5. Keep within ROW boundaries - Ensure lathe is clearly marked and visible. If unsure of ROW boundaries DO NOT PROCEED – contact a supervisor. If lathe is displaced or removed, make sure that they are put back in the original location. Utilize surveyors if on site working 6. Follow the “thumbs up” procedure when passing by equipment; eye contact, ground attachment or stop equipment /LDV and ensure it is in a locked out, thumbs up from operator in order to proceed. All ground personnel must wear required PPE including high visibility clothing. Be aware of your surroundings 7. 3-point contact climbing on and off the equipment. 8. Assess ground conditions. If on foot - Walk, don’t run. 9. Ensure that Crossing Agreements are in order. Place mats to prevent ground pressure damage to buried facilities if necessary. 10. Throughout the TEMP existing line will be adjacent to the work. TMEP line to be marked along the ROW. All personnel will be made aware of NO Crossing at orientation. 11. Ensuring spill trays and secondary containment is used while fueling. Never fuel within 100m of a water source unless necessary. In such cases a two-person fueling procedure is required. 12. Spill response equipment will be immediately available onsite. Spill kits are to be carried on all heavy equipment and in all vehicles. All spills will be contained and cleaned up immediately, along with proper notification given to Ledcor and client. Spilled materials and contaminated soil will be properly stored in containers and removed from site. Spill kits must be re-stocked after each use.	

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9. Blasting														
9.1.	Blasting	1. Worker not certified or holds expired blast certificate 2. Detonators left in exposed areas or adjacent to other blast components 3. Explosives left unguarded or forgotten at work site presenting danger to other workers, public or wildlife 4. Workers not informed of magazine location and any restrictions can lead to unintended entry into storage zone 5. Housekeeping and moisture can contribute conditions that can lead to an explosion 6. Detonator cords improperly stored 7. Mechanical issues with transport vehicle 8. Improper storage of flammable materials can cause an explosion on conveyance vehicle 9. Improper transportation may trigger a detonation.	4	B	4B	☐	☑	☐	☑	☐	☑	☑	1. Copies of blasting certificates to be filed during safety orientation and the original kept on person during work. Photo copies not permitted 2. Detonators must be kept separate from explosives or safety fuses, fuse lighters, igniter cords or connectors are stored. At the loading site, detonator products must be stored separately from other explosives, and in a crush resistant box which is clearly identified. 3. Explosives at the worksite must be guarded or contained in secured day boxes until used or returned to storage magazines when not used. 4. Signage regarding restrictions must be displayed on magazine, and unit must also be secured from potential vandalism 5. Ensure interior of magazine is kept scrupulously clean and covered or lined inside to prevent contact with any ferrous metals 6. Stored separately from fuses, detonators, or explosives 7. Transport vehicle must be operated in a safe manner and be in excellent mechanical condition. Daily vehicle inspections and attention to needed maintenance cannot be delayed. Drive no faster than 90 Km/h. Carry two dry chemical fire extinguishers 8. Flammable materials may be transported but must be separated and secured from movement on the vehicle 9. Explosives carried in a vehicle must be in a fully enclosed, locked, fire resistant fixed container or compartment and separate from passengers Electric detonators must be transported in their original conditions with legs wired shut as shipped/received form manufacturer. Detonators must be stored separately from explosives during transport	1A

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		10. Improper transport on mobile drill rig leading to potential detonation 11. Potential collision with trains while crossing rail lines 12. Defective/deteriorating explosives 13. Predrilling without proper permits, potential misfires from other prior work 14. Drilled hole is too small for explosive load 15. Loading charge 16. Safety fuse lighting and detonation 17. Stray currents and static electricity 18. Radio frequency precautions 19. Control of radio transmitter not maintained											10. Explosives and detonators must be kept separate in locked containers and separated from heat sources 11. At uncontrolled crossing, vehicle must come to a complete stop, ensure track is clear and then cross. 12. Dispose of according to manufacturer's instructions Cold explosives must not be warmed by hot water or steam and must be brought to working temperature according to manufactures recommendations. Smoking or open flame is not permitted within 50 feet or 15m where they are stored, handled or loaded into holes. 13. Ensure proper ground disturbance and applicable permits are obtained and clearances granted. If entering previous blasted area, check for misfires and any rock that may fall and clear. Blasting matts must be used in proximity of TMEP line or roadways 14. Ensure hole size sufficient to avoid ramming, pounding load into bottom of hole 15. Make up primer only when ready to place explosives. Do not carry components in any clothes. Always remove wrappers form cartridges. Blasting must be suspended when thunder/lightning. Any hole that is to be left must be guarded by a worker. Working alone protocols must be activated if needed. Keep any vehicle from driving over a loaded hole. 16. A lighted match may be used. When lighting multiple fuses maintain 3 foot safety rule. Use antistatic protection on safety fuse. Do not use a fuse shorter than 1 m on singles. Do not use kinked or damaged fuse assemblies 17. Do not drag detonator leg wires on ground or throw in air 18. If minimum distances are not determined, electrical blasting circuits are not permitted within: 100 m (330 ft) of a CB or other mobile or portable radio frequency transmitter, and; 1 000 m (3,300 ft) of an AM, FM, TV, or other fixed radio frequency transmitter. 19. Warning signs must be posted to alert vehicles to turn off radios and traffic control pe3rsons deployed to instruct	

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		20. Blasters requirements 21. Post blast conditions 22. Misfire procedures must be implemented											people to turn off transmitters when electric circuits are being connected. 20. Is responsible for all steps of the blasting operations. Must ensure blast area is kept clear of personnel. Responsible to post guards to prevent entry into blast site. Blast signals in accordance with blasting protocols, 12 signals at I minute part and two minutes silence before blast. Post blast, once conditions are determined safe a 5 second signal must be conducted to notify others it is safe to return to blast area. Warning procedures and signal method must be posted in a conspicuous place for all workers to be instructed of. 21. Blaster to examine area for misfires All clear has been sounded and personnel can resume work When using any electrical blasting, the blaster must ensure the firing cables are disconnected from blast machine and has short circuited the lead wires, and wait 10 minutes before letting personnel in to area. If detonated by fuse, 30 minutes must expire before allowing personnel into work area. 22. Blaster conducts inspection of area to determine unexploded charge Marks and cordons off any misfire Determines and directs angle of hole to be drilled no closer than 2 feet from misfired charge. Use moderate air/water pressure of combination of both with a plastic fitting to expose and remove misfire	
23. Stringing														
	Stringing pipe with stringing pipelayer.	1. Soft and uneven ground. 2. Crush Zones (feet under outriggers) 3. Other workers in area. 4. Falling from equipment.	4	B	4B	☐	☑	☐	☑	☐	☐	☑	1. Park equipment on level ground when possible. Assess ground conditions for weight of the load. When on soft ground use dolly pads to help level the load. 2. Ensure all ground personnel are away from the truck when lowering outriggers. 3. Do not release the straps until the picker truck is fully set up. 4. Use 3-point contact when mounting and dismounting equipment. Make sure steps and ladders are clear of mud and other debris.	1A

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		5. Defective equipment/ lifting hooks 6. Suspended load. 7. Line of Fire. 8. Pinch points when rigging pipe/ Crush points. 9. Miscommunication 10. Congestion. 11. Pipe falling to ground. 12. Rolling / Shifting Pipe. 13. Excessive pipe movement. 14. Surface conditions (i.e. Loose material, slippery/icy conditions, level or sloped ground). 15. Pinch point between pipe and skid pile. 16. Rolling pipe/shifting loads. 17. Poor skids / skid piles.											5. Complete pre-use inspection form prior to every use. Lower pipe to eliminate suspended loads. Ensure all pre-check inspections are complete and the hooks are rated and certified for size of pipe. 6. Be aware of body position, only necessary personnel in the work area. 7. Keep hands and fingers out of hazardous areas 8. Stay clear of pipe while loading trailer. 9. Ensure designated signal person is in place and identified by a reflective gauntlet. 10. Ensure pipe is secure in bunks before releasing grapple. 11. Load center joint first and then load sides. Trailer shall be parked on level ground. 12. Adequate support for the pipe must be used to ensure that there is no shifting or rolling of pipe. Only competent truck drivers are to perform task. The truck driver will be responsible for releasing the securing straps. 13. Side boom operator must be aware of the terrain he is traveling on, and operate his equipment accordingly so as to prevent from excessive movements or jarring activity. Tag lines must be of sufficient length to enable ground personnel to remain clear of the pipe when it is being carried. 14. Ensure protective footwear is laced properly. Workers must be observant for slip, trip or fall hazards. Caution is to be taken when walking on uneven surfaces. 15. Ground workers are to keep their hands free of the pinch point and utilize tag lines to position pipe. 16. Ensure load is centered on loader before lifting. All ground personnel must be clear of the truck bed and pipe. To steady the pipe, an open hand may be used on the side of the pipe, only if pipe is below shoulder height. Ground workers are not to position themselves between the moving load and a stationary object.	

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													17. Skid piles are to be built squarely and secure. Severely damaged skids are not to be used. Square and solid skid piles to be built and crotches as necessary.	
	Stringing with vacuum lift	1. Unfamiliarity of task/ Lack of experienced. 2. Suspended loads 3. Pipes shifting and rolling. 4. Mechanical failure. 5. Crush points/ pinch points. 6. Congested areas with ground personnel near. 7. Miscommunication working with other crews and subcontractors.	4	B	4B	☐	☑	☐	☑	☐	☐	☑	1. Operators are to undergo operator competency assessments prior to the operating any Equipment. 2. Never walk under a suspended load. 3. Adequate support for the pipe must be used to ensure that there is no shifting or rolling of pipe. Pipe bunks will be utilized to secure the pipe from rolling. No unnecessary workers/equipment is to be in the immediate work area. All personnel will be completely clear of the load when it is unstrapped to prevent anyone from being exposed to any possible pinch point. The truck driver will be responsible for releasing the initial securing straps. 4. All equipment must have a daily checklist completed before use. Any defects found, the equipment is to be tagged and removed from service until repairs are made. 5. Watch placement of body and hands and be out of the radius of the pipe/machine while in motion. Stay out of the line of fire. Signal person shall be used to guide the pipe on to skids only when the load has been lowered as low as possible. All pipe will be secured either with ground crotches, pipe chocks as per Ledcor stringing SWP 6. 50 feet exclusion radius for ground personnel when the deck hand is handling pipe. All personnel wear hi viz apparel. 7. Review and communicate daily work scope and associated hazard controls with those conducting work activity. All unnecessary personnel will be clear of the area a minimum of 50' radius. A competent person will be utilized to unsure no unauthorized personnel can enter the area.	1A
	Stringing pipe using a deckhand attachment	1. Unfamiliarity of task/ Lack of experienced. 2. Suspended loads. 3. Pipes shifting and rolling.	4	B	4B	☐	☑	☐	☑	☐	☐	☑	1. Operators are to undergo operator competency assessments prior to the operating any Equipment. 2. Never walk under a suspended load.	1A

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		4. Congested areas with ground personnel near. 5. Shifting pipe while unstrapping. 6. Mechanical failure. 7. Crush points/ pinch points. 8. Miscommunication working with other crews and subcontractors. 9. Unnecessary personnel in the working area.											3. Adequate support for the pipe must be used to ensure that there is no shifting or rolling of pipe. Pipe bunks will be utilized to secure the pipe from rolling. 4. No unnecessary workers/equipment is to be in the immediate work area. All personnel will be completely clear of the load when it is unstrapped to prevent anyone from being exposed to any possible pinch point. 5. The truck driver will be responsible for releasing the initial securing straps. 6. Pre-use inspection of all equipment is mandatory. 7. Watch placement of body and hands and be out of the radius of the pipe/machine while in motion. Stay out of the line of fire. Signal person shall be used to guide the pipe on to skids only when the load has been lowered as low as possible. All pipe will be secured either with ground crotches, pipe chocks as per Ledcor stringing SWP 8. 50 feet exclusion radius for ground personnel when the deck hand is handling pipe. All personnel wear hi viz apparel. 9. Review and communicate daily work scope and associated hazard controls with those conducting work activity. All unnecessary personnel will be clear of the area a minimum of 50' radius. A competent person will be utilized to unsure no unauthorized personnel can enter the area.	
24. AC Voltage Mitigation (when working in close proximity of an overhead power line)														
	AC Mitigation	Electrical shock	2	B	2B	☐	☑	☐	☐	☐	☐	☑	1. Where applicable, the grounding crew shall measure the pipe-to-ground voltage for Induced Voltage. If the measure of 15v or greater is registered, then the pipe must be grounded. Each time a voltage measurement is made, the ground crew must record the location, chainage, time, date, weather conditions and pipe-to-ground voltage. 2. Electrical insulated gloves must be worn in addition to required PPE when measuring pipe to ground voltage.	0A

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25.	**Bending & Setup (Engineering)**													
	Bending	1. Unawareness of task hazard. 2. Slip, trips and fall on uneven ground, skids, tools. 3. Crush Points & Pinch Points. 4. Miscommunication or lack of communication 5. Using the winch: Cable snapping, pinch points to fingers, noise 6. Guiding pipe into the machine 7. Compressed air 8. Mandrel coming out of the end of the pipe 9. Congestion.	4	C	4C	☐	☑	☐	☐	☐	☑	☑	1. Review JHA & SWP prior to work starting. 2. No running allowed on the ROW. 3. No one is to stand in front of the bending machine at any time during operation. No personnel to stand in-between bending machine & boom at any time. A 2 m buffer zone will be marked around the front of the bending machine as a warning and no personnel shall enter the zone when feeding the pipe. 4. Clear communication and review of the tasks and documented. 5. Inspect all equipment prior to using and document. 6. Inspect cable prior to use; any deficiencies need to be fixed or replaced prior to using. 7. Be aware of stored energy, moving parts, and compressed air, (i.e.: bending bed, mandrel, hydraulic rams). 8. Be aware of mandrel and ensure no one is standing at the end of the pipe. 9. All vehicles to be out of the immediate work area.	1A
26.	**Transitions and End Preparation**													
	Transitions and end preparation	1. Equipment failure/improper setup. Improper inspection, leaky fittings around hoses, machine not set up correctly for the proper spec for transitioning. 2. Running machine cold – Equipment integrity, high pressure hydraulic hoses. 3. Moving transition machine into place with equipment (side boom, excavator, boom truck etc.)	3	C	3C	☐	☑	☐	☐	☐	☐	☑	1. Inspect equipment prior to use. Check for leaks and proper settings for the transition machine. Be familiar with the client transition specifications for the project. 2. Ensure transition machine is warmed up prior to use with the proper RPM's. 3. Inspect all rigging prior to hoisting transition machine. Ensure proper hand signals are utilized.	0A

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		4. Pinch points and pipe contact when inserting the transition machine in to the pipe. 5. Starting machine – rotating parts, people in line of fire. 6. Excessive noise levels. 7. Sharp metal shavings from end prep. 8. Grinding off ridges – flying debris.											4. Keep hands clear of pinch points. Center machine, double check line up and slowly moves transition machine in to position. 5. Ensure personnel are clear prior to start the machine. All guards are to be in place during operation and personnel operating the machine are to be clear of the rotating parts. 6. Hearing protection to be worn during machine operation. 7. If shavings pile up never remove with your hand use the long needle nose pliers to remove shavings from the machine. The machine must be stopped prior to removing any shavings. When cleaning up metal shavings from end prep, use a magnet to gather the shavings and dispose. Whenever working with the metal shavings. Kevlar gloves MUST be worn. 8. Double eye protection (face shield and safety glasses) when buffing and grinding	
27. Welding														
	Welding	1. Moving equipment. 2. Competent personnel for Automatic Welding (If Auto Welding are used). 3. Pinch points/crush points. 4. Hot surfaces & open flames. 5. Dust, gases and fumes Flying debris.	3	C	3C	☐	☑	☐	☑	☐	☐	☑	1. 6-meter buffer zone to be maintained around heavy equipment. Stay in line of sight of operator and ensure clear communication. 2. If Automatic Welding equipment is used, personnel to be trained and competent in the use of “Auto Weld” equipment and follow all “Auto Weld” welding procedures. 3. Body and fingers clear and proper positioning. Adequate support for pipe. 4. Flash back arrestors on oxygen and acetylene. 20 lbs fire extinguisher on all welding and crew trucks. Water trucks, watering cans, Pulaski’s are available through the warehouse to be used as needed. FR clothing to be worn when preheating. Welder to wear welding coats or leathers 5. Impact face shield & CSA approved safety glasses while grinding/buffing (the welder helpers are to wear foam backed sealed safety eyewear). Note: In the weld shacks helpers must wear foam backed safety glasses with the head strap.	0A

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		6. Poor ventilation. 7. Arc flash. 8. Leaking propane, oxygen or acetylene bottles etc. 9. UV exposure 10. Forest fire											6. Welding shacks will be ventilated. Respiratory protection available as required. 7. Do not look at the arc. Proper eye protection for welding (welding hood for the welders and proper eye protecting for helpers) 8. Inspect hoses and fittings daily 9. Sunscreen available in the warehouse for UV protection in addition to required PPE 10. A fire watch will be utilized to monitor hot work during seasons where potential forest fire exists.	
28. Sandblasting and Coating.														
	Sandblasting	1. Equipment malfunction 2. Electrical shock – Sandblasting 3. Electrical hazards – Induction coil 4. Flying debris 5. Poor air quality/ Respiratory issues 6. People in the immediate area/Flying media 7. High pressure hoses/High pressure air 8. Noise 9. Chemical hazards	4	C	4C	☐	☑	☐	☐	☐	☐	☑	1. Complete sandblasting daily checklist. 2. Ground pipe prior to any sandblasting activities. 3. Pre-Inspection of cables prior to work commencing. All deficiencies will be noted and reported to supervision. Ensure twist locks are tight prior to heating. Never open coils when heating process is in place. Coil power must be turned off when heating is not occurring. 4. Approved blasting suit, respiratory protection to be used at all times. 5. Fresh air pump to have valid certification. Documented air quality test certification will be kept on file on Ledcor connect. 6. No authorized personnel allowed in the immediate area – signage to be erected around sandblasting operations. 7. Whip checks and Chicago fittings at all connections. Deadman switch to be functional at all times 8. Hearing protection to be used anything over 85 dBA. 9. All sandblasters are to be familiar with the product they are using and SDS sheets will be readily available. Fit testing and APR training will be made available as required.	1A

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	Coating	1. Slip, Trips and falls from cords, skids, hoses. 2. Overhead powerlines. 3. Fumes, skin irritation. 4. Foreign bodies in the eye. 5. Open flame. 6. Compressed Gasses. Instant frost bite from propane vapor. 7. Hot surfaces/flames can cause burns. 8. Flying abrasive and personnel in the area. 9. High temperatures can cause burns 10. Electrical shock 11. High pressure hoses 12. High pressure air	3	C	3C	☐	☑	☐	☐	☐	☐	☑	1. Watch footing placement and remove any tools, items that may cause a trip. 2. Watch for clearance of the coating/ blasting units and the clearance of the overhead powerline. 3. Read and review the SDS sheet for acetone, and always acetone use in a well-ventilated area. Wear rubber gloves and ensure that the used rags are stored properly while on the R.O.W and disposed of in the appropriate container when they are brought back to the yard. 4. Face shield and sealed eye wear to be worn when filing the weld 5. Leather welding gloves must be worn. All flames will be extinguished when not in use. Strikers will be used to start torch, never use a lighter. All Vehicles & Equipment to be equipped with a 20 lbs. Fire Extinguisher. 6. Inspect hoses, regulators fittings for leaks damage and tightness. Purge Lines prior to starting. Bottles must be disconnected for transportation and secured in an upright position. 7. If using liquid torch for preheat, you must wear a heat-treated face shield and flame retardant other clothing. 8. Only the operator with an abrasive blasting suit and respirator protection is allowed. All other personnel must be removed from the immediate area. The operator must be trained and fit tested for the respiratory protection. 9. Burrs and debris shall be removed from surface prior to blasting. 10. Electrical cords are to be inspected daily before use. Make sure section being blasted is grounded and keep cords out of water filled areas. 11. Whip checks must be used; daily inspection must be completed to ensure that they are properly placed. 12. Do not use compressed air to remove dust/ particles from clothing or equipment. Do not blast towards traffic on ROW.	0A

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		13. Suspended load (Induction Coil) 14. Crush point between the pipe and the coil 15. Noise from generator 16. Pinch points when closing the clamps on the induction coil. 17. Congested area. 18. Tripping hazard from the umbilical cord 19. Toxic substance (Coating Epoxy).											Stop traffic if necessary and do not allow any vehicles to park in the blast danger zone. 13. Never walk under a suspended load. Use a tag line and ensure all workers are clear of immediate area. 14. Never touch pipe after the heat coil comes off. 15. Hearing protection is to be worn. 16. Use tag line to control the moment and never put your hands between the load and the pipe. 17. All unnecessary personnel to stay clear of area. 18. Make all crew members/visitors aware of this tripping hazard. Use high vis markings to make it visible. Tuck away if possible. 19. Use in a well-ventilated area or use a full-face mask or a half mask with vapor cartridges. Wear mono goggles when using a half mask. Ensure cartridges are changed at a minimum every 2-3 day. Refer to MSDS prior to use. Coating product will be approved prior to arriving onsite. Copy of the MSDS will be readily available at the work site. 20. Impervious gloves are to be worn at all times when working with coating product. Refer to user manual and MSDS for precautions and PPE requirements. 21. Ensure certification for the Jeeper and Jeeper Meter is available at the warehouse 22. Make sure Jeeper is shutoff before removing the spring.	
29. Excavation														
	Mechanical excavation.	1. Inadequate training for personnel involved in ground disturbance activities. 2. Missing locates. Not understanding the locates, missing possible hazards, not realizing full potential of visible hazards.	4	C	4C	☑	☑	☐	☑	☐	☐	☑	1. All personnel involved in ground disturbance activities will be trained with a valid certificate that meets IRP 17 requirements. Complete ground disturbance checklist prior to any excavation activities. 2. Ensure line sweeps are completed and One Calls have been made. All terms of the crossing agreement must be adhered to.	1A

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		3. Fueling equipment and vehicles. Fueling vehicles and equipment within 100m of a water course (as required) 4. Equipment failure 5. Contact with buried utilities 6. Excavator becoming unstable during excavation 7. Slips, Trips and Falls coming on and off equipment. 8. Weight of equipment going over hot line, ground conditions. 9. Ground personnel near working equipment. 10. Overhead power lines near working equipment. 11. Unstable ditch walls, unable to get proper sloping to meet legislation. Unstable spoil piles.											3. Ensuring spill trays and secondary containment is used while fueling. Never fuel within 100m of a water source unless necessary. In such cases a two-person fueling procedure. 4. All equipment to be inspected prior to use in accordance with Ledcor preventative maintenance program and defective equipment to be removed from service immediately. 5. Only approved operators may excavate hot lines. An approved hot line operator list will be maintained by HSE. 6. All operators must have an operator competency completed on them prior to any excavating activities. 7. Be aware of climbing on and off the equipment and ground conditions. 3-point contact when climbing on and off equipment. 8. Clear communication prior to digging and knowing the ROW boundaries and locates. 9. 6m safe approach when people are in operating area. Back up alarms to be on all equipment 10. Spotters to be used in congested areas or overhead power lines in the area. Follow Ledcor SWP for Overhead Power Lines. 11. Spoil piles to be 1 m away from the edge and sloping per soil type. ROW which is extremely narrow in some areas, the distance and storing of the spoil pile will have to be addressed. When such situations arise, the Ledcor Superintendent will convene with the Construction Manager to discuss alternative measures and safety controls to be taken. Spoil piles are to be no greater than a 45-degree measured from the vertical.	
	Safe Excavation Entry	1. Unawareness of excavation hazard. 2. Inadequate access/egress	3	C	3C	☐	☑	☐	☐	☐	☑	☑	1. Prior to entry a safe excavation entry checklist must be completed by the crew entering the excavation. Ensure the requirements of the checklist have been met i.e.: sloping, trench box (if required, access/egress etc.) 2. Ensure adequate access/egress. Ladders or stairs are to be placed no more than 8 metres from where the work is being	0A

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		3. Unsecured ladders 4. Slippery/muddy conditions											conducted. Access/egress is to be provided on both side of an obstruction in the ditch i.e. each side of the pipe. 3. Ladders are to be secured to prevent movement and extend 3 ft. above the excavation. 4. Maintain 3-point contact when ascending and descending the ladder	
	Double stacking trench boxes.	1. Deep excavation 2. Pinch/Crush Points from box wall and equipment. 3. Pinch points from spreader bars, hand tools and rigging. 4. Suspended load and uncontrolled movement. 5. Ground personnel in the immediate area. 6. Improper rigging or failure of rigging. 7. Heavy equipment working near an excavation. 8. Missed process; trench box movement or trench box being crushed from land slide.	3	C	3C	☑	☑	☐	☐	☐	☐	☑	1. Excavation over 6 m must be certified by a professional. 2. Stay out of the line of fire and avoid pinch points from materials and equipment movement. 3. Keep hands and feet clear of pinch points from spreader bars, hand tools and rigging. 4. Taglines to be utilized, more than one if necessary 5. Ground personnel to step back out of the 6-meter danger plus any additional reach as the trench box is lifted upright 6. Ensure load capacity tag is on the lifting bridle. If that tag is not there they are to be tagged out. 7. Spotters to be used if equipment nears the edge of the excavation. Spotters to watch the trench wall for cracks or crumbling 8. Ensure partial backfill of trench box walls is completed. Soil piled on the sides as high as practical (just enough so backfill doesn't spill around the edge into the box). Foreman holds responsibility for ensuring completion.	0A
30. Lowering In														
	Lowering In	1. Improper rigging/equipment failure 2. Noise 3. Overhead power lines	4	B	4B	☐	☑	☐	☐	☐	☑	☑	1. Ensure equipment is inspected, certified and personnel clear of the fall zone in cause of equipment failure when lowering in. Ensure proper rigging and no damage to coating. 2. Hearing protection to be worn at 85 dBA 3. Be aware of any potential overhead hazards in place and have proper spotters in place where required. Follow Ledcor SWP for Overhead Power Lines	0A

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		4. Uneven terrain and ground conditions/ Unstable ditch 5. Suspended loads 6. Pinch points/Crush points 7. Uneven load balance 8. Electrical shock (Induced voltage) 9. Moving skid slough 10. Lowering In Plan MOC non-compliance											4. Watch footing and inspect excavation banks for stability prior to lowering in task. 5. No unnecessary personnel in the area. Never walk under a suspended load. 6. Stay out of the line of fire. 7. Inspect equipment prior use – check rigging, load lines, side boom etc. Utilize counter weights when lowering in as required. 8. If working near of an overhead power line the following must be adhered to; Use nonconductive slings. At least one static discharge cable shall be used to connect the pipe segment being lowered to a suitable ground in order to minimize induced voltage. Personnel should avoid contact with the pipe when removing the slings as a potential for shock may exist. 9. Riding on skid slough is prohibited 10. All lowering-in activity must be conducted as per approved Lowering-In Plan.	
31. Backfill														
	Mainline backfill	1. Damage to the pipe 2. Congested work area 3. Miscommunication 4. Equipment Failure 5. Slip, Trip and falls coming on and off equipment.	3	B	3B	☐	☑	☐	☐	☐	☐	☑	1. A spotter will accompany each excavator to ensure no rocks, hard lumps are placed on the pipe or damage is done to the pipe. 2. Unnecessary personnel to be out of the area as well as equipment/light vehicles. 3. Clear communication between operator and spotter. 4. Ensure equipment is inspected and if any deficiencies are noted and should be reported. 5. 3-point contact climbing on and off the equipment.	0A

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													6. Backfill operations must follow the guidance outlined in the Environmental Protection Plan (appendix J in the PSSP) with respect to trench compaction and RoW decompaction. 7. Backfill shall be completed according to specification 8. Backfill at valve sites must be completed according to specification.	
32. Tie In														
	Tie In	1. Equipment failure 2. Moving equipment 3. Swinging pipe 4. Pinch points/crush points 5. Stored Energy 6. Unsupported pipe 7. Welding hazards - Hot surfaces & open flames. Dust, gases and fumes. Arc flash. 8. Flying debris 9. Leaking propane, oxygen or acetylene bottles. 10. Electrical shock (when working in close proximity of an overhead power line)	4	C	4C	☐	☑	☐	☐	☐	☐	☑	1. Daily equipment inspections. 2. 6-meter buffer zone to be maintained around heavy equipment. Stay in line of sight of the operator and ensure clear communication. 3. Clear of swing zones 4. Body and fingers clear and proper positioning – watch for pinch points when lining up the pipe. 5. Be mindful of the stored energy when cutting the pipe, when the pipe is being lined up and when in the clamps. Personnel never to put themselves in the line of fire when pipe is moving under strain. 6. Ensure the pipe is properly secured from unintentional movement as per the Ledcor SWP. Adequate support for pipe inspects skid piles prior to starting the work. 7. Follow controls in the welding and tie-in JHA. Proper PPE for task in accordance to Ledcor SWP. 8. Impact face shield & CSA approved foam backed safety glasses while grinding/buffing 9. Flash back arrestors on oxygen and acetylene 10. Isolated pipe sections for tie-ins or cut outs that are near of an overhead power line must be bonded regardless of pipeline-to-ground voltage. If the pipe-to-ground voltage exceeds 15v	1A

PROJECT HAZARD ASSESSMENT (PHA)

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		11. MOC non-compliance to OWNER accepted Tie In Procedure.											the pipeline shall be temporarily grounded according to the spec for the mitigation of induced voltage.	
	Tie- In Backfill	1. Damage to the pipe. 2. Congested work area 3. Miscommunication 4. Inexperienced operators 5. Equipment Failure 6. Slip, trips and falls	3	B	3B	☐	☑	☐	☐	☐	☐	☑	1. A spotter will accompany each excavator to ensure no rocks, hard lumps are placed on the pipe or damage is done to the pipe. 2. Unnecessary personal to be out of the area as well as equipment/light vehicles. 3. Clear communication 4. Operator competency assessments will be completed prior to anyone operating 5. Ensure equipment is inspected and if any deficiencies are noted and should be reported. 6. 3-point contact climbing on and off the equipment.	0A
33. Creek Crossing and Restoration														
	Creek Crossing.	1. Environmental impact 2. Working near water 3. Spills/Water contamination 4. Miscommunication 5. Slips & falls	3	C	3C	☐	☑	☐	☐	☑	☐	☑	1. No fueling within 100m of water source. 2. PFD's available as required and to be worn when working within 5 m of a water body. 3. Inspect equipment prior to use. Ensure vehicles and equipment are clean. Ensure spill kits and trays are in all equipment. 4. Clear communication with Foreman and Ledcor Environmentalists 5. Proper footwear and be aware of footing and ground conditions	0A
	Creek Restoration	1. Contacting Pipe 2. Inexperienced Operator.	3	C	3C	☐	☑	☐	☐	☑	☐	☑	1. Use a spotter when shading in materials. Ensure enough material is in place over pipe before bucket packing over the pipe. 2. Operator must be deemed as a component operator by the supervisor prior to conducting this task.	0A

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		3. Moving/Swinging Equipment. 4. Frozen Material 5. Putting Channel in the Wrong Spot, 6. Miscommunication 7. Awkward Lifts, Heavy Lifts. 8. Falling Debris 9. Pinch points 10. Slips Trips and Falls on Coconut Cloth 11. Flying Debris/Dust. 12. Use of chainsaw. 13. Miscommunication and congestion. 14. Improper/inadequate rigging.											3. Stay out of danger zone of equipment and always get thumbs up confirmation before approaching. 4. Always uses appropriate soil materials for task. 5. Follow direction form environmental representative and drawings. 6. Use thumbs up communication. One designated signal person to the hoe operator only. 7. Have a plan before task starts and make sure everyone knows what that plan is, and that it has been communicated correctly. Get help with lifts if needed. Get help with lifts if needed, use proper body positioning. Use proper ergonomics when lifting larger rocks and moving them by hand, use equipment when possible. 8. Bucket should be free of dirt, snow, Ice and any other materials that may break free and fall when working over workers. 9. Never place yourself or any tools or materials between hoe bucket and post intended to be pushed/pounded in. Wear gloves appropriate to tasks. Stay out of swing zone of hammers, never place hands between hammer and the intended point of contact. 10. Wear appropriate foot wear to conditions. Look ahead at intended route of travel. 11. Wear safety glasses to prevent dust and debris of the coconut cloth from entering eyes. 12. Person operating a chainsaw must have a chainsaw ticket. Refer to Chainsaw use JHA. 13. Use designated signal person when working in tight congested areas. Use spotter if in congested area. Thumbs up communication with operators. 14. Check rigging before every lift for wear and also it is rated for the load it is going to lift.	

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		15. Damaging bank during restoration. 16. Suspended Loads. 17. Long reaches over piling.											15. Pull out plywood in a smooth steady motion, so that banks are not damaged. 16. Never stand under a suspended load, ensure route of travel that load is intended to take is clear of any obstacles. 17. Plan ahead to make sure hoe can still reach the channel without damaging newly reclaimed banks. Evenly distribute material to the channel bottom.	
34. Trenchless Crossing Horizontal Directional Drills (Highway crossing, Rail Crossings and Live Lines) and Horizontal Directional Boring														
	Horizontal Directional Drilling.	1. Unfamiliar with Ledcor's safety program 2. Line contact/strike 3. Congestion 4. Noise 5. Environmental impact /Spills 6. Pinch points/Line of fire	4	B	4B	☑	☑	☐	☐	☑	☐	☑	1. All drills will be performed by Subcontractors; Ledcor will utilize our subcontractor management program and ISN Network to conduct a risk assessment on the subcontractor. The subcontractor management will sign the project PSSP identifying that they will be compliant with the Ledcor safety requirements. Subcontractor must have JHA's for the work they are conducting which will be reviewed by Ledcor prior to starting. 2. All drills will have an HDD execution plan submitted to Ledcor prior to green lighting any drill. The execution plan will identify schedule, hazards and path of travel. Ensure a plan is discussed prior to the work being performed. 3. Spotter to be utilized when in congested area in accordance with the Ledcor spotting safe work practice. Spotters must position themselves outside of equipment/vehicle blind spots. Ensure eye contact with operator before proceeding with the task. 4. Subcontractor to adhere or exceed project hearing protection requirement (85 dB). 5. Ensure spill kits are inspected regularly, and re-stocked if contents have been removed. Containments must be readily available. 6. Keep body out of the line of fire and ensure that any equipment being worked on is left in a "zero energy state" Spotters must position themselves outside of equipment/vehicle blind spots. Ensure eye contact with operator before proceeding with the task.	1A

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		7. Equipment failure 8. Slips/Trips/Falls 9. Working at night. 10. Suspended loads 11. Rigging failure 12. Lack of communications – entry and exit end 13. Working at height 14. Specialized lift of drag sections for pipe pullback. 15. Workers unfamiliar with and/or not oriented to the TMEP accepted Lift Plan											7. Complete pre-start walkaround inspections on all vehicles and equipment. Document and report any deficiencies. 8. Access and egress points; walkways, chicken runs, ladders, must not have any debris. Regularly maintain these areas. Use three-point contacts when climbing up and down equipment. 9. Area will be well lit at night with light plants. 10. Ground personnel must stay at a safe distance from suspended loads. NEVER walk beneath suspended loads. Inspect tag lines before use, and do not wrap tag lines around your hand or wrist. 11. Inspect all slings, shackles and lifting hooks prior to rigging. Tag out any defective rigging equipment. Lifting equipment certification to be submitted to LSLP at mobilization of drill crew. 12. Test two-way radios prior to using them. Operators and spotter(s) must have clear communication through hand signals or two-way radios. 13. When working at heights workers must be tied off when above 6 feet or an appropriate handrail installed. 14. Lift profiles will be referenced for each drag section and a pre-pullback meeting will be held with all subcontractors 15. Pre lift meeting to review lift with all involved personnel including drill, pullback, supporting staff prior to each pullback.	
	Horizontal Directional Boring	1. Unfamiliar with Ledcor's safety program 2. Line contact/strike	4	C	4C	☑	☑	☐	☐	☑	☐	☑	1. All bores will be performed by Subcontractors; Ledcor will utilize our subcontractor management program and ISN Network to conduct a risk assessment on the subcontractor. The subcontractor management will sign the project PSSP identifying that they will be compliant with the Ledcor safety requirements. Subcontractor must have JHA's for the work they are conducting which will be reviewed by Ledcor prior to starting. 2. Bores to have an HDB execution plan submitted to Ledcor prior to green lighting any drill. The execution plan will	1A

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		3. Inadequate lighting or low light conditions. 4. Slips, trips and falls from uneven, muddy conditions. Or when mounting and dismounting equipment. 5. Damaged rigging, unrated rigging, or incorrectly sized rigging. 6. Damaged or worn cradles. 7. Bent or broken rollers. Or damaged bearings. 8. Damaged or loose; pins, blocks, mouse trap or stick. 9. Inoperable or malfunctioning side boom. 10. Pinch points from cradles, pipe and mouse trap. 11. Working around suspend load. 12. Awkward load; working with cradle rollers.											identify schedule, hazards and path of travel. Ensure a plan is discussed prior to the work being performed. 3. Provide artificial lighting by means of equipment work lights, light plants or head lamps. 4. Be cautious with footing, choose the best path of travel. Use 3-point contact when mounting and dismounting from equipment and keep hand and foot holds clear of debris and mud. 5. Inspect rigging for damage and wear. Ensure rigging has a legible load rating and is adequate for the load being lifted. 6. Inspect cradles prior to use for damage and wear. 7. Inspect rollers, ensure the move freely. 8. Visually inspect side boom; ensure pins, blocks, mouse trap and stick are in working order and show no signs of damage or cracks. 9. Perform pre-operation checklist, function test controls. Inform supervisor of any defects 10. Keep hands away from pinch points and avoid the line of fire. 11. Never put any body part underneath a suspended load. Be mindful of body position. 12. Do not put hands on cradle rollers. Allow the machine to do the work, get extra help if required.	

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		13. Miscommunication or poor hand signals. 14. Ground personnel working around heavy equipment. 15. Pipe section rolling off skid piles. 16. Over stressing pipe section. 17. Heavy load, side boom leaning or tipping. 18. Stored Energy 19. Pinch points between cradles/ rollers/ pipe. 20. Miscommunication between crew, rig and equipment 21. Pinch points from shackles, reamer and pull head. 22. Working around a suspended load. 23. Unsafe excavations 24. Communication delays with rig. 25. Unexpected movement or reamer or pull head.											13. Use clear communication and hand signals. Operators only accept signals that are understood. 14. Do not lift pipe until everyone is clear. Ground personnel to remain in line of sight of operators 15. Tie off tractor to be in position. 16. Maintain control of pipe, section at all times. Space side booms and cradles at appropriate increments to ensure pipe ovality is maintained at all times. 17. Counter weights to be out when on section. Load to be calculated prior to lifting. 18. Don't stand at ends of pipe. Stay on work-side when pipe is moving. 19. Be aware of hand placement on rollers and cradles keep hands clear of all pinch point locations. 20. Be sure radio communication between pipe crew and drill crew has been tested. Have spare radio batteries on hand if required. Ensure all operators are in the line of sight of the signal person. Stop signal can be given by anyone. 21. Keep hands and body away from pinch points and out of the line of fire. Confirm rig/ side booms are locked out when making the connection. Ensure everything has come to a stop before making any adjustments. 22. Never position yourself or any body part underneath a suspended load. 23. Prior to entering any excavations, ensure that you have checked the excavation (access/egress, properly shored, spoil pile 1.2 m) reviewed and signed the safe excavation entry checklist. 24. Driller to remain at the rig controls and must notify pipe crew if stepping away. Confirmation of rig lockout to be given. 25. Rig Crew and Pipe Crew to use 3-way communication and confirm all starting and stopping of rig. 26. Make sure jeeper is shut off before removing the spring.	

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		26. Electrical shock. 27. Poorly or non-grounded jeeper. 28. Pinch point on T-posts and pounder. 29. Slip, trips and falls from tools, skids cords and edge of the excavation. 30. Open excavation.											27. Ensure solid ground connection is made, remove rust or paint if required. 28. Watch hand placement and use proper tools to install or remove t-posts. 29. Remove all tools, skids, hoses around walking path prior to installing fence. 30. Fence to be installed 6 feet from the excavation edge and if near public access, flashing delineators are required.	
35. Test (Hydrostatic) Pigging (Caliper) & Drying														
	Hydrostatic test	1. No hydrotest plan – not meeting proper specifications 2. Environmental concerns – water source and dewatering 3. High pressure 4. Hydrotest within populates and urban areas (Valemount and Blue River) 5. Slips/trips & falls 6. Failure of fittings or tools 7. Congestion 8. Miscommunication 9. Noise 10. Hose movement	4	B	4B	☐	☑	☐	☐	☑	☐	☑	1. Hydrotest plans to be submitted to TMEP for approval prior to start of hydrostatic test activities. 2. The hydrotest plan for water and dewatering must be in compliance with the Environmental Protection Plan. 3. Signage and red ribbon to be used as required preventing unauthorized people from accessing the danger area (100 m) around test. Test shacks shall be located at least 10 m from the test section. 4. Hydrostatic Test Public Notification to be developed and included as part of the Hydrostatic plan. 5. Use of 3-point contact when climbing on and off ladders. 6. Pre-inspection of all fittings and valves. Inspection of tools prior to commencing task. 7. Ensure water trucks use a spotter in tight areas. 8. Planned communication method between testing supervisor and crew (use of radio). 9. Proper hearing protection to be worn at 85 dBA. Double hearing protection after 105dBA. 10. Whip checks in place at all connections and inspected daily.	0A

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		11. Dewatering of the line (wrong area, loud noise and high pressures). 12. Open water (drowning)											11. Pre-task meeting for testing will conducted daily. 12. Every worker must wear a PFD when working within 5 m of open water with potential of drowning (1m or 3 feet deep).	
36. Driving to/from site and on Row														
	Driving on the project.	1. Driving in congested traffic 2. Driving through construction zones 3. Traffic patterns changing 4. Distracted drivers 5. Unsecured loads 6. Overhead power lines 7. Passing workers on Row 8. Fatigue, speeding substance abuse.	4	C	4C	☐	☑	☐	☑	☐	☑	☑	1. All Ledcor vehicle operators must be compliant with the Ledcor DriveSafe policy. All vehicles on the project (laydown yard included) must adhere to the cone policy except for when refuelling. A cone must be placed at the rear side of your vehicle when parked. All vehicle operators must complete a vehicle 360 degree walk around prior to moving the vehicle. 2. Obey all traffic signage and drive to the road conditions. 3. Follow the traffic accommodation plan when hauling equipment. Use flaggers as required. 4. As part of the TMEP Project policies, all hands-on cellular devices are PROHIBITED to be used while operating a vehicle or equipment. 5. All loads are to be secured prior to leaving the yard or ROW. Load straps and cargo nets are available in the warehouse as needed. 6. Overhead power lines will be identified with signage. 7. Speed limit on the ROW is 30km/h and 10km/h when passing workers. 8. Awareness training through orientation. Adherence to the DriveSafe Program, Driver record review. 9. All employees will review and sign the SWP for driving On/Off the ROW.	2C
37. Working under and around power lines														

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	Working under and around powerlines	1. Untrained workers 2. Line strikes	4	B	4B	☐	☑	☐	☐	☐	☑	☑	1. All workers assigned to task near overhead powerline will be knowledgeable of the Ledcor Overhead powerline SWP. 2. Signage and barriers will be placed before and for the duration of the work scope. Goalposts and signage at a minimum of 7 m from the powerline as per the overhead powerline specification. Signalers equipped with air horn will be utilized for crossing equipment under overhead power lines. Maintain the safe limits of approach See WorkSafe BC limits.	1A
38. Working around buried utilities														
		1. Untrained workers 2. Hotline encroachment 3. Exposed lines	4	C	4C	☐	☑	☐	☑	☐	☑	☑	1. Only workers competent and knowledgeable of the Ledcor Mechanical Excavation of Buried Utilities SWP will be assigned to the task. During orientation the survey color coding will be reviewed with the workers. Stickers have also been made to give to the workers to help them identify buried utilities. 2. A competent buried utility resource will be assigned to maintain One calls, be knowledgeable of all applicable crossing agreements. Line will not be crossed until all the requirements have been met in accordance to the crossing agreements. All equipment ramps will be built in accordance to the crossing agreements and TMPL damage prevention plan. A staked safety zone 2 m of the existing TMEP line. A spotter will be utilized when excavating around hot lines. No mechanical excavation within 2 feet of a live line or if the crossing agreement states a greater distance, then the greater distance applies. 3. When work is being conducted near of a live line an initial gas test will be conducted prior to entry into the excavation.	2B

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		4. Working between hotlines (lines on either side)											4. Always work within the approved ROW boundaries.	
39. Potential For Critical Lifts														
	Critical lifts	1. Heavy loads - Not knowing the weight of the load 2. Unaware of the equipment lifting capacity 3. Multiple pieces of equipment - miscommunication 4. Unstable ground	4	B	4B	☑	☑	☐	☐	☐	☐	☑	1. Know the weight of the load being lifted. 2. All equipment utilized for lifting must have a load chart on the equipment. All equipment utilized in lift applications will have a yearly inspection on the lifting components. Documentation will be made available on request. 3. Critical lifts must have a critical lift checklist completed prior to the lift as per LSLP Safe Work Practice For all critical lifts, a pre-job meeting must occur and be documented. 4. Ensure ground is inspected for stability prior to commencing critical lifts. Implement safety measures as required i.e. matting For more information on critical lift see Ledcor Crane and Lifting Program, Ledcor SWP for Rigging and Hoisting.	0A
40. Installation of screw anchors														
	Screw anchors	1. Pinch points between anchors and excavator attachment and pin. 2. Moving equipment with suspended load around ground crew. 3. Stored energy from screw anchor and swivel head	3	C	3C	☐	☑	☐	☐	☐	☐	☑	1. Ensure fingers and hands are clear from end of anchor that is to be attached to the excavator. 2. One designated signaler only. No personnel to stand under the suspended load. Ensure the operator has a clear swing path. Use proper hand signals and maintain eye contact with operator. 3. Stay out of danger zone of moving parts, do not over torque anchor. Control screw anchor from walking into pipe.	0A

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		4. Rotating parts and entanglement 5. Working in excavation regulation and project requirement.											4. All personnel to keep hands and body clear of rotating parts. No loose-fitting clothing or exposed long hair allowed. 5. Buoyancy control crews to follow the safe excavation entry checklist process. Any deviation from the process will need prior approval from superintendent and safety manager.	
41. Installation of sheet piling														
	Installation of sheet piling	1. Sharp edges from sheet piles 2. Improper rigging 3. Pinch points 4. Moving sheet piling – pinch points, failed rigging 5. Stored energy from sheet piles and excavation. 6. Working near mobile equipment. 7. Sheet piling at improper depth. 8. Loud noise	3	C	3C	☐	☑	☐	☐	☐	☐	☑	1. Have welder clean up any sharp edges and ensure all holes for shackles are cleaned up and no signs of tears in the sheet piling. Holes should be placed a minimum of 2 inches from either edge of the sheet piling. 2. Cable slings and bridals to be used due to the metal cargo and possible sharp edges . 3. While directing the hoe the spotter should be well out of the area in which the sheet piling is to be placed. 4. Although sheet piling is still attached to hoe bucket, it could move once slack in the rigging while the other hoe bucket is supporting it. No ground workers are to be in that direct area. 5. Know the limits of the machine. Use equipment properly, sheet piling has sharp edges, use proper bucket placement. 6. A 6-meter buffer zones must be respected and acknowledgement and thumbs up from the operator before entering the buffer zone. 7. Sheet piling must be installed below water depth to properly do its job. 8. Wear hearing protection as the noise would exceed 85 db.	1A
42. Buoyancy Control - Installing bag weights / bolt-on weights														
		1. Heavy lifting causing muscle injuries 2. Soft ground resulting in stuck/ damage equipment.	3	B	3B	☐	☑	☐	☐	☐	☐	☑	1. Utilize mechanical means to lift bags/weights	1A

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		3. Unsafe excavations (not adequately shored, no access/egress) resulting in injuries. 4. Strike from working near heavy equipment. 5. Mechanical equipment failure due to improper preventative maitainance 6. Improper Rigging resulting in failure causing inuries and property damage 7. Crush points resulting injuries of damage – suspended loads 8. Defective tools/equipment 9. Pinch Points between top & bottom of bolt on weights 10. Improper use of saw and/or banding equipment for lagging resulting injuries 11. Congested work area											2. Place matting on access as required assessment and conditions. 3. No personnel to enter the excavation 4. Six-meter buffer zones must be respected and acknowledgement and thumbs up from the operator before entering the buffer zone. Clear communication between ground personnel and operator via hand signal or verbal 5. All equipment to be inspected prior to use in accordance with Ledcor preventative maintenance program and defective equipment to be removed from service immediately. 6. Ensure slings and shackles are rated for load to be lifted and free of defects 7. Ensure all personnel stay out of hazard area while loads are suspended or in hazards zones while equipment is being unloaded. NO ONE gets under a suspended load. 8. Ledcor HSE Program: Inspect all hand tools, rigging devices, and equipment in accordance with manufacturer specifications before using. Tag out/ lockout if defective. Remove any defective items from service, and report to immediate supervisor. 9. All personnel must be removed from pinch points and confirm all hand placement when lining up weights. 10. Ensure that personnel using saws or banding equipment for lagging are properly trained and competent via JHA and work observation 11. Unnecessary personnel to be out of the area as well as equipment/light vehicles.	
43. Installing valves														

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		1. Unfamiliarity of task 2. Miscommunication 3. Rigging failure from awkward load. 4. Suspended load.	3	C	3C	☐	☑	☐	☐	☐	☐	☑	1. JHA will be developed for valve installation and all personnel must review prior to starting task. 2. Clear communication between ground personnel and operator via hand signal or verbal. 3. All rigging will be inspected by a competent worker prior to use. Ensure load capacity tag is on the lifting bridle. If that tag is not present, they are to be tagged out 4. No personnel to walk under a suspended load	0A
44. Steep Slope Work														
	Steep Slope Assessment	1. Wild life 2. Rough roads 3. Unfamiliarity with scope of work 4. Working Alone	3	C	3C	☑	☑	☐	☑	☑	☑	☐	1. Wildlife awareness training via orientation., monitor and report sighting. Bear spray. 2. Utilization of UTV where possible. Training. Use walking when unsure. 3. Task pre-planning through foremen meeting. Completion of hazard assessment prior to going to work area.	1A
	Steep Slope Work (Ground personnel)	1. Worker falling 2. Inadequate orientation of personnel on steep slope 3. Steep hll loose material	4	B	4B	☑	☑	☐	☑	☑	☑	☐	1. LSLP Site-Specific Safety Plan 2. TMEP HSMP Section 57 and Appendix G 3. LSLP Steep Slope Work Plans (Site Specific ERP including helivac, sttep slope rescue plan) 4. Engineering drawings 5. Anchoring assistance 6. Signage/barriers 7. Access roads with guardrails where required by assessment 8. Dedicated Steep Slope Supervisors 9. Daily Steep Slope Pre-Work Checklist 10. Discussion at morning toolbox talk 11. Superintendent/Foreman monitoring 12. LSLP Health and Safety monitoring	
	Steep Slope Work (Equipment)	1. The risk of contact by moving machinery due to loss of control caused by steep and/or unstable slopes resulting in multiple fatalities 2. Mobile or static winch failure attributed to mechanical failure or frayed winch cable resulting in fatalities	4	B	4B	☑	☑	☐	☑	☑	☑	☐	1. LSLP Site-Specific Safety Plan 2. TMEP HSMP Section 58 and Appendix G 3. LSLP Steep Slope Work Plan (no work down from steep slope activities) 4. Steep Slope Work Plans 5. Engineering drawings 6. Access roads with guard rails 7. Supervisor, Operator, and Worker training	

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
													8. Anchoring assistance 9. Signage/barriers as applicable	
45. Clean Up														
	Machine Cleanup	3. Environmental impact 4. Overhead power lines 5. Congestion 6. Uneven/unstable grounds. 7. Stuck equipment. 8. Equipment over buried utilities due to removed markers. 9. Steep Slope Work Plan non-complaince	3	B	3B	☐	☑	☐	☐	☑	☑	☑	10. Final cleanup activities must be in compliance with TEMP specifications and the Environmental Protection Plan, Waste management plan to be used for contaminated soil. All spills are contained and cleaned up. Land is returned to its original state. 11. Do not load equipment near or around power lines 12. Minimize traffic. Demobilize any unused equipment to reduce congestion when clean-up. Use a spotter when backing up or in congested area. 13. Watch footing. Plan your route. Utilize equipment if possible, to level out work areas as needed (back blade). 14. Daily inspection of work area prior to starting work will be mandated to identify “soft spots” and marked prior to equipment activities. 15. Daily inspections of work area to include identification of buried utilities and markers. All operators to participate on the inspection walk-around to identify buried utilities in the area. 16. Cleaning scope on steep slope as per HSMP and PSSP must be completed in accordance to the approved plan. Oversight by qualified supervisor.	0A
	Top Soil Replacement	1. Contact with hot line 2. Contact with overhead power line 3. Moving equipment 4. Soil conditions 5. Slips, trips and falls on uneven ground, tools, skids.	3	B	3B	☐	☑	☐	☐	☑	☐	☑	1. No equipment will work directly over hot line. All equipment will work perpendicular to the existing TMEP Line with a 2-m stake safety zone. 2. Lower all attachments before passing underneath power line. Utilize designated signal man with air horn when passing equipment under power line. 3. Moving equipment 4. Soil conditions	0A

PROJECT HAZARD ASSESSMENT (PHA)

Note: When adding a new row, ensure template content is copied.

Jobs		General Loss Exposure	Risk Evaluation (see RAM)			Control Needs							Controls (in detail)	Residual Risk Rating
No.	List all tasks to be completed for the scope of work.	Consider health, safety, damage, fire, quality, production problems etc. Consider people, equipment, materials and environment.	Severity	Probability	Hazard Rating	Engineering	Safe Work Methods	Industrial Hygiene Review	Skill Training	Environmental	Special Rules	PPE		
		6. Lifting heavy items causing back injury											5. Slips, trips and falls on uneven ground, tools, skids. 6. Lifting heavy items causing back injury	
46. Security Patrol														
		1. Subcontractor unfamiliar with Ledcor safety program. 2. Personnel working alone. 3. Protest and threats of violence.	3	B	3B	☐	☑	☐	☑	☐	☐	☑	1. Subcontractor will be awarded the work as per Ledcor subcontractor management program from the list of approved subcontractors. Subcontractor to review PSSP prior to mobilization to site. 2. Security subcontractor to submit working alone program for approval prior to mobilization. The program is to meet or exceed Ledcor working alone procedure. 3. All security personnel to be trained to TMEP Enhanced security training and to hold provincial security training certificate.	0A

PROJECT CRITICAL TASKS LIST

The following tasks are identified as critical requiring at a minimum a safe work method (SWP or JHA) or a specific safe execution plan to be developed and reviewed prior to undertaking the task:

Critical Task	TMEP Reference Document	Project Execution Document
Confined Space	HSMP Section 66	Ledcor Confined Space Program
Ground Disturbance	HSMP Section 70 TMEP Damage Prevention Plan	Project Ground Disturbance Plan
Hot Work/ Gas Detection	HSMP Section 45	Project Welding JHA Gas Detection SWP
H2S	HSMP Section 77	Project JHA Respiratory Protection Program Gas Detection SWP
Hoisting and Rigging	HSMP - Appendix A Section 8	Project JHA Hoisting and Rigging Program
Managing the control of hazardous energy	HSMP – Appendix A Section 24	Lockout & Tagout Program
Motor Vehicle	HSMP – Section 32	Project Driving JHA DriveSafe Program
Working at Height	HSMP – Appendix A Section 13	Fall Protection Program
Working on Steep Slope	HSMP Section 57	Steep Slope Safety Plan

REVIEW AND APPROVAL

Past Action Items Reviewed by Signature: Eddy Kibambe Date: 09/22/2020
Action Items include: Audits, learnings from incidents, and safety alerts

Prepared by Signature: Eddy Kibambe Date: 09/22/2020

Checked by Signature: Lindsay Miller Date: 09/22/2020

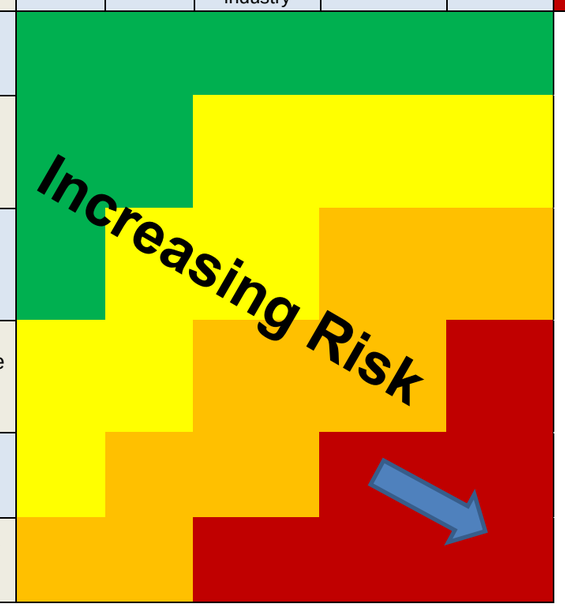
Approved by Signature: Matt Granger Date: 09/22/2020

STANDARD REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared By	Checked By	Approved By
09/22/2020	Updated all section to include comment from TMEP revision 3A	4	Eddy Kibambe	Lindsay Miller	Matt Granger
05/11/2020	Updated section 5 to include Steep Slope Requirements, included Critical Task List	3	Eddy Kibambe	Lindsay Miller	Matt Granger
05/08/2019	Updated PHA and controls to meet Ledcor standards and TMEP specifications	2	Eddy Kibambe	Jason Hoard	Jason Hoard
9/20/2017	Formatted to new template.	1	Eddy Kibambe	Darryl Braaten	Jason Hoard
6/25/2017	Initial Draft	0	Scott Coulter	Jason Hoard	Jason Hoard

RISK ASSESSMENT MATRIX

CONSEQUENCES					INCREASING PROBABILITY				
SEVERITY	PEOPLE	ASSETS	ENVIRONMENT	REPUTATION	A	B	C	D	E
					Never heard of in the industry	Heard of in the industry	Has happened in the organization or more than once per year in the industry	Has happened at the location or more than once per year in the organization	Has happened more than once per year at the location
0	No injury or health effect	No damage	No effect	No impact					
1	Slight injury or health effect	Slight damage	Slight effect	Slight impact					
2	Minor injury or health effect	Minor damage	Minor effect	Minor impact					
3	Moderate injury or health effect	Moderate damage	Moderate effect	Moderate impact					
4	PTD* or one fatality	Major damage	Major effect	Major impact					
5	More than one fatality	Massive damage	Massive effect	Massive impact					



LEGEND

*PTD = Permanent Total Disability
*SPC – Safety Process Committee

- Green = Good Standing
- Yellow = If no SPC*-approved Safe Work Method(s), at a minimum, use JHA approved by Project Manager/Construction Manager
- Orange = If no SPC*-approved Safe Work Method(s), at a minimum, use JHA approved by Project Sponsor
- Red = WORK CANNOT PROCEED

For more information, see **Risk Assessment Program**.

Appendix C – Training

Trans Mountain Expansion Project
Spreads 3 & 4A

PROJECT SPECIFIC SAFETY PLAN
APPENDIX B – TRAINING REQUIREMENTS

STANDARD PROGRAM REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared by	Checked by	Approved by
Sept-22-2020	Updated Steep Slope Supervisor CQS	4	Eddy Kibambe	Giuseppe Roda	Matt Granger
May-15-2020	Updated to include the Smartsheet Training Matrix, CQS	3	Eddy Kibambe	Scott Olson	Matt Granger
Mar-10-2020	Updated to include Workday, updated training matrix, CQS	2	Eddy Kibambe	Scott Olson	Matt Granger
Sept-17-2018	Updated to descope 4B	1A	Eddy Kibambe	Darryl Braaten	Jason Hoard

1.0 INTRODUCTION

Lack of competency or otherwise not having enough training, knowledge and experience to do a work task safely with little or no direct supervision is noted as having a potential for risk of injury or property damage and must be appropriately mitigated by LSLP personnel and our subcontractors. A training plan and matrix is included within this appendix that outlines the minimum training requirement for site access and job specific requirements within the TMEP scope.

In addition to the standards identified in this training plan, LSLP will ensure the appropriate regulatory requirements are met including Journeyman certifications for trades, Driver's Licenses for site vehicle operators and Medical accreditation for medical personnel.

LSLP will utilized existing Ledcor and Sicim recruitment, onboarding, training processes in order to meet TMEP's Contractor Competency Assurance Plan (CCAP) requirements. Subcontractors to LSLP must upload the training and submit training certifications on Smartsheet LSLP Master Training Matrix for all personnel that will be working on site for review and approval 2 working days prior to attending the project orientation. LSLP personnel training and competency records will be retrieved from internal system such as BLUE, Workday, Competency SharePoint by the training & competency coordinator. Both LSLP and subcontractor training and competency records will be consolidated and maintained through the project training and competency tracking matrix by the Project Training Coordinator on Smartsheet.

2.0 LSLP RECRUITMENT AND ONBOARDING PROCESS

2.1 Resources

In effort to capitalize on existing resources, LSLP will utilized current recruiting and onboarding process for salaried employees, independent service providers, and union (CLAC) craft.

2.2 Job Requisition

The hiring manager with the approval of the project manager is responsible to initiate the recruitment process. This is done by creating a job requisition based on Human Resource Career Level Profile, LSLP developed Contractor Qualification Specifications and Project Training Matrix.

2.3 Recruitment Process

The Ledcor recruitment team with the support of the hiring manager, is responsible to screen potential candidates, coordinate interviews, check references as required before an offer of employment is extended.

Prior to finalizing an offer to a suitable indirect candidate, the hiring manager is responsible to obtain approval from the project manager and TMEP through a Personnel Authorization Form (PAF).

2.4 Onboarding Process

Once an offer has been extended and accepted, the onboarding team will create a Workday profile and support the completion of drug and alcohol pre-access tests for all direct and indirect employees.

Employees will be required to upload the required pre-hired records onto Workday. The following are the minimum the pre-hired records for direct and indirect that must be uploaded on Workday for the TMEP Spread 3 & 4A:

(1) Pipeline Construction Safety Training (PCST) Certification

(2) Ground Disturbance Level 2 Certification

(3) Ledcor Pipeline Limited Online Orientation Certificate of completion

(4) CN Contractor Online Orientation Certificate of completion.

The onboarding team will also collect copies of driver licenses, motor vehicle records, drug and alcohol test compliance to generate a Recruitment Report that will be used by the Project Training Coordinator populate the project training and competency matrix.

See Appendix B – Ledcor Recruiting Process Maps

3.0 ORIENTATION PROGRAM

3.1 Ledcor Pipeline HS&E Online Orientation

In addition to having at a minimum PCST and Ground Disturbance Level 2, personnel must complete the Ledcor Pipeline HS&E Online Orientation housed at the following link:

https://www.bistrainer.com/index.cfm?action=learner.Invitation&form.fldInvitationCode=101858332

The Ledcor Pipeline HS&E orientation covers a range of topics, including Ledcor's commitments to health, safety, and environment, potential hazards and risks you may encounter in the workplace, and site expectations for you as an employee, subcontractor, visitor, or client.

The topic cover in the Ledcor Pipeline HS&E Orientation include:

- Module 1 (Welcome to Ledcor Pipeline)
- Module 2 (Legislation and Responsibilities)
- Module 3 (Hazard Management, FLHA Training, Worksite Inspection and Observation Program)
- Module 4 (Incident Management)
- Module 5 (General Workplace Rules)
- Module 6 (Equipment Operation & Working Around Equipment)
- Module 7 (Ledcor Policies & Programs; DriveSafe, ATV/UTV Safety, Drug & Alcohol, EAP)
- Module 8 (Survey, Excavation, Safe Excavation Entry, Overhead Powerline)
- Module 9 (Environment)
- Module 10 (Code of Conduct)
- Module 11 (Conclusion)

3.2 Site Specific Safety Orientation

All personnel beginning work on the project must meet the pre-hired requirement and attend the Spreads 3 & 4A Site Specific Safety Orientation. This orientation is an in-person session facilitated by LSLP HS&E resource. LSLP requires at least 24 hours' notice for orientation request**.**

The request for orientation can be sent to LSLP.Training@Ledcor.com

All personnel attending this orientation must meet the minimum pre-hire requirement and be greenlighted on the Project Training and Competency Matrix. Personnel not meeting the pre-hire requirement will not be admitted to the session until all requirements are met.

The site specific safety orientation includes but not limited :

- Project Overview,
- Rights and Responsibilities
- Project Specific Program (Mentorship, FLHA Energy Wheel, Ground Disturbance, Safe Driving)
- Project Specific Rules & Requirement (PPE, Workplace Rules, TMEP LSRs, Disciplinary Action)
- Pipeline Job Safety
- Incident Reporting & Management
- Emergency Preparedness
- Specific Awareness Program (Housekeeping, Hand Safety, H2S, Asbestos)
- Diversity Awareness, Harassment, Violence, Bullying
- Security
- Safety Commitment
- Environmental Awareness
- Knowledge quiz

3.3 TMEP Training

Following the Site-Specific Orientation, all personnel who have not completed the TMEP Orientation Training (OG405 TMEP Orientation Videos). The training includes:

- Video 1: Welcome to the TMEP
- Video 2: Contractor Safety
- Video 3: Health and Safety
- Video 4: Level 1 Environmental Education and Compliance
- Video 5: Staying Safe in Bear Country
- Video 6: Cultural Awareness
- Video 7: Security Awareness
- Video 8: Stakeholder Engagement and Communications

3.4 Visitor Orientations

All visitors are required to complete the TMEP Visitor Orientation prior to accessing the worksite. Visitors must be escorted at all times while onsite and LSLP will ensure that at a minimum, the following requirements are met;

- Review of the TMEP Safety Visitor Orientation Video
- Review of LSLP PPE requirements for Visitors
- Review of TMPL Facility, site specific requirements (where applicable)
- Review of the LSLP Visitor Orientation pamphlet
- Record of the Visitor Orientations submitted to the LSLP safety office to be kept on file

4.0 CORE TRAINING REQUIREMENTS (CMSTQ)

TMEP requires that all workers have Canadian Minimum Safety Training Qualifications (CMSTQ) (see table below). This ensures that all workers on the work site are indoctrinated to a minimum standard irrespective of training provided through Orientation.

CMSTQ CORE Training Requirements (Typically delivered through GCC/EPC Orientation) (X = Required) *In-house training is acceptable*	Core Training Requirements (All Companies) New/Annual Employee Orientation – Employer must include, but not limited to, general awareness training as defined in the TQ Matrix Course Descriptions																			
	OWNER CLIENT Specific Orientation	Avalanche Awareness	Electrical Safety Awareness	Confined Space Awareness	Driving Safety Awareness	Environmental General Awareness	Fall Protection Awareness	Fire Protection / Extinguishers Awareness	First Aid (OFA) Awareness	Flammable & Combustible Liquids	Hazard Recognition Awareness	H2S Awareness	Incident Reporting Awareness	Lockout / Tagout Awareness (Affected)	Personal Protective Equipment - PPE	Slips, Trips, Falls & General Housekeeping	CSTS / PCST (WHMIS)	Wild Animal Safety Awareness	Violence Prevention
Training Frequency in Yrs. (0=One Time)	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	3	3
ALL WORKERS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Note that H2S Alive training is required on all brownfield facilities. H2S Awareness is acceptable for greenfield areas including facilities and pipeline construction.

*Of Note; The LSLP Site Specific Orientation for Spreads 3 & 4A will meet the minimum compliance standards of the CMSTQ in a combination of training as described below:

- Pipeline Construction Safety Training (PCST) – Completed pre-hire
- Ledcor Pipeline HS&E Online Orientation – Completed pre-hire
- Spread 3 & 4A Site Specific Orientation- Completed on site
- TMEP OG405 Orientation Training – Completed pre-hire through ISN or onsite

CMSTQ CORE Training Requirements are listed below:

1. Avalanche Awareness

2. Electrical Safety Awareness
3. Confined Space Awareness
4. Driving Safety Awareness
5. Fire Protection / Extinguishers Awareness
6. First Aid (OFA) Awareness
7. Flammable & Combustible Liquids
8. Hazard Recognition Awareness
9. H2S Awareness
10. Incident Reporting Awareness
11. Lockout/ Tagout Awareness
12. Personal Protective Equipment - PPE
13. Slips, Trips, Falls & General Housekeeping
14. CSTS / PCST (WHMIS)
15. Wild Animal Safety Awareness
16. Violence Prevention

5.0 LSLP TRAINING MATRIX

In addition to the Core training to meet CMSTQ, LSLP has developed a Job Specific Training Matrix that outlines the minimum standard of training that personnel must meet as per job positions. These training are a combination of pre-hire and on the job, and vocational certification that must be met by position.

See appendix A – LSLP Training Matrix for more details.

6.0 HEAVY EQUIPMENT OPERATOR COMPETENCY

6.1 LSLP Heavy Equipment Operator Competency

The experience, work history and qualifications of workers and equipment operators will be considered prior to them being assigned to higher risk activities at the work site. All LSLP operators must participate in the Ledcor documented competency assessment process. The operator competency program requires heavy equipment operators to have their skill set be assessed and documented. Based on this evaluation process, operators are assigned duties commensurate with their abilities.

Competency Assessment Forms can be found here. Only LSLP qualified assessors can conduct competency evaluations.

6.2 Subcontractor Heavy Equipment Operator Competency

All subcontractors who have operators operating heavy equipment onsite, must have a competency evaluation program that includes at a minimum;

- Declaration of work experience
- Competency assessment
- Documented evaluation

All assessments must be submitted to LSLP safety for tracking purposes.

6.3 Pipelayer Training Program

LSLP has an internal Pipelayer Training program that meets the minimum requirements of the Enform Side-Boom Training Standard. The Training program consists of classroom based instruction and in field

evaluations. All Pipelayer operators are required to attend and be evaluated to training program requirements.

7.0 GROUND DISTURBANCE

7.1 Ground Disturbance Training

All workers directly involved in ground disturbance will be trained to the “Ground Disturbance 201 Safety Training Standard” of the Alberta Common Ground Alliance (ABCGA).

Workers not involved in ground disturbance must be trained in “Ground Disturbance Awareness” as a minimum standard. Project office staff are exempt from this rule.

7.2 Hot Line Operators

As part of LSLP’s Ground Disturbance Plan, LSLP will maintain an internal “Hot Line Operator” list. The hot line operator list is a list of the operators that are approved based on an evaluation to excavate hot lines within the Line Owner ground disturbance perimeters.

8.0 RAIL TRAINING

Where work is undertaken within the railway Right-of-Way, workers must follow the Owner’s safe work procedures for working on railway property which may include;

- Specific requirements as dictated in the crossing agreement (where applicable)
- For work on CN property, workers must complete an online safety orientation which can be found here.
- For work CP Rail, workers must follow the CP “Minimum Safety Requirements for Contractors Working on Railway Property”

9.0 DOCUMENT CONTROL AND RECORDS MANAGEMENT

Training records will be managed onsite and supported through the Ledcor training and tracking systems referred to as “BLUE” and “Workday”. As a minimum requirement, the following will be tracked;

- Orientation Records including CMSTQ
- Visitor Orientations
- Operator Competencies
- Applicable Training Certifications
- Applicable Journeymen Trade Certificates

10.0 PROJECT TRAINING MATRIX

LSLP Spread 3 & 4A Training Matrix

Legend

- Mandatory (M)
- Journeyman (J)
- Job-Specific

	Course length (hours)	Delivery Method	Pre-Hire/ On Project Training	Driver	Driver	Driver	Driver	Driver	Engineer	Engineer	Engineer	Engineer	Engineer	Enigneer	Enigneer	Enigneer	Enviro	Enviro	Enviro	Enviro	Enviro	Enviro	Enviro	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Foreman	Labourer	Labourer	Labourer	Labourer	Labourer	Labourer	Labourer	Management	Management	Management	Management	Management	Management	Management	Management	Management	Mechanic	Mechanic	Mechanic	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Office	Operator	Operator	Operator	Operator	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	Safety	Safety	Safety	Safety	Security	Welder	Welder	Welder	Welder	Welder
				Driver Group 1	Driver Group 2	Driver Group 3	Driver Group 4	Sandblaster/Coater	Assistant Project Engineer / Measureman	Project Coordinator	Project Engineer	Senior Project Engineer	GIS Technician	GNSS Design Technician - Junior	GNSS Design Technician - Senior	GNSS Supervisor	Environmental Assistant	Environmental Compliance Coordinator	Environmental Compliance Lead	Environmental Manager	Field Environmental Advisor	Senior Environmental Advisor	Senior Environmental Manager	Bending Engineer	Camp Supervisor	Foreman - Group 1	Foreman - Group 2	Foreman - Group 3	Foreman - Group 4	Foreman - Group 5	Foreman - Steep Slope	Ground Disturbance Coordinator	Strawboss 1 - Pipe Gang	Strawboss 2 - Operator	Strawboss 3 - Labour	Welding Foreman	Bead Grinder	Clampman	Labour - General	Labour - Skilled	Spacer	Stabber	Welder Helper	Construction Manager	Equipment Manager	Equipment Vehicle Coordinator	Project Director	Project Manager	Senior Project Manager	Superintendent	Assistant Superintendent	Traffic, Transportation, & Logistics Manager	Welder Utility w/ rig	Mechanic	Mechanic w/ rig	Administrative Assistant	Assistant Office Manager	Contracts Administrator	Contracts Manager	Contracts Specialist	Document Control	Document Control Manager	First Nation Coordinator	HR Coordinator	Office Manager	Payroll Supervisor	Procurement / Buyer	Project Accounts Payable	Project Controls	Project Controls Manager	Scheduler	Senior Project Controls	Stakeholder Relations Manager	Senior Project Controls II	Operator Group 1	Operator Group 2	Operator Group 3	Operator Group 4	QA/QC Manager	Coating Coordinator	Material Coordinator	QA/QC Coordinator Lvl 2	QA/QC Manager II	QC - String & Bend / Lowering In	QC - Welding	QC Turnover / IT Coordinator	Senior QA/QC Coordinator Lvl 1	Welding Coordinator	QC - Coating / Blasting / Backfill	Safety / Security Manager	Senior Safety / Security Manager	Field Safety Coordinator	Senior Safety Advisor	Security	Automatic Technician	Automatic Technician - Intermediate	Automatic Bug Operator	Welder	Welder w/ rig
Required Pre-Hire Training																																																																																																				
PCST (6-8 hours)	8	Online	Pre-Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Ground Disturbance Level II (6-8 hours)	8	Online	Pre-Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M																		M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M					
Ledcor Pipeline Limited Orientation (1.5 hours)	1.5	Online	Pre-Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
CN Orientation Online (0.5-1 hour)	1	Online	Pre-Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M																		M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
TMEP Site-Specific Orientation																																																																																																		
Site Specific Orientation includes H2S Awareness (4-5 hours)	5	In Person	Post Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
TMEP Safety/Security Orientation Videos included in Site Specific Orientation (3 hours)	3	In Person	Post Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
TMEP Ground Disturbance Training (2 hours)	2	In Person																																																																																																		
TMEP Environmental Level 2 (1.5 hours)	1.5	Class	Post Hire														M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M								M	M	M	M	M	M	M	M	M																										M				M							M	M	M	M	M					
Other Training																																																																																																		
ATV Training (10 hours)	10	Class	Post Hire	JS	JS	JS	JS	JS					JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS		JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS				JS	JS	JS	JS	JS	JS	JS	JS																				JS	JS	JS	JS												JS	JS	JS	JS	JS					
Avalanche Training (10-20 hours)	20	Class	Post Hire																							JS	JS	JS	JS	JS	JS		JS	JS	JS															JS	JS																																											JS	JS	JS	JS	JS					
Bear Awareness (10 hours)	10	Class	Post Hire																																																																																															
Basic Chainsaw Safety (20 Hours)	20	Class	Post Hire																					JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS																																																								
Confined Space (10 Hours)	10	Class	Post Hire					JS																JS		JS	JS	JS	JS	JS	JS		JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS										JS																																							JS	JS	JS	JS	JS	JS	JS	JS	JS	JS
Gas Detection (2 hours)	2	Class	Post Hire					JS																JS		JS	JS	JS	JS	JS	JS		JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS										JS																																							JS	JS	JS	JS	JS	JS	JS	JS	JS	JS
H2S Alive (10 hours)	10	Class	Post Hire	JS	JS	JS	JS	JS																JS		JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS							JS	JS		JS	JS	JS																				JS	JS	JS	JS		JS	JS	JS		JS	JS		JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS
Respirator Fit Test (3 hours)	3	Class	Post Hire					M																		JS	JS	JS	JS	JS	JS		JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS										JS	JS	JS																																							M	M	M	M	M	JS	JS	JS	JS	JS
Elevated Work Platform (10 hours)	10	Class	Post Hire																					JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS			JS	JS			JS										JS	JS	JS																				JS	JS	JS	JS												JS	JS	JS	JS	JS	JS	JS	JS	JS	JS
Fall Protection (10 hours)	10	Class	Post Hire	JS	JS	JS	JS	JS																JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS			JS	JS			JS										JS	JS	JS																				JS	JS	JS	JS												M	M	M	M	M	JS	JS	JS	JS	JS
ENFORM Oil Field Driver Training (10 hours)	10	Class	Post Hire	JS	JS	JS	JS	JS																																																																																											
Enhanced Security Awareness	1	Class	Post Hire																	M			M	M	M	M	M	M	M	M	M	M	M	M	M	M								M	M		M	M	M	M	M	M							M						M					M			M						M				M							M	M	M	M	M					
Environment Level 3	3.5	Class	Post Hire														M	M	M	M	M	M	M																																																																											
Fire Watch (4 hours)	4	Online	Post Hire					JS																													JS	JS	JS	JS	JS	JS	JS																																																												
JOHSC Member Training (16 Hours x 8 people) - Per year	16	Class	Post Hire	JS	JS	JS	JS	JS																									JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS							JS	JS		JS	JS	JS																				JS	JS	JS	JS																			JS	JS	JS
Journeyman		School	Pre-Hire	J																																																	J	J	J																																													J	J
Leadership of Safety Excellence (20 hours)	20	Class	Post Hire																	M			M	M	M	M	M	M	M	M	M	M				M								M	M			M	M	M	M	M																												M				M							M	M	M	M	M					
Pipelayer Operator Training (10 hours)	10	Class	Post Hire																							JS	JS	JS	JS	JS	JS		JS	JS	JS	JS																																									JS	JS	JS	JS																					
S 100 Fire Suppression (20 hours)	20	Class	Post Hire																							JS	JS	JS	JS	JS	JS		JS	JS	JS	JS			JS	JS										JS	JS																								JS	JS	JS	JS												JS	JS	JS	JS	JS					
Occupational First Aid - Level 1 CPR (20 hours)	20	Class	Pre-Hire	M	M	M	M	M									M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M														M	M	M	M	M	M										M														M				M							M	M	M	M	M					
Supervisor Onboarding Training (40 hours)	40	Class	Post Hire																					M	M	M	M	M	M	M	M	M				M																																																																
Traffic Control (20 hours)	20	Class	Post Hire	JS	JS	JS	JS	JS																JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS									M																																											JS	JS	JS	JS	JS					
Basic Rigging Training	8	Class/Online	Post Hire																																				JS	JS	JS	JS	JS																																																													
Swift Current Rescue Awareness	4	Online	Post Hire																							JS	JS	JS	JS	JS	JS								JS	JS	JS	JS	JS																																																											
Advanced Rigging Training	6	Online	Post Hire																							M	M	M	M	M	M					M														M	M				M																																																
Transportation of Dangerous Good (4 hours)	4	Online	Pre-Hire	M	M	M	M	M									M	M	M	M	M	M	M	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS																M	M	M	M																																							M	M	M	M	M					
Drug and Alcohol Breathlizer test	8	Class	Post Hire																																																																																								M	M	M	M						
Driver Training with In-cab evaluation	20	Class	Post Hire	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
CMSTQ (All personnel will have met the requirements for the CMSTQ through the Pipeline Online Orientation, the TMEP orientation, and PCST				M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

11.0 LSLP CQS

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Senior Environmental Manager	**Work Location (s)**	Valemount, Blue River BC

Job Description	The Senior Environmental Manager is responsible for the CET and all required environmental submissions to the TMEP environmental inspection team. The Senior Environmental Manager will provide the interface between the Contractor and TMEP on environmental construction related matters.
Roles and Responsibilities	The Senior Environmental Manager is responsible for the CET and all required environmental submissions to the TMEP environmental inspection team. The Senior Environmental Manager will provide the interface between the Contractor and TMEP on environmental construction related matters. Ensuring permit conditions and environmental commitments are reviewed, incorporated into construction plans and that systems and procedures (as described in this CEEP) are properly implemented. The Senior Environmental Manager will understand the requirements of applicable environmental legislation, TMEP environmental commitments, policies and procedures, CER Conditions, Environmental Assessment office (BC EAO) Conditions, ERD's and Indigenous commitments (as per MBA's provided), landowner requirements (as per Line List) TMEP commitment tracking table are adhered to and monitored in the field.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Training and Qualification		
Ref (1)	**Education**	**Certification**	**Description**
	✓		10+ years' experience, or equivalent, in the petroleum and/or environmental industry
	✓		Experience working on large pipeline construction projects, working collaboratively in a project team to maintain a coordinated approach to managing environmental issues. Experience in building and managing technical teams. Project management experience. Experience in technical writing and review.
	✓		Degree in environmental engineering or science
		✓	Professional Designation (*Preferred)

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Environmental Level 3 Training		✓
		✓	TMEP Enhanced Security Awareness Training		✓
		✓	Transportation of Dangerous Good		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spreads 3 & 4	**Date**	September 6, 2019
Job Title	Foreman	**Work Location (s)**	Valemount, Blue River, BC

Job Description	The Supervisor's role is the education, training, mentoring, and coaching of their workforce. They are responsible for the direct supervision and safety of their crews and are accountable to the Project Superintendent for the performance of personnel through safe work planning, safe work practices, and job procedures.
Roles and Responsibilities	Provide front line supervision to various tradesmen, labourers, and equipment operators as required by the project site.
	Perform daily work site inspections monitoring safety and quality of work
	Prepare and deliver work instructions to the crew at the start of daily shifts and communicate work progress, schedule variance, and the crew and safety performance to site supervision.
	Ability to supervise crews between 2-50 individuals depending on the assigned project.
	Leads the compliance with established safety work processes and work methods.
	Follow all rules and regulations as presented by the Project Specific Safety Program, including LSLP and any client safety orientation. This should include the requirements of the owner and regulatory body, including any WorkSafe BC requirements.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
			Minimum 5 years' experience supervising in pipeline construction
			Previous experience working with pipe larger than 36"

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓

	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓
		✓	TMEP Ground Disturbance Training		✓
		✓	TMEP Soil Handling Training		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓
	✓		Standard First Aid Level C with CPR		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spreads 3 & 4	**Date**	September 6, 2019
Job Title	Ground Disturbance Coordinator	**Work Location (s)**	Valemount, Blue River, BC

Job Description	Possesses thorough knowledge of Ground Disturbance regulations and is responsible for representing the company to landowners, regulators, and utility representatives on issues related to ground disturbance on mainline pipeline construction.
Roles and Responsibilities	Point of contact and liaison between owners, reps of utilities and the construction team providing the necessary Ground Disturbance information to the construction team.
	Control, maintain, and implement the first call process throughout the life cycle of the project, including the creation and supply of an organized Ground Disturbance package that will capture all information gathered throughout the completion of the project.
	Review and audit Crossing Agreements ensuring all legalities have been identified and are executed or in place prior to commencement of the Project scope.
	Witness daylighting, HDD crossings, open cut crossings, and backfill activities to capture any and all information as required.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
			5-7 years industrial and/or pipeline construction experience and one of the below:
		✓	Completion of post-secondary education in Civil Engineering or Construction Management

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
			Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓

	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓
		✓	TMEP Ground Disturbance Training		✓
		✓	TMEP Soil Handling Training		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Superintendent	**Work Location (s)**	Valemount, Blue River BC

Job Description	The Superintendent is responsible for successful execution and completion of large diameter pipeline projects with crew sizes upwards of 800 employees. They also ensure construction operations are performed in a safe and efficient manner is a key responsibility. They demonstrate leadership in the application of the Project Specific Safety Program (PSSP) to promote overall compliance of Ledcor Safety and Environmental standards, applicable OH&S Acts, regulations and codes with all employees and subcontractors. They also develop, maintain, and drives the construction schedule in conjunction with the project and operations team to ensure budgets and timelines are met.
Roles and Responsibilities	Demonstrates leadership in the application of the Project Specific Safety Program (PSSP) to promote overall compliance of Ledcor HS&E standards, applicable OH&S Acts, regulations and codes with all employees and subcontractors.
	Develops, maintains and drives the construction schedule in conjunction with the project and operations team to ensure budgets and timelines are met.
	Ensures pipeline operations are well organized and coordinated and comply with client specifications and regulatory requirements.
	Maintains strong working relationships with client representatives, subcontractors, suppliers and labour force.
	Oversees project reporting that accurately tracks site progress, events, inspections and other relevant information.
	Strategically plans and implements manpower levels and material quantities and ensures proper equipment and trades are available as required.
	Assumes leadership role and provides guidance to field supervisors in order to contribute to their development and career growth; including conducting performance reviews and identifying training needs.
	Works with the field operations supervision to identify and select qualified field personnel.
	Assumes a leadership role and provides guidance to project team members in order to contribute to their development and career growth.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Training and Qualification		
Ref (1)	**Education**	**Certification**	**Description**
			10+ years' experience in large diameter pipeline construction.

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓

	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Traffic Manager	**Work Location (s)**	Valemount, Blue River BC

Job Description	The Traffic Control Manager is responsible for supporting and managing project Traffic Management Plan and supporting LSLP Health, Safety and Environmental Protection Program at the worksite level.
Roles and Responsibilities	Implement the LSLP Project Traffic Management Plan (TMP), client, and Ministry of Transport construction requirements
	Schedule traffic control set ups and crews in collaboration with the construction crews according to project schedule.
	Interacts with client and jurisdictional representatives as required on all safety issues.
	Supervises all activity, exercises the authority to stop and correct any work should any conditions expose persons, property or the environment to imminent danger or noncompliance of the policies, programs or regulations.
	Participates in all project planning meetings related to project work planning and scheduling to ensure planning processes include TMP requirements.
	Communicates regularly with Project Manager and Supervision in determining daily site traffic movement needs and ensure traffic control is implemented to meet or exceed the TMP and regulatory requirements.
	Performs workplace hazard assessments to identify traffic movement risks.
	Immediately report any conditions that do not meet regulatory requirements to the Project Manager.
	Provides assistance with the preparation of traffic management information, advice on interpretation of local government OH&S regulations.
	Delivers traffic control/management education, training for information at the weekly safety meetings.
	Liaises with client and regulatory authorities at the site level to promote safety and assist to resolve any issues of non-compliance.
	Ensures local emergency agencies have been made aware of the unscheduled delays.
	Monitors subcontractors to ensure compliance with regulatory requirements at a company, site and provincial level.
	Ensures appropriate quantities of supplies of appropriate traffic control devices.
	Completes all required monthly, weekly and daily reports.
	On-call during non-working hours for notification regarding a site deficiency or incident Manages all traffic control staff on site

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Training and Qualification		
Ref (1)	**Education**	**Certification**	**Description**
			3 to 5 years' experience in traffic management role.
		✓	British Columbia Traffic Control Person Certification

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓
	✓		Transportation of Dangerous Good		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Quality Control Manager	**Work Location (s)**	Spread 3 and 4A

Job Description	Ensure implementation of the Project Quality Plan, Inspection and Test Plans, daily quality reports are accurate, interface with operations and Client counterpart. Ensure clients expectations and contractual obligations are adhered to.
Roles and Responsibilities	Supervise and mentor multiple supporting QC Inspectors providing direction for priorities based on construction activities
	Represent LSLP in meetings with the client and regulatory agencies
	Understand contract and specification requirements for the Project Quality activities
	Set up and lead all quality processes to achieve project requirements including inspections to comply with approved Inspection and Test Plans (ITP's) and code requirements
	Implement the quality management system and develop the Project Quality Plan
	Develop, implement, and interpret the Inspection and Test Plans (ITP's)
	Complete Non-Conformance reports and implement dispositions
	Internal and Subcontractor surveillance and audits
	Detailed technical inspections for welding, coating, and additional disciplines

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
	✓		5 Years industrial and/or pipeline construction experience and one of the below:
	✓	✓	CSA W178.2 Welding Inspector Certification to Level 1 or 2, and a current Visual Acuity Record / Eye Exam
	✓	✓	NACE CIP Level 1 or higher, Coating Inspection Certification
	✓	✓	Preference given to API 1169 Pipeline Construction Inspector Certification

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety		✓

			Training System (CSTS)		
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Quality Welding Inspector	**Work Location (s)**	Spread 3 and 4A

Job Description	Monitor field Welding activities including bevel prep, pre-heat temperature, fit up, electrode size and type, travel speed, voltage, amperage, and heat input fall within the parameter range listed within the WPS.
Roles and Responsibilities	Read and understand specification requirements for the related construction activities
	Communicate the requirements of the ITP (Inspection and Test Plan), code requirements, and client specifications to the craft personnel
	Monitor ongoing welding activities to ensure the Welding Performance Specification (WPS) is being adhered too, including pre-heat, parameter taking, and interpass temperature.
	Identify Non-Conformances and report them to the Quality Manager
	Ensure Quality records and maintained and filed for the Project turnover

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
	✓		5 Years industrial and/or pipeline construction experience and one of the below:
	✓	✓	CSA W178.2 Welding Inspector Certification to Level 1 or 2, and a current Visual Acuity Record / Eye Exam

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	Safety	Technical		Internal	External

Approvals

LSLP Representative		Signature		Date	
Client Representative		Signature		Date	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Quality Coating Inspector	**Work Location (s)**	Spread 3 and 4A

Job Description	Monitor field coating activities including ambient conditions, anchor profiles, DFT's, coating adhesion, hardness of coating and holiday testing of completed coating. Complete the necessary coating report and insert into the Project Turnover
Roles and Responsibilities	Read and understand specification requirements for the related construction activities
	Communicate the requirements of the ITP (Inspection and Test Plan), code requirements, and client specifications to the craft personnel
	Monitor ongoing coating activities to ensure performance to specifications and coating procedures and Manufacturers Quality Application Procedure (MQAP)
	Identify Non-Conformances and report them to the Quality Manager
	Ensure Quality records and maintained and filed for the Project turnover
	Work Closely with the Construction team to ensure the final coating is as per code and client requirements
	Ensure coating reports are signed off by client prior to filing for turnover

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
	✓		5 Years industrial and/or pipeline construction experience and one of the below:
	✓	✓	NACE CIP Level 1 or higher, Coating Inspection Certification

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓

	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Ground Disturbance Training		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Safety Manager	**Work Location (s)**	Valemount, Blue River BC

Job Description	The Safety Manager is the paramount onsite safety resource and is responsible for building the safety team for the project including mentoring, training and coaching of all safety personnel and project staff. This individual is accountable for the creation and implementation of the Project safety program on sites and facilitates safety and operations resources to meet short-term and long-term safety objectives.
Roles and Responsibilities	Responsible for being the liaison and supporting all subcontractors, notably the avalanche monitoring, medical, and traffic sub-contractors, to ensure execution and adherence to LSLP's and client safety program and requirements
	Oversee the entire Safety team and resolve any day-to-day or routine issues through immediate actions or short-term planning within defined processes.
	Provide guidance and oversight for incident investigations and management at all locations.
	Leads Health and Safety audits (internal and external) and develops action plans to address deficiencies identified.
	Represent the Contractor at Client meetings and interfaces and recommend to Senior safety management and project management; tactics or steps required to implement safety programs and enhance the overall safety culture of the Project.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Training and Qualification		
Ref (1)	**Education**	**Certification**	**Description**
			10+ Years Health and Safety experience in oil & gas industry and 5+ Years Health and Safety experience in a management role related industry (e.i. pipeline construction, facility construction) and one of the below:
		✓	Certificate in Health and Safety from an accredited University or National Construction Safety Officer (NCSO) Designation (*Mandatory)
	✓		Diploma or Degree in Occupational Health and Safety from an accredited University (*Preferred)
		✓	Canadian Register Safety Professional (CRSP) Designation (*Preferred)

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓

	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓
	✓		Transportation of Dangerous Good		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	September 06th, 2019
Job Title	Security Supervisor	**Work Location (s)**	Valemount, Blue River BC

Job Description	The Security Supervisor is responsible for overseeing and coordinating the physical security and incident management of project site operations throughout the life cycle of the project. This individual participates in the planning of security strategies and acts as a key point of contact with the Owner's representatives, law enforcement, subcontractors and related stakeholders.
Roles and Responsibilities	Provides key input into strategic and tactical direction and supervision of security personnel during both regular project operations and during periods of protest and demonstration.
	Provides site-specific security advice to project security liaison to ensure effective implementation of security plans and protocols.
	Supervises the response to investigation of security incidents and provides input into the planning of incident response strategies.
	Collaborates with security leads on neighboring projects to ensure alignment in strategy and incident response and develops risk mitigation strategies to address security issues and escalated incidents.
	Establish and maintain effective relationships with law enforcement liaison(s), ensuring regular communication and coordination between law enforcement and project stakeholders and acts as the key point of contact with law enforcement during active situations.
	Ensures effective and ongoing coordination and communication with subcontractors on site to align security protocols and recommends on best practices to address security risks.
	Collaborates with senior security management on project-wide security matters. Participates in regular security briefings and provides regular reporting and recommendations.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Training and Qualification		
Ref (1)	**Education**	**Certification**	**Description**
			XX+ years' experience in a Law Enforcement including demonstrated supervision and leadership skills. Experience policing First Nation Communities and large Public disobedience events (*Preferred)

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	

	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓
	✓		Transportation of Dangerous Good		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spreads 3 & 4	**Date**	September 6, 2019
Job Title	Welder w/rig	**Work Location (s)**	Valemount, Blue River, BC

Job Description	The Journeyperson B Pressure Welder will possess extensive experience using SMAW welding procedures and possesses an all positions CWB ticket. Will also possess experience welding pipe as well as non-pipe items related to the installation of piping on a pipeline construction project.
Roles and Responsibilities	Performs pipe welding (capable of rolling pipe and/or position welding)
	Develops patterns for projects or follow directions given in layouts, blueprints, and work orders.
	Cleans and checks for defects in pipe
	Mentors and coaches apprentice welders as well as performing other related duties as assigned

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
			5 years industrial and/or pipeline construction experience, welding experience and one of the below:
		✓	Interprovincial Red Seal or have a Journeyman Welding ticket form a recognized provincial training authority
		✓	Carbon Steel Performance Qualification ticket for SMAW F3/F4
		✓	Valid CWB all positions ticket
		✓	CSA W178.2 Welding Inspector Certification to Level 2 or 3, and a current Visual Acuity Record / Eye Exam
		✓	Welding Engineering Technologist Diploma
		✓	API 1169 Pipeline Construction Inspector Certification (*Preferred)

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	

	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spread 3 & 4A	**Date**	November 15, 2019
Job Title	Environmental Compliance Lead	**Work Location (s)**	Valemount, Blue River BC

Job Description	The creation and development of all required environmental processes, plans, and management of environmental compliance supporting the CEEP and subsequent construction activities.
Roles and Responsibilities	The Environmental Compliance Lead will be required to understand Trans Mountain's commitments, policies and procedures, and all federal, provincial and local permits, approvals, and authorizations provided by Trans Mountain. The Environmental Compliance Lead will regularly communicate with the TMEP EI Team to assist in the management of regulatory processes, the identification and tracking of compliance requirements, compliance with commitments and conditions, regulatory reporting, compliance verification and training. With respect to environmental commitments and requirements, internal tracking of compliance requirements, compliance verification, non-compliance reporting and corrections, incident reporting and documentation will be completed by the Environmental Compliance Lead. Additionally, any commitments outlined in Trans Mountain's Pipeline Environmental Protection Plan (Volume 2) and its Resource-Specific Mitigation tables (Volume 7) will be monitored, tracked and reported on.

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Training and Qualification		
Ref (1)	**Education**	**Certification**	**Description**
			10+ years' experience, or equivalent, in the petroleum and/or environmental industry
			Experience working on large pipeline construction projects, working collaboratively in a project team to maintain a coordinated approach to managing environmental issues. Experience in building and managing technical teams. Project management experience. Experience in technical writing and review.
	✓		Degree in environmental engineering or science
		✓	Professional Designation (*Preferred)

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			Training Provider	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety Training System (CSTS)		✓

	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓

Supplemental Job-Specific Training

	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Environmental Level 3 Training		✓
		✓	TMEP Enhanced Security Awareness Training		✓
		✓	Transportation of Dangerous Good		✓

Approvals

LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

Project	TMEP Spreads 3 & 4	**Date**	May 11th, 2020
Job Title	Steep Slope Supervisor	**Work Location (s)**	Valemount, Blue River, BC

Job Description	The Supervisor's role is the education, training, mentoring, and coaching of their workforce. They are responsible for the direct supervision and safety of their crews and are accountable to the Project Superintendent for the performance of personnel through safe work planning, safe work practices, and job procedures including the LSLP Steep Slope Safety Plan.
Roles and Responsibilities	Provide front line supervision to labourers, and equipment operators as required by the Steep Slope Safety Plan.
	Perform daily work site inspections monitoring safety and quality of work
	Prepare and deliver work instructions to the crew at the start of daily shifts and communicate work progress, schedule variance, and the crew and safety performance to site supervision.
	Ability to supervise crews between 2-50 individuals depending on the assigned project.
	Leads the compliance with established safety work processes and work methods.
	Follow all rules and regulations as presented by the Project Specific Safety Program, including LSLP Steep Slope Safety Plan, and any client requirement. This should include the requirements of the owner and regulatory body, including any WorkSafe BC requirements.
	Continuous monitoring the workforce for incompetence, dereliction of duty or inattentiveness while mentoring and coaching the group in diligent pro-active participation in the process safety focused culture required to be consistently successful in performing such high-risk activities.
	Being seen and heard at every opportunity championing a pro-active process safety culture through open and interactive communication protocols, information sharing and assurance of understanding, and a personal commitment to strict adherence to the site specific TMEP accepted SSWP

Educational and Other Professional Certification Requirements (Supplemental to High School or Equivalent)

	Education and Certification		
Ref (1)	**Education**	**Certification**	**Description**
			Minimum 5 years' experience supervising in pipeline construction
			Previous experience working with pipe larger than 36"
		✓	Hold a valid advanced hoisting and rigging certificate

Mandatory Project Specific Orientation and Training

	Training and Qualification Type			**Training Provider**	
Ref (2)	**Safety**	**Technical**		**Internal**	**External**
	✓		Required Pre-Hire Training *Pipeline Construction Safety Training (PCST) or Construction Safety		✓

			Training System (CSTS)		
	✓		Required Pre-Hire Training *Ground Disturbance Level II		✓
	✓		Required Pre-Hire Training *Ledcor Pipeline Limited Orientation	✓	
	✓		Required Pre-Hire Training *CN Orientation		✓
	✓		LSLP Site-Specific Orientation (Includes TMEP Safety, Security and Environment Level 1 training videos)	✓	
		✓	TMEP Environmental Level 2		✓
		✓	TMEP Ground Disturbance Training		✓
		✓	TMEP Soil Handling Training		✓

Supplemental Job-Specific Training

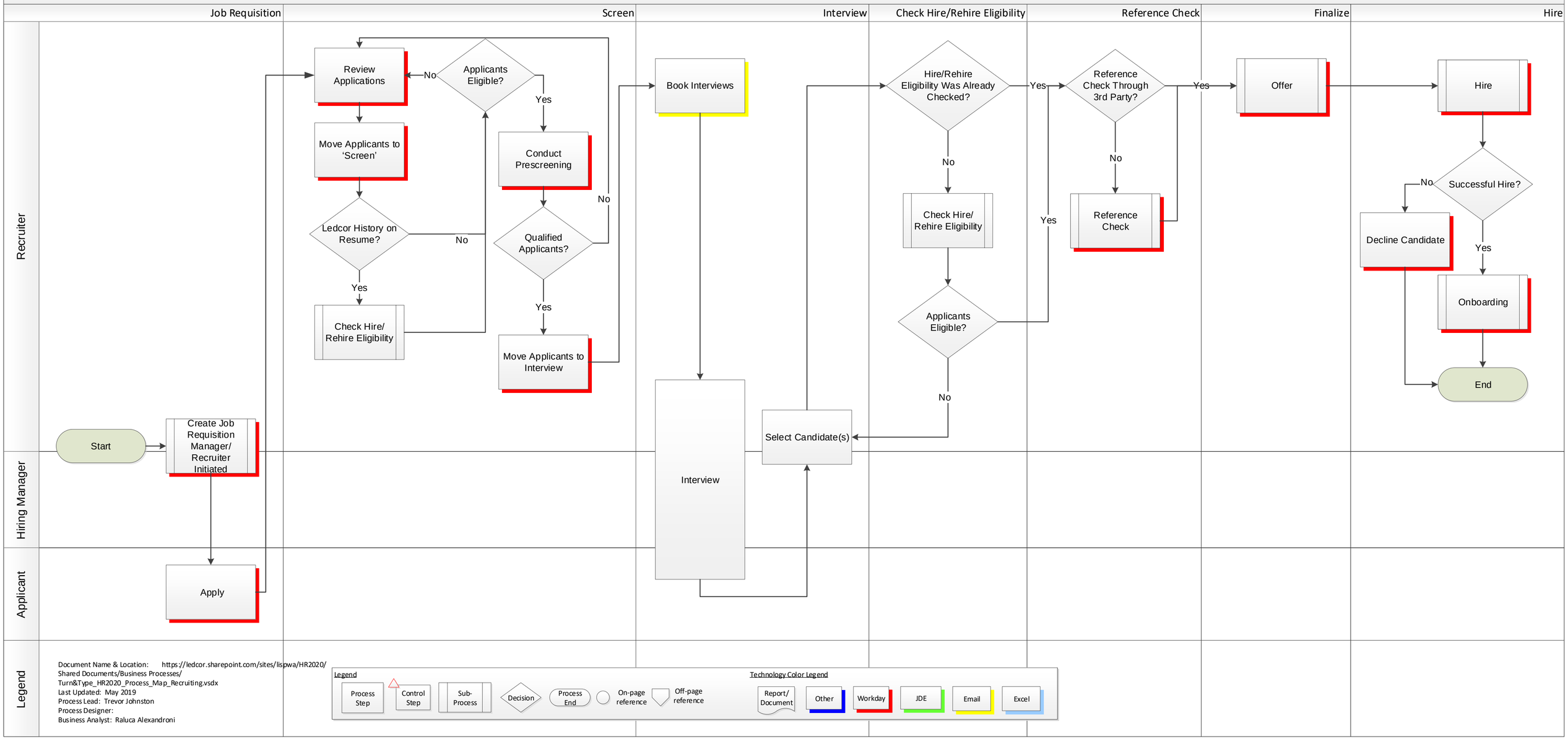
	Training and Qualification Type			Training Provider	
Ref (6)	**Safety**	**Technical**		**Internal**	**External**
	✓		Leadership for Safety Excellence (LSE)		✓
		✓	TMEP Enhanced Security Awareness Training		✓
	✓		Standard First Aid Level C with CPR		✓

Approvals

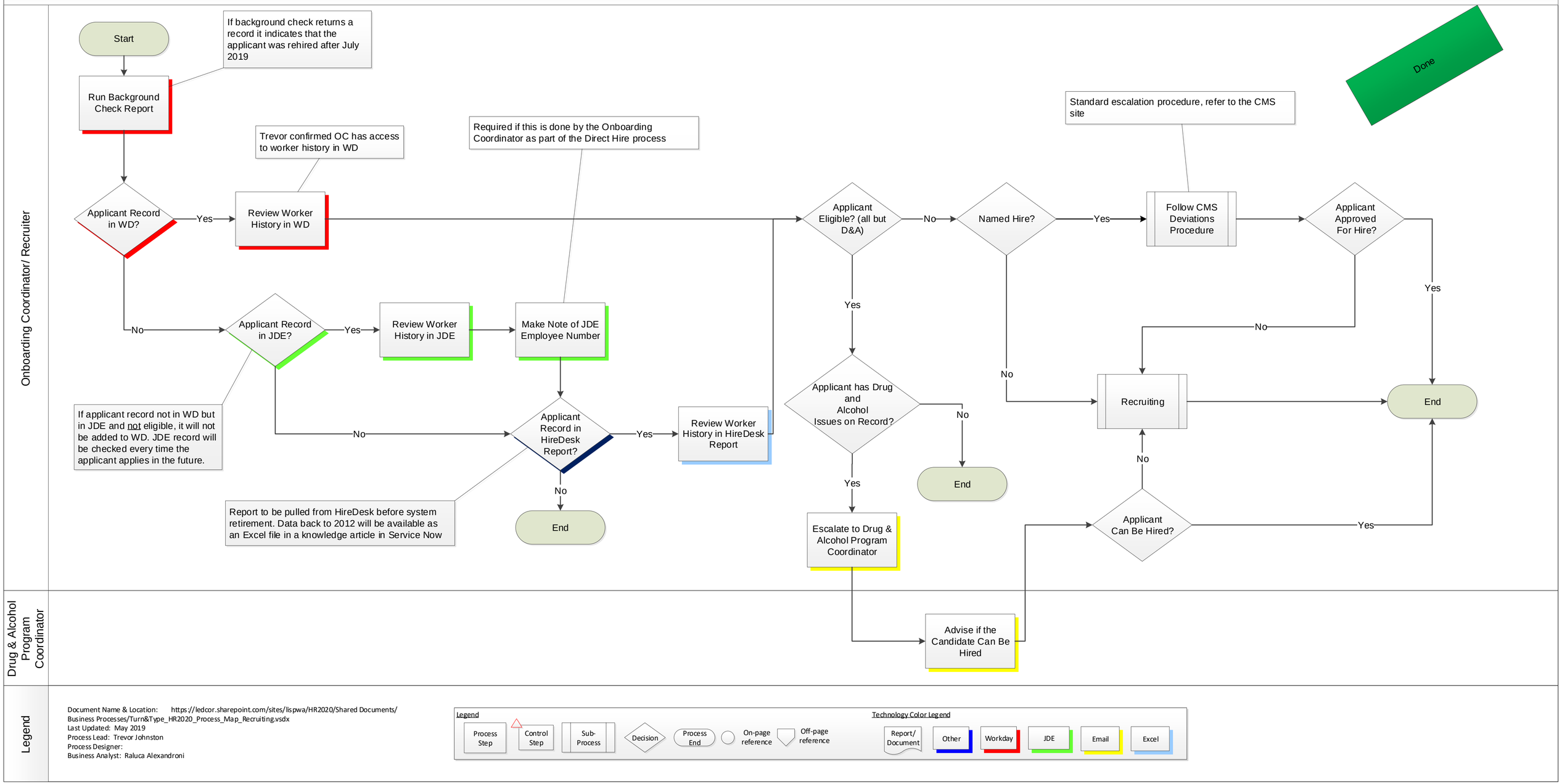
LSLP Representative		**Signature**		**Date**	
Client Representative		**Signature**		**Date**	

12.0 LEDCOR RECRUITING PROCESS MAPS

HR2020 Recruiting Process



HR2020 Check Hire/Rehire Eligibility Process



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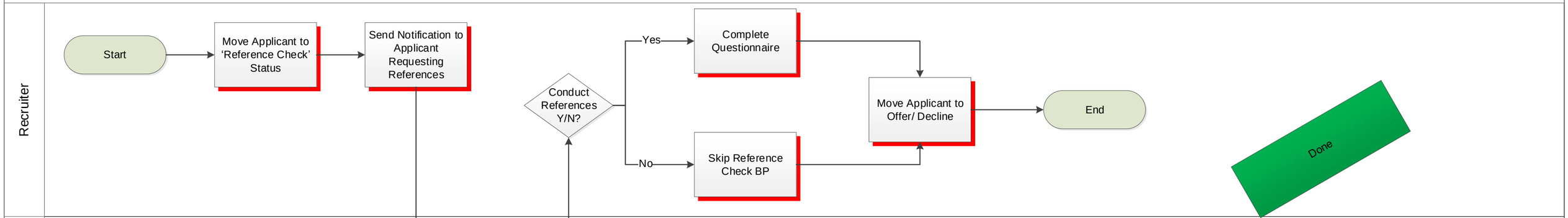
Last Updated: May 2019
Process Lead: Trevor Johnston
Process Designer:
Business Analyst: Raluca Alexandroni

HR2020 Reference Check Process



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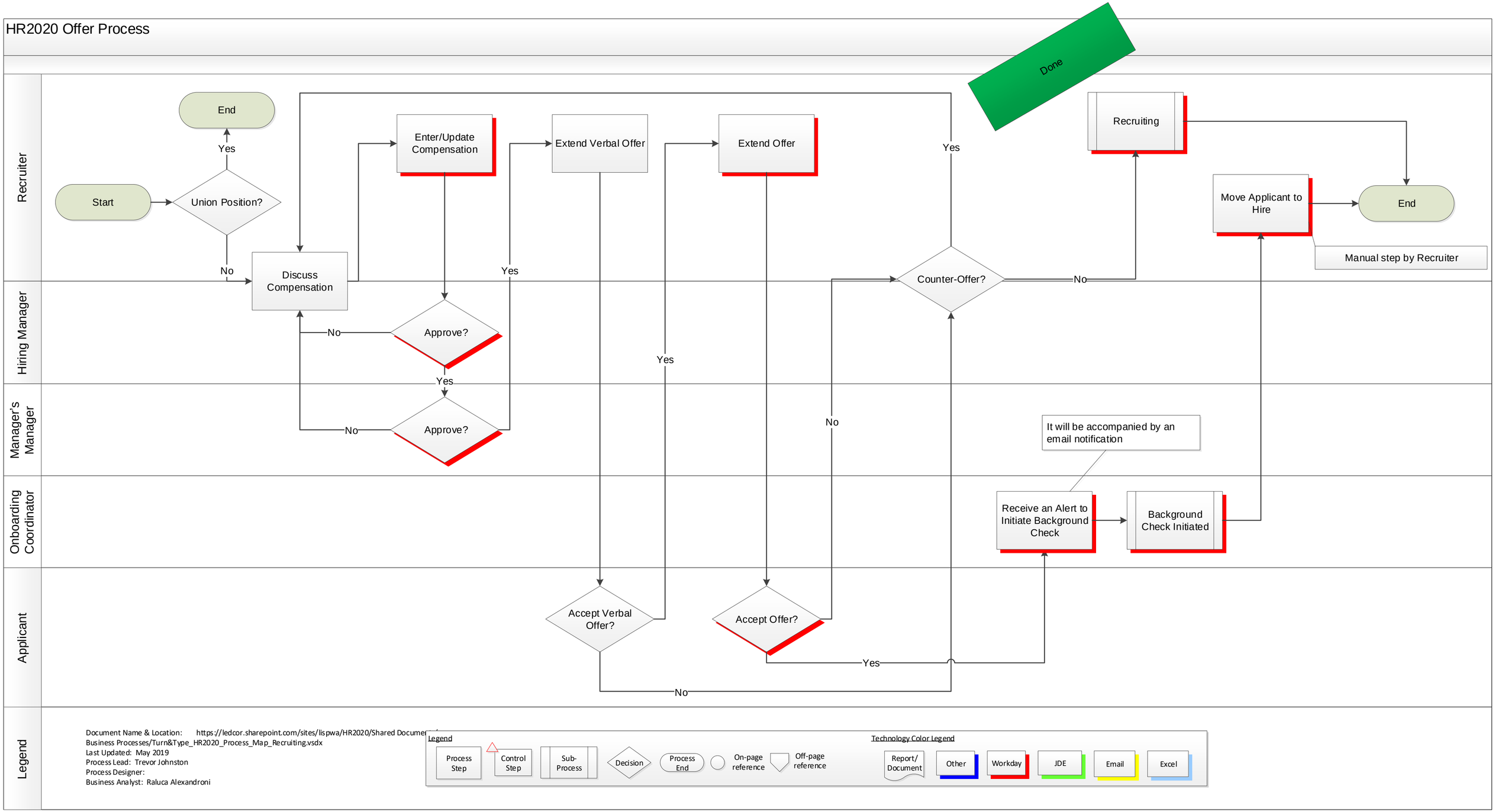
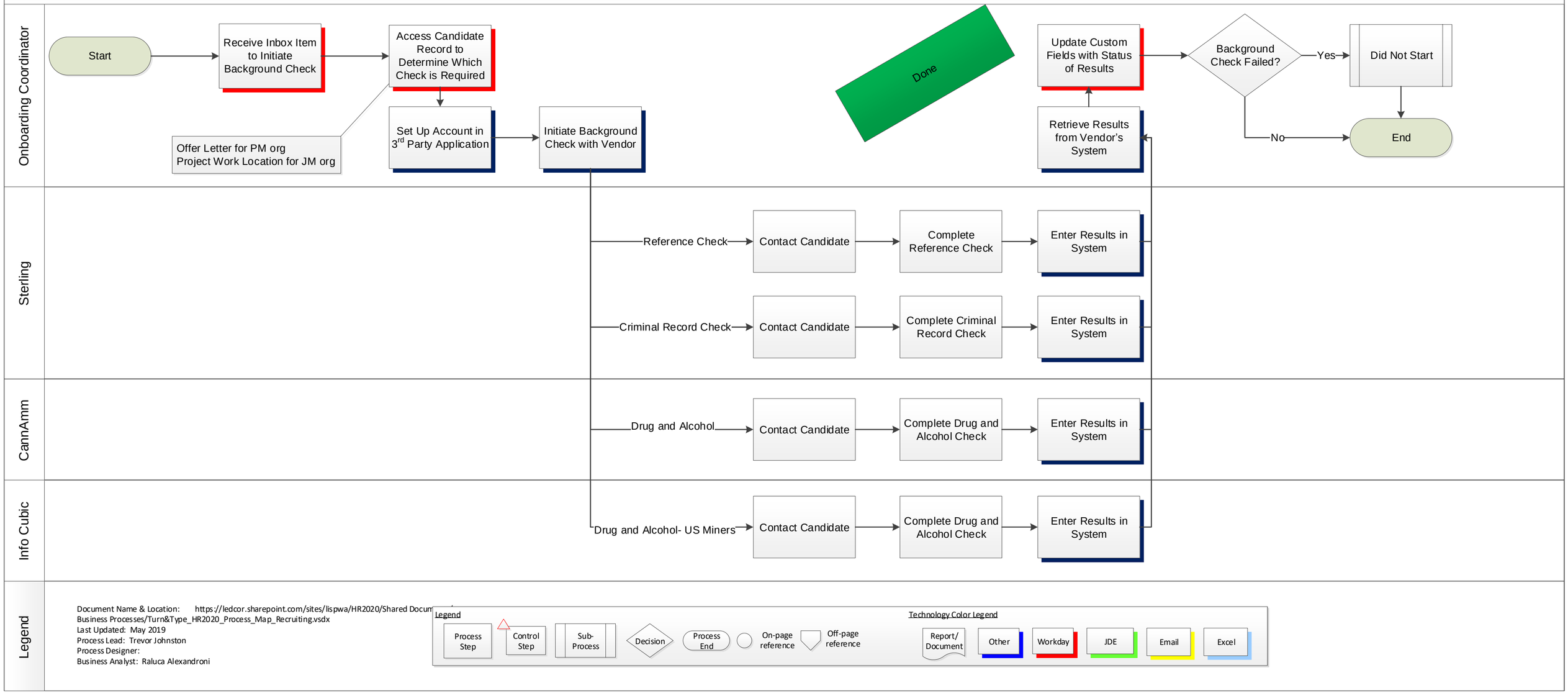
Last Updated: May 2019
Process Lead: Trevor Johnston
Process Designer:
Business Analyst: Raluca Alexandroni

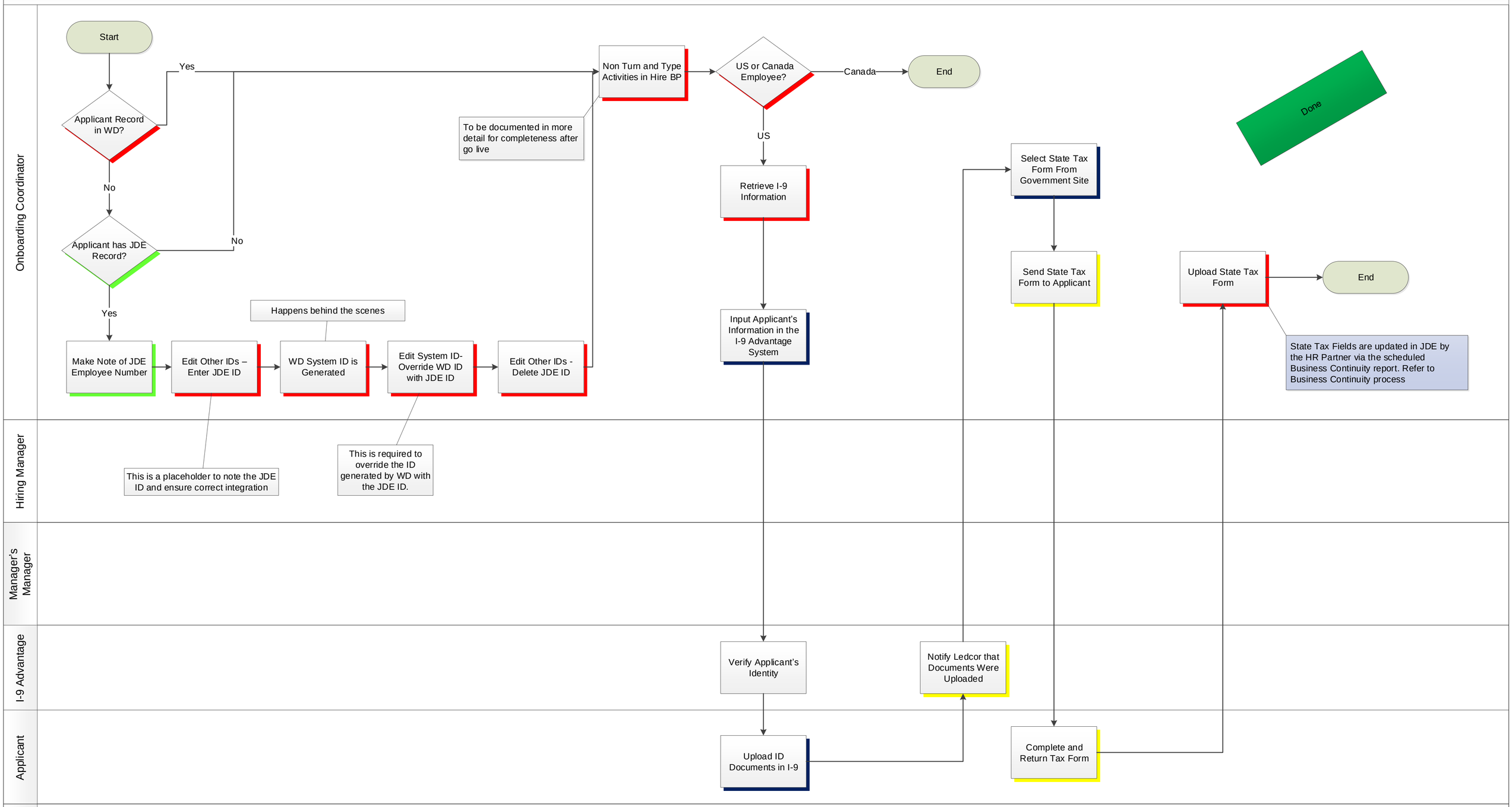
HR2020 Offer Process



HR2020 Background Check Process



HR2020 Hire Process Non-Union Employees



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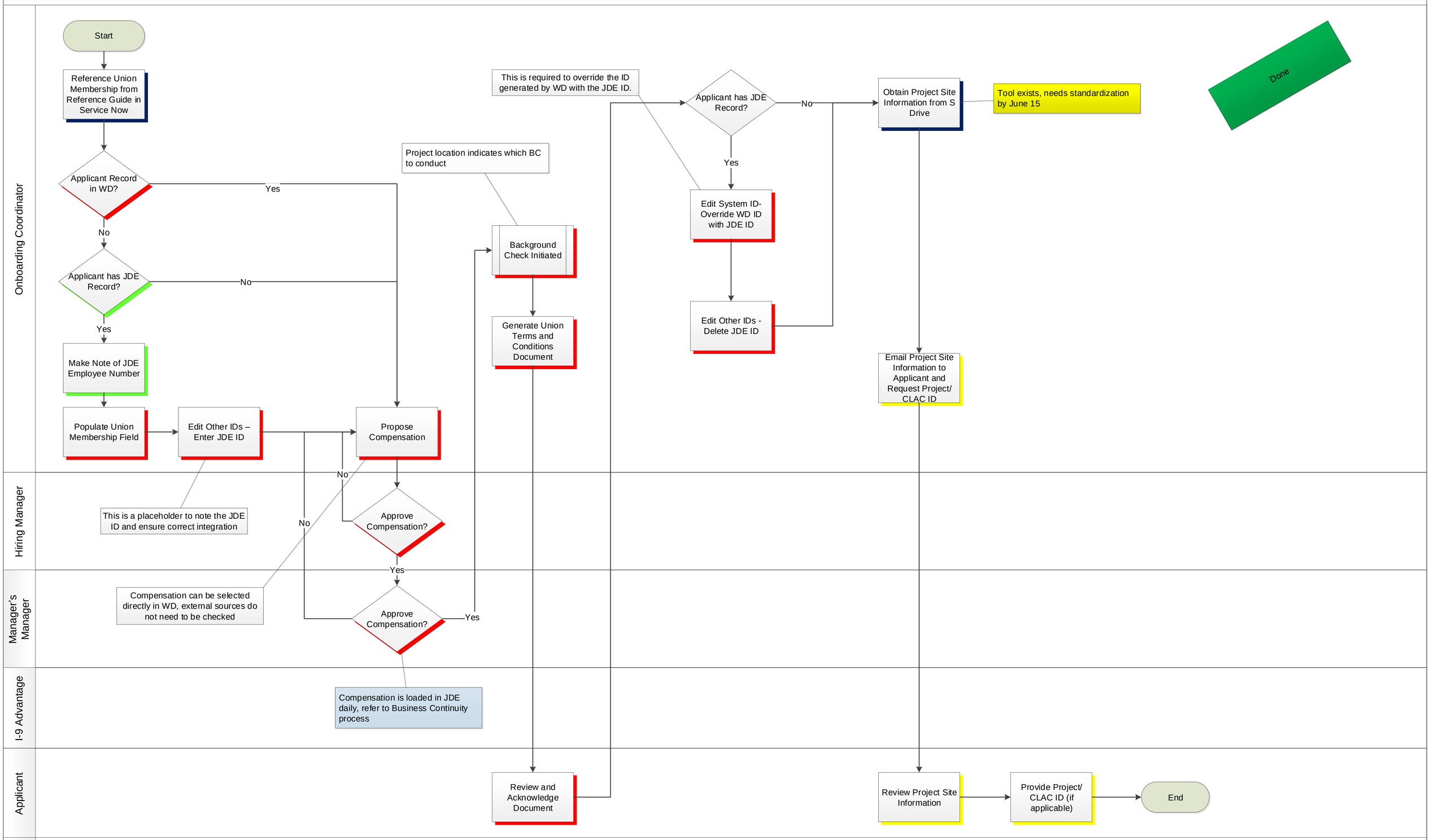
Last Updated: May 2019
Process Lead: Trevor Johnston
Process Designer:
Business Analyst: Raluca Alexandroni

HR2020 Hire Process Union Employees



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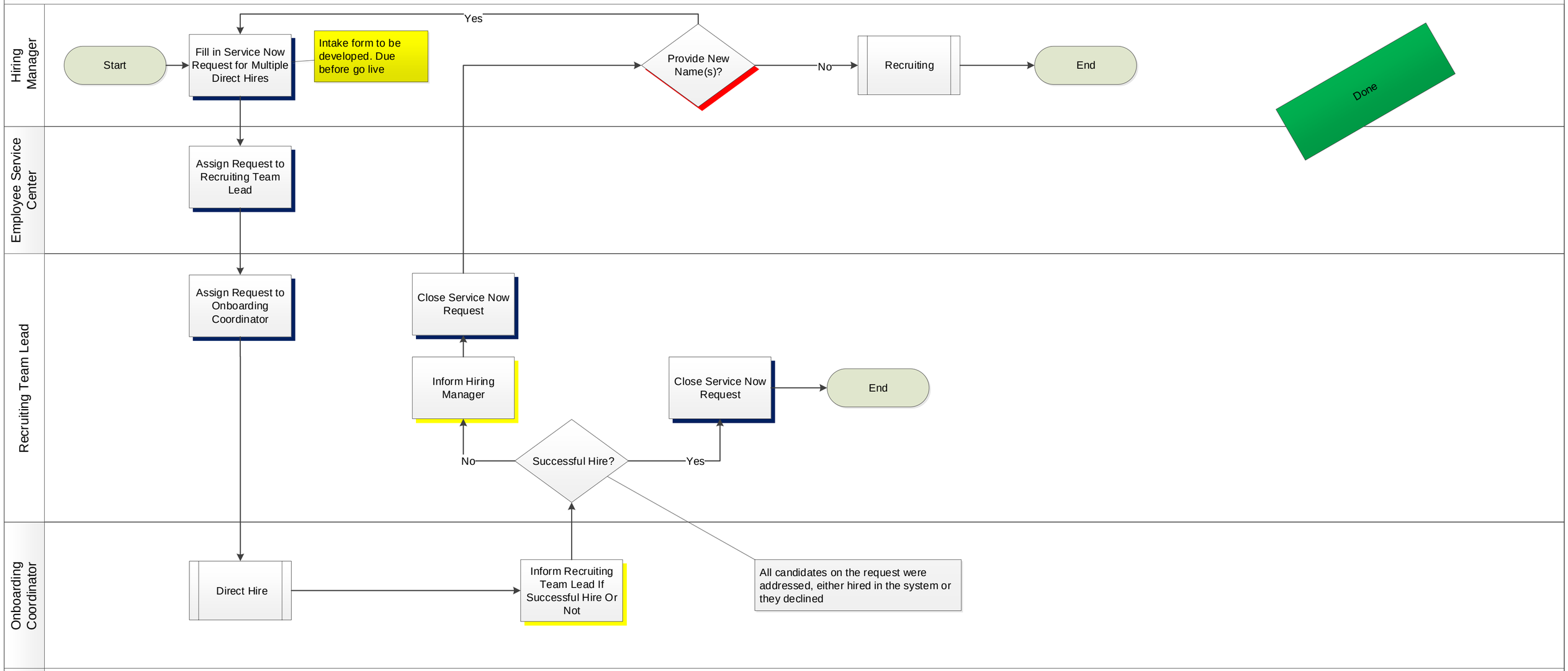
Last Updated: May 2019
Process Lead: Trevor Johnston
Process Designer:
Business Analyst: Raluca Alexandroni

HR2020 Initiate Direct Hire Process (Union Employees Only)



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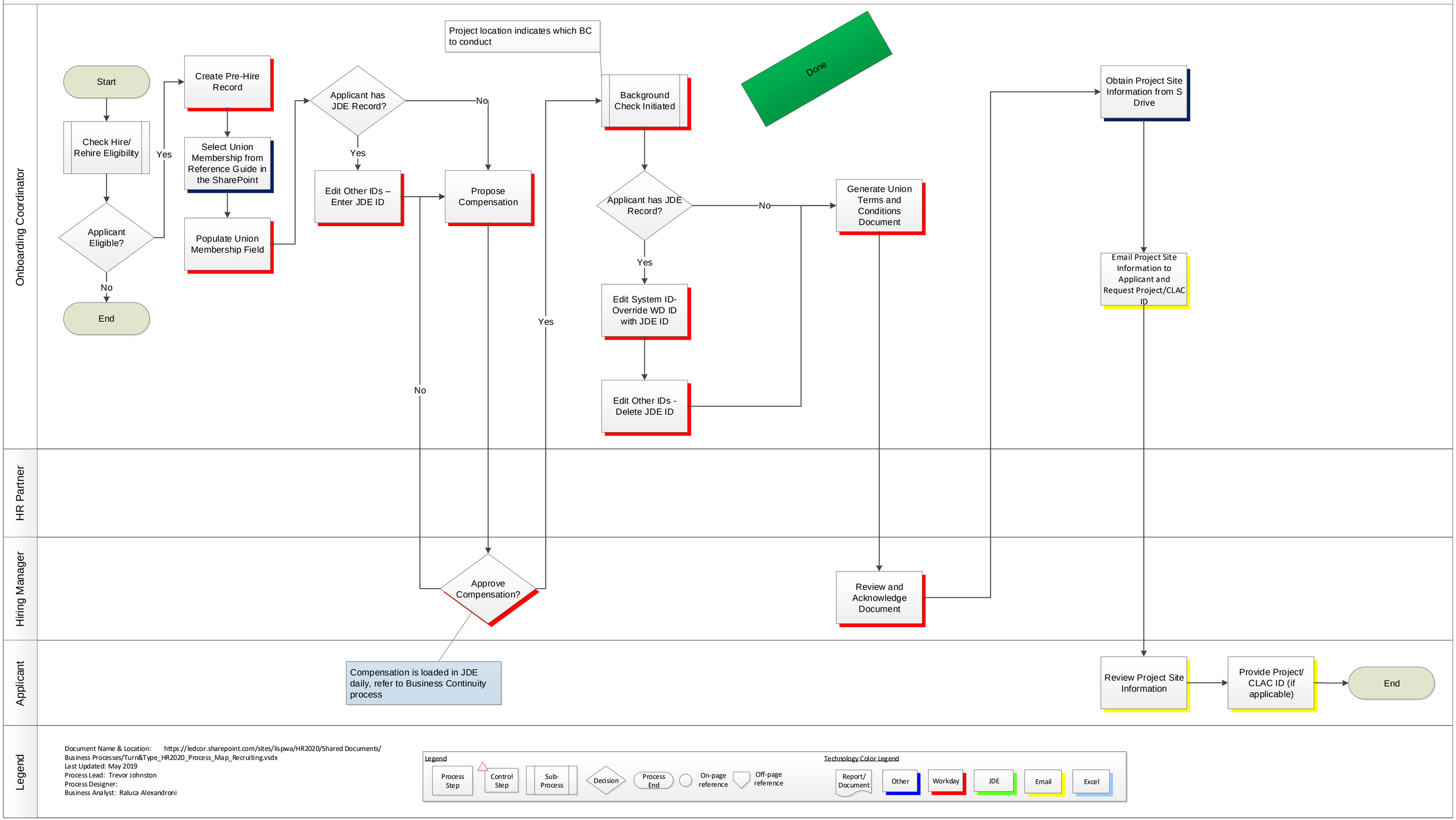
Last Updated: May 2019
Process Lead: Trevor Johnston
Process Designer:
Business Analyst: Raluca Alexandroni

HR2020 Direct Hire Process (Union Employees Only)



Appendix D – LSLP Ground Disturbance Plan

Trans Mountain Expansion Project

GROUND DISTURBANCE PLAN

TMEP Document # 01-13283-S3 S4A-M002-HS-PLN-0004 R0

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	Reviewed by TMEP	Pages Revised	Issued Type
0	E. Kibambe 2019-11-13	G. Roda 2019-11-13	M. Granger 2019-11-13	L. Duncan 2019-11-15		Issued for Use

Table of Concordance

No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
1	Ground Disturbance Plan	5.0	10	All workers directly involved in ground disturbance will be trained to the "Ground Disturbance 201 Safety Training Standard" of the Alberta Common Ground Alliance (ABCGA).	With exception to welders, all workers directly and indirectly involved in ground disturbance will be trained to the "Ground Disturbance 201 Safety Training Standard" of the Alberta Common Ground Alliance (ABCGA).		11/7/2019
2	Ground Disturbance Plan	12.0	31	Should any unintended contact which include bending or kinking, damaging the pipe coating, denting, flattening, gouging, penetrating, puncturing or rupturing, scratching, severing, occur with an underground pipe or utility, all work shall immediately stop and be reported to the TMEP PLP-D for a damage evaluation of the underground infrastructure. The Pipeline owner shall be immediately contacted, and work shall not resume in the area until an investigation by the Sr. PLP Designate is complete.	Should any unintended contact which include bending or kinking, damaging the pipe coating, denting, flattening, gouging, penetrating, puncturing or rupturing, scratching, severing, occur with an underground pipe or utility, all work shall immediately stop and be reported to the DPM for a damage evaluation of the underground infrastructure. The Pipeline owner shall be immediately contacted, and work shall not resume in the area until an investigation by the DPM or designate is complete.		11/7/2019

TABLE OF CONTENTS

1.0 PURPOSE

This Ground Disturbance Plan focuses on the damage protection requirements that pertain to the Trans Mountain Expansion Project (TMEP) Spreads 3 & 4A.

This Ground Disturbance Plan shall be reviewed and or updated if any of TMEP's Practices, Procedures or Standards are revised over the duration of the Project.

2.0 REGULATORY REQUIREMENTS

2.1 Canada Energy Regulator (previously the National Energy Board) Act and Regulations

As the Trans Mountain Pipeline crosses, interprovincial borders, it falls within the Canada Energy Regulator (CER) jurisdiction, previously known as National Energy Board (NEB). The Pipeline Safety Act, effective June 2016, is intended to improve pipeline safety. This act resulted in the updating of the National Energy Board Act and Regulations. Regulatory amendments, effective June 2016 include the:

- CER Pipeline Damage Prevention Regulations – Authorizations; and
- CER pipeline Damage Prevention Regulations - Obligations of Pipeline Companies, which replaces Pipeline Crossing Regulations, Part II.

The intent of the new regulations is to provide clear requirements to pipeline owners, landowners and land users planning to conduct an activity around a pipeline. Updates to the regulations include modernizing regulatory language, building in damage prevention best practices for improved ground disturbance requirements and clarifying safety practices.

2.2 Occupational Health & Safety (Provincial and Federal)

All Ledcor Sicim Limited Partnership (LSLP) personnel and Subcontractors must be aware of, and adhere to, applicable Federal Canada Labor Code (Part 3.12) and British Columbia OHS Regulation (Part 20.78 – 20.98). Appendix D of the TMEP Health and Safety Management Plan, or HSMP outlines the minimum health, safety and environment requirements to be followed.

The above requirements should be considered the minimum standard, and the strictest standard outlined within all documents must be maintained. Other documents that must be adhered to include:

- Ledcor Ground Disturbance Program
- TMEP Damage Prevention Program (DPP)
- TMEP Health and Safety Management Plan (HSMP)
- Third Party Crossing Agreements
- Project Specific Requirements, including:
  - Permits (Ground Disturbance, Safe Work)
  - Engineered Job Plans (Working on Top of TMPL or during blasting/piling operations)
  - Locate Documentation ("Locates")

3.0 ABBREVIATIONS AND DEFINITIONS

TERM	DEFINITION
30M Permit	The Trans Mountain Pipeline (TMPL) 30 meters (100ft) Ground Disturbance Prescribed Area Permit system to be used in pipeline construction in proximity to the TMPL (Line1). The 30M Permit will match the expiry timeline of the one-call. This is to the discretion of the DPS.

Brownfield	TM fenced facilities, pump stations, terminals.
CCGA	Canadian Common Ground Alliance
CER	Canada Energy Regulator
Contractor	Contractor means the person or entity, including the general construction contractor, under contract to Trans Mountain Expansion Project (TMEP or project) to perform project work. Contractor includes any subcontractor hired by the contractor to perform project work, in this plan, ground disturbance work.
(Daily) Safe Work Permit	The TMPL Operations permit for work on TMP facilities or near the existing, in service, pipeline.
DPI	(TMEP) Damage Prevention Inspector, field person responsible for ensuring safe ground disturbance activities in a Quality Assurance (QA) role or Pipeline Protection (PLP) on-site present designate.
DPM	(TMEP) Damage Prevention Manager, project executive responsible for ensuring that project execution does not affect the safety and integrity of the TMPL.
DPP	Damage Prevention Plan
DPS	(TMEP) Damage Prevention Supervisor, project field representative responsible for ensuring that the requirements of the corporate PLP program and the TMEP DPP are properly executed and enforced.
Foreign Line Crossing Checklist	Must be completed in addition to the LSLP GD checklist whenever working within a third-party right-of-way.
Ground Disturbance Foreman (GD Foreman)	contractor field representative responsible for directing GD work at the worksite.
Ground Disturbance Plan (GD Plan)	Ledcor Ground Disturbance Program and LSLP Ground Disturbance Plan for TMEP Spreads 3 & 4.
Ground Disturbance Permit (GD Permit)	The LSLP internal permit system (GD Checklist) to be used and which may require attachment of the 30 meters permit of facilities ground disturbance permit.
GD Supervisor	The Contractor’s responsible person for the implementation of the ground disturbance plan and the TMEP DPP. Supports the GD Foreman in the execution of ground disturbance activities as per this plan.
GPR	Ground-penetrating radar

Greenfield	Greenfield areas are defined as areas within TM Facilities with no TM underground utilities and verified by: a complete area locate sweep, no utilities identified through the one-call system, no utilities identified through a site inspection and review of drawings and plans.
ISLMS	Integrated Safety and Loss Management System
OCMS	One Call Management System
PLP	A TMPL term used to designate people and or/systems enacted by TMP for the purposes of protecting TMPL infrastructure.
Proximity Permit	The permit issued by a foreign utility owner to the TMEP authorizing: the installation of temporary structure, fencing, soil stockpile, on or over the foreign utility's ROW, other GD activity in a ROW, GD work under a buried utility, a vehicle crossing over or entering a ROW. For the purpose of this GD plan, TMPL Line 1 is
ROW	Right-Of-Way
Safe Excavation Entry Checklist	Ledcor form to be completed prior to entry into any excavation deeper than 1.2 meters. The checklist must be reviewed and signed by all personnel who enter the excavation.
TM	Trans Mountain Canada Inc.
TMEP (or project)	Trans Mountain Expansion Project
TMPL	Trans Mountain Pipeline
TMPL Line 1	Existing pipeline and its associated support infrastructure, including test leads, anode beds, deactivated pipeline segments to be reactivated and other pipeline-associated underground structures.
TMPL Line 2	New pipeline and its associated support infrastructure built by the TMEP, including active portions of Line 1 that will be used for the expansion.

4.0 GROUND DISTURBANCE OVERVIEW

Ground Disturbance is considered as any work operation or activity that results in a disturbance or displacement of soil or cover, including, but not limited to: auguring, backfilling, blasting, boring, clearing, digging, driving (fence posts, bars, rods, pins, anchors, or pilings), drilling, excavating, grinding and milling of asphalt/ concrete, land levelling/ grading, peat removing, ploughing to install underground infrastructure, quarrying, seismic exploration, soil loading, stump removal, topsoil stripping, trenching, tree planting, sign installation, and tunneling.

Activities that disturb the soil to a depth less than 20 cm (8 in.) are not considered a ground disturbance as long as the ground cover over the utility is not permanently removed. Surveying and staking do not qualify as a ground disturbance if the stakes do not penetrate the ground more than 20 cm (8 in.) deep.

Note that equipment crossing over underground infrastructure may be considered a “ground disturbance” activity as per provincial or federal regulations. For the purposes of the definition of “ground disturbance” in this plan, mobile equipment, including light vehicles, crossing the TMPL is considered a ground disturbance. Crossing of 3rd Party underground infrastructure is also considered a ground disturbance by TMEP unless expressly stated it is not, by the 3rd Party underground infrastructure’s owner.

4.1 Proximity (Crossing) Installation Permit, (For 3rd Party Crossings)

Any structure or other ground disturbance activity that encroaches on the right-of-way (ROW) or 30m (100 ft.) Prescribed Area of the existing TMPL or other, 3rd-Party owned underground infrastructure, or that crosses over or under the underground facility (pipeline), including (but not limited to):

- Construction and construction equipment;
- Roads, railways, and highways;
- Underground utilities, including the TMEP pipeline and;
- Ditches or fences.

4.2 Prescribed Area*

A 30-m-wide (100 ft.) area extending perpendicularly from either side of the pipe centerline. The prescribed area is not marked by stakes. Any GD work in this area requires an approved 30m permit or facility GD permit. All ground disturbances within this zone requires the pipeline operators’ consent, e.g., a 30M permit, and/ or a Facility Ground Disturbance Permit.

The permit must be completed and reviewed with all personnel involved prior to ground disturbance. Note: This area is sometimes referred to as the 30 meters (100 ft.), Safety Zone.

4.3 Foreign Utility

All 3rd Party underground utilities other than the in-service TMPL and TMPL associated terminal and station piping. Foreign utilities may or may not be covered under the local One Call system and may be a privately-owned utility. In these instances, the owner of the utility must be contacted directly, and arrangements made to work in proximity to their underground pipe or facility.

Prescribed Area is a new term introduced in the updated CER Damage Prevention Regulations, effective June 2016.

4.4 2 Meters (6.6 ft.) Staked Safety Hot Zone

A 2-meters-wide (6.6 ft.) area extending perpendicularly from either side of the TMPL pipe. The safety hot zone is marked by permanent stakes (pink stakes).

This zone prohibits equipment from encroaching or potentially working within 2 meters (6.6 ft.) (staked Safety Hot Zone) of the centerline of the existing TMPL NPS 24”/ 30”/ 36” pipes except where specifically allowed in the specifications and an approved variance.

NO WORK OR USE OF THE AREA WITHIN THE 2 METERS STAKED SAFETY ZONE IS ALLOWED, INCLUDING PILING OF MATERIAL, UNLESS AUTHORIZED APPROPRIATELY BY THE DPM USING THE TMEP VARIANCE FORM.

4.5 Right-of-Way (ROW or Easement)

The area along and around a pipeline which is legally permitted to be used. This may be the ROW for TMEP to construct the TMEP pipeline, the existing TMPL ROW, or other, 3rd Party ROWs. A ROW is defined by a registered survey plan.

4.6 Ground Disturbance Permit

The Ground Disturbance Permit (Ledcor GD checklist) issued by LSLP ensures that all basic requirements for a ground disturbance are in place including, but not limited to, TMEP permits, Locates & Locate Drawings, One Call and Responses, site/owner/3rd Party drawings/As-Builts/Sketches, a visual site inspection and review and sign off on all the above as being in place (signed by the LSLP GD Supervisor and TMEP DPI)

4.7 Facilities Ground Disturbance Permit

The TMEP permit authorizing a ground disturbance on a Brownfield facility site, including terminals, tank farms and pump stations

4.8 30 Meters Ground Disturbance Prescribed Area Permit

The TMEP Permit authorizing a ground disturbance within 30 meters of an existing TMP pipeline AND associated infrastructure including, but not limited to test leads, anode beds and other pipeline-associated, non-facility structures as part of the pipeline. Generally, a new permit will be issued by the DPS that matches the expiry date of the one-call renewal.

5.0 TRAINING

5.1 Ground Disturbance Training

All workers directly involved in ground disturbance will be trained to the “Ground Disturbance 201 Safety Training Standard” of the Alberta Common Ground Alliance (ABCGA).

All workers indirectly involved in ground disturbance will be trained to the basic industry-approved “Ground Disturbance Level 1” (101 Standard) or other equivalent training.

Workers not involved in ground disturbance must be trained in “Ground Disturbance Awareness” through orientation. Project office staff are exempt from this rule.

5.2 Heavy Equipment Operators

All heavy equipment operators will be evaluated per the Ledcor operator competency program. Subcontractors who have personnel operating heavy equipment must meet or exceed this competency standard.

5.3 Hot Line Operators

As part of LSLP’s Ground Disturbance Plan, LSLP will maintain an internal “Hot Line Operator” list. The hot line operator list is a list of the operators that are approved based on an evaluation to excavate hot lines within the Line Owner ground disturbance perimeters.

6.0 PERMITS/ DOCUMENTS REQUIRED FOR TMEP GROUND DISTURBANCE WORK

6.1 One Call Notification and Ticket

The LSLP Ground Disturbance Supervisor is responsible for notifying BC ONE Call a minimum of three days in advance of any planned work. A One Call ticket/clearance is required for all ground disturbances.

For underground utility owner companies not registered with One Call, the owner of the company must be contacted directly.

When filling out One Calls, the GD Supervisor must use the TMEP-supplied wording (E.I: TMEP_LSLP_SPREAD 3) in the One Call on-line application to ensure appropriate re-direction from the TM One Call receiving system (OCMS) to the on-site TMEP DPS for appropriate efficiency in responding.

After an initial One Call, it is the Contractor's responsibility to reduce One Call re-work where practical when, in consultation with Underground Facility Owners, including the DPS regarding the TMPL, Facility Owner permits are issued. This should serve to maximize the duration of the One Call response during continuous, TMEP construction activities. It is expected where work is non-continuous in a given location, One Call re-requests will not exceed 30 days from the previous One Call.

Excavation activity must start within 14 calendar days of placing a one call request, and the ticket will be valid for a maximum of 30 calendar days from the date the request was placed. Some member companies may request more frequent update requirements.

6.2 Contacting Foreign Utility Owners (NON-One Call)

The LSLP Ground Disturbance Supervisor is responsible to call any foreign utility owner not registered in the provincial one-call system directly and arrange for the utility owner to identify their underground utilities. In addition, the GD Supervisor must arrange with the foreign utility owner for any permits required for work near its underground utilities as per the crossing agreement.

6.3 Pipeline Locate Report

This report is issued by the qualified locators employed by the Contractor; it is a written record of identified pipe and utilities. The following information is included in the locate report:

- Name/date/weather
- Type of equipment used to perform the locate
- Results of verification of electronic locating equipment
- GPS coordinates
- Offset measurements
- Underground facilities positively identified
- Underground facilities not identified
- Deviations from as-built drawings
- Depth estimates
- Limits of work area
- Technique/method of locate
- Photos (shall be taken in sufficient detail to demonstrate the adequacy of the markings within the area of the proposed ground disturbance). Photos shall also include pertinent information including date, time, One Call ticket number, location, compass bearing, and photographer.

It is the responsibility of the Contractor to ensure Locate reports are available for all Ground Disturbances

6.4 Drawings, As-Builts, Sketches

All associated area drawings from Underground Utility Owners must be made available for review prior to starting a GD activity. This includes documentation from TMEP for existing TMPL facilities, and 3rd Party drawings as available (municipalities, other underground infrastructure utility owners, provincial roadway authorities, etc.).

6.5 TMEP GD Permits; 30 M and Facilities GD Permit

This includes the 30M Permit when working within 30 meters of the TMPL or the Facilities GD Permit when working within Facilities in brownfield areas. LSLP must retain these permits as per the following:

- The interval (e.g., 14 or 30 days) determined by the DPS when working with heavy equipment or conducting GD activities inside the prescribed area. Generally, a new permit will be issued by the DPS that matches the expiry date of the one-call renewal.
- At an interval that matches the one-call expiry date (usually 30 days) when working with heavy equipment conducting non-GD activities, such as equipment travel, outside of the safety hot zone and inside of prescribed area.
- At an interval determined by the DPS when working with heavy equipment or conducting GD activities, such as topsoil stripping, grading or ditching, outside of the safety hot zone but within the prescribed area.
- Daily for all work in the safety hot zone. At the discretion of the DPS, a variance might be considered for some non-GD activities when requesting work in the safety hot zone. The interval of issuance of the 30m permit must be noted on the approved variance.

6.6 LSLP GD Permit (GD Checklist)

LSLP has an internal GD Permit system (GD Checklist) that is required to be completed prior to any Ground Disturbance activity. When Ground Disturbance is conducted within a third-party Right of Way, a Foreign Line Crossing Checklist is required to be completed by the responsible supervisor. See appendix A for a sample copy of the Ground Disturbance Checklist and Foreign Line Crossing Checklist.

6.7 Proximity Permit (Equipment Crossings)

A Proximity Permit is issued by a foreign utility owner to the TMEP. The permit required for any facility that crosses over or under the pipeline or encroaches on the right-of-way Prescribed Area. [30-meters (100 ft.)], including (but not limited to):

- Construction and construction equipment;
- Roads, railways, and highways;
- Underground utilities;
- Landscaping; and
- Ditches or fences.

This permit shall be used on the Project for the installation of temporary Equipment Crossings, fencing or soil stockpile on or over foreign underground facilities.

Proximity permits will not be required for construction where Line 2 crosses over or under Line 1. TM will not be issuing proximity permits to TMEP project contractors.

Note: Under the revised CER Damage Prevention Regulations, the operation of a vehicle or mobile equipment across a pipeline is authorized if the person who intends to operate the vehicle or

mobile equipment across the pipeline obtains the pipeline company's written consent. During mainline construction designated crossing locations will be established, all vehicles and equipment must cross the existing in-service TM pipeline at these locations.

6.8 Pipeline Protection Ground Disturbance Procedure Variance Form

The variance process is followed in instances when the planned ground disturbance deviates from any aspect of the procedures in this plan or that of the TMEP DPP, specifically as it pertains to protection of the TMPL. The variance is also required for all work within the 2 m safety zone. The variance must clearly specify the exact nature of the deviation, the rationale behind the change, any risks associated with the requested variance and a plan to mitigate the risks. A TMEP Pipeline Protection Ground Disturbance Procedure Variance Form must be used to document the request.

When a variance is required, it is LSLP's responsibility to initiate the process. This must be done in coordination with the DPS / DPI and must be signed off by the DPM except where written authorization from the DPM is given to the DPI. Because a variance request could have complex safety or technical considerations (TMPL depth of cover, activity type, blasting/piling vibrational implications, soil types, etc.), the contractor must provide enough lead time to evaluate and process the request to avoid schedule delays, it is the Contractor's responsibility to ensure any Variance requirements are requested with enough lead time to process them for continuous, safe and efficient work.

Any variances issued must contain appropriate sketches, photographs or engineering to visually communicate the methods described within the Variance request. Sample sketches are located in drawings available to the Contractor in their Engineering specifications from TMEP and are labeled PT9000 to PT9039.

Variances will be considered on a case by case, written submission from the Contractor.

7.0 PIPELINE GROUND DISTURBANCE

7.1 Utility investigation

A utility investigation involves:

- notifying the appropriate provincial one-call centre and providing required information
- contacting foreign utility owners not registered in the provincial one-call system or private property owners
- visually inspecting the work area for evidence of underground utilities
- conducting utility locates, including locates done by foreign utility owners
- conducting locate four-way sweeps of areas where the presence of utilities is unknown
- reviewing locate drawings and identifying discrepancies between the drawings and actual utility information
- verifying utilities through daylighting (vacuum excavation or hand digging)
- completing proximity permits with foreign utility owners
- obtaining required permits or consents from TM and foreign utility owners
- managing and mitigating risk for unlocated utilities

When conducting a utility investigation, LSLP will follow the CCGA's Underground Infrastructure Damage Prevention Best Practices.

LSLP must collect and retain the following documentation regarding the utility investigation:

- the one-call ticket

- evidence of contact with foreign utility owners or private property owners not registered in the one-call system
- utility locate reports
- drawings, as-builts and sketches
- documentation of previously unidentified underground utilities
- the contractor GD permit
- an approved 30m permit or facility GD permit, whichever is relevant to the work
- location
- the variance form, if applicable
- the proximity permit, if applicable

7.2 Locating and Marking Underground Utilities

7.2.1 General Guidelines

LSLP will utilize qualified personnel and follow the CCGA best practices when locating and marking underground utilities. The locate report will be consistent with Section 6.3 of this Ground Disturbance Plan.

7.2.2 Locating Underground Utilities

Prior to beginning any ground disturbance, locates must be conducted in accordance with the following:

- The location of all underground utilities within 30 m (100 ft.) of the GD work area must be located and verified by Qualified Locators.
- A four-way sweeps of the ROW will be conducted by a TMEP designated qualified locator followed by a verification four-way sweeps of the ROW by a LSLP designated qualified locator.
- The accuracy of locating equipment must be verified immediately before use unless the underground utility has been daylighted (i.e., by vacuum excavation or hand digging). A record of equipment verification must be included in the locate report.

7.2.3 Marking Underground Utilities

LSLP must conduct marking activities in accordance with the following:

- Foreign utilities in the work area must be marked using an appropriate visible indicator for the work area, environmental conditions or contract obligations (e.g., stakes, lathe, pin flags or paint markings at intervals no greater than 10 m [33 ft.]).
- Where the underground utility including Line 2 follows a curve, the marking stakes must not be spaced more than 1 meters apart.
- All pipeline exposure locations must be identified using signs or other prominent marking methods. Colour-coded stakes and flags are recommended to identify the type of utility present (see Table 7-1).
- The boundary of the Line 1 safety hot zone must be marked with pink-topped stakes at every 20 m.
- Define a 7.5-m (25 ft.) safety hot zone around facility hydrocarbon piping (both above and below the ground), or other zone as prescribed by the utility owner. The owner's representative will determine the type of marker (e.g., flags, fencing or concrete barrier) to be used. The marker must clearly show the boundary of the zone and reflect the potential hazard of working near the utility or in a TM facility.

- Remove all utility markings after construction.

Biodegradable markings are recommended in all work areas and must be used in agricultural areas. For more information on staking, see TMEP Survey Color Codes, drawing 01-13283-M002-PT0050 (Rev 1).

LSLP GD Foremen should consider erecting visual and physical barriers, such as signage or fencing, to protect underground components.

Table 7-1: Colour Codes Markers as per TMEP DPP

Colour	Type of Underground Utility
Yellow	Pipe containing oil, petroleum, compressed air or gas, or other hazardous liquids or gasses
Red	Electrical power lines (high and low voltage)
Orange	Communications and CATV lines (including fibre optics)
Blue	Pipe containing potable or fire water
Green	Sewer systems (sanitation/storm)
Purple	Reclaimed or treated water
Pink	2.0-m safety hot zone around underground mainline pipe or 7.5-m safety hot zone around station or terminal hydrocarbon piping. Also indicates temporary survey markings. Recommended that stakes include the words Hot Zone.
White	Proposed excavations (i.e., white lining)

7.2.4 Verification of Underground Utilities

- The location of all underground utilities inside the construction project footprint must be verified by daylighting (i.e., vacuum excavation or hand digging). If the location of an underground utility cannot be confirmed or identified, vacuum excavation/ slotting will be used to expose the entire GD area. When excavating near a buried utility, care must be taken to prevent soil sloughing that could undermine existing underground utilities or above-ground facilities or other above-ground infrastructure.
- For GD work involving drilling, pile installation in a facility, the drilling location must be exposed by vacuum excavation to 3 m (10 ft.) depth or the depth of the deepest known underground utility, whichever is greater. The contractor might be directed to retain the top 3 m (10 ft.) of coring as a sample.

7.2.5 Ground- Penetrating Radar

Where the use of ground-penetrating radar (GPR) is deemed feasible, the contractor must submit a procedure for locating underground utilities. The procedure must be supplemented by visual verification at predetermined intervals designated in a variance.

The contractor must submit a written request for a variance from the requirements of this DPP to use GPR as a substitute for locates in agricultural lands or where soil conditions prevent access by construction vehicles for visual verification.

7.3 Ground Disturbance Near Line 1

7.3.1 Protection of the TMPL and Associated Infrastructure

It is the Contractors' responsibility, with oversight and approval by the TMEP DPS, to mark by staking all existing TMPL pipeline infrastructure (TMPL itself, anode beds, test leads), within 30m of the TMEP proposed line.

Listed below are the protocols required to protect TMPL infrastructure, including the TMPL prior to construction.

7.3.2 Identification of Line 1 —Staking

1. Notice must be given by the LSLP GD Supervisor to DPS prior to doing any work, including staking within 30 meters of the TMPL.
2. Complete the utility investigation as per Section 7.1.1 of this Ground Disturbance Plan which includes placing a One Call.
3. LSLP must request and receive a 30m permit from the DPS/ DPI for GD activities in the prescribed area.
4. LSLP GD Supervisor or GD Foreman, in coordination with the DPS, or designate (DPI) must inspect the site and pipeline locations to identify any site-specific hazards and manage these hazards.
5. LSLP Supervisor or GD Foreman to meet with 3rd Party Utility Owners as required, and as necessary for staking of the TMPL and to provide efficiency should 3rd Party Utility Owners also require staking/marking.
6. GD Foreman reviews TMPL and 3rd Party Drawings.
7. GD Foreman issues an internal GD Permit.
8. Hold a Pre-job Meeting to discuss:
   a. Roles and responsibilities;
   b. A review of existing and potential hazards and emergency response in the event of an incident;
   c. Permit requirements;
   d. Overview of construction ground disturbance requirements;
   e. Worksite PPE requirements;
   f. Incident reporting procedures.
9. The following must be verified as complete:
   a. Construction boundaries (TMEP Construction footprint) are established to verify that work within 30m of the TMPL is required.
      i. TMEP Construction footprint is flagged or otherwise delineated.
   b. The existing TMPL Line 1 is electronically Located and staked on the centerline every 10 meters (33 ft.) with yellow-topped stakes. The DPS or DPI may request that LSLP place stakes at shorter intervals to ensure visibility of the centerline.
      i. Locate drawings are kept for future use and clearly marked and filed
   c. The existing TMPL Line 1 is staked with a Safety Zone buffer at 2 meters (6.6 ft.) from the edge of the pipeline with pink-topped stakes at 20 meters (66 ft.) intervals on the working

side of the pipeline only or both sides where work and/or travel may take place within the 30 meters prescribed area on each side of the TMPL.

d. The centerline and 2 meters safety hot zone staking should align every 20 meters (66ft.) to provide clear identification of the TMPL, at all times but specifically at locations where the TMPL may cross 3rd Party Utilities.

10. TMPL Markings Prior to Construction
    a. Mark all ancillary Line 1 underground components such as anode beds and test leads, with orange-topped stakes and labelled in writing to indicate the type of underground component identified and its depth (top and invert).
11. Any variances to the above staking intervals which lead to equal protection of the pipeline must be requested in writing using a Variance signed off by the DPM.

The contractor must make sure that all necessary marking work has been completed before starting any GD work. At the conclusion of the GD work in the prescribed area of Line 1, the contractor must replace any safety hot zone markers that were removed, damaged or misplaced during construction per the DPP staking requirements. Stake replacement must be done within a reasonable time frame and coordinated between the TMEP DPI and contractor GD Supervisor.

Figure 7.3.1: Pipeline Safety Zones

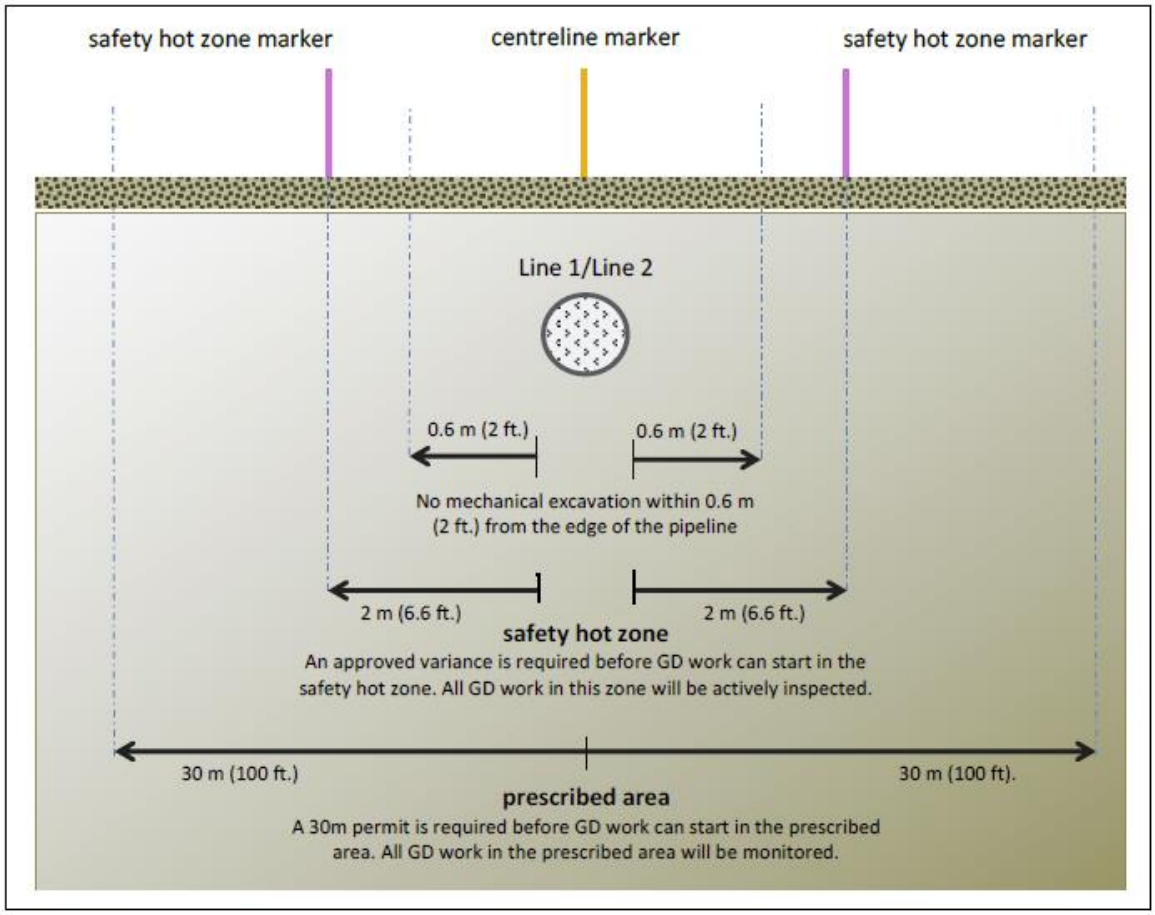
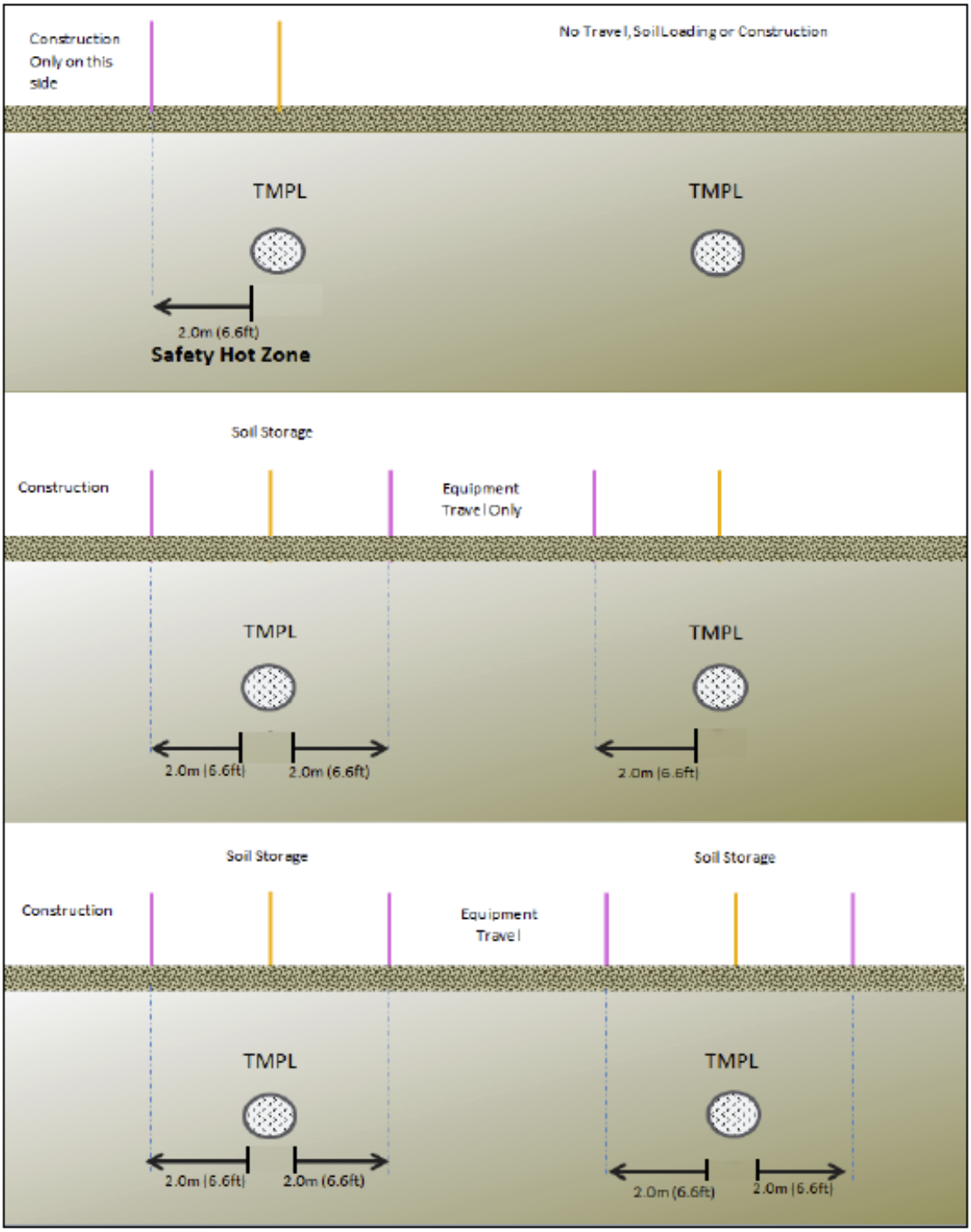


Figure 7.3.2: Marking Sections with two Pipelines



7.3.3 Verification/Expose of Line 1 (Hydrovac or Hand Exposure)

7.3.3.1 Pre-Verification Requirements

Before performing any Line 1 verification work, LSLP must:

- provide the DPS or designated DPI with a hydrovac excavation plan, including topsoil salvage, for approval. The contractor may consider hand digging instead of vacuum excavation where the depth of cover is minimal or where access for vacuum excavation equipment is limited.

1. Ensure an appropriate One Call is in place (may be done in parallel with Staking to reduce requirements).
2. Verify previous locates by reviewing locate sketches/drawings.
3. Issue a GD Permit ensuring 30m Permit and 3rd Party authorizations are in place.
   a. As a note, ensure that the hydro-vac has the ability to cross over Line 1 and foreign lines as required within the One Call request, and that all permits, and authorizations are in place.

7.3.3.2 Verification Work

LSLP will visually verify the location of the Line 1 components by means of hydrovac or hand digging.

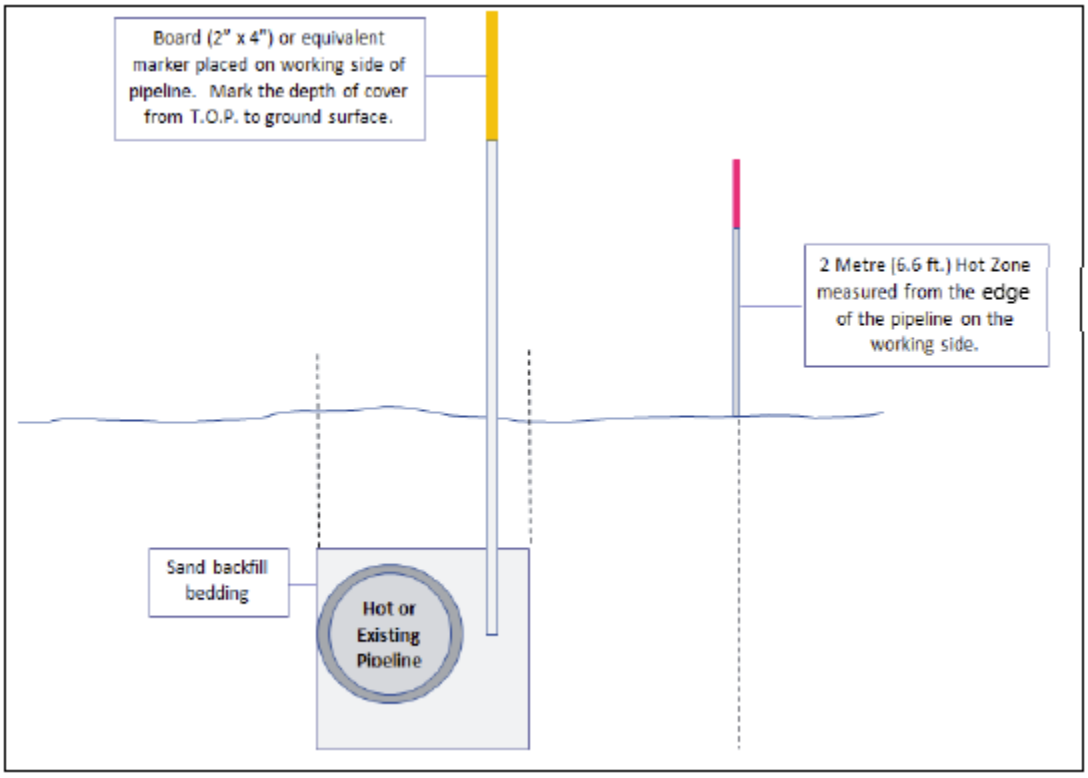
1. Locate and expose the top and working side of Line 1 (i.e., daylighting). Generally, the contractor will determine the location of Line 1 by excavating every 100 m. However, depending on pipe depth or where the soil type differs from that assumed in the soil-loading calculations, excavation might be required at more frequent intervals in some areas. In such cases, the DPS will determine the interval for exposing Line 1 as follows:
   - Where the distance between Line 1 is more than 5 m (17 ft.), the exposure holes must be no farther apart than the line of sight or a maximum of one kilometer, or closer, if the DPI deems it necessary for safety reasons
   - Where the distance between Line 1 and the project construction footprint is less than 5 m (17 ft.), the exposure holes must be no farther apart than 100 m (330 ft.), or closer, if the DPI deems it necessary for safety reasons (e.g., depth of cover)
   - At the centre of all side bends with up to five degrees of bend
   - At the centre of all bends greater than five degrees and at a point 10 m (33 ft.) on either side of the bend to ensure bend deflection is identified and visible from the centre of the bend
   - At each equipment crossing
   - On each side of a wet area (e.g., wetland, waterway)
   - On each side of a road, highway, railway or other crossing
   - At any other location required by the DPS (or DPI as designate) where the location or depth of cover might be in doubt

Tools that could damage Line 1 or its coating (e.g., probes, picks or line bars) are prohibited.

2. Once the contractor has excavated the hole, the DPI will visually inspect the exposed area of Line 1 and complete a coating evaluation report. The DPI will submit the report to the TM integrity department. A copy of the coating evaluation must be given to LSLP for record keeping.

3. Place a two-by-four board, or equivalent marker, 5 cm (2 in.) from the pipe on the working side of Line 1. Using a permanent marker, record the depth from the existing ground surface to the top of the pipe on the board (see Figure 7.3.3).
4. Place sand or other DPI-approved material in the excavation to protect the pipe coating and secure the marker board in place.
5. Replace topsoil in the excavated area.
6. Use vacuum excavation, hand digging or in-line investigation (tool-run data) to verify and mark all known appendages, such as plugs, weld-o-lets and branch connections. The TM integrity team will provide the DPM with the tool data fitting list and who will in turn provide it to the contractors. These appendages must be marked with orange-topped stakes at equipment locations, new pipe crossings or soil stockpiles. The stakes must be visible above soil stockpiles.

Figure 7.3.3: Daylight Marking of Line 1



7.3.4 Work in the Prescribed Area

When working within the Prescribed Area of the Line 1, all necessary precautions must be taken to ensure the protection of the existing pipeline. GD work, such as sign installation, clearing, grading, ditching or equipment crossings requires additional are and caution. LSLP GD Foreman with support of the GD Supervisor, in coordination with the DPS or DPI, must inspect the work area to identify any site-specific hazards and manage these hazards. The GD Foreman will:

1. Complete a utility investigation as per **Section 7.1,** ensuring that all One Calls are in place, unregistered foreign utilities are contacted, four-way sweeps are completed.
    a. This includes a site visit by the LSLP GD Supervisor or a designate and the GDI to ensure that work scope is properly defined in relation to Line 1 placement and that all staking is complete.
2. Ensure that Line 1 is adequately marked with proper staking as per **section 7.3.2** and positively identified through hydro-vac or hand exposure as per **section 7.3.3.**
3. Complete a GD Permit which verifies the above steps are completed, verifies that a 30M permit has been issued, and Facility Ground Disturbance Permit and/or a Proximity (Crossing) Permit has been issued as required.
4. No equipment will encroach within 2 m (6.6”) staked Safety Hot Zone) of Line 1 except where specifically allowed in the approved variance signed by the DPM.

Table 7.3.4: Ground Disturbance responsibilities when working near Line 1

Location Relative to Line 1	30m Permit	Contractor GD Permit	DPI * on Site	DPI * Monitor and Observe Activity	DPI * Actively Inspects GD	Hand Digging	Vacuum Excavation
Equipment crossing (during construction)			X Crossing method and loading check required	X			X
0 – 2 m (0 – 6.6 ft.)	X	X	X		X	X	X
> 2 – 30 m (6.6 – 100 ft.)	X	X		X			O
> 30 m (100 ft.)				X			
Note: X = required, O = discretion of DPS, * = or the DPS when acting as designate							

7.3.5 Working in the Safety Hot Zone

Because of space limitations in the ROW, working in the safety hot zone might be required. Work might include:

- storing topsoil or subsoil in the safety hot zone
- operating equipment in the safety hot zone or directly on top of Line 1
- operating equipment on top of material placed on top of Line 1

LSLP must submit a variance request and receive prior approval from the DPM for work in the safety hot zone (see Section 6.8). LSLP must include the coating evaluation report completed by the DPI with the variance form.

The DPM will review the variance request, the coating evaluation report and the Surface Loading Analysis Guideline of Existing TMPL (01-13283-SG-M001-PL-RPT-0001) and determine the mitigation required by the contractor. LSLP GD Foreman must verify the ground conditions and depth of cover in the work area using hand digging or hydrovac of Line 1. The DPS might request

multiple depth-of-cover verifications within the work area. If the verified depth of cover does not align with the allowed minimum depth of cover determined in the Surface Loading Analysis Guideline of Existing TMPL, the DPS will consult with the DPM for further direction.

Equipment may not enter the safety hot zone except where allowed in the specifications and an approved variance. Where approval is granted, the contractor must place a work pad (e.g., matting) to provide 2 m (6.6 ft.) of cover between the top of the underground utility and the surface of the pad or to the surface of an approved crossing method.

A DPI will be on site at all times to observe and inspect GD activities in the safety hot zone.

7.4 Equipment Crossings of the TMPL

Mobile equipment crossing will be restricted to designated, marking crossing locations. based on the damage prevention vehicle management plan. Mobile equipment will not be allowed to cross over Line 1 without a prior approval of crossing method and loading check approved by the DPS. In all cases, mobile equipment is prohibited from crossing Line 1 at locations where the depth of cover is less than 0.45 m. (See Appendix B: Area of Low Depth of Cover in Line 1 on Spread 3 & 4A)

Before installing equipment crossings or pipeline crossings, the contractor will hold a pre-job meeting to review:

- Roles and responsibilities
- Existing and potential hazards and emergency response to incidents, including incident response procedures
- Permit requirements
- Construction GD requirements
- Worksite PPE requirements

The pre-job meeting will include the DPS, DPI and a foreign utility owner representative.

Each proposed equipment crossing location should have an approved mobile equipment vehicle list based on a loading check completed by the DPS. To complete the loading check, the DPS will need equipment/ vehicle information supplied by LSLP which must include:

- Operating vehicle make, model and weight
- Track dimensions on ground (track length and pad size)
- Tire code (specifications) number of axles and tires

These requirements apply to all equipment, including pickup trucks, highway tractors and heavy equipment. LSLP will complete Appendix C for all vehicle types that will cross Line 1. Vehicle types not included in the completed Appendix C assessment will not be approved for crossing.

Where electronic locates indicate the depth of cover is less than one meters, or where specification M002-PT-1003, Dead Air Space Crossing, is not being implemented, the contractor must visually verify the depth of cover. If the required information to conduct a loading check is not available, the contractor may construct an equipment crossing using the dead-air-space methodology in specification M002-PT-1003 or a DPM approved dead-air-space crossing design.

During pre-construction (e.g., surveying), side-by-sides and quads generally will be allowed to cross over Line 1 outside of established no-cross locations (i.e., locations where depth of cover is less than 0.45 m, see Appendix B), if:

- The maximum ground pressure exerted by the vehicle does not exceed 10 psi

- The depth of cover has been verified to be greater than 0.45 m
- The vehicle will not cause rutting

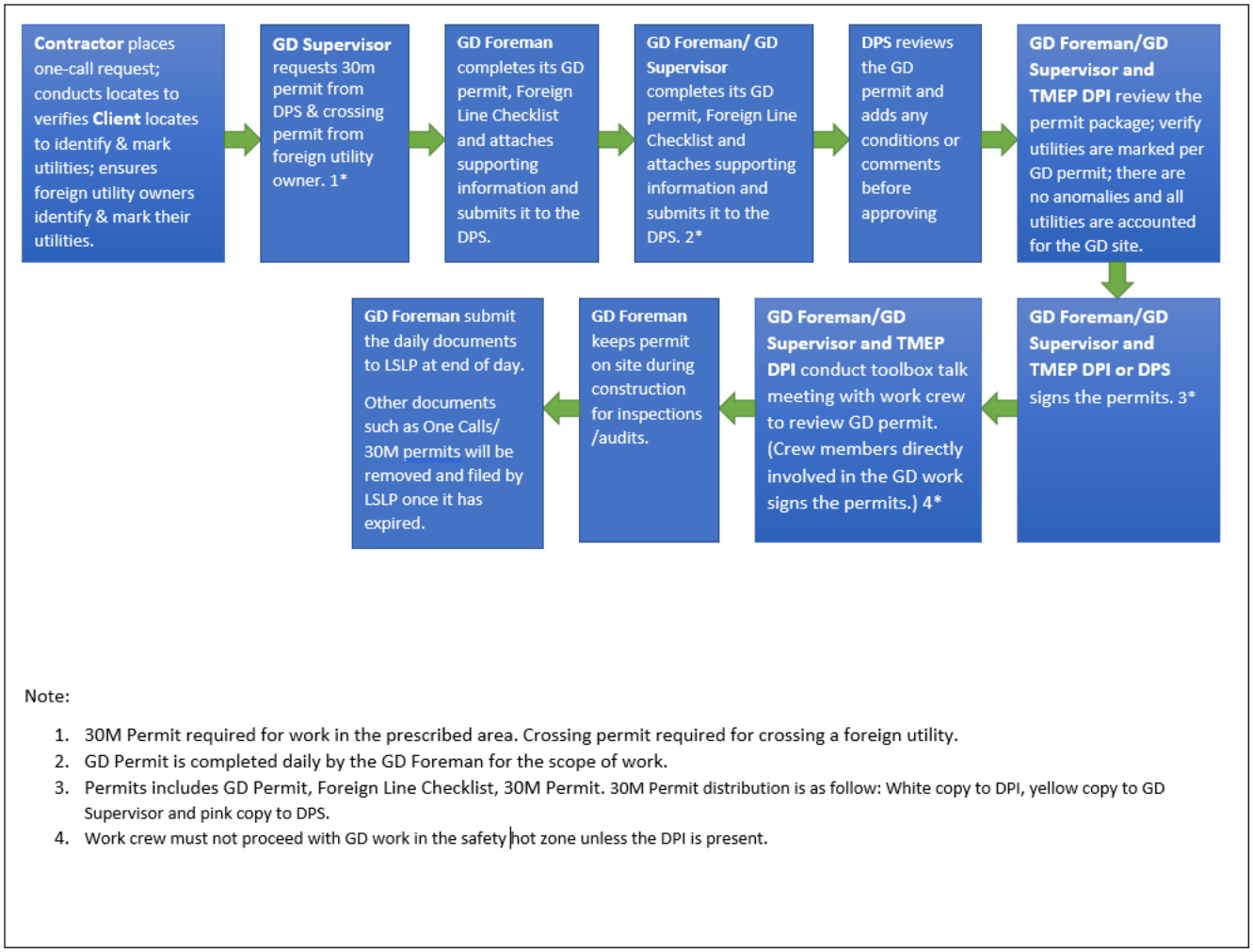
If at any crossing location these assumptions are suspect, contact the DPM. However, once designated, marked crossing locations are established, all vehicles, regardless of type, must use these crossing locations.

The contractor will maintain all vehicle crossings, which the DPI will periodically inspect.

7.5 Pipeline Ground Disturbance Permit Flow

Figure 7-5 shows the pipeline GD permit workflow. The DPI and the contractor's GD Foreman or GD Supervisor will work together to ensure that all underground utilities are properly marked and verified.

Figure 7-5: Ground Disturbance Permit Workflow



8.0 FACILITIES GROUND DISTURBANCE

8.1 Ground Disturbance within Existing Trans Mountain Facility

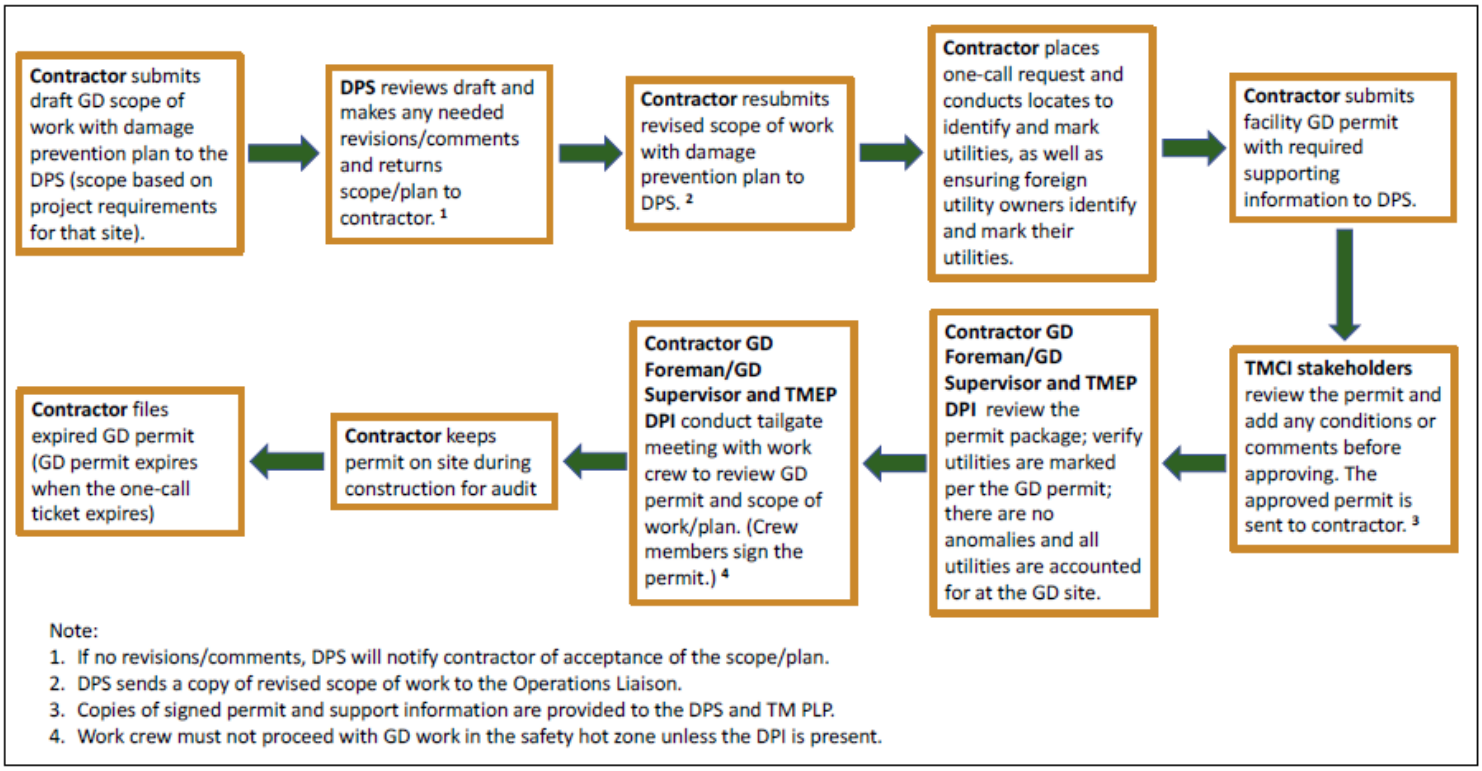
Construction activities occurring in operating TM facilities (e.g., terminals and pump stations) will require additional safeguards to ensure proper communication and coordination between construction and operations activities. For procedures on working in TM brownfield facilities, see Appendix 6 of the TMEP DPP Revision 0, July 2019.

For work in TM facilities, the contractor must follow the brownfield facility GD permit workflow shown in Figure 8-1 and TMEP Safe Work Practice 540, Designating Greenfield and Brownfield Zones During Construction.

The contractor must keep the following documentation on site during GD work in a brownfield facility:

- Facility GD permit
- Safe work permit (issued daily)
- Proximity permit, if applicable
- Locates and one-call documentation per Section 7.1, Utility Investigation

Figure 8-1: Brownfield Facility GD Permit Workflow



8.1.1 Contractor Scope of Work

The contractor is required to communicate with the Operations Liaison by developing and submitting a scope of work document (see Appendix D). The scope of work document will inform TM operations of the GD work and will be the basis for TM operations to issue a safe work permit. The scope of work will include a facility damage prevention plan. The contractor must submit the

scope of work document to the DPS or DPI at least five days before the start of planned GD work in a terminal and at least three days before the start of planned GD work in a pump station.

The DPS or DPI will forward the reviewed scope of work to the TM Operations Liaison for review and issuance of a safe work permit.

8.1.2 TMEP Facility Ground Disturbance Permit

The contractor must complete the Facility GD permit (see Appendix D) for GD work in a brownfield facility. Ground disturbance work in a facility may not proceed without an approved Facility GD permit. The facility GD permit includes:

- An activity checklist (see Appendix D) to ensure that all GD permit requirements are in place (the checklist includes both underground utilities and above-ground facilities)
- The approved contractor scope of work and facility damage prevention plan (see Appendix D)
- Other supporting information, including:
  - one-call responses
  - drawing, sketches, as-builts

The contractor can proceed with the GD work upon receipt of the approved facility GD permit.

8.1.3 Safe Work Permit (Daily)

Once the contractor has received an approved facility GD permit, TM local operations will issue the contractor a safe work permit authorizing the GD work in the facility. The safe work permit will be issued daily for the duration of the facility GD permit.

8.1.4 Changing Requirements for Brownfield Facility Work

The contractor must propose any changes to the requirements of this section, including changes related to coordination activities, roles and responsibilities, accountabilities, and permitting, either through the submission of its GD plan, a variance request or other form of documentation (e.g., prime contractor documentation). The TM Operations Vice President and TMEP Vice President will approve the changes in writing as part of the MOC process.

8.2 Greenfield Facility Permit and Document Requirements

Greenfield areas are defined as areas with no TM underground utilities and verified by:

- A complete area locate sweep
- No utilities identified through the one-call system
- No utilities identified through a site inspection and review of drawings and plans

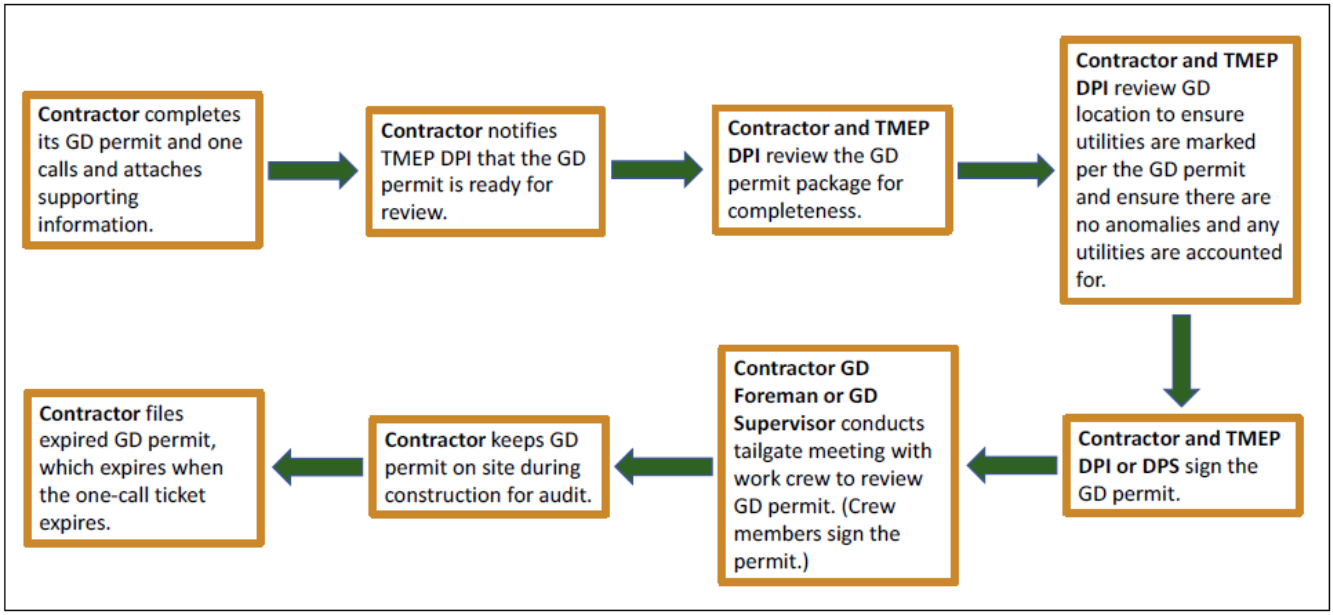
Once the area has been identified as greenfield, the contractor must erect a physical barrier, such as a fence, to clearly identify the boundary. For work in greenfield facilities, the contractor must follow the greenfield facility GD permit workflow shown in Figure 8-2 and Safe Work Practice 540, Designating Greenfield and Brownfield Zones During Construction.

The contractor GD plan and GD permit system will be used for GD work in a greenfield facility. This requires standard processes and documentation previously described in sections 7.1 and 7.2.

An area with few foreign underground utilities might also be considered a greenfield area after conducting sweeps, one calls, site inspections and reviews of the foreign utility owner's plans. These few utilities must be clearly and permanently marked so as not to present a hazard to workers from

an unintentional underground contact. This would be done under the discretion and approval of the foreign utility owner.

Figure 8-2: Greenfield Facility GD Permit Workflow



9.0 CONTRACTOR AND TRANS MOUNTAIN ACTIONS REQUIRED FOR EXCAVATING

The TMEP DPS/DPI and LSLP GD Foreman/Supervisor work together to ensure that all underground utilities/ facilities are identified and properly marked. The following procedure outlines the sequence of activities to ensure that all ground disturbance activities are conducted safely.

In the table below, the responsible party column will indicate whether LSLP or TM is responsible for the required action.

Responsible Party	Action	Notes
LSLP	Arrange for BC One Call authorities to contact utility/ facility owners to perform a locate of known utilities and facilities. For facility companies that do not use BC One Call, contact the facility owner directly.	The owner company will send a Field Rep. to work with both TM and contractor.
LSLP	Arrange for surveyors to: • Locate known utilities / facilities, mark foreign utilities / facilities and identify as required.	
LSLP	Create and maintain a Crossing Registry.	UPI will maintain the Master Crossing list.
LSLP	Ensure all One Call locates are current at the time of Ground Disturbance.	One Call locates are valid for 14 days.
LSLP & TMEP	Both TMEP and LSLP to arrange for a third party Four Way Blind (Sweep) of each site to confirm the One Call locates and if there are any unregistered or unknown buried utilities/ facilities: • Stake any indications of buried facilities for follow up.	

LSLP & TMEP	Confirm accuracy of locates in accordance with locate drawings.	
LSLP & TMEP	Inform LSLP and TM management of any unexpected utilities and/or facilities. If unexpected utilities and/or facilities found: all work, e.g. heavy equipment operation, must be postponed until confirmed design compatibility and authorized work to proceed.	
LSLP & TMEP	Issue permits (issued and pending) to indicate location of new facilities and/ or facilities: If facility/ utility owner cannot be identified, hand expose or hydro-vac to determine facility type for follow up.	
LSLP	Complete paperwork for all identified unregistered buried utilities/ facilities: • Coordinate the generation of new crossing drawings with the surveyors and submit them to UPI in order to obtain the proper crossing permits in the event the utilities are claimed by an owner after verification of type through hand exposure. • Arrange for its surveyors to locate the new facility in accordance with project staking requirements for color coding. • Update the Crossing Registry.	
LSLP	Ensure Permit Crossing/ Proximity agreements are in place prior to hand exposing identified utilities or facilities.	Note: Permit Crossing Agreements must be in place before hand exposure. An exception may be made when facility ownership is unknown, and the owner cannot be identified.
LSLP	Ensure all lines are located via: • Survey; • 4-Way Sweep; • One Call; and • Utility owner.	
LSLP	Provide the TM GDI and Operations Supervisor or designate with a scope of work document for the planned work 1 day in advance for terminals and 2 days for pump stations.	For Ground Disturbance within Terminals and Pump Stations.
LSLP	Obtain a Safe Work Permit	For Ground Disturbance within Terminals and Pump Stations.
LSLP	Coordinate the hand exposure (e.g., hydro-vac) of all buried underground utilities or facilities. If the buried utility/ facilities shown on the design drawings are not found at the location as shown on the plan, excavation must be postponed until the facility is located or the reason for its absence is determined.	
LSLP	Expose the top and working side of the pipe: • Place a board (2” x 4”) on working side of mainline.	Cover and fence off (where possible) all hand exposure holes (e.g. Hydrovac) to prevent entry if site left unattended.
LSLP	Ensure that all project documents are updated to reflect facilities/ utilities identified on the alignment sheets: • Environmental Work-Sheets; • Construction Drawings; and • Grade Plans	It is the TMEP Ground Disturbance Inspector’s responsibility to resolve any issues relating to discrepancies between the project documents.
LSLP	Prepare a review of permit package with a TMEP GDI. The permit	Alignment Sheets are not required only

	package includes: • One Call Responses either indicating that facilities are or are not located for the permitted area; • Blind 4-way sweeps for the area; • Alignment Sheets which must reflect all known facilities on all projects; and • Crossing or Proximity Agreements (as applicable - if no utilities exist in the area, these will not be included). • 30M Permit if GD is in the prescribed area. • Variance if the GD is within 2m safety hot zone	in the event that, GD is required outside of the construction areas where no drawings exist, such as with signpost installation, pipe yard work, etc.
LSLP & TMEP	Review the documents and draft the Facility Ground Disturbance Permit: both parties (LSLP & TM) must print and initial their names in the "Description of Planned Activity"	Using the facility name
LSLP & TM	Review the permit package at the tailgate meeting, to: • Verify that all documentation reflects physical conditions in the field. • Verify that all lines indicated on the One Calls, Blind Locates and construction drawing are physically indicated by staking. • Sign off the permit.	
LSLP	Conduct a Tailgate/Hazard Assessment of FLHA meeting	All involved sign onto the document.
LSLP & TMEP	Review all associated proximity or crossing agreements. Contact the Facility owner if required.	Facility owner's presence may be required.
LSLP & TMEP	Keep a copy of the Ground Disturbance Permits at the worksite during Ground Disturbance Activities. If either the TM GDI or the Contract Supervisor leaves the site, a copy of the permit must be left with a responsible person.	For work within TMP Facility boundaries retain a copy of the Facility Ground Disturbance and Safe Work Permit.

10.0 OTHER ACTIVITIES

10.1 Blasting

Blasting operations are considered a ground disturbance and therefore require a utility investigation to manage risk to underground utilities potentially affected by the activity. In areas where blasting is required, the TMEP Blasting Specification Standard MP 3120 and 3120C Supplementary guidelines must be followed. This standard specifically addresses adjacent facilities along the proposed pipeline route to ensure these are not adversely affected. Techniques to be incorporated into the specification include using instrumentation to monitor the shock waves associated with blasting activities and to limit the intensity of the shock waves to prescribed limits. Specifying the borehole pattern and the space between the boreholes. Specifying the type and quantity of explosives used, and the use of blasting mats or other devices to control projectiles, where required to protect the public or personnel safety.

When blasting activity is suggested in proximity to the pipeline or in urban locations, consideration shall be taken for non-explosive techniques such as expanding grout.

The Contractor is responsible for supplying the blasting plan to the TMEP PM for approval. The plan must be submitted at least 30 days in advance of any blasting and include:

- The type, characteristics and quantity of explosives to be used.
- The proposed method of transporting, storage and handling and use of the explosives.

- The proposed safety measures including, matting, sign, warning systems, Seismograph, etc.

At the discretion of the DPS, TM operations personnel will be stationed at mainline block valves upstream and downstream of the blast area as a precaution. The contractor will notify the DPS of the date and time of the blast so that TM air patrols can be notified.

Note: Only competent workers may handle and haul explosives.

10.2 Pile Driving or Other Vibration Inducing Activities

Pile driving, including sheet piling and driven piles, might be required near the TMPL. The contractor must submit a construction execution plan to TMEP engineering for approval before installing any piling in facilities or within the Line 1 prescribed area. When piling activities occur, the contractor must:

- Conduct a utility investigation to locate underground utilities near the proposed pile installation
- Hydro-vac or hand dig to a depth of 3 m (10 ft.), or to the deepest known underground utility within the facility, at the locations where piles will be installed. The DPI must be present during these activities.
- Backfill the excavation according to specifications

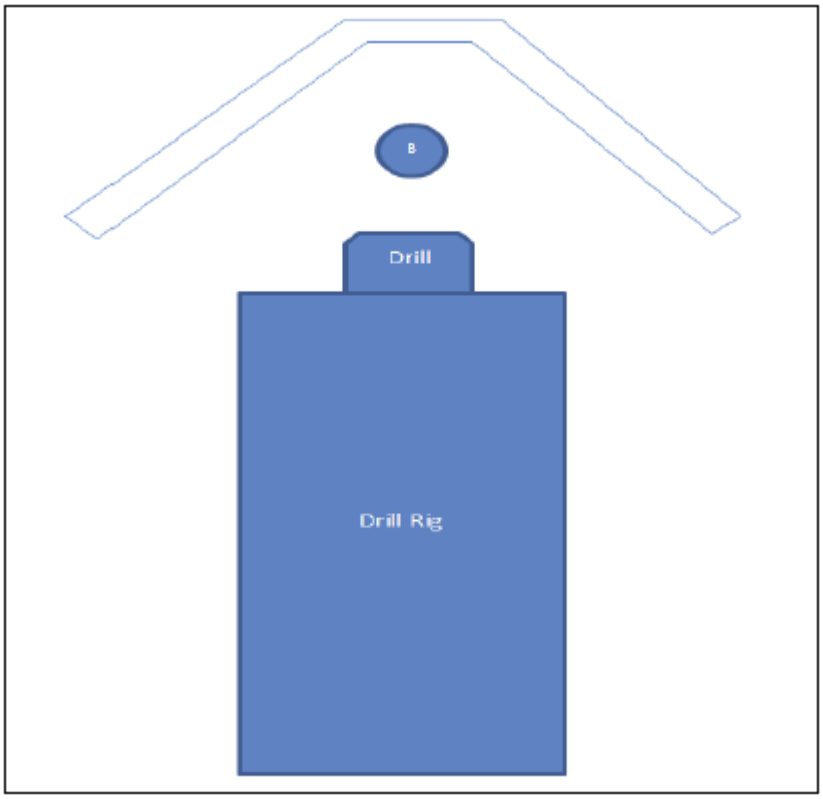
10.3 Drilling a Borehole

The contractor must verify that no utilities are present within the planned borehole location by slot-trenching a V-shaped safety trench (see Figure 10-4). The arms of the V must be:

- 1.5 m (5 ft.) long
- 3 m (10 ft.) deep or to the depth of the deepest known utility in the area (or to the depth of hard pan, if encountered)
- The width of a standard hydro-vac slot

In some cases, the contractor will be required to retain borehole core samples from ground surface to bottom hole. If the first three meters of the borehole are not required for a core sample, then the contractor may vacuum excavate to the prescribed depth, and then drill the remaining borehole to depth. The contractor must salvage the top three meters of the borehole for soil sampling and analysis, if required. This soil depth is critical for proposed subsoil stabilization measures being considered as part of facility design (i.e. soil cement mixing). Once it is confirmed that no utilities are present in the V-slot, the contractor must immediately backfill the V-slot to prevent sloughing during drilling (i.e. collapsing of the walls of the borehole.

Figure 10-4: Drilling a Borehole with Safety Trench



10.4 Trenchless Pipe Installation

Trenchless pipe installation (e.g., horizontal directional drilling, guided pipe ramming, guided horizontal auger boring, micro-tunnelling, direct pipe construction) will occur in multiple locations as part of the project construction work. Underground utilities might be present in these areas of ground disturbance and will require a utility investigation to manage the risk of contact and potential damage. See **Pipeline Construction Specification 01-13283-TMEP-MP3120**.

Special precautions, including a variance in accordance with Section 6.8, must be undertaken when trenchless pipe installations cross Line 1, regardless of clearance. The DPS will consult with the DPM to assess each variance request.

10.5 Vegetation Management

Brushing of project work areas and the Line 1 ROW will be required before construction. All brushing activities must occur within the approved and surveyed allowances. Travel over buried utilities and removal of root systems is considered a ground disturbance. The risk associated with brushing GD activities must be managed and include consideration of:

- Mobile equipment crossing over underground utilities
- Removal of root systems causing disturbance to underground utilities

Contractors are responsible for protecting all underground utilities and above-ground facilities. Before starting to brush, including driving over buried utilities inside the work area, the contractor must:

- Compete a one call
- Mark all known underground utilities
- Obtain all required permits

In areas of thick brush and forest, the contractor will perform a four-way sweep both before and after brushing to locate and mark all utilities and identify any previously unidentified utility.

For guidelines on pre-construction marking and staking, consult Appendix 12 of the TMEP DPP Revision 0, July 2019.

11.0 BACKFILLING OF EXISTING PIPELINES

Backfill material will normally consist of the material excavated during exposure operations. Large rocks or other abrasive debris must be removed before using material for backfill. The TM DPI and the LSLP GD Foreman must remain at the site until the excavation is entirely backfilled.

Before backfilling, the exposed pipe must be inspected to ensure no damage has occurred and a coating inspection report has been completed. The LSLP foreman in charge of the backfill scope of work will notify the TMEP DPS 24 hours in advance of the backfilling to allow for the coating inspection. Records of backfill must be maintained and include:

- The name of person conducting inspection.
- The date and time of inspection.

If any damage is noted, backfilling must stop and TMEP Pipeline Protection must be notified by the LSLP foreman in charge of the backfill scope of work via the TMEP Inspector on site.

All backfills are to follow TMEP specifications. However, these specifications do not replace the requirement for contractors to have their own backfill release system.

12.0 CONTACT WITH UNDERGROUND INFRASTRUCTURE

Should any unintended contact which include bending or kinking, damaging the pipe coating, denting, flattening, gouging, penetrating, puncturing or rupturing, scratching, severing, occur with an underground pipe or utility, all work shall immediately stop and be reported to the DPS for a damage evaluation of the underground infrastructure. The Pipeline owner shall be immediately contacted, and work shall not resume in the area until an investigation by the DPM or designate is complete. Incident investigations shall be undertaken as per the LSLP and TMEP incident and investigation requirements. Damage to the infrastructure may include contact with pipe coating, communication cable sheath, tracer wire or other by scratch, gouge, dent, flattening, severing, kinking or bending. LSLP management is responsible for making any required external notifications.

Of note, all LSLP GD permits (checklist) must list the Trans Mountain 24-hour Pipeline Control Center Emergency Number. In the event that an unintended contact of the TMPL pipe occurs, the Control Centre shall be called immediately at 1-888-876-6711.

Contractor GD Permits, when in proximity to 3rd Party lines which may be traveled over or otherwise excavated near or over/under, must include proximity or crossing agreements as necessary with contact information in the event of unintended contact which could lead to an emergency situation.

See LSLP ERP Appendix H for the Utility Contact Response Procedure

13.0 APPENDIX A - LSLP GROUND DISTURBANCE FORMS

13.1 LSLP Ground Disturbance Permit (Checklist)

LSLP
Ground Disturbance Checklist (GDC)

Project Name:	Start Location (KP):	Date:
Project Number:	End Location (KP):	Time:
Crew Name:	GD Supervisor Name:	Client Permit No.:
Trans Mountain 24-Hour Pipeline Control Emergency Number:		1-888-876-6711
Foreign Utility Owner's Emergency Contact Number (if applicable):		

This Ground Disturbance Checklist (GDC) must be completed prior to starting any Ground Disturbance activities.

This checklist is valid for a single daily work shift **only.** When any work is occurring **within 5 meters** of any buried utilities the Utility Crossing Checklist (UCC) must also be completed.

If **'No'** is selected for any checklist item, **Do Not Proceed with Ground Disturbance!** Contact the Superintendent.

The Supervisor is accountable for proper completion of this checklist and for the work occurring under their direction.

1. Has the entire planned work area been approved for work on the *Ground Disturbance Summary (GDS)*? Have you reviewed the GDS?	Yes	No
2. Have you reviewed the line locate maps and are they available on site?	Yes	No
3. Have you physically viewed the planned Ground Disturbance area and checked for any indication of unidentified utilities or other hazards present?	Yes	No
4. Does the field staking/marking in the planned work area match the line locate map?	Yes	No
5. Do you understand, that this checklist is required for all Ground Disturbance? If any work is planned to occur within **5 meters** of any buried utilities the Utility Crossing Checklist (UCC) must also be completed.	Yes	No

Completed by:	Signature:

13.2 LSLP Utility Crossing Checklist

LSLP
Utility Crossing Checklist (UCC)

Project Name:		Date:		Time:	
Project Number:		Location (KP):		OneCall Ticket No(s):	
Crew Name:		Crew Supervisor:		Client Permit No.:	

Instructions

This Utility Crossing Checklist must be completed prior to starting any activity within 5 meters of a buried utility.
This form has multiple Sections. You must mark the section(s) applicable to the activity you are completing. Both Section 1: Site Assessment and Section 6: Acknowledgement and Signoff must always be completed regardless of your work activity.
This checklist is valid for a single daily work shift only.
This checklist may be used for multiline utility crossings. If being used for multiline crossings, each utility must be entered on a separate table row as needed in the sections below.
If "No" is selected for any checklist item, Do Not Proceed with any activity within 5 meters of a buried Utility! Contact the Supervisor.
The Ground Disturbance Supervisor is accountable for proper completion of this checklist and for the work occurring under the Inspection. Failing to properly complete this Utility Crossing Checklist will result in disciplinary action.

Section 1. Site Assessment (Circle)

1.1	Have you reviewed the Ground Disturbance Summary (GDS) and has the previously approved work area been approved?	Yes	No
1.2	Have you reviewed the Utility Crossing Summary (UCS) for additional crossing information?	Yes	No
1.3	Are there any special conditions identified in the Agreements, and if so, have they been addressed?	Yes	No
1.4	Are the Agreements available on-site and legible?	Yes	No
1.5	Have you reviewed the applicable line locate results and are they available on-site?	Yes	No
1.6	Have you physically walked the planned Ground Disturbance area and detected for any additional or undetected utilities or other hazards onsite?	Yes	No
1.7	Does the staking/marking on planned work area match the line locate marks?	Yes	No
1.8	Have you reviewed the work scope with all crew members involved in the work? Does everyone have a clearly understanding of the work tasks, hazards, and concerns?	Yes	No
1.9	Has a new line locate been requested (on the Utility Owner Response Form)? If the Response Form is not onsite, has documentation of the request been received?	Yes	No

Section 2. Staking (Circle)

2.1	Does the staking/marking meet the minimum requirements as stated in the Agreements and approved by the Utility Owner Representative?	Yes	No
2.2	Is the area clearly marked to define where access is permitted? Have the edges been defined to ensure safe work?	Yes	No

No.	Utility Type (Pipeline, Road, Rail, Cable)	Utility Owner	Agreement Number	Crossing ID	Name Utility and Description (Pipe, Ground Wire, Air Bridge, Snow, Scarifier, Quarries, etc.)
1					
2					
3					
4					
5					

Section 3. Mechanical Excavation & Installation (Circle)

3.1	Have all utilities been successfully detected along the direct line path of the new pipeline being installed?	Yes	No
3.2	Does the proposed installation method, sequence, and minimum separation meet the Agreement conditions for all utilities?	Yes	No
3.3	Are all areas designated for the excavation and or the assembled stringer fit?	Yes	No

No.	Utility Type (Pipeline, Road, Rail, Cable)	Utility Owner	Agreement Number	Crossing ID	Mechanical Clearance Limit (m)	Crossing Position (Above or Below)	Minimum Separation (m)
1							
2							
3							
4							
5							

Section 4. Trenchless Installation (Circle)

4.1	Have all utilities been successfully detected along the direct line path of the new pipeline being installed? If Passive Detection is required/available, a deviation form must be completed.	Yes	No
4.2	Does the Trenchless Subcontractor have a system in place to verify the drill path (locating tracker)? Specify system name _____	Yes	No
4.3	Has the Trenchless Crossing Plan been reviewed by the Lead and Subcontractor Supervisors involved in the work scope?	Yes	No
4.4	Have the required Safety Roles, as per the Trenchless Crossing Plan, been available/fulfilled for the operation?	Yes	No

No.	Utility Type (Pipeline, Road, Rail, Cable)	Utility Owner	Agreement Number	Crossing ID	Mechanical Clearance Limit (m)	Crossing Position (Above or Below)	Minimum Separation (m)
1							
2							
3							
4							
5							

Section 5. Backfill (Circle)

5.1	Does the proposed backfill material and backfill method meet the Agreement conditions for all utilities?	Yes	No
5.2	Are all areas designated for the excavation and or the assembled stringer fit?	Yes	No
5.3	Do you understand that you must document the backfill process using photos before, during, and after the work?	Yes	No

No.	Utility Type (Pipeline, Road, Rail, Cable)	Utility Owner	Agreement Number	Crossing ID	Mechanical Clearance Limit (m)	Crossing Position (Above or Below)	Actual Separation (m)
1							
2							
3							
4							
5							

Section 6. Acknowledgment & Signoff

Supervisor & Client Representatives

Stakeholder	Company	Name	Signature
Supervisor	Lead Prime Contractor		
Client Representative			

Utility Owner Representative(s)

No.	Stakeholder	Company	Utility Owner Emergency Contact #	Name	Signature
1	Utility Owner Rep.				
2	Utility Owner Rep.				
3	Utility Owner Rep.				
4	Utility Owner Rep.				
5	Utility Owner Rep.				

Section 7. Comments

13.3 Safe Excavation Entry Checklist

Safe Excavation Entry Checklist

(For excavations greater than 1.2 meters)
Rev. 05 (February 11, 2018)

Exact Location of Excavation:	Date of Entry:

Step 1: Determine if the excavation is a confined space.

Confined Space – is an area that meets all of the following criteria: (answering NO to any one criteria below eliminates confined space criteria)		
Criteria	Yes/No	Comments
a) Is enclosed or partially enclosed		
b) Is not designed or intended for continuous human occupancy		
c) Has limited or restricted means for entry or exit that may complicate the provision of first aid, evacuation, rescue or other emergency response service (***Steps, Stairs or Chicken Run within 8m of a worker***)		
d) Is large enough and so configured that a worker could enter to perform assigned work		

Step 2: Determine soil classification based on the chart below as the excavation is dug. Note that frozen soil that has been exposed to the elements is NOT suitable for testing. Natural freezing as a means of soil stabilization is unacceptable under any circumstances. Circle A, B, or C within the chart below.

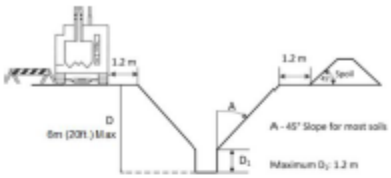
Soil Characteristics	**Soil Type**		
	Hard and compact soil "A"	Likely to crack and crumble soil "B"	Soft, sandy or loose soil "C"
Consistency	Hard, very dense in compactive condition	Stiff, compact in compactive condition	Firm to very soft, loose to very loose in compactive condition
Ability to penetrate	Only with difficulty by a small, sharp object	With moderate difficulty with a small, sharp object	With ease
Appearance	Dry	Damp after it is excavated, has low to medium natural moisture content	Appears solid but flows or becomes unstable when disturbed. Can be dry, running easily into a well-defined cone like pile, or wet
Ability to excavate with hand tools	Extremely difficult	Moderately difficult	With ease
Water seepage	Shows no signs of water seepages	Shows signs of localized water seepage	Shows water seepage
Other	Does not include previously excavated soil	Shows signs of surface cracking	- Is granular soil below the water table, unless the soil has been dewatered. - Exerts substantial hydraulic pressure when a support system is used

Step 2: Determine cut back requirements based on soil type. Circle A, B or C in the diagrams below, or if conditions dictate circle D for the use of a Trench Box.

Safe Excavation Entry Checklist

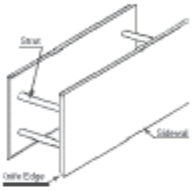
(For excavations greater than 1.2 meters)
Rev. 05 (February 11, 2018)

Hard and compact soil
"A"



Likely to crack and crumble soil or Soft, sandy or loose soil
"B" "C"

Trench Box
"D"



The following checklist is to be filled out, signed and dated prior to each crew entering the excavation. Then all workers entering the excavation are to print, initial and date on the following page. Each day workers are to review the list and sign prior to entering the excavation. Compliance with all of the following items is required prior to entry.	YES	N/A	NO
Are the excavation walls cut back to 45° or in accordance to the soil type in step 2 or a trench box installed if needed?			
Is the spoil pile at minimum 1.2 meter back from excavation?			
Is the area free of surface and tension cracks?			
Have loose soil and rocks been controlled or removed so they will not enter the excavation?			
Is the excavation secured/ identified to prevent vehicles or equipment from entering?			
Has a signaling system been established for mobile equipment working near the edge of the excavation?			
Have precautions been taken to protect workers from accumulation of water in the excavation?			
Has someone been designated to maintain the water removal equipment?			
Has surface water and runoff been controlled or diverted to keep it out of the excavation?			
Have access and egress points been installed so no worker in the excavation will never be more than 8 meters away from said access/egress point?			
Are cut-in stairs or engineer steps been used for access/egress and are they in suitable condition?			
Have access/egress points been set up on both sides of the pipe?			
Have a least 2 points of access/egress been set up?			
Is gas monitoring being used to measure H2S, LEL's, CO and O2?			
If hotlines are in the excavation is a 15 meter restricted zone for Fire Retardant clothing and no smoking rule being maintained?			
Has vehicle/equipment parked adequately to prevent exhaust build up in the excavation?			
Has an emergency response system been established?			
Have all Non-compliance items been corrected? If not, CONTACT THE SUPERVISOR PRIOR TO PROCEEDING.			

Supervisor Sign Off		
Name:	Signature:	Time:

14.0 APPENDIX B – TMEP GROUND DISTURBANCE FORMS

14.1 TMEP 30M Ground Disturbance Prescribed Area Permit

TRANSMOUNTAIN

30 Metre (100 ft.) Ground Disturbance Prescribed Area (Safety Zone) Permit

Conditional on Fulfillment of the Terms of this Permit

System _____ KM/Mile Post _____ 1 Call # _____ Proximity # _____ Date _____

GPS Coordinates. (decimal degrees): Lat. _____ Long. _____ Time _____

Address/Land Description:

Applicant _____ Representative _____

Address _____ Telephone _____

Contractor _____ Representative _____

Address _____ Telephone _____

Description of Scope of Work:

Pipeline Location and Proposed Activity Sketch:

The TMEP DPI and the contractor's representative must review and discuss the following pipeline safety items:

- ☐ The pipeline location is clearly marked, and the significance of the markings have been explained to the person performing the work.
- ☐ The contractor's intention and scope of work are understood by both parties.
- ☐ The DPI has explained that any ground disturbance work within 2 m (6.6 ft.) of the pipeline requires a TMEP representative to be on site.
- ☐ The DPI has explained that only the work described in this permit is authorized and that any changes or additions require a new permit.
- ☐ The DPI has explained the rules of working within the prescribed area pursuant to the conditions on the reverse of this form.
- ☐ The DPI has provided the contractor's representative with a copy of TM's Ground Disturbance Pipeline Protection Requirements.
- ☐ The DPI has explained that all ground disturbances must be in accordance with applicable regulations.
- ☐ The contractor's representative has been advised that copies of TM's damage prevention educational materials are available on request.

☐ The DPI has provided a copy of this form to the contractor's representative and instructed that the signed off form must be kept on site during the work.

Is the DPI required on site during the ground disturbance work? ☐ Yes ☐ No ☐ Applicant to Initial

Comments: _____

Is a Proximity (Crossing) Permit required? ☐ Yes ☐ No

Comments: _____

This permit EXPIRES at 4:30 p.m. local time _____, 20_____ following the date listed below. If excavation or backfilling is not complete by this time, excavation or backfilling MUST stop until a valid permit is in place.

Subject to the terms and conditions in TM's Ground Disturbance Pipeline Protection Requirements and those listed above, conditional consent to conduct the ground disturbance work described in this permit is granted to:

Applicant Name Granted by:	Signature	Date
TM Representative	Signature	Date

IMPORTANT: SEE NOTES ON REVERSE

IMPORTANT

1. This permit to excavate within 30 m (100 ft.) of TM's pipeline is granted based on the information given at the time of the original request. Only the work described in the permit is authorized. TM must be contacted before any changes to the scope of work or location. Any such revision cancels this permit and requires a new permit from TM.

2. No blasting will be permitted within 100 m (330 ft.) of the pipeline unless approved by TM.

3. At no time is any type of activity permitted in TM's right-of-way nor is any vehicle permitted to travel across or along the right-of-way without prior written approval from TM.

4. **If contact is made (or even suspected) with the pipeline, then stop work immediately** and shut down all powered equipment and other ignition sources. Leave the area and inform TM immediately. Pipeline products are under high pressure and are flammable, and they can form explosive mixtures.

5. If paint, stakes or other temporary markings require replacement, then notify TM immediately.

6. Markings must be in accordance with the uniform colour code developed by the American Public Works Association (APWA) and accepted by the Canadian Common Ground Alliance best practices.

Colour	Type of Underground Utility
Yellow	Pipe containing oil, petroleum, compressed air or gas, or other hazardous liquids or gasses
Red	Electrical power lines (high and low voltage)
Orange	Communications and CATV lines (including fibre optics)
Blue	Pipe containing potable or fire water
Green	Sewer systems (sanitation/storm)
Purple	Reclaimed or treated water
Pink	2.0 m safety hot zone around underground mainline pipe or 7.5 m safety hot zone around station or terminal hydrocarbon piping, also indicates temporary survey markings (recommended that stakes include the words Hot Zone)
White	Proposed excavations (i.e., white lining)

7. All property or right-of-way boundary lines staked by a line-locating contractor are not legal boundaries. The contractor is responsible for ensuring that a registered land surveyor locates all legal boundaries.

8. At all times, the contractor shall comply with the DPI's instructions, including instructions to stop work.

9. If a conflict arises between the permits, schedules, or instructions provided by the DPI, or by site conditions, the contractor must immediately stop all excavation or backfilling work and contact the DPI immediately. The DPI will notify the contractor when work can resume.

10. The contractor shall retain a copy of this permit on site while work is underway and be able to produce it upon request by any TM representative. Failure to do so could result in work being temporarily stopped until the permit can be produced.

For more information, contact the DPS responsible for the pipeline section to which this permit applies.

14.2 Ground Disturbance Procedure Variance Form

TMEP Ground Disturbance Procedure Variance Form

TRANSMOUNTAIN

System _____ KM/Mile Post _____ 1 Call # _____ Xing # _____ Date _____

Address/Land Description:

Third Party Details:

Facility Owner _____ Representative _____

Address _____ Telephone _____

Contractor _____ Representative _____

Address _____ Telephone _____

Type of Work _____

Pipeline Location and Proposed Activity Sketch:

Variance Requested:

Justification:

Precautions:

Monitoring Plan:

☐ **A 30 Metre Prescribed Area Ground Disturbance Permit has been completed** **Dated:** _____

Damager Prevention Supervisor/Designate Comments:

Granted by: _____ _____

Damage Prevention Supervisor / Designate **Date**

14.3 TMEP Coating Evaluation Report

Date of Inspection: Click here to enter a date.	*Technician's Name:*

Location

Pipeline System: Choose an item. Click here to enter text.	*Pipe Diameter:* Choose an item.
Chainage (km post): ☐km	*Length of Pipe Exposed (include units):*
GPS Coordinates (Lat/Long - WGS84) *Enter coordinates in decimal degrees, 5 decimal places*	*Latitude:* *Longitude:*

Reason for Pipe Exposure

- ☐ Anomaly Investigation
- ☐ Test Station Installation/Repair
- ☐ Line Locate
- ☐ Proximity Installation
- ☐ Other - Specify:

Cover

Depth of Cover (include units):
Soil Type:

One Call

☐ Alberta	☐ British Columbia
One Call Number:	

Description of Coating

Refer to Pipeline Maintenance Procedure *4.2.11 Evaluating the Condition of Exposed Pipe* for evaluation criteria.

Existing coating type:	
Condition of Existing Coating (As Found)	*Comments:*
☐ Good	
☐ Fair	
☐ Poor *	

* Provide details for Technical Services under "Additional Notes:

Recoating type applied (if applicable):

Additional Notes:

Photo:

Click here to enter text.

Backfill Material used to Bed the Pipeline:

Click here to enter text.

Click here to enter text.

15.0 APPENDIX C – TMEP FACILITY FORMS

15.1 TMEP Facility Ground Disturbance Permit

TRANSMOUNTAIN

Trans Mountain Expansion Project
Facility Ground Disturbance Permit
Conditional on Fulfillment of the Terms of this Permit

Ref #	1 Call #	Start Date
Facility/Location		End Date
Permit Number	if work cannot be completed in the permitted timeline, this permit must be renewed	

Originator: (Project Manager/Representative)	**Phone number**:
Responsible Party (Print Name): (Person and Company Performing the Work)	**Phone number**:

Description of planned activity: (type of work or ground disturbance, location of work area) Refer to Scope of Work.

The following critical items shall be reviewed and discussed by the TMEP DPI and the Third Party Representative. If any boxes are unchecked, do not proceed.

Yes	N/A	Planning and Records Confirmation, Visual Inspection, Preconstruction	Initial
☐	☐	1. Has a One Call been placed as per the Regulations or Agreement (min 2-3 days)?	_____
☐	☐	2. Have non-members of One Call Service been notified with a request to locate/stake underground infrastructure?	_____
☐	☐	3. Have ALL infrastructure owners responded to the ground disturbance notification and located/staked their underground infrastructure?	_____
☐	☐	4. Has the work been reviewed with the Project Manager, EH&S, Facility Representative and (if required) PLP Representative?	_____
☐	☐	5. Has a loading stress assessment been completed for equipment/vehicles passing over underground infrastructure not covered by a Proximity Permit?	_____
☐	☐	6. Has an adequate scope of work including Facility Damage Prevention Scope of Work and site plan been submitted to all parties?	_____
☐	☐	7. Has the area been checked for physical signs which could indicate existing underground infrastructure?	_____
☐	☐	8. Have ALL the as-built and/or plans been provided for the electronic utility locate?	_____
☐	☐	9. Has the work area been swept/searched with an electronic locating device (4 direction or equivalent) for known & unknown underground infrastructure?	_____
☐	☐	10. Will all underground infrastructure be daylighted to the utility owner requirements, permits, TMCI Standards, and regulations?	_____
☐	☐	11. Are the as-built plans and electronic locate marks consistent and documented in the Facility Damage Prevention Scope of Work?	_____
☐	☐	12. Has a pre-job meeting been held, including walk around/site inspection to review scope of work/damage prevention plan with all persons involved?	_____
☐	☐	13. Are all persons involved aware of the Facility Damage Prevention Scope of Work and safety requirements associated with the planned ground disturbance work?	_____
☐	☐	14. Are all applicable hazard controls & safety measures in place?	_____
☐	☐	15. Is a Qualified Inspector available to **monitor** and **observe** the Ground Disturbance activity?	_____
☐	☐	16. Are copies of applicable permits and the Facility Damage Prevention Scope of Work on site and reviewed by ALL involved workers?	_____
☐	☐	17. Has the required fencing and barricades for underground infrastructure identification/protection purposes been installed?	

I/we have read over the required documentation as described above and the work shall be completed in full compliance of the permit conditions.

TMCI Operations (Facility Representative)	Name: (print)	Signature:	Date:
TMEP Responsible Party (Ground Disturber)	Name: (print)	Signature:	Date:
TMEP DP Inspector	Name: (print)	Signature:	Date:
TMEP DP Supervisor	Name: (print)	Signature:	Date:

Comments

IMPORTANT: READ CONDITIONS ON REVERSE IMPORTANT

11. This permission to conduct ground disturbance activities within a Trans Mountain Canada Inc. (TMCI) Facility is granted based on the information given at the time of this original request. Only the work described on the permit form is authorized. TMCI must be contacted prior to any changes to the scope of work or location. Any such revision **cancels** this document and requires a **new permission** from TMCI.

12. The Third Party Representative shall retain a copy of this Permit on site while work is underway and be able to produce it upon request by a TMCI representative.

13. **If contact is made (or even suspected) with an underground utility, stop work immediately** and shut down all powered equipment and any other ignition source. Leave the vicinity and inform the TMCI representative immediately.

14. Notify the underground infrastructure owner immediately if paint, stakes, or other temporary markings require replacement.

15. For more information please contact the TMEP Damage Prevention Inspector or TMEP PLP Operations Interface at **1-888-767-0304.**

16. At all times, the Third Party and the Contractor shall comply with TMCI's Inspector's instructions, including any instructions to cease work.

17. In an event of a conflict between the Permits, any schedules, the instructions provided by the Qualified Inspector, or the site conditions, the Third Party and Contractor shall immediately cease all activity related to the ground disturbance and shall contact the Qualified Inspector immediately. Activities related to the ground disturbance shall only recommence upon the Qualified Inspector's instruction.

Communication Workflow:

Contractor identifies Facility GD and includes in Project Scope of Work ⇨ *Contractor Registers BC or AB 1 Call and mobilizes 3rd Party Locates in the work area. U/G utilities are identified and marked, documentation is produced, photos taken of the Work Area.* ⇨ *Contractor and TMEP DPS complete the FGD Permit and assemble all documentation for the FGD Permit*

⇩

Permit/documents reviewed and executed by Stakeholders. Signed FGD Permit scanned and distributed to all Stakeholders. 3 hard copies of the Permit:
-1 to TMCI PLP
-1 to Ground Disturber
-1 to TMEP DPS (for files)

⇦ *Review documents at the worksite (TMEP DP Inspector with Contractor/ GD crew). Review the GD Work Area to ensure proper identification of U/G utilities. Address any anomalies.*

⇦ *Review of TMEP DPP; no GD work in "hot zone" without TMEP DPS present.*

15.2 Contractor Scope of Work for Facilities Form

TM operations will issue a daily safe work permit for work in TM facilities (e.g., terminals and pump stations). The contractor must complete this form to provide operations with information on the proposed ground disturbance work. The TMEP DPS will contact the contractor if additional information is required.

Contractor Scope of Work for Facilities Form

Date: (MM/DD/YY)		
Location:		
Name of Contractor:		
Name of Subcontractor(s) Number of Contractors on site.	1.	
	2.	
	3.	
Work start: MM/DD/YY		Work stop: MM/DD/YY
Describe the work to be performed and the name of contractor or subcontractor performing the work.		

Submitted by: _____, Date: _____

16.0 APPENDIX D – SPREAD 3 & 4A RESTRICTED (NO GO) CROSSING OF TMPL

Areas with Low Depth of Cover in Line 1 Spread 3-A

Piping Segment	Start			End		
	Chainage	Lat	Long	Chainage	Lat	Long
TMPL HARGREAVES-DARFIELD 24IN KM	470716.671247	52.996131	-119.278951	470968.067894	52.994697	-119.281839
TMPL HARGREAVES-DARFIELD 24IN KM	471742.569365	52.990350	-119.290834	471856.926109	52.989678	-119.292118
TMPL HARGREAVES-DARFIELD 24IN KM	472062.135842	52.988407	-119.294327	472123.796574	52.987996	-119.294943
TMPL HARGREAVES-DARFIELD 24IN KM	472276.586581	52.986984	-119.296481	472319.319296	52.986704	-119.296918
TMPL HARGREAVES-DARFIELD 24IN KM	474119.034197	52.976369	-119.314832	474167.629565	52.976052	-119.314339
TMPL HARGREAVES-DARFIELD 24IN KM	474220.561561	52.975715	-119.313788	474254.076254	52.975429	-119.313689
TMPL HARGREAVES-DARFIELD 24IN KM	476561.537684	52.970552	-119.345105	476623.484452	52.970574	-119.346025
TMPL HARGREAVES-DARFIELD 24IN KM	479551.378523	52.966992	-119.380127	479558.407400	52.966964	-119.380218

Areas with Low Depth of Cover in Line 1 Spread 3-B

Piping Segment	Start			End		
	Chainage	Lat	Long	Chainage	Lat	Long
TMPL HARGREAVES-DARFIELD 24IN KM	503421.436130	52.780447	-119.255282	503430.958521	52.780401	-119.255164

Areas with Low Depth of Cover in Line 1 Spread 3-C

Piping Segment	Start			End		
	Chainage	Lat	Long	Chainage	Lat	Long
TMPL HARGREAVES-DARFIELD 24IN KM	520659.977937	52.648483	-119.187544	520717.348566	52.648206	-119.186830
TMPL HARGREAVES-DARFIELD 24IN KM	523409.288057	52.630074	-119.162320	523423.267945	52.629976	-119.162190
TMPL HARGREAVES-DARFIELD 24IN KM	523711.867595	52.627928	-119.159590	523720.582389	52.627867	-119.159510
TMPL HARGREAVES-DARFIELD 24IN KM	524250.681818	52.624110	-119.154708	524261.346926	52.624035	-119.154610
TMPL HARGREAVES-DARFIELD 24IN KM	550204.896277	52.430370	-119.156778	550423.062333	52.428482	-119.156111
TMPL HARGREAVES-DARFIELD 24IN KM	555922.286740	52.383566	-119.179992	555969.535981	52.383163	-119.180195
TMPL HARGREAVES-DARFIELD 24IN KM	558449.493559	52.362036	-119.183146	558466.637950	52.361883	-119.183137
TMPL HARGREAVES-DARFIELD 24IN KM	559426.247174	52.353527	-119.181952	559483.726879	52.353024	-119.181772
TMPL HARGREAVES-DARFIELD 24IN KM	559553.152189	52.352404	-119.181564	559688.055007	52.351194	-119.181777

Areas with Low Depth of Cover in Line 1 Spread 3-C (cont'd)

Piping Segment	Start			End		
	Chainage	Lat	Long	Chainage	Lat	Long
TMPL HARGREAVES-DARFIELD 24IN KM	561589.705489	52.334630	-119.179012	561635.094197	52.334227	-119.178976
TMPL HARGREAVES-DARFIELD 24IN KM	563521.145662	52.317333	-119.180880	563576.676466	52.316842	-119.181024
TMPL HARGREAVES-DARFIELD 24IN KM	566067.852510	52.295029	-119.182020	566157.332363	52.294219	-119.182000
TMPL HARGREAVES-DARFIELD 24IN KM	566188.426417	52.293938	-119.181999	566242.650856	52.293448	-119.181987
TMPL HARGREAVES-DARFIELD 24IN KM	568588.455532	52.274240	-119.191310	568595.947201	52.274177	-119.191350
TMPL HARGREAVES-DARFIELD 24IN KM	568650.959255	52.273708	-119.191611	568681.664376	52.273448	-119.191763
TMPL HARGREAVES-DARFIELD 24IN KM	570738.649469	52.255908	-119.198793	570804.584495	52.255397	-119.199229
TMPL HARGREAVES-DARFIELD 24IN KM	571086.180212	52.253341	-119.201580	571127.685457	52.253020	-119.201886
TMPL HARGREAVES-DARFIELD 24IN KM	571258.014531	52.252029	-119.202893	571315.238500	52.251584	-119.203312
TMPL HARGREAVES-DARFIELD 24IN KM	572217.905879	52.244151	-119.208331	572226.935851	52.244073	-119.208368
TMPL HARGREAVES-DARFIELD 24IN KM	572320.862009	52.243269	-119.208768	572347.492916	52.243042	-119.208884
TMPL HARGREAVES-DARFIELD 24IN KM	572529.697831	52.241492	-119.209707	572557.011255	52.241248	-119.209810
TMPL HARGREAVES-DARFIELD 24IN KM	572643.598361	52.240532	-119.210200	572651.452363	52.240464	-119.210249
TMPL HARGREAVES-DARFIELD 24IN KM	573083.656268	52.236750	-119.212038	573097.643838	52.236630	-119.212097
TMPL HARGREAVES-DARFIELD 24IN KM	573774.209682	52.230843	-119.214953	573785.959112	52.230742	-119.215003
TMPL HARGREAVES-DARFIELD 24IN KM	576804.091452	52.205773	-119.229831	576983.350085	52.204317	-119.230982

Areas with Low Depth of Cover in Line 1 Spread 4-A

Piping Segment	Start			End		
	Chainage	Lat	Long	Chainage	Lat	Long
TMPL HARGREAVES-DARFIELD 24IN KM	595302.559570	52.055555	-119.318418	595313.667564	52.055467	-119.318492
TMPL HARGREAVES-DARFIELD 24IN KM	604185.993154	51.979490	-119.341314	604189.577518	51.979459	-119.341330
TMPL HARGREAVES-DARFIELD 24IN KM	607556.531970	51.951465	-119.348091	607566.607446	51.951390	-119.348172
TMPL HARGREAVES-DARFIELD 24IN KM	608585.875668	51.942540	-119.347228	608597.769900	51.942476	-119.347085
TMPL HARGREAVES-DARFIELD 24IN KM	615185.322007	51.889956	-119.308566	615196.147791	51.889860	-119.308539
TMPL HARGREAVES-DARFIELD 24IN KM	633582.262909	51.744172	-119.335883	633595.287605	51.744060	-119.335940
TMPL HARGREAVES-DARFIELD 24IN KM	633610.431090	51.743936	-119.336001	633622.569600	51.743832	-119.336053
TMPL HARGREAVES-DARFIELD 24IN KM	633652.567335	51.743577	-119.336190	633665.512306	51.743468	-119.336257

Areas with Low Depth of Cover in Line 1 Spread 4-A (cont'd)

Piping Segment	Start			End		
	Chainage	Lat	Long	Chainage	Lat	Long
TMPL HARGREAVES-DARFIELD 24IN KM	633692.383447	51.743246	-119.336404	633703.166625	51.743156	-119.336462
TMPL HARGREAVES-DARFIELD 24IN KM	633720.893223	51.743009	-119.336557	633731.243047	51.742923	-119.336614
TMPL HARGREAVES-DARFIELD 24IN KM	633749.117787	51.742776	-119.336716	633760.599281	51.742682	-119.336782
TMPL HARGREAVES-DARFIELD 24IN KM	633781.109641	51.742514	-119.336900	633792.214273	51.742423	-119.336963
TMPL HARGREAVES-DARFIELD 24IN KM	648051.705454	51.670607	-119.488730	648084.556389	51.670592	-119.489206
TMPL HARGREAVES-DARFIELD 24IN KM	649291.323265	51.670400	-119.506562	649306.260382	51.670397	-119.506779

Appendix E – Incident Reporting & Investigation

1.0 TABLE OF CONTENTS

2.0 PURPOSE

To provide direction to Constructors employees and subcontractors responsible for conducting incident investigations or participating in the incident investigation process. To outline the responsibilities and accountabilities for individuals and groups. Incidents must be investigated as soon as reasonably possible after they occur using the procedure outlined in this document.

An effective incident investigation determines the direct, indirect and root causes of the incident. Such causes include the unsafe conditions, at-risk behaviours, and/or controls which contributed to the incident and recommend corrective actions. The intent of effective incident investigations is to prevent similar incidents, identify and correct trends, operate more efficiently, while continuously improving our HSE management systems and processes.

3.0 SCOPE

Applies to all Ledcor Constructors employees and subcontractors, and covers all incidents as defined by the Business Unit (BU) and approved by the Vice President (VP) of Health, Safety, and Environment (HS&E). This includes injuries/illnesses to workers, subcontractors and/or general public/third parties, equipment or property damage, motor vehicle damage, security breaches, environmental damage, near miss/near hits, and at-risk behaviours.

4.0 ACRONYMS, TERMS AND DEFINITIONS

At-Risk Behaviour – The actions people do when they forget, ignore, or disobey known safety expectations or fail to consider potential hazards.

Competent Person – A person who is:
Qualified: A person that has read, understands, and is committed to following this program.
Trained: As per the training section (**Section 6.4.**) in this Program.
Experienced: As determined by the person's supervisor, or in the case of subcontractors, the designated competent Ledcor representative.

Incident – An undesired event;
- **a)** Events which cause harm to a person, or damage to property or the environment resulting in loss, or;
- **b)** Near misses/near hits and at-risk behaviours with no result of loss.

Incident Investigation – A detailed collection and analysis of all data and facts about an incident.

Intermediate/Basic/Root Causes – The causes which lead to an incident.

Unsafe Condition – A hazardous condition which could result in an incident.

5.0 RESPONSIBILITIES

Project Manager/Construction Manager –

- Ensure incident investigation preliminary reports are completed by the end of shift.
- Evaluate the quality of the incident investigation report and effectiveness of the corrective actions.
- Participate in incident investigation review meetings.
- Notify Ledcor Communications and Client if media personnel will be responding to the scene.
- Determine who will be a member of the Incident Investigation Team and ensure alignment with the Project Specific Safety Plan (PSSP).
- Notify regulatory bodies as required (police, government agencies, etc.) as per the PSSP.

Superintendent/General Foreman –

- Ensure a Supervisor/Foreman, who is competent in incident investigation, promptly investigates all reported incidents within their area of responsibility.
- Notify Ledcor management and the Client Construction Coordinator or designate when an incident occurs, as defined in the PSSP or by the PM/CM at project start up.
- Ensure required documents are completed and given to Ledcor's HS&E Department.

Supervisor/Foreman –

- Ensure the injured person is cared for immediately.
- Freeze the incident scene and take control of the incident, witnesses, and others involved in the incident.
- Immediately notify their Superintendent and HS&E Team of the incident.
- Actively participate in the incident investigation and provide relevant information pertaining to the incident.
- Participate as a member of the Incident Investigation Team for incidents within their area of responsibility.

Person(s) –

- Immediately report all incidents to their Supervisor/Foreman.
- Provide assistance if competent to do so
- Stop all activity in the area/freeze the scene.

Subcontractor –

- Immediately report and investigate all incidents which occur while working on a Ledcor project as described in the PSSP.
- Meet or exceed Ledcor's Incident Investigation Program requirements.

Senior HS&E Manager –

- Audit the quality of all incident investigation reports.
- Review and approve Safety Alerts for quality and consistency.
- Facilitate incident investigation review meetings.

HS&E Manager/Lead Coordinator –

- Participate in the review of the incident investigation process.
- Participate in identifying corrective actions.
- Notify the Client's HS&E designate.
- Ensure the 10D-S Incident Investigation Report is completed, and details are entered in Incident Management System (IMS).

HS&E Coordinator –

- Oversee the care and control of the worker involved in the incident.
- Participate in gathering evidence, including taking witness statements.
- Participate in the analysis of evidence and identifying incident causes.
- Arrange a Drug and Alcohol test as per **Ledcor's Drug and Alcohol Program**.
- The HS&E department will be responsible to facilitate the investigation and provide assistance to the Supervisor/Foreman.
- The HS&E Coordinator must be competent in performing incident investigations, or must be monitored.
- A P3 HS&E Coordinator or Safety Manager shall be responsible to monitor the investigation process.

Incident Investigation Team –

- Gather and analyze evidence to determine incident causes.
- Identify adequate and appropriate corrective actions.
- Update the 10D-S Incident Investigation Report, and gather the required sign-offs.

6.0 PROGRAM

6.1 PROCEDURE

1. Take Immediate Action

In the event of an injury, the first person on scene will contact the first responders. In the event of a property damage or environmental release, they will ensure steps are taken to safely isolate the equipment or hazardous substance and control any release of harmful substances to prevent further loss. In case of motor vehicle incident off-site that causes injury, damages the vehicle to the extent of not being drivable, or if anyone is suspected of being guilty of a criminal offence (e.g. drunk driving), call the Police. If the vehicle's position creates a hazard, and if it is safe to do so, bring the vehicle to the side of the road and put on hazard lights**.**

2. Report Incident

Any employee or subcontractor that witnesses, or is involved in an incident is required to notify their Supervisor/Foreman as soon as reasonably practicable and stop work in the area. Further notifications will be made following the *Incident Investigation Communication Chart* outlined in the PSSP.

Note: in case of injury, refer to the procedure in section 18 of Ledcor's **Health, Safety, and Environmental Program**.

3. Assess the Scene

The Supervisor and/or HS&E team member will make an assessment of the scene to look for hazards which may pose a secondary risk to people, property and/or environment.

4. Establish Control (Freeze the Scene)

The Supervisor will ensure the scene has been frozen and secured. They will assign a person to restrict access to the scene, place barriers, tape, and/or cones to delineate the scene, and establish a safekeeping area for collected samples, parts and equipment. Witnesses and/or those involved with the incident must be considered when freezing the scene.

5. Notify Client and Senior Leadership

The Project Leadership Team will notify the required individuals/groups as per the *Incident Investigation Communication Chart* outlined in the PSSP.

6. Drug and Alcohol (D&A) Testing

The Project Leadership Team will determine if a D&A test is required for any of the individuals involved in the incident as per **Ledcor's Drug and Alcohol Program**.

7. Flash Reporting

The HS&E Coordinator will send out a Flash Report as per Ledcor's Flash Report criteria. The Flash Report should be issued within **4 HOURS** of the incident. When categorizing the Flash Level, the following criteria will be used:

Flash Level Criteria

See **Flash Level Criteria** Reference for more information.

No Flash

Project Leadership team will investigate all incidents to determine IMS Flash criteria. "No Flash" criteria will be defined as an incident that causes an injury or illness that has been determined to be a non-work related injury. In addition, security and non-occupational losses can also be 'No Flash' to generate an IMS number for information-collection purposes.

Note: Depending on circumstances, injuries and illnesses occurring in camps outside of work hours may be reportable to WCB as the worker is considered a "captive worker". Captive workers are workers who, because of the circumstances and nature of their employment, have no reasonable alternative to living in a bunkhouse or campsite (e.g. a remote campsite).

Note: The Project Management Team will have final decision if an incident will be classified as a No Flash. The HS&E team will ensure the following is completed for all incidents classified as a No Flash:

- Incident to be entered in IMS as a No Flash and an IMS number will be generated.
- Hard copies of the incident will be retained at the site level.
- Soft copies of No Flash incident must be recorded as per the Project Filing Index.
- Notification will be forwarded to the Health and Wellness Manager.

8. Gather Evidence

The Incident Investigation Team will gather and evaluate the evidence in the following categories:

PEOPLE

The gathering of people evidence involves the systematic interviewing of people involved and witnesses of the incident and having Incident and Witness Statements completed. People and witnesses involved in the incident should identify any personal characteristics or behaviours which may have contributed to the event or incident causes.

Note: Reassure those being interviewed that the purpose of the interview is to identify causes of the incident, and to prevent similar incidents from occurring. Emphasize that the purpose of the investigation is to find facts and identify corrective actions, not to find fault.

Anyone directly involved in the incident must complete the **Incident Statement Form** and any witnesses must complete the **Witness Incident Statement Form 10B**.

PHYSICAL

Gathering of physical evidence involves taking photographs, measurements, and samples from the scene, to identify the physical mechanisms and environmental factors related to the incident.

To effectively gather physical evidence the Investigation Team will follow these guidelines:

a) A fixed reference point should be established and all measurements taken from that point.
b) All debris, items, or parts involved in the incident must be collected.
c) Use a diagram to note the placement of objects and landmarks, and where samples were taken.
d) Photographs of the incident scene or sequence of events must be taken from multiple views and should include shots from overhead if possible. Start with a broad view of the entire work area, and take pictures progressively closer to the incident and resulting damage.
e) Take close-up photographs of damaged components and/or parts involved in the incident.
f) If the incident is related to equipment or material failure the manufacturer or supplier should be contacted to find out if the failure is due to a known defect.

PAPER

Gathering of paper evidence involves collecting documents that provide evidence to direct underlying causes of the incident.

Examples of documents to be collected be the Investigation Team include:

- Field Level Hazard Assessment – from the worker and crew for that day, and prior days if relevant
- Job Hazard Analysis for the work scope
- Safe Work Practices
- Relevant near miss reports, going back over at least the past 3 months
- Toolbox Talks
- Orientation documents (i.e. fit for duty, medical history)
- Safety Meetings
- Personnel training records
- Competency checks
- Applicable manuals
- Permits
- Equipment maintenance records (e.g. vendor records)
- Data recordings from equipment
- Disciplinary records
- Mentorship program information
- Relevant work site inspections and behavior based observations

Note: It may be helpful for the site to create a centralized incident investigation kit(s) to assist the incident investigation and ensure all necessary steps are taken. The kit may include items such as a camera, measuring tape, barricade tape, Ziploc bags, tags, graph paper, required forms and the **Incident Investigation Checklist (Form 10C)**.

Note: For incidents involving a fatality or loss greater than $250,000 the BU Leader and Vice President of HS&E may assemble an impartial investigation team from outside the BU in which the event occurred.

9. Release the Scene

The scene should only be released after all physical evidence and witness statements have been collected. The witness interviews/statements and physical evidence must be reviewed prior to releasing the scene to ensure they do not conflict. Verify the scene can be released according to Government, Client, and Ledcor requirements before work re-commences. Government requirements will supersede Client and Ledcor requirements.

Note: Ensure as much evidence as possible is gathered before the scene is released. Collecting further physical evidence or witness statements may not be possible once operations re-commence at the scene.

10. Analyze the Evidence

The Incident Investigation Team, including the Project Leadership, will lead the review of the evidence to determine the causal factors, including direct, indirect, and root causes of the incident.

6.2 IDENTIFY THE CAUSES

Causal Analysis

10D-S Report

The root cause of the incident is determined by identifying the type of incident, the at-risk behaviours and unsafe conditions (immediate causes), and the personal and job/system factors (basic/root causes).

The Incident Investigation Team will facilitate the causal analysis with supervision and work through the **10D-S Incident Investigation Report Form**. It is important to follow the chronological sequence and explain why each cause has been selected based on collected evidence. Evidence must be available to justify each cause.

Underlying Causal Analysis

At the request of Senior Management or from the Incident Review learnings, the investigation team will be requested to gain an understanding of the sequence of events and their relationship with human responsibility and accountability – **Underlying Causal Analysis**. The investigation team will explore how and why people's behaviours/actions contributed to the incident. Specific corrective actions will focus on changes required in human behaviours at the personal and organizational/systems level to prevent further incidents. These underlying causes, learnings, and corrective actions will be captured at a personal level and/or at an organizational level using the **Personal Underlying Causes** form and/or the **Organizational System Underlying Causes** forms, respectively.

Through the collection of people, paper, and physical evidence, the investigation team will determine the underlying causes and capture them in IMS.

Recommend Corrective Actions

The criteria for corrective actions are as follow:

- Intended to permanently and directly resolve each root and contributing cause of the incident.
- Decided upon according to the hierarchy of controls for hazards, and implemented using the **SMART** methodology (Specific, Measurable, Achievable, Realistic, and Time-Bound).
- Cannot be assigned to another person without their approval.
- Must be monitored to ensure they effectively address the causes and do not inadvertently create hazards themselves.
- Must be written to allow for continual use and communication throughout the project to avoid recurrence. Considerations must be made for the current workers on-site, workers returning to site, and new workers coming to site.

The HS&E Team will enter all required information into IMS and the **Corrective Action Log**.

6.3 INCIDENT REVIEW MEETINGS

The purpose of an incident review is to verify with Senior Leadership that the worksite has adequately investigated the incident and prevention of re-occurrence has been implemented. This will involve verifying that necessary evidence has been gathered, reports have been completed, and corrective actions effectively address the causes, and have been assigned to appropriate personnel. Requirements for Incident Review Meetings will be defined by the individual BUs.

Level C Review Meetings

At the discretion of the Project Manager/HS&E Manager, based on the incident severity and potential, a site incident review meeting may be scheduled within 24 hours of the incident. The PM/CM should have a completed initial investigation report prior to conducting the meeting.

The HS&E Manager will ensure the **Post-Incident Review Meeting Form (10C)** is completed to capture attendance and any additional learnings that may arise from the meeting.

Level A and B Review Meetings

After the site conducts a review meeting and has determined corrective actions, contact must be made with the BU HS&E Administrator, or other assigned individual, to set up a Senior Leadership Incident Review Meeting.

The Incident Review Meeting should be scheduled with Senior Ledcor Leadership within **48 HOURS** of the incident. If a review meeting cannot be scheduled within 48 hours, Senior Leadership must be notified to explain and arrange an acceptable time. Required meeting attendees will be defined by the BU and Project/Construction Manager. Employees/Subcontractors involved in the incident, along with their Supervisors, should participate in the meeting. The intent of the participation in the meeting will be to identify the importance of safety to Ledcor, and seek feedback from people directly involved. The intent is not to finger-point or blame.

The investigation documents must be sent to the BU's Safety Administrator, or other assigned individual, immediately after the invite has been sent. These documents must be available to all participants for their review prior to the meeting.

Client Review Meetings

Depending on the Project and Client, review meetings for all levels of incidents may be required. Review meetings with the Client will be conducted after the site conducts an internal review meeting and has determined corrective actions.

If a significant incident occurs as defined by the client, the HS&E Manager will meet with the Client Project Management Team to gain an understanding of the expectations of information required (i.e., template, PowerPoint, report, etc.) to ensure the Client's needs are addressed.

Documentation

The HS&E Manager will ensure the following documentation is available for the Incident Review Meeting:

- 10D-S Investigation Report
- Witness Statement(s)
- FLHA
- JHAs/SWPs
- Photos
- Any applicable competency assessments
- Any applicable manufacturer's specifications
- Any additional applicable documentation

Sign-offs

Once the reviews are completed, the Incident Investigation Team will update the *10D-S Incident Investigation Report* as required. The Incident Investigation Team will gather the required sign-offs from the Project Leadership Team indicating the corrective actions prevent reoccurrence. All documents will be forwarded to the Business Unit HS&E Team.

Filing

The HS&E Team will input the information into IMS as per the *IMS User Guide Standards and Procedures*. Any additional required filing will be conducted as per CMS standards.

Completion Timelines Summary

- The Flash Report should be issued within 4 hours of the incident occurring.
- The 10D-S form should be completed by the end of the shift.
- For levels A and B, and if required for level C, the Site Incident Review Meeting should be scheduled within 24 hours of the incident.
- For levels A and B, the Senior Leadership Review Meeting should be scheduled within 48 hours of the incident
- Within 72 hours of a vehicle incident, the ***10F Vehicle Incident Report*** must be completed and a copy must be forwarded to Ledcor Risk Management and to the worker's supervisor.

6.4 TRAINING AND COMPETENCY

Employees in Supervisory, Management, Senior Leadership, and HS&E positions who are required to complete an incident investigation must successfully complete the Ledcor Incident Investigation Training.

Prior to leading an incident investigation, proficiency in incident investigation must be demonstrated.

Parameters for involvement by HS&E Coordinators is outlined in the *Constructors HS&E Coordinator Competency Measure* documents. The HS&E Coordinator must be a proficient and competent P2 at a minimum to facilitate the investigation process. Where there is not a P2, the HS&E Coordinator must be monitored. A P3 level HS&E Coordinator or HS&E Manager shall be responsible to monitor the investigation process. HS&E Coordinators and Supervisors/Foreman and others leading incident investigations must complete the *Competency Forms* (see Appendix B) to verify an understanding of the Incident Investigation Process.

Client-specific training requirements must also be applied as per the site-specific requirements. This may include, but is not limited to, training in, and use of other investigation techniques.

7.0 REFERENCES

- Constructors HS&E Coordinator Competency Measure
- Employee Incident Report (Form 10A)
- Witness Incident Statement (Form 10B)
- Incident Statement Form
- Incident Investigation Checklist (Form 10C)
- Incident Investigation Report (Form 10D-S)
- Vehicle Incident Report (Form 10F)
- Safety Alert (Form 10G)
- Post-Incident Review Meeting (Form 10C)

8.0 RECORDS

- Employee Incident Report (Form 10A)
- Witness Incident Statement (Form 10B)
- Incident Statement Form
- Incident Investigation Checklist (Form 10C)
- Incident Investigation Report (Form 10D-S)
- Vehicle Incident Report (Form 10F)
- Safety Alert (Form 10G)
- Post-Incident Review Meeting (Form 10C)

9.0 APPENDICES

- Appendix 1: **HSE Coordinator Incident Response and Investigation Competency**
- Appendix 2: **Supervisor/Foreman Incident Response and Investigation Competency**

APPENDIX 1: HSE COORDINATOR INCIDENT RESPONSE & INVESTIGATION COMPETENCY

Name:	**Date:**	Yes	No
HSE Coordinator has reviewed the site specific Emergency Response Plan			
INITIAL RESPONSE			
Demonstrates an understanding of:			
Ensuring supervision has secured the scene to prevent further impact			
Ensuring supervision has assessed the need for care of all injured workers and understands what action is required for: • Situations requiring Emergency Services • Situations where transport worker to Medical aid by company vehicle is appropriate			
Contacting and guiding ERT to the incident scene			
Informing ERT of incident details. Details include: • Type of incident (Ex. Medical emergencies, fire, suspended worker, confined space, wildlife, etc.) • Type of response required (Fire, Ambulance, Security) • Number of injured workers • Injured workers' condition if known			
Ensuring supervision has frozen the scene and ensured the incident scene is preserved			
NOTIFICATIONS			
Demonstrates an understanding of reporting all incidents they are informed of to the HSE Manager and Construction Management Team			
INCIDENT INVESTIGATION			
Completed Ledcor's Incident Investigation Training			
Reviewed and understands all parts of the Ledcor Constructors Incidents Investigation Program			
Independently completed the various steps of the investigation process: • Completion of Flash report • Collection of witness statements and worker interview • Completion of 10D-S and investigation with the supervisor • Lead incident review meetings • Completion of 10D-S review and sign off • Closure of corrective action • Upload and closure of IMS			
Understands the evidence collection process to ensure a thorough investigation. Knowledge of possible evidence sources.			

Assisted construction management in developing corrective actions which are SMART (Specific, Measurable, Attainable, Realistic and Timely)		
CARE AND CONTROL		
Understands and promotes the supervisor's requirement of maintaining care and control of workers from the time the incident occurred to the time a drug and alcohol test has been deemed not required or has been completed.		

The HSE Coordinator has demonstrated competency in incident response and investigation.

HS&E Manager **Date**

APPENDIX 2: SUPERVISOR/FOREMAN INCIDENT RESPONSE & INVESTIGATION COMPETENCY

Foreman:	**Discipline:**	**Date:**	Yes	No
Reviewed the site specific Emergency Response Plan				
INITIAL RESPONSE				
Demonstrates an understanding of:				
Securing the scene to prevent further impact				
Ensuring care of all injured workers • Situations to call Emergency Response • Situations to transport worker to Medical Aid by company vehicle				
Contacting and guiding ERT to the incident scene				
Informing ERT of incident details. Details include: • Type of incident (Ex. Medical emergency, fire, suspended worker, confined space, wildlife, etc.) • Type of response required (Fire, Ambulance, Security) • Number of injured workers • Injured workers' condition if known				
Freezing the scene and ensuring the incident scene is preserved as is at the time of the incident				
Communicating the importance of freezing the scene to crew				
NOTIFICATIONS				
Demonstrates an understanding of:				
Reporting all incidents to their direct supervisor				
Communicating required information to the HSE department				
Reinforcing with the crew the importance of reporting all incidents				
INCIDENT INVESTIGATION				
Complete Ledcor's Incident Investigation Training				
Demonstrates an understanding of their role in the investigation process				
Understands the importance of securing evidence including: • People for witness statements and interviews • Documents • Property				
CARE AND CONTROL				
Understands the requirements of maintaining care and control of workers from the time the incident occurs to the time a drug and alcohol test has been deemed not required or has been completed.				

The Supervisor/Foreman has demonstrated competency in incident response and investigation.

HSE Manager

Date

Acknowledgement Form

I hereby acknowledge that I have reviewed and understand the contents of the Ledcor Constructors Incident Investigation Program. I understand that I must have a thorough knowledge of, and abide by, these requirements. If I have any questions during the process of this task, I will stop and speak with my immediate Supervisor (Foreman). I further acknowledge that I understand that the requirements contained within this Program are conditions of my continued employment with Ledcor.

Print Name	Signature	Date

10.0 STANDARD PROGRAM REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared by	Checked by	Approved by
Dec-13-16	Initial issue for Constructors	00	L. Harman, S. Bernon, S. Maclean, A. Reid	L. Harman	L. Jones
Jan-03-17	Changed timeline for completing form 10F from 48 hours to 72 hours	01	A. Reid	L. Harman	L. Jones
May-11-17	Removed Flash Level Criteria section – replaced with Corporate Flash Level Criteria document.	02	V. Archibald	S. Woodman	L. Jones

FLASH LEVEL CRITERIA

Determine the flash level based on the ***realistic potential consequences*** of the incident and/or near miss.

	LEVEL A	LEVEL B	LEVEL C
PEOPLE	• Restricted Work exceeding 5 days • Lost Time Injury (LTI) • Occupational exposure exceeding legislative exposure limits	• Medical Aid (MA) • Restricted Work Case (RWC) where either duration is up to, or including, 5 days.	• First Aid (FA)
ASSETS	• Damage or loss over $5,000 to property or small equipment • Damage or loss over $10,000 to a motor vehicle • Damage or loss over $20,000 to heavy equipment (bulldozer, grader, 777, etc.) • Damage or loss over $50,000 to aircraft	• Damage or loss $1,000 to $4,999 to property or small equipment • Damage or loss $5,000 to $9,999 to a motor vehicle • Damage or loss $5,000 to $19,999 to heavy equipment (bulldozer, grader, 777, etc.) • Damage or loss $10,000 to $49,999 to an aircraft	• Damage or loss less than $999 to property or small equipment • Damage or loss less than $4,999 to a motor vehicle • Damage or loss less than $4,999 to heavy equipment (bulldozer, grader, 777, etc.) • Damage or loss less than $9,999 to an aircraft
ENVIRONMENTAL	• Environmental remediation costs over $10,000 • Any environmental incident reportable to government or regulatory agency, regardless of volume or environmental impact • Persistent, severe environmental damage that will lead to a loss of commercial or recreational use, or loss of natural resources (area or complete site shut down for Emergency)	• Environmental remediation costs between $1,000 and $9,999 and not reportable to government or regulatory agency • Limited persistent environmental damage • Spill or release not reportable to agencies but reported to client.	• Environmental remediation costs less than $999 and not reportable to government or regulatory agency • Contained within premises
REPUTATION	• Client review at national head office • Removal from Client site • Potential regulatory action to restrict operations or impact operating licenses • Provincial/National media coverage • Refusal to work – imminent danger validated	• Formal review with Client at BU or Division level • Regional public concern • Local stakeholders aware (i.e. government, community, industry) • Local media coverage • Incident involving any third party including the public • Refusal to work – investigated, no imminent danger present but reported to government or regulatory agency	• Report to Client • Refusal to work – investigated, no imminent danger present
SECURITY	• Theft/Damage to Property/ Criminal Activity loss over $10,000 • Assault related criminal offence	• Theft/ Damage to Property/Criminal Activity loss - over $1000 to below $10,000 • Trespassing - removed from site with incident (i.e. local authorities utilized) • Illegal protesting	• Theft/ Damage to Property/Criminal Activity – loss under $1000 • Legal protesting (i.e. picket line, no loss of work, no blocking of access to Ledcor worksites)

REFERENCE REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared by	Checked by	Approved by
Mar-10	Initial Issue	00	-	-	-
Feb-15	Updated property, small equipment, and heavy equipment thresholds.	01	-	-	-
Jan-14-17	Updated to include motor vehicle and aircraft thresholds.	02	V. Choi	P. Bruder	L. Harman
Jan-02-19	• Added instruction for use • Created Table for Flash Levels • Added additional A, B & C Flash criteria for Impact on Reputation, Environmental, Security, and Harm to People incidents. • Removed volumes from Environmental Incidents • Added financial loss values to environmental incidents	03	V. Wong L. Jones LSC	C. Stepien	L. Jones
Dec-06-19	• Revised header section of the document to provide more clarity on the flash level criteria (CMS Feedback)	04	A. Javadi	P. Belair	L. Jones

TMEP SPECIFIC INCIDENT REPORT TEMPLATE

On the Trans Mountain Expansion Project, LSLP will submit incident investigation reports using the CSM0001 Form on the following pages of this appendix.

TRANSMOUNTAIN

TMEP – CONTRACTOR INCIDENT REPORT

1. GENERAL INFORMATION: (COMPLETE FOR ALL INCIDENTS)

☐ Medical Aid	☐ Illness	☐ First Aid	☐ Low Potential Near Miss	☐ High Potential Near Miss	☐ Property Damage	☐ Equipment Damage	☐ Agency Interaction
☐ Report Only	☐ Fire	☐ Unauthorized Activity (GD)		☐ Security (Complete CSM-001-S)		☐ Vehicle/ MVI	☐ Fatality

Was this reportable to any government agency? ☐ Yes ☐ No	If yes, list agency and person reported to:	☐ AB OHS ☐ AB WCB ☐ WorkSafe BC ☐ CER

Project Name:	Location:	☐ AB ☐ BC	Time Zone: ☐ Mountain ☐ Pacific
Date of Report:	Incident Date:	Time (24hr): ☐ AM ☐ PM	County or Municipality:

Reported To:	Reported By:
TMEP Project/Hiring Manager:	TMEP Onsite Safety Rep:
Incident location same as the work location? ☐ Yes ☐ No If No, where did the incident occur?	Enter specific details about this location: Closest TM Location:

Contractor Company Name:

Subcontractor Company Name:

Contractor Involvement Type:	☐ Caused by	☐ Contributed	☐ Involved	☐ Witnessed

Post Incident Testing Conducted ☐ Yes ☐ No	Test Failures ☐ Yes ☐ No ☐ NA

If no test conducted, what was the rationale for not testing (explain):

What was the worker doing just before the incident occurred?

2. WORK INFORMATION: (COMPLETE FOR ALL INCIDENTS)

Work Shift: ☐ Call-Out ☐ Overtime ☐ Regular ☐ Night Shift	Was work stopped? ☐ Yes ☐ No
Number of days worker has been on shift?	Days On: Days Off:

How Many Days/Months/Years has Employee Performed this Job Task? _____ YRS _____MONTHS _____ DAYS

Name of Witness:	(FIRST)	(LAST)	Witness Phone #

3. LIFE SAVING RULE(S) BREACHED: (CHECK ALL THAT APPLY)

☐ Confined Space	☐ Working at Heights	☐ Work Authorization	☐ Safe Mechanical Lifting	☐ Damage Prevention	☐ Bypassing Safety Controls
☐ Driving	☐ Hot Work	☐ Line of Fire	☐ Fit for Duty	☐ Energy Isolation	☐ None

4. INJURY / ILLNESS INFORMATION: (ONLY COMPLETE IF ILLNESS OR INJURY RESULTED FROM INCIDENT)

☐ Medical treatment provided	☐ Recordable injury	☐ Modified work	☐ Loss time injury

Did the worker have ER treatment: ☐ Admitted to hospital ☐ Observed in hospital (not admitted) ☐ Hospitalized overnight

Date of first medical care:	Time away from work after first day of injury
Treatment facility:	Physicians name:

Type of Event: Choose an item.	Injury Type: Choose an item.	Illness/Exposure: Choose an item.

Describe body part injured (Right or Left if applicable):

Other, please explain:

5. VEHICLE INCIDENT: (COMPLETE IF APPLICABLE)

☐ Avoidable ☐ Unavoidable

Weather Conditions Choose an item.	Driver Visibility Choose an item.	Road Conditions Choose an item.	Road Surface Choose an item.	Occurred On: Choose an item.

6. EQUIPMENT/PROPERTY DAMAGE (COMPLETE IF APPLICABLE)

Equipment damage: ☐ Yes ☐ No	Property damage: ☐ Yes ☐ No	Damaged: Choose an item.

Distribution: Contractor to On-site Safety Rep or Chief Inspector
On-site Safety Rep or Chief Inspector to Project/Hiring Manager
Safety Analyst enters incident and corrective actions in Incident Tracker.

7. AGENCY INTERACTION: (COMPLETE IF APPLICABLE)

☐ Announced ☐ Unannounced	☐ Federal ☐ Local	Citation Issued: ☐ Yes ☐ No
Reason for Inspection:		
Agency Name:		
Inspector Name:	Inspector Contact Phone #:	
Description and Results of Inspection:		

8. SEVERITY OF INCIDENT: (REFER TO TRANS MOUNTAIN SEVERITY MATRIX)

Actual	☐ Level 1 - Minor	☐ Level 2 – Moderate	☐ Level 3 – Major	☐ Level 4 – Critical	☐ Level 5 - Extreme
Potential	☐ Level 1 - Minor	☐ Level 2 – Moderate	☐ Level 3 – Major	☐ Level 4 – Critical	☐ Level 5 - Extreme

9. CONTRACTOR – SUPERVISOR INVESTIGATION: (Must be completed prior to submitting to Company Investigation)

Event Type: Select from drop down list Choose an item.

Immediate Cause(s): Select all the drop downs that apply in the left column from the DNV scat chart.

Choose an item.	Explain:
Choose an item.	Explain:
Choose an item.	Explain:
Choose an item.	Explain:

Root Cause (s):

Choose an item.	Explain:
Choose an item.	Explain:
Choose an item.	Explain:
Choose an item.	Explain:

#	CORRECTIVE ACTIONS – Description of Action	Person Responsible	Target Date	Date Completed
1				
2				
3				
4				
5				

Name (Print):	Signature: (Contractor Project Manager)	Date:

10. TRANS MOUNTAIN ONSITE PROJECT SAFETY OR DESIGNATE REVIEW (Completed by Trans Mountain)

Agree with investigation results ☐ Yes ☐ No	If **NO** provide explanation:	
Corrective actions reviewed/adequate: ☐ Yes ☐ No	If **NO** provide explanation:	
TAS initiated ☐ Yes ☐ No	Explained to contractor ☐ Yes ☐ No	
Name: (Trans Mountain Onsite Representative)	Title:	Date:

11. Project Manager / Construction Manager Review (Completed by Trans Mountain)

Last Name	First Name	Signature	Date

12. INCIDENT TRACKER (Completed by Trans Mountain Safety Analyst)

Recorded in Incident Tracker (date):	Entered by:	Incident # Assigned:

Enablon Event Classification: Environment, External Agency, Health and Safety, Pipeline RoW, Process Safety, Security, Integrity		**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
Enablon Consequence #1	**Enablon Consequence #2**	**Minor**	**Moderate**	**Major**	**Critical**	**Extreme**
Injury or Illness	• Report Only (Untreated Injury) • First Aid Case • Medical Treatment • Restricted Duties • Lost Time • Permanent disability • Fatality	• Untreated or First Aid Injuries or discomforting illnesses	• Medical Aid or Restricted Duty Injuries or acute illnesses resulting in a required temporary work accommodation.	• Lost Time Injuries or chronic illnesses where the worker is unable to return to work in any capacity the day following the incident.	• Single fatality	• Multiple fatalities
Property or Equipment Damage	• Third Party • Trans Mountain • Contractor	• <$100K	• ≥ $100K < $1M	• ≥ $1M < $10M	• ≥$10M < $100M	• ≥ $100M
Unauthorized Activity	• First or Second Party Contacted Trans Mountain Line • Third Party Contacted Trans Mountain Line • Trans Mountain Contacted Third Party Line • Non-Excavation Asset Damage • Unauthorized No Contact	• Unauthorized activity or crossing (UA) outside 7.5 m of the pipe (outside RoW) • No heavy-duty vehicle or mechanized equipment.	• Unauthorized activity or crossing (UA) within 7.5 m of the pipe (inside RoW) with No Contact • Any UA with heavy-duty vehicle or mechanized equipment (inside or outside RoW) with No Contact	• Unauthorized activity or crossing (UA) causing Pipe Damage (includes pipe or coating damage) with No Rupture	• Unauthorized activity or crossing (UA) causing Pipe Damage with a Rupture	
Vehicle	• Avoidable • Unavoidable	• Vehicle Damage (while driven) < $5k	• Vehicle Damage (while driven) $5k - $20k	• Vehicle Damage (while driven) > $20k		
Regulatory	• **Environment** • Health and Safety • Security • Damage Prevention • Control Centre • Emergency Response • Integrity • Construction • Operations and Maintenance • Other	• No Impact or self-disclosed regulatory non-compliance/audit finding with few minor corrective actions • No regulatory fines	• Notice of Violations with a few significant corrective actions or multiple limited corrective actions • Small regulatory fines (< $25K)	• Notice of Violations with multiple significant corrective actions • Medium regulatory fines ($25K -$100K)	• Regulatory order for short-term suspension of operations or work stoppage. • Large regulatory fines ($100K-$1M)	• Regulatory order for long-term suspension of operations or work stoppage. Very Large regulatory fines (>$1M)

Appendix F – Audits & Leading Indicator Calendar

STANDARD PROCEDURE REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared by	Checked by	Approved by
Mar-19-19	Original Issue	00	S. Woodman C. Stepien	C. Stepien	L. Jones

1.0 PURPOSE

To provide a consistent audit process, which is utilized across the Ledcor Group of Companies; measuring the execution of the HS&E program that meets Ledcor's standards.

2.0 SCOPE

Applies to all active Ledcor projects and work locations. Ledcor Business Units will have the flexibility to define the auditable unit to which of the audit applies.

3.0 ACRONYMS, TERMS AND DEFINITIONS

Auditable Unit – A Ledcor project, site, or Business Unit that encompasses the scope of the audit which is determined by the Business Unit Leader in conjunction with the Head of HS&E.

Audit Team – A group that is assembled to conduct an audit. This team may include senior or project leadership from outside the auditable unit, HS&E personnel and/or participation from other shared services (e.g. Human Resource, Finance, Environment or Equipment).

Head of HS&E – The most senior Ledcor HS&E employee within a Ledcor operating group.

HS&E Gold Standard Audit – An audit which reviews the level of compliance to **Ledcor's HS&E Standards** and measures the HS&E performance within the Auditable Unit.

Kick Off Meeting – A meeting (formal/informal) between the lead auditor and auditable unit leadership which is held prior to the audit to communicate and/or review the plan to complete the audit.

Lead Auditor – A P4 or M1 level safety professional or higher assigned to conduct an audit.

Project/Site Leadership – Project Manager, Operations Manager, Construction Manager, Superintendent, HS&E Manager and/or Lead, Office or Facility Manager.

Senior Leadership – Consists of but is not limited to Chief Operating Officer, Senior Vice Presidents, Vice Presidents, Directors, General Managers, Operations Managers, Project Sponsors and Business Unit HS&E Directors / Managers.

4.0 RESPONSIBILITIES

Project/Site Leadership

- Provides the required resources for participation and completion of the audit process.
- Reviews audit results with the HS&E Manager/Lead and develops action plan(s) to address non-conformances or recommendations.
- Verifies completion of action plans within the specified timelines.
- Verifies effectiveness of corrective actions.

Lead Auditor

- Conduct preparation activities prior to the audit.
- Complete all project/site access requirements.
- Arrange for travel requirements; as necessary.

- Consult with the Head of HS&E (of the appropriate Operating Group) to determine if there are specific areas of focus including follow up of key findings from previous audits.
- Complete the audit report including recommendations for continuous improvement.
- Verify that audit team participants have some level of auditor training/experience.
- Verify that leadership participating as a member of the audit team, is from outside the business.
- Immediately address uncontrolled life critical risks identified through the audit with the project leadership team.

Head of HSE

- Establish audit schedule for the year.

HS&E Manager/Lead

- Participate in the development of an action plan to address non-conformances or recommendations with auditable unit leadership.
- Participate in site inspection, and other activities as required by the Lead Auditor.
- Schedule required interviews as identified by Lead Auditor.

Employees and Sub-Contractors

- Participate in interview process when required.

ACCOUNTABILITY

Senior Leadership

- Verify the implementation of this procedure throughout their operating group.

5.0 PROCEDURE

5.1 Establish Audit Schedule

1. The Head of HS&E for the Operating Group in consultation with Senior Leadership determines the Gold Standard Audit schedule for the upcoming year.

   Note: The frequency of Gold Standard Audits is set by the Operating Group.

2. The Head of HS&E for the operating group provides the final audit schedule to the Corporate Head of HSE for approval.

3. The Head of HS&E for the Operating Group, in consultation with the senior leadership team, assigns the lead auditor and/or audit team (if applicable) responsible for completion of the audit(s) and communicates with the auditor and/or the audit team

5.2 Audit Preparation

1. The Lead Auditor prepares for the Audit.

   Note: These activities include (but are not limited to):
   - Reviewing previous audits and corrective actions
   - IMS entries from within audit scope

- Project Hazard Assessment
- Lagging indicators
- Focus inspections on critical tasks

2. The Lead Auditor and Audit Team (if applicable) conduct the audit activities.

   Note: The length of the audit depends on the size and complexity of the auditable unit, however the following requirements will apply to all audits:

   - Kick-off Meeting led by the Lead Auditor
   - Project Tour; Worksite Inspection
   - Documentation Review
   - Conduct Interviews
   - Observations or work activities (i.e. attend a Toolbox Talk and a Safety Meeting)

5.3 Conduct the Audit

1. The Lead Auditor documents the audit findings on the **Gold Standard HS&E Audit Tool**.

   Note: An overall score of 80% or higher is considered a "pass". A "Gold Standard" flag is available from Corporate HS&E for a project/site that has passed the audit. Scoring is based on a weighted system that includes:
   - Audit questionnaire score
   - Formal inspection score
   - Leading indicators including participation
   - Lagging indicators
   - Compliance to High Risk/Life Critical standards. Any non-conformance in this area must be noted as "HIGH SEVERITY" on the "Audit Findings" tab in the **Gold Standard HS&E Audit Tool**. For **each** high severity non-conformance, 20% will be automatically deducted from the final score.

2. The lead auditor and/or audit team meets with auditable unit, HS&E and leadership to conduct a preliminary review of the audit findings prior to leaving the project/site at the conclusion of the audit.

   Note: Any item believed to require immediate attention will be discussed at this time.
   Note: Scoring will not be released until the final report.

3. The Lead Auditor completes the audit report by entering and finalizing the audit findings in the **Gold Standard HS&E Audit Tool** within ***one week*** of the audit. This includes:
   - finalizing the audit findings in the *"Verification Checklist"* tab,
   - manually entering the items identified on the "*Overall Summary*" tab, and
   - completing the Audit Findings summary in the *"Audit Findings*" tab.

5.4 Review Audit Findings and Establish Action Plan

1. The Lead Auditor provides the final completed **Gold Standard HS&E Audit Tool** to auditable unit HS&E as well as the Senior Leader for the auditable unit.

Note: Refer to the audit criteria reference guide (*"Reference Guide*" tab) in the **Gold Standard HS&E Audit Tool** for specific audit criteria/requirements.

2. The auditable unit team develops the corrective action plan based on the Audit Findings.

3. The auditable unit team provides the final draft of the Corrective Action Plan to the Operating Groups Head of HS&E for approval.

4. The auditable unit completes the Corrective Action Plan within the specified timelines.

6.0 REFERENCES

- **Ledcor's HS&E Standards**
- **Gold Standard HS&E Audit Tool**

7.0 RECORDS

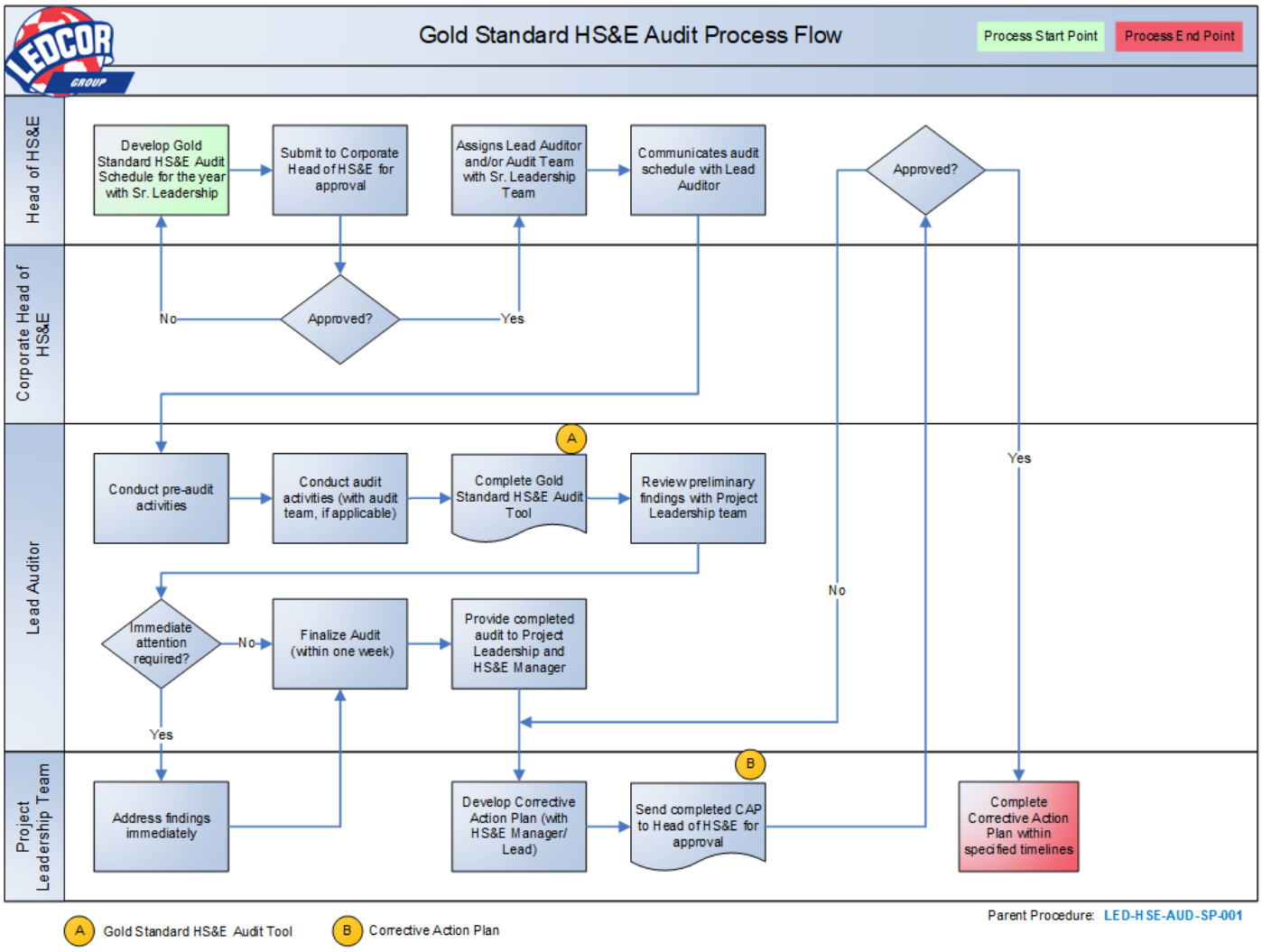
- Operating Group/Business Unit Audit Schedule
- Gold Standard Audit Tool
- Corrective Action Plan

8.0 APPENDIX (as applicable)

N/A

9.0 PROCESS FLOWCHART

See next page



Click here to view an enlarged copy of the flowchart

STANDARD PROCEDURE REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared by	Checked by	Approved by
Jun-17-14	Initial Issue	00	A. Jiang	R. Stark	B. Edwards
Jan-23-15	Added detail regarding meeting COR Expiry dates	01	R. Stark	J. Pach	N. Richardson

1.0 PURPOSE

To provide clear instructions to employees on the completion of Certificate of Recognition (COR) Audits.

2.0 SCOPE

Applies to internal and external COR audits for all applicable jurisdictions.

3.0 ACRONYMS, TERMS AND DEFINITIONS

Auditor – The person or persons assigned or and authorized by Ledcor to conduct a COR audit. The auditor may be internal (Ledcor employee) or an external contracted service provider, depending on whether an Internal (maintenance) audit or External (certification) audit, respectively is being completed.

Audit Team – The internal or external auditor personnel assigned or authorized by Ledcor to complete the COR audit. These personnel must hold current COR auditor status, granted by a certifying partner. (Alberta Construction Safety Association, BC Construction Safety Association, Enform etc.)

Certifying Partner – External bodies (industry associations, provincial construction associations) which are authorized by the applicable provincial ministry to administer their COR program. A certifying partner provides internal and external auditor training. They must approve the auditor and the audit schedule. They receive and review completed audits. For those External (Certification) audits achieving the minimum standard, the Certifying Partner recommends employers to the applicable provincial ministry for issuance of a COR number and certificate.

Certificate of Recognition (COR) – An accreditation that is granted by a provincial ministry to an employer. (Based on their WCB or WSIB account.) The awarding of a COR number and certificate confirms the employer has a functioning health and safety management system that has been evaluated by a certified auditor and achieved at least a defined minimum standard.

COR Audit document – The Certificate of Recognition audit tool that has been developed by the applicable provincial ministry to be used as the document for applying a consistent standard to which an employer's health and safety management system and the effectiveness of its implementation are measured.

DOI – Documentation, Observation, Interview. The evaluation methods utilized within the sections of the COR audit document to verify program compliance and effectiveness.

External COR (Certification) Audit – The process by which the COR Audit is completed by an external auditor. The audit is completed on a minimum three year period cycle. The audits are conducted by an external auditor who holds current COR auditor certification and is approved by a certifying partner. The accredited, external auditor provides an objective assessment of the health and safety management system. At completion of the audit, a Certificate of Recognition is awarded if at least a defined minimum standard is achieved.

Internal COR (Maintenance) Audit – The process by which the COR Audit document is completed by an internal auditor. To maintain COR status, internal audits must be conducted annually and submitted to a certifying partner in between the external COR audits. The audits are generally conducted by the employer, via an employee who holds current COR auditor certification and is approved by the certifying partner.

In Progress Letter – A letter that may be issued by certifying partners. It communicates that the employer is "In Progress" of completing an external COR audit. The letter is not a replacement for a COR certificate. Some clients will accept an 'in progress' letter as indicating an employer as being in compliance with COR certification standing.

HS&E – Health, Safety, and Environment

HS&E Team – HS&E Manager, Lead, and / or Coordinator

Project Leadership Team – Project Manager, Construction Manager, Superintendent, HS&E Manager and / or Lead

4.0 RESPONSIBILITIES

Auditor / Audit Team –

- Ensure an expert level understanding and adhere to all the requirements of the COR audit process as identified by the certifying partner.
- Measure the application and effectiveness of the employer's health and safety management system.
- Upon completion, present the findings to the audited unit leadership team and submit the audit document to the certifying partner.

Business Unit HS&E Manager –

- Understand the COR audit process as well as how a COR certificate is important to the running of the business they support.
- Assemble the Audit Team and function as the primary point of contact for the auditor.
- Facilitate the audit process for both Internal (Maintenance) and External (Certification) COR Audits.
- Ensure the Business Unit is always in possession of a valid COR certification.

Project Leadership Team –

- Ensure awareness of the COR audit process as well as how a COR certificate is important to the running of their business.
- Facilitate the COR audit process by aiding the Auditor and Auditor Liaison through provision of documents, arrangement of worksite observations, and facilitate interviews.

Auditor Liaison –

- Ensure a functional level of understanding of the COR audit process, as the primary point of contact for the auditor to facilitate the audit process. This role remains the responsibility of the Business Unit HS&E Manager until otherwise designated.

ACCOUNTABILITY

Business Unit Leader –

- Ensure that the applicable COR Audits are in place and maintained for their Business Unit.

Business Unit HS&E Manager –

- Ensure that the applicable COR Audits are in place and maintained for their Business Unit.
- Ensure the completion of the Internal / COR Maintenance Audit and the External / COR Certification Audit according to the requirements set out in the various provincial Certificate of Recognition (COR) programs.

5.0 PROCEDURE

1. The Business Unit HS&E Manager in conjunction with the Business Unit Leader will determine that applicable COR Audits are in place for the Business Units they support.

2. The Business Unit HS&E Manager will ensure they have a functional level of understanding of the requirements set out under the applicable COR Audit program(s). They will ensure they schedule their required audits to ensure that their Business Unit maintains its COR certification.

   Note: The external COR Auditor has a set and limited amount of time to complete the COR Audit and submit all the documentation to the Certifying Partner (i.e. ACSA provides 45 days and the BCCSA provides 6 weeks). The Certifying Partner then reviews and approves the audit document for submission to the regulatory body for issuance of the Certificate of Recognition within a defined time frame (i.e. ACSA has up to 45 days to submit to Partnership Alberta). Partnership Alberta will usually issue the COR Certificate within a week, however, these timelines must be verified and understood well in advance of audit scheduling as they are subject to change.

   During this time period, if the prior Certificate has expired, the Business Unit is without a valid COR. An “In Progress” letter may be issued to cover this time frame and the new COR will be dated three years from the previous expiration date. The Business Unit HS&E Manager must determine if the “In Progress” letter meets the Business Unit needs as per their client requirements, pre-qualification, and estimating process. If not acceptable, the Business Unit HS&E Manager must manage the external COR audit schedule that enables issuance of the new COR prior to expiry of the prior COR.

3. The Business Unit HS&E Manager will inform the Business Unit Leader when an Internal / Maintenance Audit or External / Certification Audit are to occur.

4. For an External / Certification Audit, the Business Unit HS&E Manager will arrange for a certified external Auditor to complete the audit.

5. The Business Unit HS&E Manager must have their auditor selection approved by and must also register their business for either an internal or external audit with the applicable certifying partner. Each certifying partner has their own approval process.

6. The Business Unit HS&E Manager and the Business Unit Leader / Auditor Liaison (this role may be delegated to another HS&E resource will hold a pre-audit meeting with the Auditor to discuss details including, but not limited to:

   a. The purpose and scope of the audit
   b. Schedule of events concerning DOI
   c. Confidentiality of information
   d. Audit requirements
   e. Non-conformance handling
   f. Questions and concerns

7. The Business Unit HS&E Manager will inform the Project Leadership Teams once the schedule has been finalized to ensure they understand their roles and responsibilities in the audit process and DOI requirements. This includes:

   a. Gathering and preparation of relevant documentation
   b. Facilitation of observation tours as required
   c. Identifying the number of worker and supervisor interviews required

8. The Project Leadership Team and the Auditor Liaison will provide the Auditor with the necessary support. During the Auditor site visit, the following will occur:

   a. The Project Leadership Team will ensure that all required documentation is provided to the Auditor, this may include furnishing additional documents that were not already prepared.

   b. A member of the Project Leadership Team will accompany the auditor on all observation tours and answer any questions that Auditor may have with regards to the Observation Checklist.

   c. The Project Leadership Team will ensure that employees to be interviewed are available and private interview rooms have been provided.

   d. If additional interviews are required, the Auditor Liaison will notify the Project Leadership Team so they can be arranged.

9. The Project Leadership Team and the Auditor Liaison will ensure that all questions or concerns that the Auditor may have over the course of the COR audit are addressed to the best of their capabilities and shall direct all others to the Business Unit HS&E Manager.

10. The Business Unit HS&E Manager, Business Unit Leader, and the Auditor Liaison will attend the post-audit / closeout meeting following the completion of the COR audit with the Auditor.

11. The Business Unit HS&E Manager will ensure that all findings from the COR audit are communicated and understood. The gaps or improvement items are to be documented in a Performance Improvement Plan for stewardship to closure. All audit documentation is filed as per the **HS&E Document Management Plan**.

12. Internal audits are to be completed every year except for the year of the external audits. They are required in order to maintain a company's COR status. The Business Unit HS&E Manager will

ensure that there are certified auditor(s) available to complete the internal audit. The audit process, documentation and closure of all findings are the same as for external audits.

13. COR Audits, COR Certificates and Action Plans are to be placed and maintained on the Ledcor Connect **Safety Audit** page under Constructors HS&E.

Note: Refer to the applicable Provincial Audit Protocol for further clarification and requirements.

6.0 REFERENCES

- HS&E Document Management Plan

7.0 RECORDS

- COR Audit Document
- Performance Improvement Plan

8.0 APPENDIX (as applicable)

- N/A

9.0 PROCESS FLOWCHART

- N/A

STANDARD PROCEDURE REVISION HISTORY

Date	Details of Revision	Rev. No.	Prepared by	Checked by	Approved by
May-26-14	Initial Issue	00	D. Eastaugh	N. Richardson	B. Edwards

1.0 PURPOSE

To provide an outline on the use of the Project Safety Assessment which will enable users to gauge the effectiveness, quality, of the HS&E Program on the project.

2.0 SCOPE

Applies to Project Safety Assessment completed on projects as prescribed by their Business Unit.

3.0 ACRONYMS, TERMS AND DEFINITIONS

HS&E Team – HS&E Manager, Lead and / or Coordinator

Project Leadership Team – Project Manager, Construction Manager, Superintendent, HS&E Manager and / or Lead

Senior Leadership Team – Consists of but is not limited to Chief Operating Officer, Senior Vice President's, Vice President's, Directors, General Managers, Operations Managers, and BU HS&E Directors / Managers.

4.0 RESPONSIBILITIES

HS&E Team –

- Prepare the documents for the Project Safety Assessment, assist with the assessment, and manage the follow-up or corrective actions.

Project Leadership Team –

- Assist anyone who is completing the Project Safety Assessment.
- Develop and implement any follow-up actions.

Senior Leadership Team –

- Complete the Project Safety Assessment as required by their specific Business Unit Leading Indicator Calendar.
- Share the results of the Project Safety Assessment with the Project Leadership Team.

ACCOUNTABILITY

Business Unit Leader –

- Ensure that Project Safety Assessment is being completed as required and that the findings noted have been addressed by the Project Leadership Team.

5.0 PROCEDURE

1. The person utilizing the **Project Safety Assessment** will determine the areas of focus; this may be done prior to or during the site visit.

Note 1: The Project Safety Assessment encompasses the overall HS&E Program for the project and to check everything at each visit may not be feasible. It is at the discretion of the person utilizing the Project Safety Assessment to determine if they will do an assessment of all HS&E elements listed, or focus on a limited number of elements.

Note 2: Over the course of a year, it is recommended that all elements of the Project Safety Assessment be completed.

2. The person utilizing the Project Safety Assessment may notify the Project Leadership Team of the upcoming Project Safety Assessment, allowing time to gather and prepare documentation (if required).

3. The person utilizing the Project Safety Assessment will complete it using the Project Safety Assessment Template with the following methods:

a. Observation: A method that allows a person to observe people, equipment, documents, and the environment at a worksite.

b. Documentation: A review of documentation to verify that the required process, policies, and procedures are in place and that adequate records are being kept.

c. Interviews: A face to face meeting used to gather and verify information about understanding and effective execution of the HS&E Program.

4. The person completing the Project Safety Assessment will sit down with the Project Leadership Team to review the findings from the Project Safety Assessment. The Project Leadership Team will determine what Corrective Actions are required.

5. The HS&E Team will record and track any actions utilizing the projects **Corrective Action Log** and the HS&E Team will file the Project Safety Check as per the **Project Filing Index**.

6.0 REFERENCES

- Project Filing Index

7.0 RECORDS

- Project Safety Assessment Template
- Corrective Action Log

8.0 APPENDIX (as applicable)

- N/A

9.0 PROCESS FLOWCHART

- N/A

2020 Leading & Lagging Indicator Calendar
Ledcor Pipeline Limited

THINK SAFETY™
WORK SAFELY

Ledcor Pipeline Limited HS&E Objectives

- "Strengthen our current processes through employee engagement, ongoing measurement, verification & continuous improvement."

Leading Indicator Activities	Workers	JOHSC	HS&E Coordinators	Supervision (Foreman)	Eng, Quality & Env. Coord.	Project Leadership	Senior Leadership
HS&E Planning Activities *Attend, Participate, Lead Toolbox Meetings*	Participate in All	-	Participate 4/week	Lead 1/day	Participate 1/month	Participate 1/week	Participate 1 per 60 days
Safety Meetings *Attend, Participate, Lead*	Participate in All	-	Participate in All	Participate in All	Participate in All	Lead All	Participate 1 per 60 days
Worksite Inspections *Conduct Worksite Inspections*	-	1/monthly	Conduct 2/week and review all	Conduct 1/week	Conduct 1/week	Conduct 1/week	Conduct 1 per 60 days
Focused Inspections *Conduct focused inspections on critical tasks*	-	-	Conduct 1/month	-	-	-	-
FLHA Quality Reviews *Conduct and sign FLHAs*	-	-	Review & Sign 10/day	Review & Sign All	-	Review & Sign 10/week	-
Worksite Observations *Complete WSOs*	-	-	Conduct 2/week	Conduct 2/week	Conduct 1/month	Conduct 1/week	Conduct 1 per 60 days
Corrective Action Log *Review of Action Items – Closure/Effectiveness*	-	Review in JOHSC	Review All	Review as Required	-	Review Log 1/week	-
Incident Investigations *Participation and Incident Level*	-	Review in JOHSC Participate where required	Lead All	Participate in All	-	Participate in All	Review All Level A&B Flashes
Incident Review Meetings *Participation and Incident Level*	-	-	Lead All	Participate in All	-	Participate in All	Participate in all Level A & B Incident Investigations
Emergency Response Drills	• Minimum every 3 months						
HS&E Perception Survey	• Minimum of 1 per Year						
Gold Flag Audit	• Minimum 1 every 6 months						
Core Safety Training Completion (Mandatory)	100% Completion of Core Safety Training - Identify Core HS&E Training being measured: • Review & Sign PSSP Acknowledgement • Supervisor Interactive Development Session (Seminar) • Leadership for Safety Excellence (where provincially applicable) • DriveSAFE program • Pipeline Construction Safety Training (PCST) • Ground Disturbance for Supervisors Level 2 (GDL2) • Standard First Aid – Level C CPR						

Lagging Indicator Targets	TRIF	FAIF	VIF	LCIF
Ledcor Pipeline Limited	0.75	3.0	3.0	15.0
Subcontractor	-	-	-	-
Total	0.75	3.0	3.0	15.0

Total Recordable Injury Frequency (TRIF)

$$\frac{MA + LTI + RWC \ x \ 200{,}000 \ Hours}{Hours \ Worked}$$

Loss Control Incident Frequency (LCIF)

$$\frac{FA + MA + LTI + RWC + PD + Env + Security + MVI \ x \ 200{,}000 \ Hours}{Hours \ Worked}$$

Definitions

- **Senior Leadership Team:** Consists of but is not limited to: Senior VP's, VP's, Directors, General Managers, Operations Managers, Quality Control Managers, Environmental Managers, Project Sponsors and HS&E Directors/Managers.
- **Project Leadership Team:** Consists of but is not limited to: Project Managers, Superintendents and HS&E Leads.
- **Lead:** Responsible for successful completion of that activity.
- **Conduct:** Lead or Co-lead, to do or carry out an activity.
- **Participate:** Help in preparation, attend and when appropriate speak up to help achieve the objective of that activity.
- **Review**: Understand the expectation around the activity - Provide support and feedback, help determine corrective actions when applicable.

Appendix G – Fire Mitigation Plan

Trans Mountain Expansion Project

Fire Hazard Mitigation Plan

TMEP Document # 01-13283-S3 S4A-M002-EV-PLN-0004 R0

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	Reviewed by TMEP	Pages Revised	Issued Type
0	Eddy Kibambe 2019-11-18	Giuseppe Roda 2019-11-18	Matt Granger 2019-11-18	S.D.Ayres 2019-11-20	All	Issued for Use

TABLE OF CONCORDANCE

Document Title	**Fire Hazard Mitigation Plan**						
Document Number	**01-13283-S3 S4A-M002-EV-PLN-0004**					**Revision**	**B**
No.	**Document**	**Section**	**Page**	**Previous Text**	**Revised Text**	**Comment**	**Date**
1	Fire Hazard Mitigation Plan	All	All		Changed revision B to 0		11/18/2019

TABLE OF CONTENTS

1.0 INTRODUCTION

Throughout construction of the Project and its related worksites, LSLP will engage in construction activities that are considered to have high fire risks and may use controlled burning as a method of disposal for clean wood and brush, mitigation against forest pest infestations, and reducing future wildfire risks. The prevention of uncontrolled fires and the management of controlled burning require hazard assessment and abatement, and a thorough understanding of provincial and local requirements. Spread 3 and 4A cross the British Columbia Natural Resource Districts of Prince George and Thompson-Rivers; and the Prince George and Kamloops Fire Centres, respectively. By using best management practices and wildfire information provided by the province of British Columbia, LSLP and its subcontractors will comply with TMEP-provided commitments and requirements, as well as all applicable legislation regarding the management of wildfire prevention and industry requirements.

1.1 Purpose

The purpose of the Fire Hazard Mitigation Plan is to provide an overview of how Ledcor-Sicim Limited Partnership, and its subcontractors, will execute the safe and environmentally responsible management of wildfire risks, uncontrolled fire prevention, and execution of controlled burning activities. This Plan will complement and adhere to the TMEP Health and Safety Management Plan, the environmental plans and their associated commitments to fire prevention and burning requirements (Volume 2, Pipeline Environmental Protection Plan, 01-13283-GG-0000-CHE-RPT-0006). Ledcor-Sicim Limited Partnership is committed to ensuring that construction activities are in compliance will all safety and environmental legislation, regulations, and commitments.

During the construction of Spread 3 and 4A of the Trans Mountain Expansion Project, consideration will be given to activities that have a high fire risk potential, the prevention of wildfire incidents, and that preparedness is established when engaging in controlled burning activities. This Plan will identify proper planning, safe practices, and appropriate techniques to manage wildfire risks, prevent uncontrolled fires, conduct controlled burning activities, and response requirements. LSLP is committed to managing fire hazards in a manner that is protective of the environment, and compliant with applicable regulations and landowner requirements.

2.0 LEGISLATION

2.1 Federal

Dangerous Goods Transportation and Handling Regulation

The Transportation of Dangerous Goods Act and associated regulations are intended to promote public safety during the importing, handling, and transportation of dangerous goods. The Act sets out general requirements that must be met; and the regulations describe specific details on how to ship and transport dangerous goods. Schedule 1 provides a list of dangerous goods by UN number. The Project will undertake activities and use materials that are identified under Schedule 1 of the regulations.

2.2 Provincial

BC Open Burning Smoke Control Regulation

Exposure to wood smoke has the potential to cause discomfort and illness due to chemicals and particulates in the smoke. Smoke can also impact visibility throughout the landscape, impacting road and air travel. The Open Burning Smoke Control Regulation and its Code of Practice are intended to encourage the reduction and reuse of vegetative debris whenever possible. If open burning is a viable option, the regulation allows burning under strict, safe conditions, which are aimed at keeping smoke to a minimum. The regulation applies to fires associated with land clearing activities.

BC Wildfire Act and Regulation

The Wildfire Act and Wildfire Regulation define the legal responsibilities and obligations to which everyone in British Columbia is subject. When bans and restrictions are established in the province, the Act and Regulation make them enforceable. The Act and Regulation specify responsibilities and obligations on fire use, wildfire prevention, wildfire control, and rehabilitation. This includes hazard assessment and hazard abatement and the performance of high-risk activities. The Act is applicable on both Crown and private lands throughout the province.

BC Forest Fire Prevention and Suppression Regulation

The Forest Fire Prevention and Suppression Regulation outlines high and low-risk activities and appropriate types and quantities of tools and fire suppression systems to be available during industrial activities. The undertaking of low or high-risk activities, combined with the fire danger class for the work site, will determine the type of equipment required.

BC Ministry of Transportation and Infrastructure

Under the Highway Act it is an offence to make a fire within 6 metres of the centre of a highway, make a fire at a place that will endanger a bridge or cribbing, or to leave a fire unextinguished on a highway. Considerations need to be made when monitoring smoke from burning activities so as not to impede visibility and safe travel on highways. Signage requirements for burning activities are subject to Ministry of Transportation and Infrastructure approval.

BC Wildfire Service

The BC Wildfire Service is tasked with managing wildfires through a combination of wildfire prevention, mitigation, and suppression strategies, on both Crown and private lands outside organized areas such as municipalities or regional districts. The BC Wildfire Service is part of, and mandated by, the Government of British Columbia to deliver effective wildfire management and emergency response support.

Workplace Hazardous Materials Information System

WorkSafeBC is responsible for enforcing the Occupational Health and Safety Regulation. WHMIS requirements in British Columbia outline the employer's responsibilities for a WHMIS program, requiring labels and Safety Data Sheets (SDS), in addition to worker education and training. WorkSafeBC enforcement officers are designated as federal WHMIS officers to enforce the federal WHMIS requirements from the Hazardous Product Act and its associated regulations. In 2015, the Government of Canada revised WHMIS to incorporate the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) for workplace chemicals.

2.3 Local

Fraser Fort George Regional District

Within the Fraser Fort George Regional District, the Project intersects with small municipalities that rely on volunteer fire fighting services. The regional district refers companies to review the provincial requirements for burning activities, however, where applicable, notification to local by-law officers and fire departments may be required depending on the burning locations. Local information can be obtained, and notification of burning activities can be completed through the Fraser Fort George Fire Rescue Services – Volunteer Fire Agencies and the Valemount and District Volunteer Fire Department (**Table 4**).

Thompson-Nicola Regional District

Within the Thompson-Nicola Regional District, the Project intersects with small municipalities that rely on volunteer fire fighting services. The regional district refers companies to review the provincial requirements for burning activities, however, where applicable, notification to local by-law officers and fire departments may be required depending on the burning locations. Local information can be obtained, and notification of burning activities can be completed through the Thompson-Nicola Regional District Fire Service Advisory Committee and the Vavenby Community Volunteer Fire Department (**Table 4**).

BC Wildfire Services

The province of British Columbia is divided into six regional fire centres. These are further divided into local fire zones. Each fire centre is responsible for wildfire management within its boundaries. The Project intersects the Prince George Fire Centre boundary, the Kamloops Fire Centre boundary, and is within the Robson Valley (G3) fire zone and the Kamloops fire zone (K1), respectively. The nearest Fire Zone Office to the Project is located in Valemount, BC; and the nearest Fire Centre Office to the Project is located in Kamloops, BC.

The Prince George Fire Centre is located within the largest forest region in the province and is largely rugged and remote. The region is home to sub-alpine fir, interior cedar-hemlock, and boreal and sub-boreal spruce forest ecosystems. The Kamloops Fire Centre coordinates the wildfire response across south central BC; from Blue River to the United States border. The terrain ranges from glaciers to open range and semi-arid desert to the interior rainforest; and supports a variety of vegetation including Ponderosa pine, Douglas-fir, Jack or Lodgepole pine, Spruce, Balsam, and Sagebrush.

3.0 ROLES AND RESPONSIBILITIES

3.1 L & S Limited Partnership

Project Personnel

All Project personnel will be required to attend Site Orientation prior to conducting construction activities on the Project. Project personnel, including subcontractors, will be provided with information daily from LSLP regarding weather and site conditions to ensure personnel are aware of the fire risks, mitigations, and restrictions for their work sites via the daily Health, Safety, Security and Environment Memo. All

Project personnel involved in high-risk activities will be responsible for ensuring they are compliant with regulations with assistance from LSLP Environment.

Project personnel will have assistance in determining risks associated with their works and appropriate mitigations from LSLP fire boss, Environment, Health and Safety, and TMEP project management. Risks associated with each construction activity will be assessed by Project personnel that will determine the appropriate fire hazard mitigation methods, and the most suitable types of fire prevention and fire-fighting tools, equipment, and resources that will be available at their work site. In the event that an uncontrolled fire occurs, project personnel are required to respond, if safe to do so and report incidents to LSLP Environment. Additional, specific responsibilities of Project personnel will be described in this Plan.

LSLP Environment

LSLP Environment will be responsible for providing regulatory and Owner information to Project personnel regarding fire hazard mitigation, response, and reporting requirements for the Project. Information-sharing will be in the form of an environmental section within the Site Orientation, notification to Project personnel and subcontractors through telephone, email, or two-way radio, providing refreshers through daily Toolbox Talks, and providing current and forecasted weather, wind, and fire danger conditions within the Toolbox Talk via the Health Safety, Security and Environment memo to ensure Project personnel can assess the risks associated with their activities.

LSLP Environment will liaise with TMEP Environment to ensure proposed and regulated mitigation measures, response materials, and response methods are suitable and in compliance with Project and legislative requirements. LSLP Environment will also liaise with TMEP Environment to apply for regulatory exemptions, if required. LSLP Environment will work with Project personnel, the LSLP Environmental Response Team, and the LSLP Fire Boss to ensure an understanding of fire prevention measures, mitigations, monitoring requirements, and response techniques. All environmental incidents will be documented by LSLP Environment for the Project and provided to the Owner.

LSLP Environment will be available to inspect and monitor construction activities, including high-risk activities and burning activities, to ensure activities are in compliance with Project and legislative requirements, and, if corrective actions are required, to document environmental issues, incidents, and non-compliance. If required, LSLP Environment will liaise with TMEP Environment to apply for regulatory exemptions. LSLP Environment will collaborate with LSLP Health and Safety, LSLP Operations, and the LSLP Fire Boss to ensure input from all disciplines is considered when applying for exemptions. Additional, specific responsibilities of LSLP Environment will be described in this Plan.

LSLP Health and Safety

LSLP Health and Safety will assist in designating and training a Fire Boss for the Project. LSLP Health and Safety will ensure that a comprehensive Emergency Response Plan is developed for the Project that includes evacuation requirements for the Project. LSLP Health and Safety will also implement safe work practices for construction activities that involve heat and fire. LSLP Health and Safety will work with Project personnel, LSLP Environment, LSLP Fire Boss, and Subcontractors to ensure fire-fighting tools such as extinguishers, shovels, and Pulaski’s are available on Project equipment and vehicles and as required by the hazard assessment. Additional, specific responsibilities of LSLP Health and Safety will be described in this Plan.

LSLP Operations

LSLP Operations and its subcontractors will be required to acquire, maintain, provide fire hazard mitigation and prevention tools, equipment, and resources throughout the duration of construction activities. Where applicable, additional materials for activities with a higher fire risk may be required. LSLP Operations and its subcontractors will be responsible for incorporating mitigation and prevention measures into their daily construction activities and responding when required to incidents that may occur as a result of construction activities.

When responding to environmental incidents, LSLP Operations will be responsible for providing details to LSLP Environment. This information will assist in coordinating Owner and regulatory notifications, and incident response techniques.

LSLP Operations will be responsible for managing construction activities in a manner that is protective of the environment, and compliant with applicable regulations, landowner requirements, and Owner provided procedures and contingency plans. Additional, specific responsibilities of LSLP Operations will be described in this Plan.

LSLP Fire Boss

Prior to commencement of construction, LSLP will designate a Fire Boss that has current S-100 training and sufficient fire-fighting experience. S-100 training is a basic fire suppression training that meets the requirements under the BC Occupational Health and Safety Regulation. The Fire Boss will be familiar with fire suppression techniques, equipment, and Project procedures to assist Project personnel in the inspection of fire extinguishers and equipment in an effort to minimize the fire hazard risks. The Fire Boss will have knowledge of this Fire Mitigation Plan and Fire Emergency Response Plan to provide oversight of the Project overall fire mitigation effort and support emergency response in the event of a fire related emergency.

LSLP Fire Watch

LSLP will designate personnel on each crew conducting high risk activities during high-fire season as Fire Watch. When a Fire Watch is required, the Fire Boss will ensure a Fire Watch is deployed to ensure that they can reasonably see the site of the high risk activity during the time that the fire watch is required, has at least one fire-fighting hand tool, actively watches and patrols for sparks and fires on the site of the high risk activity, immediately carries out fire control and extinguishes the fire, if practical, and has the means on site to report the fire. Fire watch requirements are described in Schedule 3 (**Table 1**) of the BC Wildfire Regulation. Additional, specific responsibilities of the LSLP Fire Boss will be described in this Plan.

3.2 Subcontractors

Subcontractors retained by LSLP will be required to adhere to Project requirements, including fire hazard mitigation techniques, and will participate in Site Orientation prior to commencing any activities associated with the Project. Subcontractors may also be required to attend a kick-off meeting with LSLP to review specific Project requirements pertaining to their tasks, such as supplying fire-fighting equipment and tools, documentation, or if their activities are considered to have high fire risks. Subcontractors will be responsible for incorporating fire hazard mitigations into their daily activities and are subject to inspection and auditing by LSLP Environment.

While engaged in Project activities, subcontractors will ensure that required fire-fighting tools and materials are available and competent personnel are present to follow this plan and initiate a response if necessary. In the event of an environmental incident, subcontractors will be required to report incidents to their LSLP Foreman. LSLP Foremen can assist with response requirements, and assistance of the LSLP Environmental Response Team can be requested. Subcontractors may be required to provide an environmental incident report to LSLP Environment if they are involved in an environmental incident. Additional, specific responsibilities of subcontractors will be described in this Plan.

3.3 Owner

TMEP will provide up-to-date Environmental Reference Documents including supporting appendices and contingency plans to LSLP as they become available to ensure correct information is accessible to Project personnel. TMEP will also share its fire hazard mitigation and response procedures specific to the Project as well as the TMEP Health and Safety Management Plan and associated Emergency Management Program to ensure LSLP can establish compliance with requirements and commitments. TMEP will determine if regulatory notification is required based on LSLP-provided information resulting from Project environmental incidents.

TMEP Environmental Inspectors will be available during construction to assist with fire hazard mitigation and prevention measures, and to provide support for LSLP during incident response. The Owner's Environmental Inspection will also inspect and audit construction crews and activities to ensure compliance with Project commitments and regulatory requirements. The Owner may issue Non-Compliance Reports to LSLP for non-compliance with Project environmental requirements.

4.0 UNCONTROLLED FIRE PREVENTION

Construction activities associated with the Project have the potential to create fire risks and fire hazards including but not limited to the use of heating devices, hot works, smoking, equipment, and surrounding environmental conditions. Prior to and throughout construction of the Project, fire hazard identification and risk assessment will be completed by LSLP that will encompass construction activity risks as well as potential surrounding fire hazards. By identifying the risks and hazards, practical measures can be implemented to reduce the risk of those hazards. Allowing for additional planning to be undertaken establishing work procedures that ensure the safety of Project personnel, adjacent communities, and adjacent facilities.

LSLP, including its subcontractors, is committed to exercising due diligence and taking reasonable measures to ensure wildfires do not occur, and if they do occur, taking reasonable efforts to contain them.

4.1 Education and Training

All Project personnel are required to participate in a Site-Specific Orientation which will outline basic fire prevention mitigations, potential tools and resources, and basic response requirements and techniques. Project personnel will be made aware of this Plan, the Emergency Response Plan, the Environmental Response Plan, and the Owner-provided Fire Contingency Plan (Volume 2). In addition to plans, procedures, and requirements for the Project, fire safety topics will be incorporated into daily Toolbox Talks, safety meetings, and daily supervisory meetings when required.

Fire prevention mitigations will be considered for construction activities associated with the Right-Of-Way (ROW) and Project footprint, the LSLP Yards, and Camps. Project personnel will be required to consider where construction activities are taking place, the risks of a fire starting, and the risk of a fire spreading. Considerations such as access to the work site in the event of an emergency, if the construction activity to be executed is considered a high or low-risk activity, what fire-fighting tools are required based on the activity and site conditions, if there are flammable/combustible materials being used or stored, and emergency contacts for the Project (**Table 4**), including the designated Fire Boss. LSLP Health, Safety and Environment will ensure that Project personnel are aware of daily conditions and fire hazard mitigation requirements based on online resources and current conditions within the Project footprint. Fire prevention requirements for the LSLP Camp will be provided to camp guests during check-in and dependent upon the selected subcontractor.

Where additional training is required for specific Project personnel, such as the designated Fire Boss or individuals directly involved in high-risk activities, arrangement will be made by LSLP for Project personnel to attend and obtain suitable and relevant training, such as the S-100 Basic Fire Suppression and Safety Training.

4.2 Equipment and Resources

The type and quantity of fire-fighting equipment required under the BC Forest Fire Prevention and Suppression Regulation and the BC Wildfire Regulation are dependent upon whether the construction activity is considered high-risk or low-risk, the number of workers associated with the Project, current site conditions, and current and forecasted weather conditions. LSLP will require that all Project vehicles, equipment, and utility vehicles carry a suitable and fully charged fire extinguisher. Where possible, equipment and vehicles will be required to carry fire-fighting equipment such as Pulaski axes, shovels, and backpack pumps in sufficient quantities so that each worker has access to, at minimum, one hand tool with which to carry out fire suppression work. Fire extinguishers will also be required in Project offices, wash cars, warehouses, and fueling stations.

Using online resources to determine the daily fire danger rating and the current and forecasted weather conditions, LSLP Environment will assist Project personnel in determining if certain types and quantities of fire-fighting tools are required for construction activities. Certain construction activities will require additional fire-fighting equipment based on whether the activity is considered a high or low fire risk.

Project personnel must ensure that fire-fighting hand tools are available at their work site in a combination and type to properly equip each person at that work site with a minimum of one fire-fighting hand tool. Fire-fighting tools may include, but are not limited to, shovels, axes, Pulaski axes, backpack pumps, and fire extinguishers. The intent is to use the most appropriate tool for the conditions and type of fire suppression expected.

High risk activities are described in the BC Wildfire Regulation and can include mechanical brushing, disk trenching, preparation or use of explosives, using fire or spark-producing tools, grinding, mechanical land clearing, clearing and maintaining ROW including mowing, welding, and logging activities. High risk activities within 300 meters of forest of grass land on or after March 1 and before November 1, unless the area is snow covered, must determine the Fire Danger Class for the location of the activity. Fire danger ratings and risks will be determined by LSLP Environment.

In addition to sufficient fire-fighting hand tools, high risk activities require a fire suppression system, which may involve the delivery of water, the addition of surfactant, the application of a suppressant, or a combination of all three. The fire suppression system should be capable of initial suppression of a fire of a reasonable and foreseeable size if started as a result of the high-risk activity. High risk activities are restricted at certain times when the fire danger class reaches a set threshold, as set out in Schedule 3 (**Table 1**) of the Wildfire Regulation. LSLP may request an exemption to the restrictions described in Schedule 3 to be considered to continue some construction activities throughout the fire season.

Fire Danger Class (DGR)	Restriction	Duration
III (moderate)	After 3 consecutive days of DGR III or greater, maintain a fire watcher after work for a minimum of one hour	Until after the fire danger class falls below DGR III
IV (high)	Maintain a fire watcher after work for a minimum of 2 hours	Until after the fire danger class falls below DGR III
	After 3 consecutive days of DGR IV, cease activity between 1 p.m. PDT (Pacific Daylight-Saving Time) and sunset each day	Until after the fire danger class falls to DGR III for 2 consecutive days, or falls below DGR III
V (extreme)	Cease activity between 1 p.m. PDT and sunset each day and maintain a fire watcher after work for a minimum of 2 hours	Until after the fire danger class falls below DGR IV for 2 or more consecutive days
	After 3 consecutive days of DGR V, cease activity all day	Until after the danger class falls below DGR V for 3 or more consecutive days, or falls below DGR IV

***Table 1**: BC Wildfire Regulation, Schedule 3, Restrictions on High Risk Activities.*

In addition to the required equipment and online resources, Project personnel may request the assistance of the LSLP Environmental Response Team to deliver additional equipment, tools, and manpower.

4.3 Monitoring and Prevention

Project personnel are required to incorporate fire prevention techniques and mitigations into their daily work plans. By completing risk assessments, assessing the surrounding work site, inspecting tools and equipment, and determining if their construction activity is a high-risk activity. Project personnel, and if required, the Fire Boss, will be responsible for monitoring construction activities, respond to issues, and reporting incidents to LSLP Environment.

Smoking

Smoking within the Project footprint, LSLP Yards, and LSLP Camps will be conducted at designated smoking areas where one fire-extinguisher and one waste receptacle will be available. Designated smoking areas will be located a sufficient distance away from flammable and combustible materials. Additional information regarding smoking can be found in the TMEP Smoking Policy.

High Risk Activities and Hot Works

LSLP will engage in activities that are considered high-risk under the BC Wildfire Regulation. These activities may include:

- Welding, grinding, and cutting;
- Using fire- or spark-producing tools;
- Mechanical brushing, mechanical land clearing, and tree processing;
- Wood chipping, milling, and processing;
- Controlled burning;
- Preparation or use of explosives;
- Rock drilling; and
- Operating power saws;

During times that a Fire Watch is required as per the BC Wildfire Regulation (**Table 1**) between March and November, LSLP will ensure that a designated Fire Watch is available to reasonably see the site of the high risk activity, has, as a minimum, at least one fire-fighting hand tool, actively watches and patrols for sparks and fires on the site of the high risk activity, immediately carries out fire control and extinguishes the fire, if practical, and has the means on site to report the fire. When required, multiple, trained Fire Watch may be required to provide oversight if multiple high-risk activities are taking place.

When Project personnel are engaged in high-risk activities, they will be required to remove ignition sources from around their work site and ensure that sufficient types and quantities of fire-fighting hand tools are available for each worker at the site as per the BC Forest Fire Prevention and Suppression Regulation.

Equipment, Vehicles, and Utility Vehicles

All Project equipment, vehicles, and utility vehicles will be inspected daily before use to ensure they are in good working order, and to address any issues that may be present. Where possible, it is recommended that equipment and vehicles park on mineral soils and avoid parking over top of tall or dry vegetation. Project personnel will be required to maintain their equipment and vehicles daily to ensure vegetation and debris do not accumulate underneath. All Project vehicles will be required to carry a suitable number of fire-fighting tools for the number of workers. Where possible, fire-fighting tools, such as shovels, may be fastened to equipment.

Fuel, Explosives, Combustible, and Flammable Materials Storage

Project personnel handling and storing fuels, explosives, combustible and flammable materials on the ROW, at the LSLP Yards, and Camps are required to be knowledgeable of WHMIS requirements and associated SDS information. Where fuels, explosives, combustible and flammable materials are being stored, signage and/or placards will be required, ignition sources removed, and “No Smoking” signage posted.

During clearing activities, logging debris and slash will be managed so as to reduce wildfire hazards by ensuring that slash piles are set back from ignition sources or high-risk activities and placed in a manner that reduces fire risks. Project personnel, LSLP Environment, and TMEP will also monitor the ROW, adjacent lands to the Project footprint, and logging debris and slash piles for Mountain Pine Beetle infestations or other diseases.

Heating Devices

Project personnel may be permitted to use heating devices such as space heaters. Space heaters must be placed in a location a sufficient distance from walls, cables, and other flammable or combustible materials, and turned off at end of shift and when not in use. Fire prevention requirements for the LSLP Camp will be provided to camp guests during check-in.

5.0 CONTROLLED BURNING MANAGEMENT

Controlled burning of clean wood and brush may be considered as a disposal method during clearing activities. Burning of logging slash and bark materials is a common practice that may be used and, in some cases, will be required to mitigate against the potential for forest pest infestations and reducing future wildfire risk. The burning of wastes, refuse, or materials other than clean wood and brush will not be permitted. Depending where controlled burning activities take place, local or regional requirements may be required.

5.1 Pre-Burning Requirements

Permits and Registration

The Project crosses the Fraser Fort George Regional District and the Thompson-Nicola Regional District. The municipalities along the Project route rely on volunteer fire-fighting services. The BC Wildfire Services (**Table 4**) manages rural fire permitting outside serviced areas by issuing burn reference numbers. Prior to burning, Project personnel and LSLP Environment will determine if burning is scheduled to take place within an area served by a Municipal Fire Department. If the burning activities are within the Village of Valemount, a Fire Permit from the Village Office will be obtained in addition to a burn reference number. If burning activities are outside of a serviced area, a burn reference number will be obtained from the BC Wildfire Services. Whether official notification of burning is required, LSLP Environment will provided courtesy notification to nearby fire departments.

Burning reference numbers are created over the phone by providing legal descriptions of burn locations, the number of piles to be burned, and site contact information. The size and number of piles to be burned will determine the category of the fire (**Table 2**). Burning reference numbers expire after two (2) weeks of receiving, regardless of whether burning has taken place. If burning cannot be completed within two (2) weeks because of poor burning conditions (weather, venting, etc.), a new burning reference number must be obtained.

Category	Description
Category 1	- Small open fire for waste material - Does not exceed 2m in height and 3m in diameter or width - Campfires are any fires smaller than 0.5m high by 0.5m wide
Category 2	- Small open fire for grass or stubble - 1 to 2 concurrently burning piles no larger than 2m high by 3m wide - Burn area less than 0.2ha in size
Category 3	- Large open fire more than 50m from combustible material - Any fire larger than 2m high by 3m wide - 3 or more concurrently burning piles no larger than 2m high by 3m wide - 1 or more burning windrows, stubble or grass burning over an area greater than 0.2ha
Category 4	- Large open fire for root raked windrows
Category 5	- Large open fire less than 50m from combustible material
Category 6	- Large open fire for grass or stubble
Category 7	- Resource management open fire for waste material
Category 8	- Broadcast burn resource management open fire

***Table 2**: Descriptions of different categories of fires as per the BC Forest Fire Prevention and Suppression Regulation.*

Weather and Surrounding Conditions

LSLP Environment will report the fire danger risks to Project personnel through the daily Toolbox Talk memo. LSLP Health and Safety will include the daily weather forecast within the daily Toolbox Talk memo. It is the responsibility of the person and company completing the burning activity to ensure weather conditions and the surrounding conditions are ideal and safe. Online resources are available for LSLP Environment to monitor current and forecasted weather, wind speeds, ventilation indexes, fire danger ratings (**Table 3**), and any local, regional, or provincial prohibitions and restrictions.

Prior to burning activities, LSLP Environment will consider the number of rain-free days in the Project area, if there are strong wind gusts or consistent winds on site, and if ground conditions are dry. Project personnel will be required to arrange burn piles, so they are an appropriate size, piled to burn efficiently, and a safe distance, or fuel break, is established. In consultation with TMEP Environment, LSLP Environment and Project personnel will consider these weather conditions and prevailing winds before burning in the vicinity of highways, airports, or roads.

LSLP Environment will obtain and record the most up-to-date fire danger rating provided by the BC Wildfire Services to determine the fire risk and if any Schedule 3 (**Table 1**) restrictions apply to the activity. LSLP Environment will also obtain and record the most up-to-date ventilation index to determine if the forecasted measure of atmospheric turbulence is sufficient to disperse smoke. The closest fire danger rating stations to the Project are the McBride Station under the Prince George Fire Centre, and the Blue River Station and Clearwater Station under the Kamloops Fire Centre. The closest ventilation forecast

stations are located in McBride and Clearwater. The BC Wildfire Regulation states that the ventilation index must be “Good” on the day of burning, and “Good” or “Fair” on the following day.

Danger Class Rating	Description
1 Very Low Danger	Fires may start easily and spread quickly but there will be minimal involvement of deeper fuel layers or larger fuels
2 Low Danger	Fires may start easily and spread quickly but there will be minimal involvement of deeper fuel layers or larger fuels
3 Moderate Danger	Forest fuels are drying and there is an increased risk of surface fire starting. Carry out any forest activity with caution
4 High Danger	Forest fuels are very dry, and the fire risk is serious. New fires may start easily, burn vigorously, and challenge fire suppression efforts. Extreme caution must be used in any forest activities. Open burning and industrial activities may be restricted
5 Extreme Danger	Extremely dry forest fuels and the fire risk is very serious. New fires will start easily, spread rapidly, and challenge fire suppression efforts. General forest activities may be restricted, including open burning, industrial activities, and campfires

***Table 3**: Definitions of the danger class ratings in the province of British Columbia.*

Equipment and Materials

Project personnel involved in controlled burning activities are required to have specific fire-fighting tools available, and knowledge of locations where additional fire-fighting tools and resources are available for use, based on the category of the fire, the number of workers present, the fire danger rating, and the number of burn piles to be burned. Depending on the fire danger rating, a Fire Watch may be required to monitor burning activities for the prescribed durations in the BC Wildfire Regulations (**Table 1**), however, all Project personnel involved in burning activities are required to manage, monitor, and inspect their work site.

Burning activities associated with the Project will likely be considered a Category 3 fire (**Table 2**). If there is a change in fire category, LSLP Environment and Project personnel will refer to the BC Wildfire Regulation and the BC Forest Fire Prevention and Suppression Regulation to determine requirements specific to the category.

Project personnel are required to take all necessary precautions to ensure the fire will be contained in the burn area, and that a fuel break of at least ten (10) metres is established around the burn area. The use of burning sleds (“sloops”) may be considered, where practical, to improve efficiency of burning woody debris. LSLP Operations will ensure that Project personnel involved in the management of Category 3 fires have at least two (2) pieces of heavy equipment, two (2) fire suppression systems, and eleven (11) workers who are each equipped with at least one fire-fighting hand tool; and that the fire is reasonably watched and patrolled by a person equipped with at least one fire-fighting hand tool to prevent the fire from escaping. If it is more reasonable and practical, LSLP Operations can plan for all workers, fire suppression systems, heavy equipment, and fire-fighting hand tools within thirty (30) kilometres by road if on Crown land, or all resources working on the land if on land other than Crown land, are made

available to Project personnel involved in burning activities. Project personnel are required to ensure that the required water delivery systems are set up and tested prior to initiating burning activities.

Depending on the burning location, Project personnel will be required to be knowledgeable of nearby fire-fighting tools and resources that could be used to suppress an accidental fire, including potential water sources, hydrants, environmental response trailers, LSLP Environmental Response Team, and additional heavy equipment and fire-fighting tools. In addition to tools and resources, Project personnel will also be required to establish a communication plan and ensure that telephones or radios are available and in good working order.

Test Burn

The available fire danger rating stations and ventilation index stations may not be indicative of site-specific weather and conditions. It is imperative that Project personnel ensure smoke from burning activities is venting properly to ensure that transportation routes, nearby residences, and buildings are not impacted. It is recommended that Project personnel start a test fire to ensure that smoke is dispersing at an appropriate height. This can be completed by conducting a test burn using a smaller burn pile, and watching and documenting the smoke dispersion, the time, and the weather conditions. All environmental legislation still applies, however, the local area where the proposed burning activities will take place may be experiencing different conditions than those displayed on the available stations.

Techniques may need to be implemented to limit smoke production, including limiting pile size, reducing fuel moisture content, and maintaining loose burning piles free of soil. Consideration will also be made when scheduling burning activities to limit the effect of smoke in the vicinity of sensitive receptors. The test burn will establish if weather conditions and winds are suitable for burning activities.

5.2 Burning Locations

Specific burning locations are required to be provided to the BC Wildfire Services in order to obtain a burning reference number. When selecting locations for burning activities, LSLP Environment, LSLP Operations, Subcontractors and Project personnel will be required to consider the surrounding receptors and ground conditions.

Where burning locations are selected on private land, landowner permissions will be requested and obtained by the Owner prior to commencing burning activities. It is recommended to locate burn piles on exposed mineral soils where topsoil and root zone salvage has occurred. If necessary, burning sleds may be used where salvage has not been completed. LSLP will avoid burning activities on peat-rich soils in order to limit the risk of residual fires following construction. The Open Burning Control Regulation also requires that burning activities be completed at least 100 metres from neighbouring residences and businesses, and at least 500 metres from schools (when in session), hospitals, and facilities used for continuing care. LSLP Environment and TMEP Environment will work collaboratively to ensure mitigations and wildfire prevention measures are in place and effective if burning activities are approved within these setbacks.

5.3 Equipment and Resources

Project personnel are required to ensure they have sufficient types and quantities of fire-fighting tools based on the BC Wildfire Regulation, the BC Forest Fire Prevention and Suppression Regulation, and based on the most up-to-date fire danger ratings available for the proposed burning location. Project

personnel must have fire-fighting equipment available that is capable of controlling any fire that may occur as a result of their activities.

LSLP Environment will work with LSLP Operations and Project personnel to clarify what types and quantities of fire-fighting tools are required based on the current conditions and regulations. The Owner-provided Fire Contingency Plan (Volume 2) requires at a minimum that Project vehicles carry fire-fighting equipment such as Pulaski axes, shovels, and backpack pumps in sufficient quantities so that each worker has access to, at minimum, one hand tool with which to carry out fire suppression work; and that all motorized equipment must carry a fully charged fire extinguisher. High risk activities are required to have a functioning fire suppression system. It may involve the delivery of water, the addition of a surfactant, the application of a suppressant, or a combination of all three.

5.4 Monitoring and Inspections

All burning activities must be conducted in accordance with burning permit requirements. Project personnel involved in burning activities are required to monitor and patrol their work site to ensure fire risks are mitigated and prevention of fire spread is established. Project personnel are also required to have equipment, tools, and resources in place to ensure incident response is reasonable in the event that a fire becomes out of control. Project personnel must be able to demonstrate that they are prepared to carry out fire control, if necessary, extinguish the fire, if feasible, and report the incident as soon as practical. If there is a change in weather or site conditions, Project personnel, LSLP Environment, and TMEP will work collaboratively to determine if burning activities can continue or if activities should cease with all fires being fully extinguished.

During ignition and until all risk of the fires escaping is eliminated, there must be at least one adult person at the burn area who actively patrols to prevent the fires from escaping and is equipped with a round nose shovel, an axe or a Pulaski, and a backpack pump containing at least eighteen (18) litres of water or equivalent. The number of piles or windrows at the site that may be ignited or burning at one time must not be more than the number of ignited or burning piles or windrows that the person patrolling the fires is able to take timely action to prevent any of the fires from escaping.

Project personnel responsible for burning activities are required to monitor the burn area and piles at all times and prevent the controlled fire from spreading. All fires must be extinguished before the expiration of a burning reference number, and, if required, inspected and monitored by the LSLP Fire Boss if conditions require (**Table 1**). Remaining ashes from burn piles can be spread and, if required, mixed with water or snow, to ensure they are extinguished. Following the completion of burning activities, the Owner may be required to conduct infrared scanning of burn locations to identify hot spots. If hot spots are discovered, LSLP may be required to execute additional extinguishing methods to ensure hot spots are eliminated.

Project personnel will also be expected to be prepared to extinguish controlled burn piles if conditions change, or the risks become too high to continue burning activities. TMEP may also request burning activities be shut down is conditions permit. In the event that the controlled burning activity becomes out of control, Project personnel are required to initiate fire control, extinguish the fire, if practical, and report the fire as soon as practicable.

6.0 EMERGENCY RESPONSE

In the event of an uncontrolled fire caused by Project activities, Project personnel will commence fire suppression measures immediately upon detection of the fire, provided that current fire behaviour allows personnel to safely proceed. Suppression efforts will take into consideration the fire behaviours, safety of personnel, training, the fitness of personnel, and equipment availability. All equipment and personnel in proximity to the out of control fire will be made available to control the fire, if required. Project personnel will be required to assess the surrounding area and determine if moveable materials, particularly explosive or flammable materials and vehicles, can be immediately moved to a safe location. Fire suppression efforts will continue until the fire is extinguished, until it is no longer safe for Project personnel to respond to the fire, or until otherwise notified by the appropriate jurisdictional authority. LSLP may assist in fighting non-Project related uncontrolled fires outside the Project footprint if reasonable, safe, and feasible.

When safe to do so, Project personnel are required to report incidents to an LSLP supervisor, who will notify LSLP Environment. LSLP Environment will assist Project personnel involved in an incident with the coordination of mobilizing additional fire-fighting tools and equipment, the deployment of the LSLP Environmental Response Team, and recruiting assistance from the designated Fire Boss, if necessary.

When reporting an out of control fire, whether it was caused as a result of construction activities or natural causes on or adjacent to the Project footprint, Project personnel are expected to provide the following information to the LSLP supervisor or LSLP Environment:

- Contact information
- Location of the fire
- Fuel type burning, and what fuels are nearby
- Approximate size of the fire
- How quickly the fire is spreading
- Current weather conditions, including wind direction
- Colour of the smoke
- Values at risk (lives, property, structures)
- How best to access the worksite

LSLP Environment or the LSLP Fire Boss will immediately relay general information regarding the incident to TMEP Environment, who will be responsible for advising the appropriate provincial, municipal, or federal authorities. If unable to do so, LSLP Environment will report the fire to the appropriate authorities (**Table 4**).

Service	Location	Contact Information
Valemount and District Volunteer Fire Department	1380 5th Avenue Valemount, BC V0E 2Z0	**Phone**: 911 **Phone**: 1-250-566-9800 **Fax**: 1-250-566-9890 **Fire Chief**: Rick Lalonde **Deputy Chief**: Donovan Gee
McBride Fire Department	875 South West Frontage McBride, BC V0J 2E0	**Phone**: 1-250-569-3117 **Fax**: 1-250-569-2421
Clearwater Fire Hall	336 Clearwater Village Road Clearwater, BC V0E 1N0	**Phone**: 911 **Phone**: 1-250-674-3733 (non-emergency) **Phone**: 1-250-674-3015 (after-hours emergency) **Fire Chief**: Mike Smith, 1-250-674-2257
Blue River Volunteer Fire Department	5937 5th Street Blue River, BC V0E 1J0	**Phone**: 1-250-673-8255 **Fax**: 1-250-673-8202
TNRD Community Volunteer Fire Departments – Vavenby Fire Hall	141 Vavenby Bridge Road Vavenby, BC V0E 3A0	**Phone**: 1-250-676-9223 **Fax**: 1-250-676-9617
BC Wildfire Services	**Spread 3** Fire Centre: Prince George, Fire Zone: Robson Valley (G3) **Spread 4A** Fire Centre: Kamloops Fire Zone: Kamloops (K1)	**Burn Registration**: 1-888-797-1717 **Fire Information**: 1-888-336-7378 **Prince George Fire Centre**: 1-250-565-6124 **Kamloops Fire Centre**: 1-250-554-5500
BC Forest Fires Reporting Center	**Spread 3** Fire Centre: Prince George, Fire Zone: Robson Valley (G3) **Spread 4A** Fire Centre: Kamloops Fire Zone: Kamloops (K1)	**Report a Wildfire**: 1-800-663-5555 **Report a Wildfire**: *5555 (on most cellular networks)
Fire Boss	Spread 3	**Contact**: TBD **Phone**: TBD **Email**: TBD
Fire Boss	Spread 4A	**Contact**: TBD **Phone**: TBD **Email**: TBD

LSLP Project Director	Spread 3 & Spread 4A	**Contact**: Dan Tobin **Phone**: 1-780-465-8677 **Email**: Dan.Tobin@Ledcor.com
LSLP Construction Manager	Spread 3 & Spread 4A	**Contact**: Curtis Berube **Phone**: 1-780-914-0076 **Email**: Curtis.Berube@Ledcor.com
LSLP Superintendent	Spread 3 & Spread 4A	**Contact**: Lindsay Miller **Phone**: 1-780-385-1257 **Email**: Lindsay.Miller@Ledcor.com
LSLP Senior Project Manager	Spread 3 & Spread 4A	**Contact**: Matt Granger **Phone**: 1-780-232-8069 **Email**: Matt.Granger@Ledcor.com
LSLP Senior Environmental Manager	Spread 3 & Spread 4A	**Contact**: Jamie Wishart **Phone**: 1-250-549-0349 **Email**: Jamie.Wishart@Ledcor.com
LSLP Environmental Manager	Spread 3 & Spread 4A	**Contact**: TBD **Phone**: TBD **Email**: TBD
LSLP Environmental Compliance Lead	Spread 3 & Spread 4A	**Contact**: Rilee Chambers **Phone**: 1-587-3547 **Email**: Rilee.Chambers@Ledcor.com
LSLP Health & Safety Manager	Spread 3 & Spread 4A	**Contact**: Eddy Kibambe **Phone**: 1-780-995-5635 **Email**: Eddy.Kibambe@Ledcor.com

***Table 4**: Emergency contact information and key contacts for Spread 3 and Spread 4A.*

Project personnel under the direction of the LSLP Fire Boss will continue fire suppression efforts until the fire is extinguished, until it is no longer safe to respond, or until otherwise notified by the appropriate authorities. Once the fire is controlled and/or extinguished, the LSLP Fire Boss will ensure that efforts are adequate and will monitor the burn area for smouldering materials. If an evacuation is required due to the out of control fire, LSLP Operations, LSLP Environment, and LSLP Health and Safety will coordinate the evacuation as per the Project Emergency Response Plan. If required, additional services from first-responders or companies capable of fighting fires may be retained.

7.0 DOCUMENTATION

LSLP, including its subcontractors, is committed to exercising due diligence and taking reasonable measures to ensure wildfire do not occur, and if they do occur, taking reasonable care to contain them. This includes documentation of efforts to assess weather and site conditions and burning locations and creating incident reports when issues or incidents occur due to fire prevention and mitigation measures and burning activities.

LSLP Environment will be responsible for documenting daily weather conditions and forecasts to show that an assessment could reasonably be made to determine if high-risk activities, including burning activities, could be completed while preventing fire hazards. LSLP Environment will also document the fire danger rating to show that consideration could be made as to which fire-fighting tools, equipment, and resources should be allocated to certain construction activities.

LSLP Environment will make a record of an Environmental Incident Report when environmental incidents occur that will be made available to the Owner. Burning locations will be recorded when obtaining burn registration numbers and will be made available for post-construction monitoring.

Appendix H – Access Road Communication Plan

Trans Mountain Expansion Project
Spreads 3&4

ACCESS ROAD COMMUNICATION PLAN

TMEP # 01-13283-S3 S4A-M002-HS-PLN-0005 R0

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	Reviewed by TMEP	Pages Revised	Issued Type
0	E. Kibambe 2020-06-08	G. Roda 2020-06-08	M. Granger 2020-06-08			Issued for Information

TABLE OF CONTENTS

TABLE OF CONCORDANCE

No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
1	Radio Communication Plan	1	6	N/A	All vehicles including ATV and UTV must be equipped with a radio when travelling on Call Roads.	Added ATV and UTV as a vehicle requiring radio on Call Roads	6/8/2020
2	Radio Communication Plan	6.0	7	N/A	All personnel involved in steep slope operations must be within discernible hearing range of at least one handheld or mobile two-way radio. Steep slope operations will have a dedicated radio channel for the operation. This will be communicated at the daily toolbox talk as part of the steep slope work plan review. Each operator shall be equipped with a two-way radio device. All two-way radio devices shall be in good working order and shall be tested at the beginning of each day and periodically throughout the day as required. Spare batteries must be available at the site of the steep slope operation. LSLP will provide TMEP with programed radios with all channels used on project. Steep slope supervisor will provide authorized personnel entering the steep slope area with clear instruction as to which radio channels are in use as part of the toolbox talk review.		6/8/2020

No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
3	Radio Communication Plan	7.0	7	N/A	During blasting operations, a radio channel different from the rest of the pipeline construction operation will be utilized to communicate. The communication plan and radio channels to be used will be discussed as part of the daily toolbox talk with the blasting crew. Mobile radio transmitters, cellular phones shall be kept well away from areas of the electrical blasting operations and signs shall be posted to have all transmitters near the site turned off.		6/8/2020
4	Radio Communication Plan	9.0	8	Many access roads to the ROW are designated as call roads. This means that the vehicles coming in and out will need to call their position as they travel on them. The call roads will have signs posted indicating which radio channel and frequency to use.	Many access roads to the ROW are designated as call roads. This means that the vehicles including ATV and UTV coming in and out will need to call their position as they travel on them. The call roads will have signs posted indicating which radio channel and frequency to use.		6/8/2020
4	Radio Communication Plan	9.0	8	N/A	In the event of an emergency requiring STARS support, the caller (medic or HS&E) will provide the channel and radio frequency which will be used to support the evacuation efforts. This radio channel will be discussed at the toolbox		6/8/2020

No.	Document	Section	Page	Previous Text	Revised Text	Comment	Date
					talk on a daily basis with the medic support team.		

1.0 ABBREVIATIONS AND DEFINITIONS

TERM	DEFINITION
Call Roads	These roads have been determined to be high risk; a sign will be posted at the entrance to the road indicating that the road is for “Radio Controlled Traffic Only. All vehicles including ATV and UTV must be equipped with a radio when travelling on Call Roads.
CER	Canadian Energy Regulator
Contractor	Contractor means the person or entity, including the general construction contractor, under contract to Trans Mountain Expansion Project (TMEP or project) to perform project work. Contractor includes any subcontractor hired by the contractor to perform project work.
“Down”	Direction of travel indicating you are travelling down the Kilometer Post markings and away from the Right-Of-Way
“Up”	Direction of travel indicating you are travelling up the Kilometer Post markings and toward the Right-Of-Way
ROW	Right-Of-Way
RR	BC Resource Road Channel typically from RR-1 to RR-29
Owner	Trans Mountain Canada Inc.
TMEP (or Project)	Trans Mountain Expansion Project
TMPL	Trans Mountain Pipeline

2.0 RADIO COMMUNICATION PLAN OVERVIEW

The purpose of the Access Road Communication Plan is to provide an overview of how Ledcor-Sicim Limited Partnership (LSLP), TMEP, and its subcontractors, will utilize various communication methods for the safe access and egress of vehicles onto the identified access roads. This Plan will complement and adhere to the LSLP Traffic Management Plan, the LSLP Project Specific Safety Plan, and the LSLP Project Specific Emergency Response Plan and their associated commitments which also complies with various TMEP Health and Safety commitments. LSLP is committed to ensuring that construction activities comply with all safety and environmental legislation, regulations, and commitments.

3.0 TRAINING

Personnel who are expected to conduct any activities on the ROW are expected to receive training on the proper use of radio when accessing and egressing resource roads and for calling emergency. The training is offered as part of the LSLP Site Specific Orientation for TMEP Spread 3 & 4A.

4.0 RADIO USAGE RULES AND PROCEDURE

4.1 General

Most radio channels that will be used on the project are open to the general public. This means that the use of the radio should be limited for the purpose communicating position on a resource road, calling in an emergency, or providing simple work instruction to a crew. All communication on the radio must be kept professional. Drivers must obey all signs, postings, and notices, including any closures, barriers, and load restrictions.

4.2 Prohibited Language

The use of profane, indecent or obscene language is prohibited. Uncivil, derogatory, sarcastic and discriminatory remarks are prohibited.

4.3 Message Content

All communications shall be done in Plain English and made as clear as possible to the receiver.

4.4 Violations

Any violations significant enough to disrupt radio communications shall be reported and investigated. Personnel found to be in violation of the radio use & procedure will be subject to disciplinary action.

5.0 RESOURCE ROADS COMMUNICATION

Most access roads to the ROW are existing forestry resource roads or privately owned roads. These roads are radio controlled and have the channel, radio frequency, or both posted at the entrance of the road. Project vehicles utilizing such roads must be equipped with a functioning radio preprogrammed with all required channels for ease of use. Every vehicle or equipment's radio using the forestry road will be set up on the radio frequency at the entrance of the road.

6.0 STEEP SLOPE COMMUNICATION

All personnel involved in steep slope operations must be within discernible hearing range of at least one handheld or mobile two-way radio. Steep slope operations will have a dedicated radio channel for the operation. This will be communicated at the daily toolbox talk as part of the steep slope work plan review.
Each operator shall be equipped with a two-way radio device.
All two-way radio devices shall be in good working order and shall be tested at the beginning of each day and periodically throughout the day as required.

Spare batteries must be available at the site of the steep slope operation.
LSLP will provide TMEP with programed radios with all channels used on project.
Steep slope supervisor will provide authorized personnel entering the steep slope area with clear instruction as to which radio channels are in use as part of the toolbox talk review.

7.0 BLASTING OPERATION

During blasting operations, a radio channel different from the rest of the pipeline construction operation will be utilized to communicate. The communication plan and radio channels to be used will be discussed as part of the daily toolbox talk with the blasting crew.

Mobile radio transmitters, cellular phones shall be kept well away from areas of the electrical blasting operations and signs shall be posted to have all transmitters near the site turned off.

8.0 EMERGENCY RADIO COMMUNICATION

In the event that a message of importance (emergency) needs to be relayed concerning a major incident or potential major incident, the sender must stipulate the following message: emergency, emergency, emergency senders name and position, brief description of the emergency, and the requested support and the location of the event. For example, " Emergency, emergency, emergency, this is James Brown, we need Medic 1 at Road 10 for a medical emergency". Once an emergency transmission has been made, all other radio transmissions on that channel must cease until either the sender or receiver declares "emergency transmission over".

In the event of an emergency requiring STARS support, the caller (medic or HS&E) will provide the channel and radio frequency which will be used to support the evacuation efforts. This radio channel will be discussed at the toolbox talk on a daily basis with the medic support team.

9.0 PROCEDURE ON CALL ROADS

Many access roads to the ROW are designated as call roads. This means that the vehicles including ATV and UTV coming in and out will need to call their position as they travel on them. The call roads will have signs posted indicating which radio channel and frequency to use.

Calling Protocol:

1) At the entrance of the call road, stop your vehicle, turn on your radio and set it to the appropriate channel. This information is posted at the entrance of the call road.
2) Radio check to confirm that your radio is working.
3) Call your position on the call road:
    - Type of vehicle
    - The name or number of the road you are traveling on
    - The kilometer location
    - Direction of travel – either up ("UP") or down ("Down")
        - Calling "Up" indicates you are travelling **up** Kilometer Post toward the ROW and you will be meeting vehicles travelling "Down".
        - Calling "Down" indicates you are traveling **down** Kilometer Post and you will be meeting vehicle travelling "Up"

Example: "One light duty vehicle, at LSLP Road 24, KP 0, traveling up"

4) You must continue to call your position and direction of travel on the call road on “must call” locations indicated with a sign.
5) Call road radio channels are to be used for safety messaging only, including calling locations. Keep Company Business or personal conversations to a minimum.

10.0 REFERENCES

This document was prepared using the following references:

1) Bradley, Allan Peng. (2014, May). **Guidance on assigning radio channels across the landscape**. Retrieve from https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resource-roads/channel-maps/assignchannels.pdf
2) “Resource Roads.” WorkSafeBC, OHS Guidelines, https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-01#SectionNumber:G1.1_1
3) **British Columbia Resource Road Channels**. Government of Canada, https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11127.html
4) **Thompson Rivers District Resource Road Channel Map 2017**. Government of British Columbia- Farming natural resources and industry, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resource-roads/channel-maps/thompson_rivers_resource_road_channels_2017.pdf
5) **Robson Valley Resource Road Channel Map 2018**. Government of British Columbia- Farming natural resources and industry, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resource-roads/channel-maps/robson_radio_roads.pdf
6) **LSLP Road Maps,** https://ledcor.sharepoint.com/:b:/r/sites/JV/SICIM/srpd3-4/P/02._Health_%26_Safety/02.05_Project_Specific_Safety_Program/02.05.10_Radio_Communication_Plan/Radio%20Channel%20Map/01-13283-S3%20S4A-M002-CO-GIS-0001%20RA%20LSLP%20Access%20Road%20Map.pdf?csf=1&e=5tnYkv

11.0 BRITISH COLUMBIA RESOURCE ROAD CHANNELS

Load Channels		
Channel	**Frequency (MHz)**	**Restrictions**
LD-1	151.700	
LD-2	151.745	Not to be used within 64 km of the Southern British Columbia border, within 50 km of Ketchikan, Alaska, or within 200 km of Juneau, Alaska.
LD-3	151.790	Not to be used within 20 km of Victoria, British Columbia
LD-4	151.805	Not to be used within 64 km of the Canada-United States border
LD-5	151.850	Not to be used within 85 km of Petersburg, Alaska
Road Channels		
Channel	**Frequency (MHz)**	**Restrictions**
RR-01	150.080	
RR-02	150.110	
RR-03	150.140	
RR-04	150.185	
RR-05	150.200	
RR-06	150.245	
RR-07	150.260	
RR-08	150.320	
RR-09	150.365	
RR-10	150.410	
RR-11	150.440	
RR-12	150.500	
RR-13	150.530	
RR-14	150.545	
RR-15	150.560	
RR-16	150.590	

RR-17	150.680	
RR-18	150.710	
RR-19	150.770	
RR-20	150.830	Not to be used within 64 km of Alaska State
RR-21	151.010	Not to be used within 64 km of the Canada-United States border
RR-22	151.130	Not to be used within 64 km of the Canada-United States border
RR-23	151.190	Not to be used within 64 km of the Canada-United States border
RR-24	151.220	Not to be used within 64 km of the Canada-United States border
RR-25	151.310	Not to be used within 64 km of the Canada-United States border
RR-26	151.340	Not to be used within 64 km of the Canada-United States border
RR-27	151.370	Not to be used within 64 km of the Canada-United States border
RR-28	151.430	Not to be used within 64 km of Alaska State
RR-29	151.460	Not to be used within 64 km of the Southern British Columbia
RR-30	151.490	Not to be used within 64 km of the Canada-United States Border
RR-31	151.520	Not to be used within 64 km of the Canada-United States Border
RR-32	151.580	Not to be used within 64 km of the Canada-United States Border
RR-33	151.610	
RR-34	151.640	Not to be used within 64 km of Washington State
RR-35	151.670	Not to be used within 20 km of Victoria, British Columbia

12.0 BC FOREST RESOURCE ROAD RADIO CHANNEL LIST

Forest Industry Frequencies			
Transmit frequency (MHz)	**Receive frequency (MHz)**	**Authorized Communications**	**Area of Operation**
157.560	157.560	Adams Lake Lumber Co. Ltd.	Adams Lake
158.130	158.130	Adams Lake Lumber Co. Ltd.	Adams Lake
152.285	152.285	Ainsworth Lumber Co. Ltd.	100 Mile House
152.960	152.960	Ainsworth Lumber Co. Ltd.	Lillooet
153.050	153.050	Ainsworth Lumber Co. Ltd.	South Caribou
153.080	153.080	Ainsworth Lumber Co. Ltd.	Savona
153.560	152.960	Ainsworth Lumber Co. Ltd.	Lillooet
153.590	153.080	Ainsworth Lumber Co. Ltd.	Savona / Lillooet
157.250	152.285	Ainsworth Lumber Co. Ltd.	100 Mile House
157.350	153.050	Ainsworth Lumber Co. Ltd.	Chasm
153.125	153.125	Alex Fraser Research Forest	Knife Lake / Gavin Lake / Horsefly Forest District / Williams Lake Forest District
151.115	151.115	Anadarko Canada Ltd.	Murphy Road
169.650	169.650	Anadarko Canada Ltd.	Anadarko PDR roads – Fort St. John to Fort Nelson
153.470	153.470	Apollo Forest Products Ltd.	Fort St. James – Mount Pope
153.470	153.470	Apollo Forest Products Ltd.	Leo Kazchek
153.470	153.470	Apollo Forest Products Ltd.	Kuskwa – road
153.470	153.470	Apollo Forest Products Ltd.	Kiskwa – road
153.770	153.770	Apollo Forest Products Ltd.	Leo Creek – road
165.960	165.960	Ardew Wood Products Ltd.	Merritt
153.500	153.500	Artomas Contractors Ltd.	Lillooet
153.470	153.470	Aspen Planers Ltd.	Merritt – Kamloops
154.040	154.040	Aspen Planers Ltd.	Merritt
150.815	150.815	Beaton River safety channel	Beaton River area
153.830	153.830	Bell Pole Co. Ltd	Lumby
153.230	153.230	Birch Creek Timber Ltd.	Revelstoke
152.150	152.150	Bond Bros Sawmills Ltd.	Vanderhoof – road
152.975	152.975	Bond Bros Sawmills Ltd.	Vanderhoof – road

153.215	153.215	Bond Bros Sawmills Ltd.	Mount Swannell – road
158.475	153.215	Bond Bros Sawmills Ltd.	Mount Swannell
150.485	150.485	Boundary Small Business Timber Association	Boundary / Grand Forks
152.975	152.975	Burlington Resources Ltd.	Ring Border gas field – Gutah Road
153.830	153.830	Burlington Resources Ltd.	Ring Border gas field – Kahntah Road
151.625	151.625	Canadian Forest Products Ltd.	Mackenzie – Main Road
151.985	151.985	Canadian Forest Products Ltd.	Polar #2 – Summit & McLeod Road
153.020	153.020	Canadian Forest Products Ltd.	Chetwynd Forest District Roads
153.530	153.530	Canadian Forest Products Ltd.	Polar #1 – North Central Roads
153.200	153.200	Canadian Forest Products Ltd. – Clear	Clear Lake
153.230	153.230	Canadian Forest Products Ltd. – Clear	Blackwater Road area
153.530	153.530	Canadian Forest Products Ltd. – Clear	Tagai Lake – road
151.985	151.985	Canadian Forest Products – Houston	Jinx Road
157.620	157.620	Canadian Forest Products – Houston	North Roads & various secondary roads
159.600	159.600	Canadian Forest Products – Northwood	Monkman
159.720	159.720	Canadian Forest Products – Northwood	Bowron
159.750	159.750	Canadian Forest Products – Northwood	Giscome
159.900	159.900	Canadian Forest Products – Northwood	Prince George
159.960	159.960	Canadian Forest Products – Northwood	Smithers – Herrick
160.080	160.080	Canadian Forest Products – Northwood	McGregor
162.030	162.030	Canadian Forest Products – Northwood	Upper Fraser – Mill yard only

152.180	152.180	Canadian Forest Products – Takla	Whitefish – road
152.180	152.180	Canadian Forest Products – Takla	Cunningham Road
152.360	152.360	Canadian Forest Products – Takla	Prince George / Elliotte Lake – road
152.450	152.450	Canadian Forest Products – Takla	Germansen-Inzana
152.450	152.450	Canadian Forest Products – Takla	Fort St. James North Road
152.450	152.450	Canadian Forest Products – Takla	Germansen-Hat
153.020	153.020	Canadian Forest Products – Takla	Bobtail – road
153.140	153.140	Canadian Forest Products – Takla	Teardrop – road
152.990	152.990	Canadian Forest Products – Taylor	Taylor – road
152.390	152.390	Canadian Hunter Explorations Ltd.	Fontas / Ring Border PDR Road
150.995	150.995	Canadian Natural Resources Ltd.	Mile 98 Alaska Hwy Road Safety North Boundary Road
151.055	151.055	Canadian Natural Resources Ltd.	CNRL Milligan Creek Road
151.055	151.055	Canadian Natural Resources Ltd.	Drake access road
151.835	151.835	Canadian Natural Resources Ltd.	Inga Lake, British Columbia
154.665	154.665	Canadian Natural Resources Ltd.	Drake access road
155.940	155.940	Canadian Natural Resources Ltd.	Birch BC – 30 km radius of 56°55'33"N 121°31'10"W
151.325	151.325	Chetwynd Forest Industries Ltd.	Sukunka Road Control
153.515	153.515	Coastal Canada Field Services Ltd.	Mile 168 road control
157.560	156.560	Creston Valley Forest Corporation	Creston
158.580	151.925	D. W. Jacobs Inc.	Tabor Mountain

151.835	151.835	Darkwoods Forestry	Kootenays
154.815	154.815	Devon Canada	Daniels Creek / Green Creek (Trutch Area)
151.685	151.685	Dunkley Lumber Ltd.	Quesnel – road
159.960	159.960	Dunkley Lumber Ltd.	Quesnel – yard
166.080	166.080	Eagle River Industries Ltd.	Malakwa, British Columbia Log Yard
153.200	153.200	East Fraser Logging Ltd.	Mackenzie / Phillips
153.380	153.380	East Fraser Logging Ltd.	Robinson Creek
153.470	153.470	East Fraser Logging Ltd.	Anzac / Parsnip Rivers
158.280	153.380	East Fraser Logging Ltd.	Tabor Mountain
151.610	151.610	Encana Corporation	Gunnell Area – 30 km radius of 59°01'37"N 121°46'18"W
151.610	151.610	Encana Corporation	Maxhamish Area – 30 km radius of 59°47'52"N 123°06'33"W
151.610	151.610	Encana Corporation	Peggo Area – 30 km radius of 58°58'37"N 120°30'33"W
152.060	152.060	Encana Corporation	Komie Road Area – 30 km radius of 59°08'18"N 121°38'27"W
152.900	152.900	Encanada Corporation	Elleh Area – 30 km radius of 58°35'37"N 121°51'11"W
152.900	152.900	Encana Corporation	Old Beaver River Road – 30 km radius of 59°42'21"N 123°23'36"W
153.650	153.650	Encana Corporation	Cabin/Petitot Area – 30 km radius of 59°28'07"N 121°50'48"W
153.650	153.650	Encana Corporation	Eskai/Bigfoot Area – 30 km radius of 58°09'22"N 121°59'48"W
154.250	154.250	Encana Corporation	Edwan Area – 30 km radius of 58°34'31"N 120°34'18"W
169.650	169.650	Encana Corporation	Reilly Road – 50 km radius of 59°51'15"N 123°14'06"W
151.955	151.955	EOG Resources Canada Inc.	Tattoo PDR 584 Resource Road
152.285	152.285	EOG Resources Canada Inc.	Maxhamish PDR 591 Resource Road
152.990	152.990	EOG Resources Canada Inc.	Gote Creek, British Columbia Resource Road
157.320	157.320	Federated Co-operatives Ltd.	Shuswap
162.840	162.840	Federated Co-operatives Ltd.	Shuswap
150.995	150.995	Finlay Navigation Ltd.	Mackenzie – Lake

153.080	153.080	Fletcher Challenge Canada Ltd.	Mackenzie – Admin
152.450	152.450	Forest Hill Contractors Ltd.	Haggen Creek
158.160	158.160	Forest Hill Contractors Ltd.	Prince George
158.790	158.790	Forest Hill Contractors Ltd.	Anzac / Carp Lake area, British Columbia
159.510	159.510	Galloway Lumber Co. Ltd.	Galloway
152.870	152.870	Georgia Pacific BM Sales Ltd.	Cache Creek
153.320	153.320	Gorman Bros Lumber & Box Ltd.	Westbank
154.250	154.250	Gorman Bros Lumber & Box Ltd.	Westbank / Merritt
153.170	153.170	Hat Lake Logging Ltd.	Fort St. James
152.150	152.150	Houston Forest Products Ltd.	Chisolm road control
159.780	159.780	Huckleberry Mines Ltd.	Huckleberry Mine Road
153.140	153.140	Husky Oil Operations	Ekwan / Bivouac - Main road
153.560	153.560	Husky Oil Operations	Bivouac tributary road
155.490	155.490	Husky Oil Operations	Ekwan tributary road
152.120	152.120	J H Huscroft Ltd.	Erickson / Creston
164.010	164.010	Kalesnikoff Lumber Co. Ltd.	Castlegar
151.325	151.325	Ketch Resources Ltd.	PDR 184 – Martin Creek Area
151.580	151.580	Keyera Energy Ltd.	209 Road (PDR561) – Starts at 57°50'07"N 122°51'22"W
151.655	151.655	L & M Lumber Ltd.	Prince George
151.355	151.355	Lakeland Mills Ltd.	Teardrop & Bobtail
151.055	151.055	Lavington Planer Mill Ltd.	Lavington – mill
153.050	153.050	Lavington Planer Mill Ltd.	Lavington – road
151.745	151.745	Lignum Ltd.	Potato Mountain – road
152.450	152.450	Lignum Ltd.	Puntzi – road
153.830	153.830	Lignum Ltd.	Williams Lake – road
157.440	152.450	Lignum Ltd.	Puntzi Mountain
159.090	153.830	Lignum Ltd.	Mount Alex Graham
165.720	165.720	Logging Road Communications	Lardeau / Duncan Lake
166.080	166.080	Logging Road Communications	Lardeau / Duncan Lake

155.940	155.940	Longwood Production Ltd.	Prince George Yard–Willowcale Road
151.685	151.685	Louisiana-Pacific Canada Ltd.	Septimus Creek Road
152.330	152.330	Louisiana-Pacific Canada Ltd.	Dawson Creek Forest District 40 km radius of 55°38'11"N 121°58'36"W
153.230	153.230	Louisiana-Pacific Canada Ltd.	Donald / Golden
153.320	153.320	Louisiana-Pacific Canada Ltd.	Golden / Malakwa
153.620	153.620	Louisiana-Pacific Canada Ltd.	Donald / Golden
153.650	153.650	Louisiana-Pacific Canada Ltd.	Dawson Creek Forest District 40 km radius of 55°38'11"N 122°06'50"W
159.090	159.090	Louisiana-Pacific Canada Ltd.	Dawson Creek Forest District 40 km radius of 55°55'04"N 121°26'47"W
150.485	150.485	Ministry of Forests – Burns Lake	Burns Lake Forest District
150.815	150.815	Ministry of Forests – FSJames	Lovell Loadout
151.115	151.115	Ministry of Forests – FSJames	Fall km 38.0 – km 47.0
151.115	151.115	Ministry of Forests	Ground Birch & Favels Creek Red Deer Creek area
151.295	151.295	Ministry of Forests	Haida Gwaii
151.295	151.295	Ministry of Forests – FSJames	Tanizul
151.295	151.295	Ministry of Forests – FSJames	Witch
151.355	151.355	Ministry of Forests	Redwillow Forest Service Road
151.355	151.355	Ministry of Forests – FSJames	Teardrop – Chief
151.655	151.655	Ministry of Forests – FSJames	Leo Creek km 38.5 – km 68.5
151.655	151.655	Ministry of Forests – FSJames	Leo Keve
151.655	151.655	Ministry of Forests – FSJames	Leo Airline
151.655	151.655	Ministry of Forests – FSJames	Germansen – Pinchi
151.655	151.655	Ministry of Forests – FSJames	Leo Rock

151.655	151.655	Ministry of Forests – FSJames	Driftwood km 0.0 – km 71.0
151.835	151.835	Ministry of Forests – Burns Lake	Burns Lake Forest District
151.985	151.985	Ministry of Forests	Barlow North Road
152.030	152.030	Ministry of Forests	Nass Valley km 65 to Highway 37
152.180	152.180	Ministry of Forests	Moldowan Forest Road
152.180	152.180	Ministry of Forests – FSJames	Cunningham
152.285	152.285	Ministry of Forests	Bear Cub Road
152.360	152.360	Ministry of Forests – FSJames	Leo Creek km 68.5 – km 104.0
152.360	152.360	Ministry of Forests – FSJames	Leo Middle (700)
152.360	152.360	Ministry of Forests – FSJames	Leo Sakeniche (900)
152.930	152.930	Ministry of Forests – FSJames	Rainbow
152.930	152.930	Ministry of Forests – FSJames	Necoslie
153.140	153.140	Ministry of Forests – FSJames	Leo Purvis
153.140	153.140	Ministry of Forests – FSJames	Ocock
153.140	153.140	Ministry of Forests – FSJames	Ocock – west
153.230	153.230	Ministry of Forests	Sutherland Trout FSR
153.410	153.410	Ministry of Forests	Dog Creek Trail
153.530	153.530	Ministry of Forests – FSJames	Takla Loadout
153.620	153.620	Ministry of Forests	Dog Creek Road
153.635	153.635	Ministry of Forests – FSJames	Germansen – Tsilcoh
153.635	153.635	Ministry of Forests – FSJames	McLeod
153.770	153.770	Ministry of Forests – FSJames	Leo Kazcheck

153.770	153.770	Ministry of Forests – FSJames	Takla 300 km 0.0 – km 18.0
154.340	154.340	Ministry of Forests – FSJames	Germansen – Cripple
154.340	154.340	Ministry of Forests – FSJames	North Salmon & West Salmon
154.665	154.665	Ministry of Forests – Burns Lake	Burns Lake Forest District
155.490	155.490	Ministry of Forests	Smithers – McDonell Lake Road
158.790	158.790	Ministry of Forests – FSJames	Driftwood km 71.0 – 95.0 km
158.790	158.790	Ministry of Forests – FSJames	Airport
158.790	158.790	Ministry of Forests – FSJames	Pinchi
159.750	159.750	Ministry of Forests – FSJames	Fall km 0.0 – 38.0 km
159.900	159.900	Ministry of Forests – FSJames	Ankwill km 13.0 – 17.0 km
159.900	159.900	Ministry of Forests – FSJames	Driftwood km 95.0 – 117.0 km
160.080	160.080	Ministry of Forests	Teardrop – Merton
160.080	160.080	Ministry of Forests	Salmon Forest Service Road
162.030	162.030	Ministry of Forests	Beverly Forest Service Road
153.635	153.635	Mount Polly Mining Corporation	Mount Polly Mine Road
151.715	151.715	Murphy Oil Ltd.	Ladyfern Road
151.055	151.055	Pacific Inland Resources	Nekitwa
151.355	151.355	Pioneer Natural Resources Ltd.	Chinchaga Gas Plant (30 km radius)
153.350	153.350	Pope & Talbot Ltd.	Trapping Creek
154.665	154.665	Pope & Talbot Ltd.	Central Arrow Lakes
156.240	156.240	Pope & Talbot Ltd.	North & South Arrow Lakes
156.240	156.240	Pope & Talbot Ltd.	Boundary – road
157.260	157.260	Pope & Talbot Ltd.	Granby – road
153.560	153.560	Pope & Talbot Ltd-Arrow Lakes division	Revelstoke

153.620	153.620	Pope & Talbot Ltd-Arrow Lakes division	Castlegar
151.715	151.715	Progress Exploration Partnership	Gundy Creek, British Columbia
153.230	153.230	Quest Wood Products Ltd.	Quesnel – yard & road
154.010	154.010	Ranger oil Ltd.	Monias area
171.450	171.450	Richfield Ventures Corp.	Richfield Camp Road – Nazko Plateau
151.835	151.835	Riverside Forest Products Ltd.	Puntzi – road
151.895	151.895	Riverside Forest Products Ltd.	Alex Graham (P&T #2)
152.900	152.900	Riverside Forest Products Ltd.	Puntzi (P&T #4)
152.960	152.960	Riverside Forest Products Ltd.	Williams Lake Forest Service Roads
153.230	153.230	Riverside Forest Products Ltd.	Okanagan Valley
153.260	153.260	Riverside Forest Products Ltd.	Okanagan Valley
153.380	153.380	Riverside Forest Products Ltd.	Lumby
153.440	153.440	Riverside Forest Products Ltd.	Lumby
153.530	153.530	Riverside Forest Products Ltd.	Williams Lake – road/mill (P&T #5)
155.940	155.940	Riverside Forest Products Ltd.	Williams Lake – yard
156.375	156.375	Riverside Forest Products Ltd.	Williams Lake – road
158.310	151.835	Riverside Forest Products Ltd.	Potato & Puntzi Mountains
158.460	151.895	Riverside Forest Products Ltd.	Smokey Mountain Lookout (P&T #1)
158.460	151.895	Riverside Forest Products Ltd.	Puntzi Mountain (P&T #1)
159.480	152.900	Riverside Forest Products Ltd.	Mt Alex Graham, British Columbia (P&T #3)
150.815	150.815	Rustad Bros & Co. Ltd (PG wood pres)	Prince George – east operations

153.050	153.050	S. McKenzie Contracting Ltd.	Revelstoke
153.500	153.500	Salmo/Nelson Logging road channel	Salmo / Nelson
151.265	151.265	Slaton Enterprises Ltd.	Prince George
151.115	151.115	Slocan Forest Products Ltd.	Engen – red / yellow /31 / 38 / Domtar Road
151.265	151.265	Slocan Forest Products Ltd.	Fort Nelson / Slocan Road safety
151.295	151.295	Slocan Forest Products Ltd.	Engen – 86 / Marten / Hedakuz / Vantine / Malput / Branch – Roads
151.355	151.355	Slocan Forest Products Ltd.	Fort Nelson / Slocan Road safety
152.030	152.030	Slocan Forest Products Ltd.	Engen – road
152.450	152.450	Slocan Forest Products Ltd.	Nazko Hwy (Bouchie Lake – Nazko)
152.930	152.930	Slocan Forest Products Ltd.	Engen – Corkscrew 200/300 Finger Lake / Gold / Long Leg – roads
153.170	153.170	Slocan Forest Products Ltd.	Fort Nelson Forest District
153.350	153.350	Slocan Forest Products Ltd.	Engen – Blue / 2500 / Branch – roads
153.470	153.470	Slocan Forest Products Ltd.	Quesnel – road
153.515	153.515	Slocan Forest Products Ltd.	Nazko – road
153.635	153.635	Slocan Forest Products Ltd.	Engen – Kluskus / Ootsa Road
154.010	154.010	Slocan Forest Products Ltd.	Big Bend truck – truck (south of Engen)
154.250	154.250	Slocan Forest Products Ltd.	North Thompson – road
154.920	154.920	Slocan Forest Products Ltd.	Engen – mill yard
155.940	155.940	Slocan Forest Products Ltd.	Kluskus truck – truck (south of Engen)
159.750	159.750	Slocan Forest Products Ltd.	Engen – Grey / Knewstubb / 88 / Indigo / Barlow – roads
157.620	157.620	Slocan Group (Radium)	Radium B.C. – log yard
158.130	158.130	Slocan Group (Radium)	Radium Hot Springs / Kootenay River Areas
158.460	158.460	Slocan Group (Radium)	Radium
154.920	154.920	Slocan Group (Slocan)	Slocan Valley
152.060	152.060	Slocan Group (Vavenby)	Clearwater
153.170	153.170	Slocan Group (Vavenby)	Cedarside
153.350	153.350	Slocan Group (Vavenby)	Valemount
157.400	157.400	Slocan Group (Vavenby)	Clearwater / Vavenby
157.590	152.240	Slocan Group (Vavenby)	Avola

157.650	152.390	Slocan Group (Vavenby)	Blackpool
157.680	152.420	Slocan Group (Vavenby)	Valemount
160.080	160.080	Slocan-LP OSB Corp.	Fort St. John Mill Site Only
153.920	153.920	Spatsum Lumber (Lytton) Ltd.	Lytton
152.030	152.030	Springer Creek Forest Products	Slocan Valley
151.115	151.115	Tackama Forest Products Ltd.	Fort Nelson – road
151.895	151.895	Tackama Forest Products Ltd.	Fort Nelson Forest District
152.030	152.030	Tackama Forest Products Ltd.	Fort Nelson – road
151.955	151.955	Talisman Energy Inc.	Farrell Creek
151.295	151.295	Tanizul Timber Ltd.	Tachie
151.610	151.610	Tembec Industries Inc.	Logyard – East Kootenays, British Columbia
152.870	152.870	Tembec Industries Inc.	East Kootenays, British Columbia
157.560	157.560	Tembec Industries Inc.	Elko
169.650	169.650	Terrane Metals Corp.	Rainbow Forest Service Road
150.485	150.485	The Pas Lumber Company Ltd.	Bear Lake (Lomack trucks)
152.930	152.930	The Pas Lumber Company Ltd.	Anzac – road
153.350	153.350	The Pas Lumber Company Ltd.	Davie Lake – road
153.650	153.650	The Pas Lumber Company Ltd.	Artic – road
162.330	162.330	Timber Service Ltd.	Quesnel Forest District
157.620	157.620	Tolko Industries Ltd.	Merritt, British Columbia – log yard
157.620	157.620	Tolko Industries Ltd.	North Thompson
158.190	158.190	Tolko Industries Ltd.	North Thompson
168.780	169.650	Tolko Industries Ltd.	Merritt
169.650	169.650	Tolko Industries Ltd.	Merritt
150.815	150.815	Tommy Lakes Road Safety	Tommy Lakes area
151.055	151.055	Weldwood of Canada Ltd.	Quesnel Mill
152.060	152.060	Weldwood of Canada Ltd.	Quesnel Forest District

152.990	152.990	Weldwood of Canada Ltd.	Quesnel Forest District
153.110	153.110	Weldwood of Canada Ltd.	100 Mile House
156.180	156.180	Weldwood of Canada Ltd.	Quesnel Forest District
158.580	153.110	Weldwood of Canada Ltd.	100 Mile House
151.580	151.580	West Chilcotin Forest Products Ltd.	Anahim Lake, British Columbia – 40 km radius
151.955	151.955	West Chilcotin Forest Products Ltd.	Anahim Lake, British Columbia – 40 km radius
150.995	150.995	West Fraser Mills Ltd.	Clinton/Ashcroft – road
151.265	151.265	West Fraser Mills Ltd. – CFI	Dawson Creek Forest District
151.715	151.715	West Fraser Mills Ltd.	Quesnel – Cottonwood
152.180	152.180	West Fraser Mills Ltd.	Potato Mountain
152.330	152.330	West Fraser Mills Ltd.	Williams Lake – Ketcham Road #5
152.975	152.975	West Fraser Mills Ltd.	100 Mile House – road
153.125	153.125	West Fraser Mills Ltd.	Quesnel – Blackwater Road #4
153.200	153.200	West Fraser Mills Ltd.	Williams Lake – road
153.530	153.530	West Fraser Mills Ltd. – CFI	Dawson Creek Forest District
153.590	153.590	West Fraser Mills Ltd.	Williams Lake Road
153.770	153.770	West Fraser Mills Ltd – CFI	Dawson Creek Forest District
157.560	153.200	West Fraser Mills Ltd.	Smokey Mountain
157.650	152.390	West Fraser Mills Ltd.	Dragon Mountain #1
158.190	158.190	West Fraser Mills Ltd. – CFI	Dawson Creek Forest District
158.475	152.975	West Fraser Mills Ltd.	Timothy Mountain
158.490	150.995	West Fraser Mills Ltd.	Pavilion Mountain
158.490	152.300	West Fraser Mills Ltd.	Two Sisters Mountain (Wells) #2
158.550	152.180	West Fraser Milles Ltd.	Potato Mountain
159.180	154.010	West Fraser Mills Ltd.	Potato Mountain
171.450	171.450	West Fraser Mills Ltd.	Quesnel – scales
156.195	156.195	West Fraser Timberlands Division	100 Mile House Forest District
150.485	150.485	Western Canadian Coal Corporation	Blind Creek Road – Dawson Creek Forest District
151.835	151.835	Western Canadian Coal Corporation	Wolverine Road – Dawson Creek Forest District

152.900	152.900	Weyerhaeuser Canada Ltd.	Kamloops
153.020	153.020	Weyerhaeuser Canada Ltd.	Merritt / North Thompson
153.410	152.900	Weyerhaeuser Canada Ltd.	Bob Lake
153.530	153.530	Weyerhaeuser Canada Ltd.	Lumby
153.890	153.020	Weyerhaeuser Canada Ltd.	Merritt
162.120	162.120	Weyerhaeuser Canada Ltd.	Princeton
162.330	162.330	Weyerhaeuser Canada Ltd.	Okanagan Valley
154.665	154.665	Woodex Forest Products Ltd.	Edgewater, British Columbia
152.390	152.390	Wynndel Lumber & Box Co. Ltd.	Creston
162.120	162.120	Zapper Contracting Ltd.	Quesnel Forest District

13.0 LEDCOR REGISTERED RADIO CHANNELS

Channel Identifier	Receive frequency (MHz)	Authorized Communications	Operation

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Appendix I – Steep Slope Plan

Trans Mountain Expansion Project
Spreads 3&4

STEEP SLOPE SAFETY PLAN

TMEP # 01-13283-SG-M002-ST-PLN-0001 R0

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	Reviewed by TMEP	Pages Revised	Issued Type
0	E. Kibambe 2020-06-08	G. Roda 2020-06-08	M. Granger 2020-06-08	C. Vest 2020-06-08	All	Issued for Use

Table of content

2.0 ABBREVIATIONS AND DEFINITIONS

TERM	DEFINITION
CER	Canadian Energy Regulator
Competent	Adequately qualified, suitably trained and with sufficient experience to safely perform the work as outlined, independently or with only a minimal degree of supervision.
Competent Person	One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate.
Contractor	Contractor means the person or entity, including the general construction contractor, under contract to Trans Mountain Expansion Project (TMEP or project) to perform project work. Contractor includes any subcontractor hired by the contractor to perform project work.
CQS	Contractor qualification specification
HSMP	Trans Mountain Expansion Project Health and Safety Management Plan.
JHA	Job Hazard Assessment
LSLP	Ledcor Sicim Limited Partnership
Mobile equipment	All equipment propelled or powered by gasoline, propane, natural gas, or diesel and used to haul, transport, excavate, move, maneuver, or hoist materials, equipment, products, or personnel
Mobile Winch	Machine mounted drum hoist (e.g., pipelayer, bulldozer, excavator).
PSSP	Project Specific Safety Plan
ROW	Right-Of-Way
Slope	Steepness or gradient of the Worksite as measured using a survey transit or clinometer, typically expressed as a percentage or in degrees.
Steep Slope	For the purpose of the Trans Mountain Expansion Project, steep slope work shall be considered as any work on any slope where anchoring is required on slope between 5° and 15° or any work on a slope greater than 15° or wherever a Steep Slope Work Plan is required following the Steep Slope Assessment.

Steep Slope Assessment	Assessment of locations, gradients, other relevant conditions to determine the classification of the slope.
Steep Slope Work Plan	Site specific steep slope plan developed by LSLP or contractors when working on a steep slope greater of 15° or more. This plan contains high level methodology, hazard assessment protocol, competency declaration, training requirement, rigging protocol, and relevant engineer drawings as required.
TM	Trans Mountain Canada Inc.
TMEP (or project)	Trans Mountain Expansion Project
TMPL	Trans Mountain Pipeline
WorkSafeBC	Provincial agency dedicated to promoting safe and healthy workplaces across B.C. A partner with workers and employers to save lives and prevent work-related injury, disease, and disability. Services include education, prevention, compensation and support for injured workers, and no-fault insurance to protect employers and workers.

3.0 PURPOSE

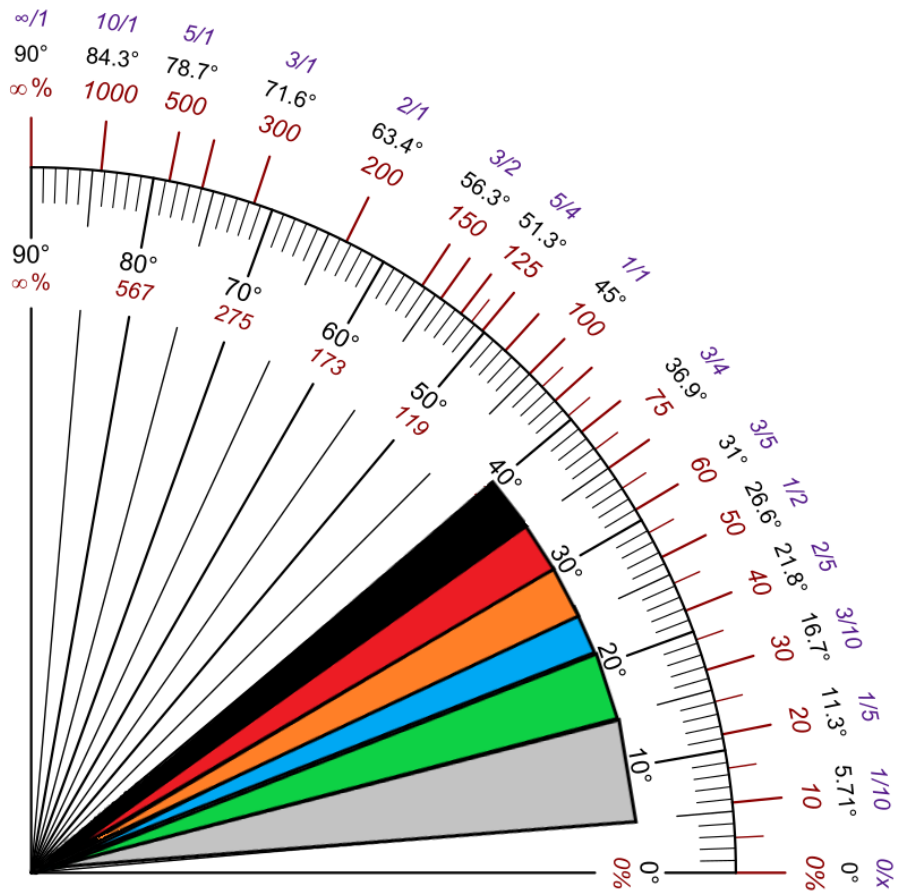
This document is intended to provide basic safety guidelines related to working on steep slopes (e.g., hills, mountains, steep or otherwise hazardous inclines, unstable slope conditions).

The purpose of these guidelines is to encourage work practices that promote safety of workers and equipment and promote the highest standards of quality during pipeline construction activities, including appropriate:

- Steep Slope identification and assessment.
- Planning for the location-specific conditions and scope of work.
- Training, qualification, and competency of crews and other personnel.
- Emergency response protocols.

For the purpose of the Trans Mountain Expansion Project, steep slope work shall be considered as any work on a slope between 5° and 15° requiring assistance by a winching system or any work on a slope greater than 15°.

Figure 3.0: Illustration of grades in degrees, percentages, and color codes for TMEP Spread 3&4A.



4.0 SCOPE

This plan will outline the method of assessing steep slope sections and determining the plan and method for performing steep slope activities. This plan applies to the pipeline ROW, LSLP build access roads, and yards of the TMEP Spread 3 & 4A.

This plan has been developed in order to meet or exceed TMEP Steep Slope Requirement as outlined on the HSMP Section 58 and applicable appendices. Where interpretation of this Steep Slope Safety Plan differs from the HSMP Section 58 and its applicable appendices, the HSMP will take precedent.

For other project specific documentation which may be applicable to this steep slope plan, refer to the LSLP work plans and associated document which includes but not limited to:

- Project Specific Safety Plan
- Organizational Chart Roles and Responsibilities
- Orientation and Onboarding Overview
- Training Matrix and Contractor Qualification Specifications (CQS)
- Hoisting and Rigging Program
- Access Road Communication Plan
- Emergency Response Plan
- DriveSafe Program
- Off Road Vehicles Safe Work Practice

This Issue for Use revision of this plan will become part of the project site specific safety plan as an appendix.

5.0 ROLES AND RESPONSIBILITIES

Prime Contractor

As the Prime Contractor, LSLP is responsible for:

- Ensure that the TMEP Steep Slope Requirement (Section 58 of the HSMP) are adhering to by all LSLP employees and subcontractors on the project.
- Establish Steep Slope assessment procedure, Steep Slope Work Plans and Emergency Response Plans, and verify that the plans are individually evaluated and confirm that all procedures are applied appropriately
- Ensure that all employees and subcontractors are adhering to this Steep Slope Safety Plan.
- Provide the project team with the resources for the implementation of this Steep Slope Safety Plan and subsequent Site Specific Steep Slope Plans, where applicable, on the project.

Construction Superintendent (s)

- Assign competent Steep Slope Supervisor to oversee steep slope activities as described in this Steep Slope Safety Plan.

- Endorse and support the implementation of this Steep Slope Safety Plan through communication with stakeholders.
- Confirm that the project team has reviewed the construction specifications and full scope of work provided for the Project and evaluated the requirements per the applicable Prime Contractor's guidelines.

Steep Slope Supervisor (s)

- Ensure Steep Slope Work Plans are developed prior to working on applicable Steep Slopes.
- Support and implement Site Specific Steep Slope Work Plans.
- Complete daily pre-work steep slope documentation as required by this Steep Slope Safety Plan.
- Communicate crew member's responsibilities and ensure work crew safety.
- Enforce the Steep Slope Work Plan requirements while working on Steep Slopes.
- Perform competency assessments to ensure crew members are qualified to perform the work assigned in a safe manner.
- Conduct daily toolbox talks with crew members and ensure that Field Level Hazard Assessments (FLHAs) are completed to ensure all crew members understand hazards associated with the steep slope work, and mitigation measure requirements.
- Communicate safety concerns and considerations to crew members prior to introducing a new process, procedure, equipment, or material to the workplace.
- Verify and ensure that crew members are adequately trained for assigned work tasks prior to beginning work. Do not allow workers to work on tasks without training and competency.
- Ensure that reliable communication devices are available prior to and during slope activities and operations.
- Relay crew member steep slope concerns/considerations to the project management team.

Engineer(s) involved with Steep Slope Planning

- The Engineered Steep Slope Drawings and Plans shall be conducted by a competent engineering professional who is knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof, with guidance or input from possible qualified construction personnel.
- Ensure that the Engineered Steep Slope Drawings and Plans meet the regulatory compliance of the applicable regulatory jurisdictions and is defendable to a regulatory body with engineering justification.

Health and Safety Representative (s)

- Assist in the identification of known or potential hazards to the environment, public, and worker safety.
- Facilitate mitigation measures to be used through discussion and consultation with key personnel.

- Complete site safety inspections and audits that are in accordance with the Project Specific Safety Plan (PSSP), this Steep Slope Safety Plan and any Site Specific Steep Slope Work Plan(s) developed on this Project.
- Act as conduit between project stakeholders to promote sleep slope information sharing.

Employee/ Crew Member (s)

- All employees shall be knowledgeable and adhere to the contents of this Steep Slope Safety Plan and associated documentation as it is applicable to their work responsibilities.
- All employees are required to complete steep slope training and orientation prior to working on steep slopes.
- Operators and spotters must familiarize themselves with the types of slope conditions that could adversely affect the operation of the equipment and winch machines.
- Consult with the supervisor or designated competent person(s) concerning the presence of hazardous conditions and confirm their understanding of the potential mitigation measures.
- All employees involved in sleep slope operations must understand the communication plan and be assigned and know their designated radio call name/number prior to work beginning.
- Wear personal protective equipment as appropriate for the task being performed.
- Exercise their right and obligation to refuse to perform unsafe work they reasonably believe with put themselves or others in danger.
- Only perform work if trained and competent in the task assigned.
- Report potential hazards to a supervisor or the designated competent person.
- At all times, must be fit for duty to perform work duties.
- Report any personal conditions/issues that could adversely affect their ability to work on hazardous slopes.

Visitors

- Follow instructions provided at the orientation and remain alert and attentive to their surroundings at all times.
- Shall be escorted when visiting hazardous slopes.
- Required to remain in approved zones.

6.0 TRAINING & COMPETENCY

6.1 Operator competency

Prior to conducting any work on a steep slope, all operators must have a completed competency declaration, be assess for steep slope work, and have a practical competency assessment completed for the equipment they are assigned to operate. Equipment operators will be assessed as a minimum on the tasks outlined in the assessment and demonstrate understanding in the requirement which include:

- Site safety operation
- Standard work practices
- Personal protective equipment
- General safety awareness
- Equipment limits
- Approaching equipment
- Pre-start checklist (visual inspection)
- Communication
- Safe start-up
- Safe operation
- Safe travel and park
- Safe shut down and End-of-shift walk around
- Emergency procedures
- Manufacturer manual review and possession

Copies of completed assessments will be stored on LSLP SharePoint and available to the steep slope supervisor in hard copies and also electronically through the iPad.

Where site-specific steep slope assessment dictates, additional training such as course tailored specifically to the operator of steep slope will be provided by a qualified third party training provider.

6.2 Worker training

In addition to general training requirement that all worker must complete prior to gain access to the project as per LSLP training matrix, all worker conducting task on a steep slope must have a completed competency declaration by a competent assessor prior to commencement of work on steep slopes.

All workers must review the steep slope Job Hazard Assessment and applicable site-specific steep slope plans prior to starting the task.

Where site-specific steep slope assessment dictates, additional training such as course tailored specifically to the worker environment will be provided by a qualified third party training provider and fall protection as per Ledcor Fall Protection Program and acceptable to WorkSafeBC.

6.3 Steep slope supervisor

Prior to any work on steep slope, a supervisor competent in steep slope operation must be assigned to oversee the operation.

The steep slope supervisor must have a completed declaration of competency in supervising steep slope operations.

Steep slope supervisors must have a valid advanced rigging training certification.

6.4 Rigging supervisor

All rigging on steep slope shall be conducted under the supervision of a competent rigging supervisor. Rigging supervisor shall be qualified and competent in advanced rigging techniques.

Where the scope of work may allow, the Steep Slope Supervisor will also fulfill the role of the rigging supervisor.

7.0 STEEP SLOPE ASSESSMENT PROCEDURE

Steep slopes and other hazardous type of terrains have the potential to greatly impact the safety of personnel and equipment, as well as, quality and production if not appropriately identified, evaluated and addressed. Operating mobile equipment on steep slopes increases the likelihood of reduced machine stability, which can result in an upset or roll-over. Such events can result in serious worker injuries or fatality, significant environmental damage and expensive lost production and machine repairs.

A hazard assessment is to be conducted on identifiable slopes where work will occur. Slope gradient will be established based on the maximum gradient a piece of equipment will be exposed to, not the overall average of the slope, unless the overall average of the slope is equal to the maximum gradient experienced by the equipment.

7.1 Slope Assessment

Slopes will be assessed using available LIDAR data, site survey data, and field assessment. From these assessments, the slopes will be classified based on the management plan required to mitigate the hazard as per table 7.2 below.

Slope planning will be based on maximum slope gradient as experienced by equipment.

Where individual slope gradient is averaged for the entire slope any slope variations with a gradient exceeding the individual averaged slope will be indicated.

Where total length of slopes is 30 m or less, a steep slope work plan may not be required following confirmation of slope conditions. Where conditions (e.g. soil types, environmental factors) warrant, a steep slope work plan will be developed and submitted to TMEP for approval.

This does not alter the requirement that ALL slopes greater than 30m in length and greater than 15 degrees in steepness must have a steep slope plan in keeping with the requirements set forth in the HSMP section 58 and Appendix G.

Any anchoring, winching, tethering, snubbing, or towing, etc. activities on slopes warrant the steep slope planning requirements and apply to all slopes, regardless of length, and all of these operations must be covered in a steep slope work plan that meets all applicable steep slope plan requirements.

7.2 Slope Characteristics

Steep Slope characteristics that affect the requirement for anchoring include, but are not limited to the following:

- Gradient
- Slope Length
- Presence of exposed or shallowly covered rock
- Site & environmental factors influencing machine stability
- Factors that may confer operational limitations or hazards

- Ground conditions
- Slope instability potential
- Friction coefficients
- Other slope specific elements
- Load characteristics
- Specific activity to be undertaken

Table 7.2 Slope classification based on management plan requirements

Class	Color Code	Slope	Assessment	Requirement
Unclassified	**None**	**5° – >15°** **8% - 27%**	• Assessment by supervisor to confirm if any anchoring is required.	• Typical construction methodology when no anchoring is required, similarly to when no slope is identified. • A steep slope plan (JHA) completed with engineered drawing is required when anchoring is required.
A	**Green**	**<15° – > 21°** **28% - 40%**	• Assessment by competent steep slope assessor.	• Steep Slope Work Plan. • Use of typical engineer drawing for anchoring as required. Site Specific engineered drawing required for anchoring when slope or activity characteristics warrant. • Wheeled vehicles are prohibited on slopes greater than 15° unless specified by the steep slope work plan. See TMEP UTV Standard for UTV requirements.
B	**Blue**	**<21° – >25°** **40% - 45%**	• Assessment by competent steep slope assessor	• Steep Slope Work Plan including anchoring plan. • Use of typical engineer drawing for anchoring. Site Specific engineered drawing required for anchoring when slope or activity characteristics warrant. • Wheeled vehicles are prohibited on slopes greater than 15° unless specified by the steep slope work plan. See TMEP UTV Standard for UTV requirements
C	**Orange**	**<25° - >30°** **45% - 58%**	• Engineer hazard/ risk assessment •	• Site Specific Steep Slope Work Plan including anchoring plan. • Site specific engineer drawing required for anchoring. • Wheeled vehicles are prohibited on slopes greater than 15° unless specified by the steep slope work plan See TMEP UTV Standard for UTV requirements

Class	Color Code	Slope	Assessment	Requirement
D	**Red**	**<30° - >35°** **58% - 70%**	• Engineer hazard/ risk assessment	• Steep Slope Work Plan including anchoring plan. • Site specific engineer drawing required for anchoring. • Wheeled vehicles are strictly prohibited on slope greater than 30°.
E	**Black**	**<35°** **<70%**	• Engineer hazard/ risk assessment	• Steep Slope Work Plan including static anchoring after clearing. • Site specific engineer drawing required for anchoring. • Wheeled vehicles are strictly prohibited on slope greater than 30°.

7.3 Steep Slope Naming Convention

All steep slopes requiring a Steep Slope Work Plan shall be name using the following naming convention in order to create consistency when referring to steep slopes and their location.

Slope Number

KP Notation "From" and "To"

Steep Slope KP 497 – KP 497+226 to 497+497

- **Slope Number**: numbered sequentially to match the Kilometer Post (KP).
- **KP Notation:** Location "From" KP 000+000, indicating start of slope based on direction of increasing KP and "To" indicating end of slope. NOTE: This does not necessarily denote the direction of work or top/bottom of slope.

8.0 PLANNING

Following the assessment of slopes, steep slope work plans will be developed for each steep slope types as per slope classification in Table 4.1. For Class C, D & E slopes, engineer site specific drawing for anchoring will be developed.

9.0 JOB HAZARD ASSESSMENT

Prior to beginning on work on any slopes requiring anchoring, the supervisor will complete and document a Job Hazard Assessment (JHA) with all crew members present. LSLP will document and keep records of these assessments.

10.0 STEEP SLOPE WORK PLAN REQUIREMENTS

10.1 General

Most steep slopes will be managed by a set of Steep Slope Work Plans and typical drawings developed by class following the minimum content found in Appendix A of this Steep Slope Safety Plan. Where the operations to be performed are very similar in nature, one steep slope plan work plan will be used for all slopes. A listing of the specific slopes to which the Steep Slope Work Plan applies will be provided within the document.

- Where a steep slope has significant variances in characteristics within the steep slope itself, these variances (benches, varying pitches within overall slope) and any relevant operational variances shall be covered within the document.

Steep slopes will be managed in accordance with TMEP HSMP Section 58 and Appendix G including engineered drawings, at a minimum.

All steep slope work plans, and supplemental documents will be submitted to TMEP in PDF format, in addition to any printed copies that are sent in accordance with the TMEP HSMP Section 58

Where the work is subcontracted, the subcontractor responsible for the work will prepare and submit the plan that meet or exceed the requirement outline in this Steep Slope Safety Plan to LSLP and forwarded to TMEP for review and acceptance.

10.2 Steep Slope Work Plan Content

Each steep slope safe work plans must contain the minimum content as per Appendix G of this Steep Slope Safety Plan. Additional documents will be provided as and when required due to specific circumstances as per table 4.1.

11.0 WORK SEQUENCE

11.1 Clearing

Prior to clearing activities, steep slope assessments will be conducted identify slopes which will require further management as per this Steep Slope Safety Plan and TMEP HSMP section 58 and Appendix G. Slopes defined as steep slope will have a steep slope work plan that the work crews will adhere to in addition to the clearing plans, and job hazard assessment.

11.2 Grading

Following any required clearing and grubbing within the workspace, the right of way will be graded to more suitable slopes. Topsoil will be stripped and stockpiled in suitable locations. Work will be undertaken by various excavators and crawler tractors, utilizing mobile winch tractors where required. The steepness of these sections will be assessed using pre-graded slopes. Steep slope work plans developed following the assessment will be applicable to grading work on steep slopes.

11.3 Blasting

Blasting operations shall be conducted as per project blasting plan. Blasting may require the use of specialize equipment for the safe delivery of blasting material on steep slopes. Steep Slope Work Plans developed will be applicable to blasting scope on steep slopes.

11.4 Stringing

During the stringing phase segments of pipe will be transported from the stockpile areas and placed on the right of way in preparation for welding. Various pipelayers and excavators, will be used during this work. Additional measures will be employed to stabilize and secure pipe where pipe is stored or strung on any surface with a gradient greater than 8 degree. Where the hazard assessment identifies the requirement of pipe retainment, a pipe restraint drawing will be developed as part of the steep slope work plans.

11.5 Bending

Sections of pipe will be bent using pipe bending equipment to allow the pipeline to follow the planned route. Bending operations will not occur on steep slope sections.

11.6 Welding

Except where otherwise prescribed by the Construction Execution Plan and by the Steep Slope Assessment and the Steep Slope Work Plan, in general welding will be performed by Mainline Welding. Where welding occurs along a slope identified as Steep Slope , the steep slope work plans developed will be adhered to and a followed during the construction activities.

11.7 Coating

In general Coating will follow the same approach of welding. Where coating is required in a slope identified as Steep Slope, the steep slope work plans will be applicable and followed during the construction activity.

11.8 Trenching

Excavation for the pipeline trench will be completed with various excavators using multiple attachments or trenchers. Some steep slope sections will require mobile or static winch assistance for this equipment. This will be reflected on the steep slope work plans.

11.9 Lowering-In

In this phase of work sections of pipe will be lowered into the trench, sometimes utilizing multiple pipelayers. For lifts using more than one piece of equipment, a lift plan will be developed with detailed drawings. Some steep slope sections will require winch assistance for lowering-in and/or welding directly inside the trench.

11.10 Breaker installation

Breaker installation will occur using track equipment and manual labor. Where required, steep slope work plans will be followed to ensure the safety of all personnel and equipment.

11.11 Backfill

During the backfill phase the pipeline will be buried. This work will involve various excavators and dozers, utilizing mobile winch assistance if required as per steep slope wok plans.

11.12 Machine Cleanup

Following completion of the previous work phases, the right of way will be remediated, and topsoil replaced. Various excavators and crawler tractors will be involved and utilize winch assistance if required as per steep slope work plans.

12.0 EQUIPMENT

12.1 Equipment requirement

Site-specific steep slope plan will include equipment details for all equipment as follow:

- Make
- Model
- Series

Each equipment shall be equipped with the manufacturer manual. Specification sheets for each equipment to be used will be included with the Steep Slope Work Plan.

12.2 Equipment inspection

All equipment mobilized to the project must have arrive with a proof of pre-mobilization inspection. Pre-mobilization inspection report will be kept on LSLP SharePoint for reference and audit purpose.

Operator will complete daily inspection of the equipment and defective equipment will be removed from service until the repairs are made.

12.3 Critical equipment inspection

Critical equipment includes rigging equipment (slings, wire rope, shackles, pins) and anchor points.

All critical equipment inspection must be completed and documented daily by a qualified steep slope supervisor. A visual inspection of the critical equipment must be completed prior to each use. Any defective equipment must be tagged out and removed from service.

13.0 COMMUNICATION

13.1 Toolbox Talk

At the beginning of each day, the steep slope supervisor will conduct a toolbox talk with all personnel to communicate expectations, review, and verify requirements as outline in the site-specific steep slope plan. The steep slope daily toolbox talk will cover as a minimum:

- All relevant JHA and tailgate meeting documents and scope of work.
- Verification that specified equipment is on site and suitably equipped/configured as per the plan.
- Verification that all personnel involved in the steep slope operations are trained and competent in this type of operation.
- Confirm that designated steep slope operators are on site.
- Review starting point for the day and schedule of operations.
- Discuss how to deal with previously unidentified hazards and changing conditions.
- Review of emergency procedures including recue plans.
- Environmental factors
    - Visibility (daylight, snow, fog)

- High winds
- Rain
- Electrical storm proximity

13.2 Radio Communication

All personnel involved in steep slope operations must be within discernible hearing range of at least one handheld or mobile two way radio.

Each operator shall be equipped with a two-way radio device.

All two-way radio devices shall be in good working order and shall be tested at the beginning of each day and periodically throughout the day as required.

Spare batteries must be available at the site of the steep slope operation.

LSLP will provide TMEP with programed radios with all channels used on project.

Steep slope supervisor will provide authorized personnel entering the steep slope area with clear instruction as to which radio channels are in use as part of the toolbox talk review.

13.3 Signage

Suggested signs dimension is 60 cm (2 ft) wide by 90 cm (3 ft) tall.

Signage must be installed at the base and the top of each steep slope section which includes but not limited to;

- Steep Slope ID
- Danger steep slope and Kilometer Post
- Slope angle (Color code)
- Travel notification protocol (Radio channel and direction of travel)
- Restricted vehicle or equipment if applicable.

Please refer to appendix B of this Steep Slope Safety Plan for the signage templates that will be used on the on project.

14.0 STEEP SLOPE SAFE WORK PRACTICE

14.1 General Safe Work Practice

Steep slope operations are dynamic workplaces that require continuous site specific assessments. Changing personnel, environmental and mechanical conditions create different hazards and risk levels. These factors are interrelated.

- Risks associated with duration of exposure depend on operator competencies, state of mind (e.g. focused on work versus fatigued or distracted by personal issues), site complexity and daily weather. The contractor is responsible to identify changing conditions (e.g. windstorm, decreased operator alertness, etc.) and apply sound judgment to re-evaluate hazards and determine what different steps or controls are necessary to assure continued machine stability and safe operations.

- All steep slope work shall be performed under the supervision of a qualified steep slope supervisor.
- Steep slope operations shall be scheduled to occur during periods of all personnel (operators, ground workers) optimal mental alertness.
- Prior to performing any work on a steep slope, a documented daily Toolbox Talk and Steep Slope Daily Checklist (Appendix C) shall be completed where the following are discussed with all personnel involved:
  - Scope of work, progress
  - Foreseeable hazards, effectiveness of implemented controls, and steps to manage unforeseen hazards.
  - Changing conditions.
  - Communication method including radio use and channels to be used.
  - Designated signal persons and signals to be used
- Signal person:
  - Shall be designated and identified visibly as the signal person (reflective gauntlets on sleeves).
  - Shall remain up slope of operations or in a safe zone out of the potential line of fire.
  - Shall be visible to all operators or in radio communication with operators at all times.
- All operations engaging tethering, winching, or anchoring shall have a designated rigging supervisor onsite when any rigging operations are involved.
- All rigging shall be inspected prior to use.
- A qualified person shall conduct a documented inspection of all rigging every calendar year.
- All rigging shall have legible manufacturer labels or markings.
- Rigging for all tethering, winching, or anchoring operations shall use “closed connections” (e.g. shackles, slings with loops, etc.) Hooks are not permitted.

14.2 Vehicle and equipment guidelines

- Wheeled vehicles are prohibited on slopes greater than 15° unless specified by the steep slope work plan. See TMEP UTV Standard for UTV requirements
- Wheeled vehicles are strictly prohibited on steep slopes of 30° or greater.
- Gear down when driving down hills; do not ride the breaks more than is required.
- All towing on steep slopes requires engineered drawing as per TMEP HSMP Appendix G.
- Equipment should never be operated beyond the maximum slope limitations established by the manufacturer. Note: This may require consideration of special lubrication requirements such as additional fluids.
- Communication with the Operator must occur prior to anyone approaching the equipment. Only approach after the Operator acknowledges your presence and purpose. Follow the 6 m buffer policy.

- In the event there are blind spots, Operators should not proceed without being given directions from a Spotter who is on the ground having a clear view of the equipment's surroundings.
- When an equipment is moving pipe (or other material/equipment) on hazardous terrain, ground personnel should always stay to the side of the ROW until the pipe is in place and the equipment has stopped.
- A full mechanical documented inspection by a qualified mechanic shall be performed following any upset/ unexpected operation prior to the continued equipment operation.
- When it comes to equipment operating limits, do not operate near the maximum stated limits.
- When operating equipment on a hillside, all motions should be deliberate and conducted at the proper rate of speed (proper rate of speed to maintain center of gravity of the machine)

14.3 Dozers

- Avoid traveling across slopes as much as practical and travel straight up and down slopes.
- When working on steep slopes, dozers should avoid travel diagonally across the slope at less than a 45-degree angle.
- Keep the dozer blade as close to the ground as possible while travelling up or down a slope.
- If the machine starts to slide sideways when working across a slope, turn the machine downhill and drop the blade.
- The dozer may require welded modifications for the top pull hook as well as the bolt on "C" frame trunnion attachments. Note: Industry best practices and manufacturer's guidelines should be considered related to any equipment modifications. This form of modification requires full engineer drawings supporting capacity required as per potential forces identified in worst case scenario.
- Debris and loose rocks along dozer breaks should be stabilized before personnel are allowed to work below them. Workers are prohibited to be below active steep slope operations.
- When parking a dozer, the blade should be placed on the ground.

14.4 Excavators

- Create a level area where Excavators are excavating along slope areas, if possible.
- Avoid travel across slopes as much as practical and travel straight up and down slopes. Where
- turning is unavoidable, or where ascending or descending, turn as gradually as possible to maintain stability.
- Under no circumstances should an Operator exit the Excavator while positioned on the hazardous terrain. If required, the Excavator should track to the nearest platform for the Operator to dismount.
- For uphill travel, extend the boom and half full bucket forward and for downhill travel bring the boom and empty bucket in close, to maximize stability and traction.
- When descending a slope, use the same (low) gear range required to climb it.
- When parking an excavator, the bucket should be placed on the ground.

14.5 Pipelayers

- A thorough analysis of the lifting capacities of the Pipelayers should be completed to verify the operation of the equipment on the slopes.
- Choose the shortest boom available to accomplish the task.

- Carry the load as low as safely possible to the ground. Make every effort to control the load. The load should be attached to a winch tractor to prevent the load from cantilevering downhill. During the lift and lay process, keep loads on the Pipelayers below the maximum allowable loads.
    - Note: Per ASME 30.14B, 85% of the maximum tipping load on the side boom is the maximum limit, however, steep slopes often require adjustments down from this maximum.
- Under no circumstances should Pipelayer Operators get off their machine while under an active load being worked on by employees on the ground. When parking a Pipelayer, weight should be positioned uphill.

14.6 Rigging

- Rigging should not be allowed to dig into the ground. If this occurs, immediately inspect the rigging for damage and/or take out of service.
- Rigging should not be used for lifting/hoisting after it is used for towing. Rigging Equipment:
    - Should have permanently affixed and legible identification markings that indicate the manufacturer recommended safe working load.
    - Should not have loads that exceed its safe working limits.
    - Wire rope, nylon slings, etc. should never be tied in knots.
    - If wire rope is kinked in any way or if the diameter of the rope changes, do not use it.

15.0 EMERGENCY RESPONSE PLAN

15.1 Steep Slope Emergency Procedures

LSLP has developed a Site Specific Emergency Response Plan in order to manage all types of emergency on the project. However, specific considerations must be considered in order to be well prepared in the event an emergency occurs while working on a steep slope. The following procedures are to be followed when working in steep slopes:

15.1.1 Equipment breakdown, precarious situations ,and upset conditions

- Stay calm – To respond effectively you need to proceed rationally.
- Do not jeopardize your own safety. Your example can influence others and thereby aid the emergency response.
- Assess the situation – What is the problem or emergency? What has happened, and what will continue to happen if no action is taken?
- Identify the cause that must be controlled to eliminate immediate, ongoing, or further danger.
- What are the possible courses of action? Which ones have the greatest likelihood of success? What are the risks and dangers associated with those actions?

    - Establish radio contact with your supervisor or on-site contact.
    - Identify your location; explain the situation, request assistance.
    - Await their recommendations / direction. Do as they say.

15.1.2 Equipment Breakdown on Steep Slopes

- Completing repairs while a machine is on a steep slope poses significant hazards and risks. If it is not possible to move the machine to stable location, take the following steps.
- Before exiting, ensure the machine is stable. If the machine feels unstable, and it is safe to do so, lower boom / blade / attachments and release loads to increase stability.
- Survey the area for hazards – danger trees, debris, partially cut trees, unstable logs, etc.
- Engage and confirm lockout procedures before undertaking any checks or repairs.
- Conduct only those repairs necessary to allow moving the machine to a flat site.

15.1.3 Precarious Positions – Nearly Upset Condition

- Evaluate the situation. Will releasing the load improve or reduce machine stability? Will raising or lowering the blade / boom / attachments increase or decrease the likelihood of incurring a rollover?
- Conduct any / all movements and operate controls smoothly and precisely.
- Stay in the cab – exiting the cab may upset the balance, or you may injure yourself as you jump, or inadvertently to a location onto which the unbalanced machine then rolls.
- If your assessment determines the least risk option is to exit the cab, first survey the area for hazards – uneven ground, debris, unstable logs, etc. Communicate your plan before exiting.

15.1.4 Machine in Upset Condition

- Stay in the cab. Heavy equipment sometimes comes to rest in delicately balanced conditions. Getting out may upset that balance and expose you to further harm.
- Secure yourself against further injury, should further machine movement occur.
- Wait for assistance to arrive.
- If your assessment rationally determines that further machine movement is likely and will result in greater injury to you, survey the area for hazards before exiting.

15.2 Additional Site-Specific Emergency Response Procedures

In addition to the above emergency response procedures, site specific emergency response procedures will be developed as required as part of the Steep Slope Work Plans, for the management of the following based on the field risk assessment:

- High angle rescue protocol
- Medevac helicopter extraction
- Tracked personnel carrier
- Forestry-specific processes
- Preparedness drills
- Response protocol for personnel injuries on the hazardous slope or any areas with difficult access

All heavy equipment used on slope work must have two exits that open from the inside and outside without the use of tools. The equipment must have on board tools that can be used by the operator to self-rescue if needed.

Escape routes must be identified and communicated to all crew members.

High-angle rescue, when required shall be accomplished by trained professionals.

No unnecessary ground personnel shall be allowed on the slope or near the operation when equipment is moving, or winch lines/rigging are under load. Only identify essential personnel that should be working on hazardous slopes.

Steep slope supervisor shall communicate and train their crew on the Steep Slope Work Plan and Emergency Response Plan.

15.3 Mock Drill

Mock drills on steep slope emergency response plan will be conducted at a minimum Quarterly to test the preparedness of the steep slope crews and emergency support personnel. These mock drills will be documented using LSLP mock drill documents found on the Project Specific Safety Plan. Corrective actions from mock drills will be developed and implemented to ensure continuous improvement.

16.0 VISITOR MANAGEMENT PROTOCOL

Due to the hazardous nature of Steep Slope work, visitors will be restricted from gaining access into the work area. Only essential visitors will be granted access into the work area by the Steep Slope Supervisor. All visitors must complete, the visitor orientation including watching the TMEP visitor orientation, and reviewing all applicable safety documentation prior to accessing the work site.

17.0 MANAGEMENT OF CHANGE PROTOCOL

Changes to this Steep Slope Safety Plan and subsequent steep slope plans and associated drawing may be made in accordance with the PSSP MOC procedure. Should LSLP identify the need for an MOC, the reason and justification will be documented for the change as well as the wording of any proposed standard or specification and submit to TMEP for consideration.

Information to be submitted with the MOC:

- Reason for change
- Authority for approving the change
- Analysis of implications created by the change
- Acquisition of required work permits required to conduct the change
- Documentation of the change process
- Communication of change to affected parts of the organization
- Time limitations
- Qualification and training of personnel affected by the change

18.0 REFERENCES

(1) TMEP HSMP Section 58 Steep Slope. Doc # 01-13283-GG-0000-HS-PLN-0001. (November 2019 updated May 2020)

(2) TMEP HSMP Appendix G Steep Slope Work Plan Minimum Content Criteria. Doc # 01-13283-GG-0000-HS-PLN-0001. (November 2019)

(3) LSLP PSSP. Doc # 01-13283-SG-M000-PL-HSE-0001 (May 2019)

(4) Ledcor Practical Competency Assessment. Doc # LED-LEG-OC-SP-00. (December 2019)

(5) INGAA Construction Safety Consensus Guidelines Hazardous Slope Construction Rev 0 (January 2019)

(6) CGL Steep Slope Best Practices. CGL4703-CGP-SA-GL-0003 (August 2019)

(7) Energy Safety Canada Competency Management Systems – A Program Development Guide –Edition 2

(8) WorkSafe BC OHS Regulation Part 26, Section 26.16 – Slope Limitations

(9) BC Forest Safety Council Hazardous Slope Resource Package (April 2013)

(10) ASME B30.9 Slings

(11) ASME B30.14 Side Boom Tractor

APPENDIX A - SPREAD 3 & 4A STEEP SLOPE LOCATIONS REQUIRING ANCHORING

Crew Assignment	From	To	Total Length (m)	Length < 21 Deg. (m)	Length 21 - 24.99 Deg. (m)	Length 25 - 30 Deg. (m)	30 + Deg. (m)
Steep Slope	497+226	497+497	271	251	5	0	15
Steep Slope	500+265	500+625	360	195	55	45	65
Steep Slope	502+199	502+347	148	148	0	0	0
Steep Slope	524+930	525+213	283	218	10	50	5
Steep Slope	536+090	536+278	188	123	5	20	40
Steep Slope	552+200	552+515	315	245	10	20	40
Steep Slope	557+600	558+083	483	423	25	20	15
Steep Slope	563+798	564+110	312	262	10	20	20
Steep Slope	567+115	567+829	714	589	25	30	70
Steep Slope	572+078	572+189	111	91	5	10	5
Steep Slope	579+400	580+100	700	670	20	5	5
Steep Slope	582+240	582+400	160	130	30	0	0
Steep Slope	589+457	589+915	458	303	70	20	65
Steep Slope	592+400	592+550	150	150	0	0	0
Steep Slope	595+450	595+650	200	200	0	0	0
Steep Slope	595+950	596+184	234	199	30	5	0
Steep Slope	601+560	601+850	290	255	35	0	0
Steep Slope	630+401	630+757	356	331	20	5	0

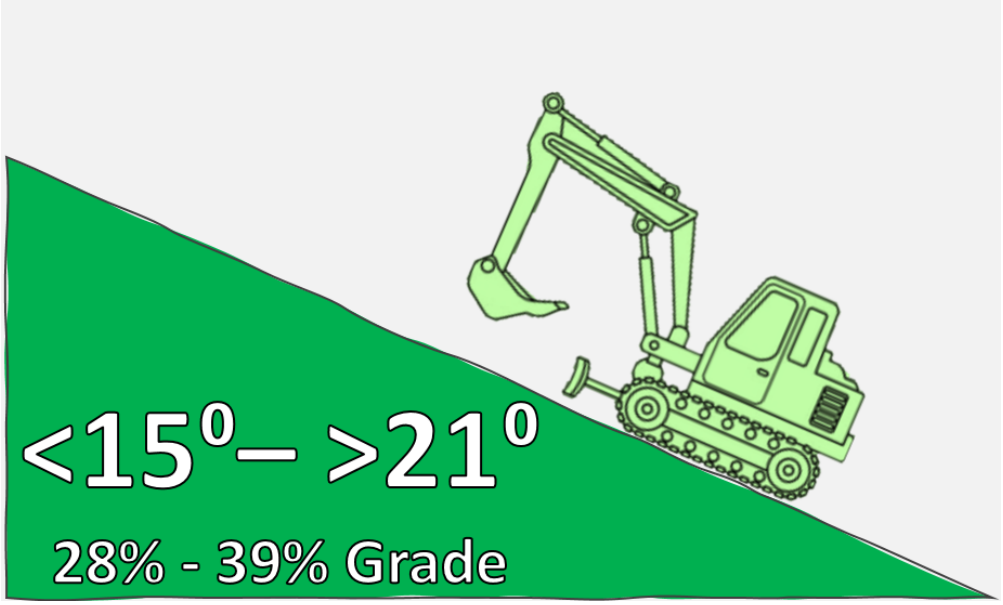
APPENDIX B – SIGNAGE TEMPLATES

DANGER

CLASS A RESTRICTED STEEP SLOPE

SLOPE ID: _____

SLOPE ANGLE: _____°



Do not proceed without reviewing the Steep Slope Work Plan

Use typical engineer drawing for anchoring as required.

Special Precautions:

_____

_____

_____

_____

_____

_____

_____

_____

_____

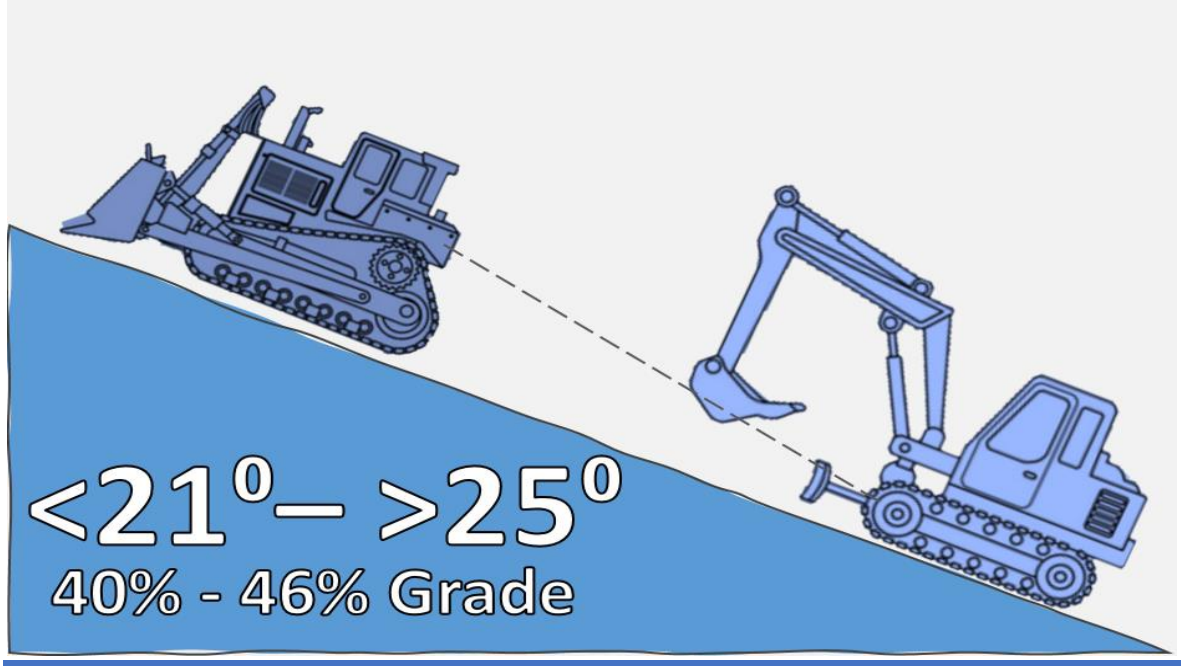
Contact # _____ **Radio:** _____

DANGER

CLASS B RESTRICTED STEEP SLOPE

SLOPE ID: _____

SLOPE ANGLE: _____°



Do not proceed without reviewing the Steep Slope Work Plan
Anchoring is mandatory
Use of typical engineer drawing for anchoring.

Follow hazard/risk assessment

Special Precautions:

_____

_____

_____

_____

_____

_____

_____

_____

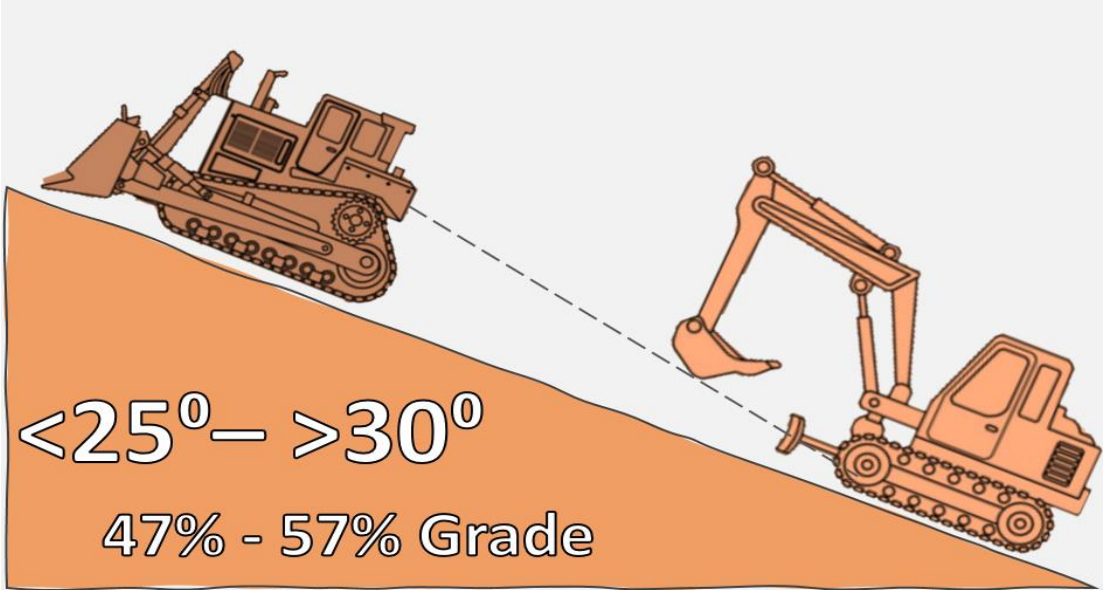
Contact # _____ **Radio:** _____

DANGER

CLASS C RESCTRICTED STEEP SLOPE

SLOPE ID: _____

SLOPE ANGLE : _____°



Do not proceed without reviewing the Steep Slope Work Plan
Anchoring is mandatory
Site-specific engineer drawing required for anchoring.

Follow Engineer hazard/risk assessment

Special Precautions:

_____
_____
_____
_____
_____
_____
_____
_____

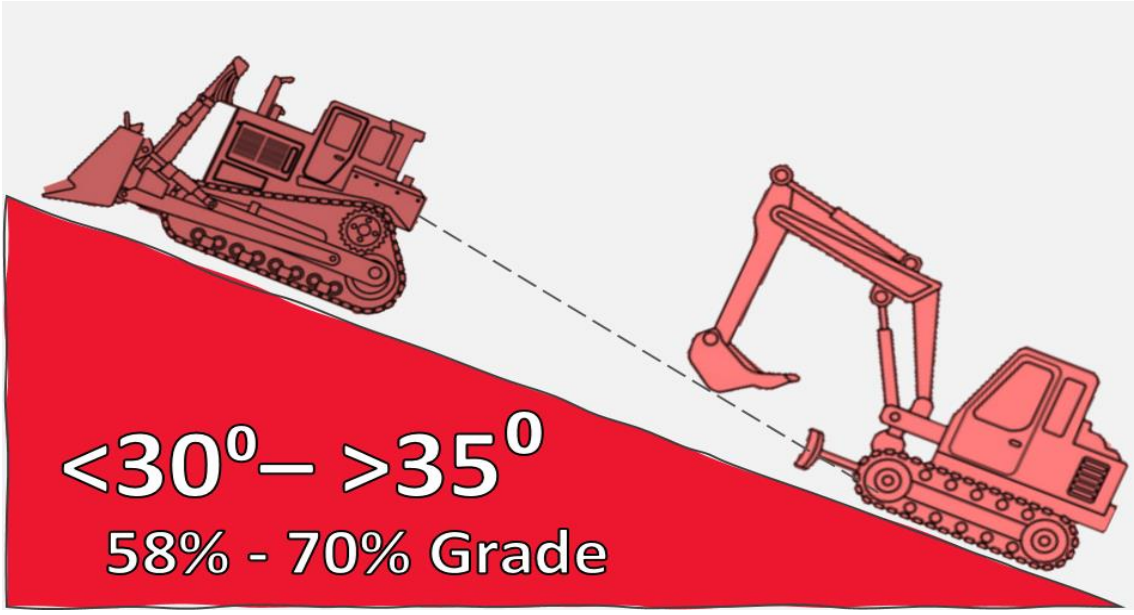
Contact # _____ **Radio:** _____

DANGER

CLASS D RESCTRICTED STEEP SLOPE

SLOPE ID: _____

SLOPE ANGLE : _____°



Do not proceed without reviewing the Steep Slope Work Plan
Anchoring is mandatory
Site-specific engineer drawing required for anchoring.

Follow Engineer hazard/risk assessment

No wheeled equipment

Special Precautions:

_____

_____

_____

_____

_____

_____

_____

_____

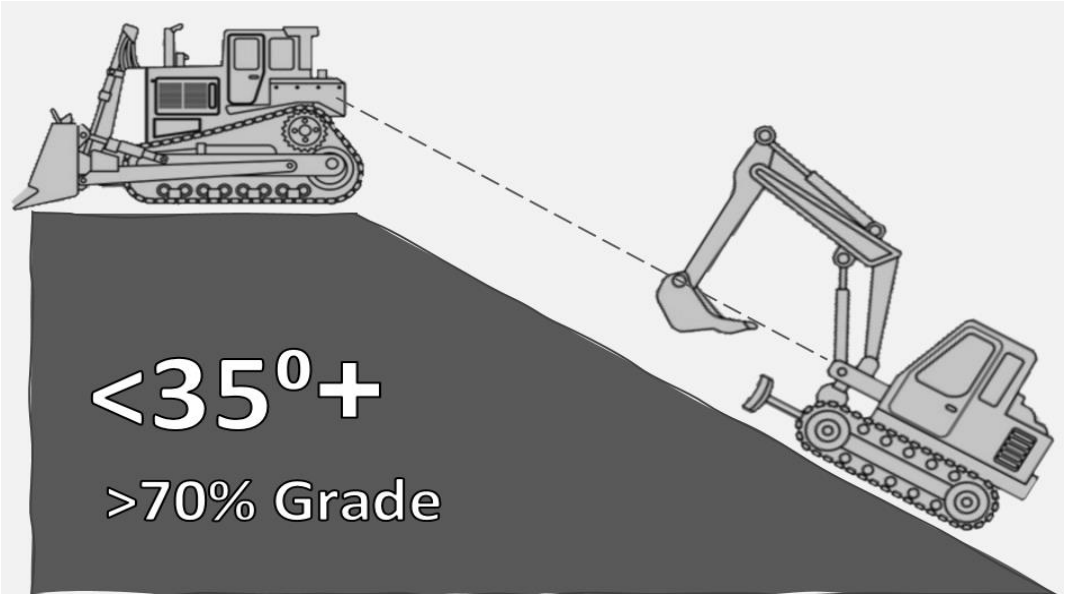
Contact # _____ **Radio:** _____

DANGER

CLASS E RESTRICTED STEEP SLOPE

SLOPE ID: _____

SLOPE ANGLE: _____°



Do not proceed without reviewing the Site Specific Steep Slope Work Plan

Follow Engineer hazard/risk assessment
Static anchoring is mandatory
Site-specific engineer drawing required for anchoring.

No wheeled equipment permitted

Special Precautions:

_____
_____
_____
_____
_____
_____

Contact # _____ **Radio:** _____

APPENDIX C – STEEP SLOPE PLAN DAILY CHECKLIST

Steep Slope Pre-Work Daily Checklist

Date: _____ Steep Slope ID _____

Steep Slope Supervisor: _____ Slope Class _____

	Yes	N/A	No
Have the ground conditions of the slope been assessed?(frozen ground,loose gravel or blast rock, frozen springs)? TYPE OF GROUND: _____			
Has a tailgate meeting been held, J.H.A been reviewed and an F.L.H.A been completed identifying hazards and adequate mitigation measures?			
Has a clear form of communication been developed between ground personnel And operators? Such as hand signals, radio communication?			
Have all operators been evaluated for the equipment they will be operating and certification on site?			
Have all operators completed a thorough pre-use inspection of their machine Including ice lugs on the track (corks. worn or missing) booms, excavators, dozers?			
Has the weight of the pipe section been determined and enough lifting power Been provided to complete the task safely?			
Has all rigging, lifting, tension points been inspected (Winch cable, Tic off/ Anchor)?			
Have the tractors hooked up to allow even weight distribution within the equipment lift capacity?			
Any work activities to take place down the slope while the equipment are on the hill? Activities: _____			
Are other crews in the line of fire or affected by the steep slope activities?			
Are all personnel comfortable with the task assigned to them?			
Are all personnel clear of their roles and understand the work scope?			

Name	Signature	Name	Signature

APPENDIX D – STEEP SLOPE WORKER COMPETENCY DECLARATION FORM

Steep Slope Competency Declaration

(Completed by Steep Slope Supervisor, to supplement applicable job specific training and mentorship)

NOTE: Workers must be assessed and deemed competent to work on steep slopes prior to being able to work without a mentor).

Worker's Name	Class of steep slope assessed on (A, B, C, D, E)
(print)	(print)

	Worker Knowledge Discussion		Needs Work	Proficient	Exceeds
1	Worker Understanding of Hazardous Slope Work Plan Requirements and Controls	1. Can describe Slope classification types and required controls needed (Review Plan, Acknowledge JHA, etc.)	1	2	3
		2. Knows when a slope should be reassessed and decision made to stop/ seek guidance (ground conditions, weather, workers below)	1	2	3
		3. Understand and takes the necessary steps to arrive to work fit for duty every day.	1	2	3
		4. Understand that work on steep slopes shall always be performed under the supervision of the qualified steep slope supervisor.	1	2	3
		5. Understand that rigging on steep slopes shall always be performed under the supervision of the qualified rigging supervisor.	1	2	3
		6. Knows that workers shall never position oneself down from active steep slope operations.	1	2	3
		7. Knows that only necessary personnel shall be allowed on the slope or near the operation when equipment is moving, or winch lines/rigging are under load.	1	2	3
		8. Knows communication protocols and radio channels being used on steep slopes.	1	2	3
		9. Understand Emergency Response Plan and role in the emergency response.	1	2	3

NOTE: Only those operators achieving a score of 2 and above in every category are permitted to operate heavy equipment on the slope.

IMPORTANT: All steep slope workers must review the applicable steep slope documentation (Steep Slope Work Plan, Job Hazard Assessment, Emergency Response Plan, Communication protocols) prior to being deemed competent to work on a steep slope.

Comments, recommendations, or future assessment needed?		
Permitted to Progress	**Yes**	**No**

Worker Pipeline Experience (# of Years / Months)		Supervisory Experience (years / months)	
Pipeline Construction	Steep Slope Pipeline Construction	Pipeline Construction	Steep Slope Pipeline Construction
(Print)	(Print)	(Print)	(Print)

Worker	
Print Name:	**Signature:**
Date:	

Supervisor	
Print Name:	**Signature:**
Date:	

APPENDIX E – STEEP SLOPE EQUIPMENT COMPETENCY DECLARATION FORM

Steep Slope Competency Declaration

(Completed by Supervisor, to be used in conjunction with Practical Assessment Form)

NOTE: Operators are to be assessed on a 5° to 15° or Class Grey slope.

Operator Name	Equipment used for Assessment
(print)	(print)

	Observed Operation	Grading Observation	Grading (circle one)		
1	Take machine up and down slope	1. Machine tracked up slope, blade high, high speed. Overconfident or lack of confidence. Travels up slope with lots of lateral movement (back and forth) 2. Machine tracked in high speed or less controlled manner e.g. jerky but blade in at right height. Confident 3. Machine tracked at low speed with blade at right height. Stays within minimal deviations. Very confident	**1**	**2**	**3**
2	Stimulated Grading and Stacking	1. Rough ground, inconsistent ground surface, jerky movement 2. Semi consistent ground, inconsistent blade movement, lacking in confidence 3. Level ground, consistent surface, clean smooth surface	**1**	**2**	**3**
	Operator Knowledge Discussion		**Needs Work**	**Proficient**	**Exceeds**
3	Operator Understanding of Hazardous Slope Work Plan Requirements and Controls	1. Can describe Slope classification types and required controls needed (Review Plan, Acknowledge JHA, etc.)	1	2	3
		2. Knows when a slope should be reassessed and decision made to stop/ seek guidance (ground conditions, weather, workers below)	1	2	3
		3. Communication procedures for normal operation	1	2	3
		4. Communication procedures for Emergency Response	1	2	3
		5. Rigging/ Winching procedures that must be followed	1	2	3

NOTE: Only those operators achieving a score of 2 and above in every category are permitted to operate heavy equipment on the slope.

IMPORTANT: All operators must first be deemed competent in basic equipment operation for this machine type through the Practical Competency Assessment process. The operator CANNOT be deemed competent for steep slope operations without evidence of having been first declared competent in basic equipment operation of this machine type. A copy of the Practical Competency Assessment form must be kept with this Steep Slope Competency Declaration Assessment.

Comments, recommendations, or future assessment needed?		
Permitted to Progress	**Yes**	**No**

Additional Training Completed, Certificates Held

Operator Pipeline Experience (# of Years / Months)		Supervisory Experience (years / months)	
Pipeline Construction	Steep Slope Pipeline Construction	Pipeline Construction	Steep Slope Pipeline Construction
(Print)	(Print)	(Print)	(Print)

Operator	
Print Name:	**Signature:**
Date:	

Supervisor	
Print Name:	**Signature:**
Date:	

APPENDIX F – EQUIPMENT PRACTICAL COMPETENCY ASSESSMENT FORM EXAMPLE

OPERATOR COMPETENCY ASSESSMENT

Dozer

ASSESSMENT TYPE		
☐ Competency Evaluation	☐ Follow Up Evaluation	☐ Maintenance Evaluation*

*Not all tasks listed apply to Maintenance evaluations. Tasks that DO NOT APPLY to maintenance assessments will be followed by ***.

OPERATOR INFO			
Operator Name (as per pay stub)	**Employee #**	**Business Unit #**	**Project #**

STATEMENT OF ASSESSMENT (To be completed by Competent Assessor)		
The above Operator has demonstrated the Ledcor minimum competency on the following equipment: ☐ Yes ☐ No (Please state why in the "Overall Comments" section below)		
Equipment Type	**Make & Model (if required by BU)**	**Assessment Date (MM/DD/YY)**
Dozer		
Overall Comments (Including any recommendations for further training.)		

DECLARATION OF EXPERIENCE	Hours
Operator declares the following hours of experience working on this type of equipment. *(1 year full-time is equal to 2,000 hours)*	

SIGNATURES		
	Print Name	**Signature**
Operator		
Competent Assessor		
Supervisor		

Submit completed document to training@ledcor.com for entry into Blue.

RESPONSIBILITIES

Operators

- ✓ It is the Operator's responsibility to ensure understanding of all requirements prior to the assessment. If the Operator does not understand or feel able to complete the assessment, it is his/her responsibility to ask for assistance BEFORE being assessed.
- ✓ An Operator is assessed as competent after demonstrating and meeting the MINIMUM requirements for safely operating equipment alone. Operators may require further training and assessments to further their knowledge and skills. Operators must contact their Supervisor to arrange training for any new tasks.
- ✓ Operators MUST NOT operate any equipment on which they have not been assessed as Competent.

Competent Assessors

- ✓ Competent Assessors must provide a copy of this document to Operators in advance of or on the first day of assessing, to ensure that Operators have a solid understanding of the expectations required.
- ✓ Competent Assessors must ensure that Operators receive appropriate training, coaching and / or instruction on any and all criteria listed in this document.
- ✓ Competent Assessors must complete the assessment based on the criteria listed in this document. If the Operator cannot adequately and safely demonstrate the competencies outlined in this document, then they MUST NOT be signed off as Competent and MUST NOT operate the equipment alone.

DEMONSTRATE SAFETY AWARENESS

1. Site Safety Operation

Yes N/A

| ☐ | ☐ | Obtains and is aware of the information required to operate safely before proceeding to the equipment.

- Attend daily tailgate / toolbox meeting.
- Obtain all job specific information that may affect work tasks (hazards, ground conditions, changes to traffic, dig maps, etc.).
- Demonstrate FLHA (Field Level Hazard Awareness) and describe JHA (Job Hazard Assessment) safety tools.
- Complete any other required safety and risk management tools, SWP's, SOPs, etc.

2. Standard Work Practices

Yes N/A

| ☐ | ☐ | Explains site operation rules and traffic regulations.

- Explain site-specific equipment procedures. ***
- Explain site-specific travelling distance between vehicles, spotting distance.
- Demonstrate knowledge of traffic regulations.
  - ✓ If running on public roadway, explain provincial, state and/or federal requirements.
  - ✓ If running on site, explain site-specific requirements.

3. Personal Protective Equipment (PPE)

Yes N/A

| ☐ | ☐ | Is properly equipped for the task.

- Hard hat
- Safety glasses
- Approved safety footwear
- Hearing protection
- High visibility vest
- Gloves
- Site and task specific

4. General Safety Awareness

Yes N/A

| ☐ | ☐ | Demonstrates safety awareness of equipment and personnel.

- Explain minimum front / side clearance required to see personnel / other equipment (blind spots).
- Explain location of alternate / emergency exit.
- Demonstrate thorough geographical understanding of the site. ***
- Demonstrate understanding of "Stop and Think".
- Demonstrate understanding of hazards and practices around access / egress of equipment.
- Explain the hazards of stored energy systems (e.g. hydraulic, air, electric, gravity, etc.).
- Understand when spotting is required.
- Explain appropriate interactions with support equipment. ***
- Demonstrate awareness of vicinity of ground personnel.
- Explain when lockout / tag out is required.
- Explain safe limit of approach distances.

Section Comments:

WALK-AROUND & PRE-START CHECKLIST

5. Equipment Limits

Yes N/A

| ☐ | ☐ | Explains how equipment clearances and limitations can affect operation.

- Explain manufacturer's specifications regarding operating equipment beyond designed capabilities in order to prevent excessive heating, wear, component damage, and risk of injury to operator and others.

6. Cold Weather Practices

Yes N/A

| ☐ | ☐ | Explains correct procedures for starting, warming up, and shutting down equipment in cold weather conditions.

| ☐ | ☐ | Explains or demonstrates correct use of auxiliary heaters (if equipped).

Note: Auxiliary heaters may be fuel-fired or electric, and perform a variety of warming tasks for various components, including cab, coolant, hydraulic oil, battery, etc..

- Follow equipment's Operation and Maintenance Manual (OMM) instructions for warming up engine and hydraulics; ensuring it warms up to operating temperature before moving/using unit..
- Follow auxiliary heating unit's OMM for correct operation of auxiliary heating unit (if equipped).
- Upon starting engine, disconnect or turn off auxiliary heating unit(s).
- At shut down, plug in and/or start auxiliary heating unit(s), following OMM instructions, and ensure that unit is working correctly; including setting timer, if required.

7. Approaching the Equipment

Yes N/A

| ☐ | ☐ | Explains the preparation steps required before inspecting the equipment, including the inspection of the work area and *use of eyes*.

- Ensure area is safe to perform pre-start check before performing a walk around.
  - ✓ Visually inspect the work area for cables, drains, obstructions, markers, rough / soft ground, and overhead hazards.

- ✓ Visually inspect that the area is clear of personnel, other vehicles and equipment.
- Claim equipment (site-specific).
- Face the equipment when mounting / dismounting, maintaining minimum three-point contact.
- Demonstrate use of eyes to ensure awareness of surroundings.
- Ensure there is no waste or debris on or in the operator cab, steps, and windows.

8. Pre-Start Checklist (Visual Inspection)

Yes N/A

| ☐ | ☐ | Completes the Pre-Operation Inspection Checklist and demonstrates knowledge of the location and operation of the major components of this equipment. Follows all site rules for pre-start checklist inspection. Site will determine which items listed below may or may not apply.

Note:

- ✓ Ensure that the equipment is isolated and safe out.
- ✓ Move systematically around equipment.
- ✓ Face towards the equipment when mounting / dismounting, maintaining minimum three-point contact.
- ✓ Check that safety / warning decals are clean and legible.
- ✓ Be sure to refer to all applicable safe work practices (SWPs).

Reference: These are visual inspections. Follow site rules.

- General Condition
  - ✓ Assess overall condition of the unit.
  - ✓ Check for damage, leaking fluids or sagging parts.
- Fire Extinguisher(s)
  - ✓ Check fire extinguisher(s) are charged, pins and covers in place, and date stamped.
- Body / Frame
  - ✓ Look for cracks, damage, excessive dirt, and wear.
- ROPS / FOPS
  - ✓ Check for damage (e.g. loose bolts and cracks) and securement.
  - ✓ Check rubber inserts for damage.
- Engine Compartment
  - ✓ Check turbo clamps are in place and oil lines are secure.
  - ✓ Check air intake system - filters, connections and clamps are in place, secure, and in working condition.
  - ✓ Lubrication: Check filters, lines, and oil levels.
  - ✓ Check electrical system.
- Cooling System & After Cooler
  - ✓ Check radiator(s) condition (clean, coolant level).
  - ✓ Check fan, shroud, and belts.
  - ✓ Ensure clamps are in place and secure.
  - ✓ Ensure systems are clean.
- Fuel System
  - ✓ Check that lines, filters, and tank mounts are tight and secure.
  - ✓ Check fuel level.
  - ✓ Check fuel cap is secure.
- Exhaust System
  - ✓ Check that pipes are tight and clamps are in place.
  - ✓ Check regeneration system (if equipped).

- Hydraulic System
  - ✓ Ensure tank mounts are secure.
  - ✓ Check oil level.
  - ✓ Ensure hoses are tight.
  - ✓ Cylinders, check mounts are secure and keepers in place.
  - ✓ Check oil cooler.
  - ✓ Check oil level.
  - ✓ Check hydrostatic drive system.
- Drive Train / Transmission
  - ✓ Check oil levels.
  - ✓ Check lines and cooler.
- Blade Assembly, Push Arms & C-Frame
  - ✓ Check face condition
  - ✓ Check edges, corner bits and bolts.
  - ✓ Check hydraulic cylinders, mounts, lines, and connectors for leaks and security.
  - ✓ Check stabilizer assembly.
  - ✓ Check push arm, trunnion, and cap / bolts.
  - ✓ Check tilt cylinder(s).
- Track & Track Frame
  - ✓ Check rails, pads, and bolts are in place and secure.
  - ✓ Check master link.
  - ✓ Check carrier rollers for damage.
  - ✓ Check rollers, mounts, caps, bolts, and guides are secure and in working condition.
  - ✓ Check idlers and bushings for damage.
  - ✓ Check bogie cartridge for oil leaks and bushing damage (if equipped).
  - ✓ Check final drive and sprocket segments for damage and bolts in place and secure.
  - ✓ Check for leaks.
  - ✓ Check track tension.
- Underside Equipment
  - ✓ Check for loose or missing bolts.
  - ✓ Check belly pans are secure.
  - ✓ Check inside roller caps and bolts are secure.
- Pivot Shaft
  - ✓ Check for leaks and damage.
- Equalizer
  - ✓ Check bearing seals for wear and leaks.
- Ripper
  - ✓ Check shank, guard, and tooth.
  - ✓ Check mechanical and hydraulic connections for wear and leaks.
  - ✓ Check hydraulic cylinders, mounts, and hoses for connection and leaks.
  - ✓ Check pins and keepers, and pin puller (if equipped).
- Other Attachments / Implements
- Cab
  - ✓ Ensure all controls and electronic gauges are operational.
  - ✓ Check windows and mirrors for cracks and dirt.
  - ✓ Check horn and backup alarm.
  - ✓ Check seat and seat belt for wear and tear, and expiry date.
  - ✓ Ensure cab is clean of all garbage and debris.
  - ✓ Check doors close securely.

- ✓ Check ROPS – including rubber inserts – for damage and securement.
- Make minor repairs or adjustments (if authorized).
- Provide help for major repairs in the field (if requested).
- Report defects according to site procedures.

Section Comments:

START UP & EQUIPMENT TESTS

9. Communication

Yes N/A

| ☐ | ☐ | Uses proper communications with all personnel while operating equipment. Includes horn, two-way radio, dispatch, and emergency procedures.

- Demonstrate site-specific horn signals.
- Demonstrate communication procedures: operators, loading operators, supervisors, and dispatch.
- Demonstrate or explain two-way radio operation. ***
- Demonstrate professional use of two-way radio etiquette. ***
- Describe proper procedure for communicating emergencies.

10. Prepare to Start Up

Yes N/A

| ☐ | ☐ | Demonstrates pre-start up requirements: seatbelts, doors closed, two-way radio, and hazards are identified.

- Check that the hydraulic lockout is applied.
- Check the work area for hazards.
- Ensure personnel and equipment is clear of the equipment.
- Turn on the two-way radio and confirm operation. ***
- Ensure fire suppression system is active (if equipped).
- Ensure doors are closed and secure.
- Ensure access steps are raised and locked (if equipped).
- Adjust seat, seatbelt, and mirrors.

11. Start Procedure

Yes N/A

| ☐ | ☐ | Demonstrates proper start up procedure.

- Turn the ignition key ON and wait for pre-lube pump to start (if equipped).
- Monitor the electronic monitoring system self-test.
- Check that the directional and control levers are in NEUTRAL.
- Check that hydraulic lockout is engaged.
- Check that park brake is applied.
- Sound one blast of the horn to indicate start up and wait 10 seconds (site-specific).
- Start the equipment using the ignition key and release when the engine starts.
- Check the electronic monitoring system for any system faults.

12. Running Checks

Yes N/A

| ☐ | ☐ | Identifies the location and operation of the main instruments / components and controls. Is able to perform the necessary running checks on these instruments / components and controls.

- Maintain the engine at low idle until the engine oil and hydraulic temperature lamps go out (if equipped).
- Allow the engine to idle for appropriate amount of time.
- Observe all gauges and instruments.
  - ✓ Indicator lights
  - ✓ Gauges
  - ✓ Function Switches
  - ✓ Warning lamps and indicators
  - ✓ Directional controls
  - ✓ Transmission selector lever / park brake lever or switch (if equipped)
  - ✓ Control levers
  - ✓ Emergency shutdown switch
  - ✓ Two-way radio
  - ✓ Manual fire suppression system actuator (if equipped)
  - ✓ Pedals
  - ✓ Throttle control
- Cycle through the controls (e.g. heater, defroster, air, lights, wipers). ***
- Explain how to use the fire suppression system (if equipped).

13. Perform Brake Tests ***

Yes N/A

| ☐ | ☐ | Park

| ☐ | ☐ | Service

- Demonstrate park brake and service brake test processes in accordance with the OMM and site procedures. Refer to OMM for correct procedures.

Section Comments:

PRACTICAL OPERATIONS

14. Smooth Start

Yes N/A

| ☐ | ☐ | Demonstrates how to move off safely and in accordance with site procedures.

- Conduct a final check of all instruments, indicators and warning systems.
- Demonstrate awareness of vicinity of personnel and other obstacles.
- Sound the horn as per site policy, indicating intention to move.
- Wait the required time (e.g. 5 - 10 seconds) as per site before moving.
- Apply the service brake.
- Release the park brake.

- Move the transmission / directional control to desired direction.
- Move the throttle / accelerator until desired engine speed is reached.
- Move the equipment forward.
- Test the directional controls for correct operation while moving off.
- Ensure lights are on at all times (BU-specific).

15. Safe Operation of Equipment

Yes N/A

| ☐ | ☐ | Performs required work task in a safe and capable manner. Monitors work area conditions. Demonstrate awareness, as appropriate, and adheres to all site and safety regulations as required.

- Describe precautions required when operating this unit.
- Identify and explain the location and use of onboard safety equipment.
- Apply the safety rules and regulations applicable to the site where work is conducted.
- Coordinate work with other workers at the work site (e.g. ancillary equipment).
- Monitor instruments and controls, potential hazards with the equipment, and changing conditions.
- Recognize and correct for blind spot limitations, using mirrors, camera, two-way radio, and spotter.
- Monitor ground conditions, berms, and edges.
- Check for overhead hazards and traffic pattern changes.
- Travel forward, whenever possible, to relocate the equipment and use appropriate speed for conditions.
- Follow site rules when travelling on haul roads and remain on the travel surface, unless otherwise instructed.
- Be aware of and drive / operate to changing surface and weather conditions.
- Maintain awareness of other personnel / traffic and equipment in the work area.
- Demonstrate "Stop and Think" ability with an in-equipment example.
- Use transmission, brakes, and throttle to negotiate ramps and uneven surface conditions.
- Follow instructions closely to maximize equipment operation efficiency. ***

16. Reversing

Yes N/A

| ☐ | ☐ | Demonstrates correct reversing techniques in a safe manner, following all site and safety regulations.

- Check surrounding area before reversing.
- Use proper communication with all personnel in the surrounding area before / during reversing.
- Reversing for extended, unnecessary lengths does not occur; move forward as soon as practicable.
- Maintain sight of equipment in the work area.

17. Slow, Stop, and Park

Yes N/A

| ☐ | ☐ | Demonstrates safe slow, stop, and park procedures in accordance with the operator manual and site procedures.

- Select safe or designated parking area clear of walkways, emergency / fire exits, refueling sites and blind corners, ensuring that first move is forward.
- Bring equipment to a complete stop.
- Move the directional controls to NEUTRAL / HOLD and check equipment is stable.
- Apply the park brake.
- Lower all raised implements to the ground.
- Idle down the equipment for appropriate amount of time.
- Switch off the engine.
- Turn off master switch (if equipped).

18. Shut Down and End-of-Shift Walk Around

Yes N/A

| ☐ | ☐ | Performs a proper shut down and end-of-shift walk around.

- Complete proper shut down procedure as per slow, stop and park instructions.
- Complete and communicate work-related reports and information to dispatch or supervisor. ***
- Report hazards and changes in work conditions.
- Perform end of shift walk around inspection. ***
- Ensure clean housekeeping.

Section Comments:

EMERGENCY PROCEDURES

19. Emergency Shut Down Procedure

Yes N/A

| ☐ | ☐ | Explains the steps of a correct emergency shut down procedure.

- Stop the equipment as soon as possible in a safe area.
- Bring the engine speed to idle.
- Lower all raised implements to the ground.
- Place controls in neutral / park position.
- Call Emergency on the two-way radio.
- Turn ignition OFF.
- Leave the equipment when safe to do so.
- Activate the emergency shutdown switch.

20. Contact with Live Electrical Conductor

Yes N/A

| ☐ | ☐ | Explains the suggested practice for contact with a live electrical conductor.

- If safe to do so, break contact with minimal damage between the equipment and electrical source and move a minimum of 10 meters or 33 feet away, park, and shut down.
- If not possible to break contact:
  - ✓ Warn all personnel to stay clear.
  - ✓ Stay in the operator cab until directed to leave.
  - ✓ Do not attempt to touch any electrical conductor.
  - ✓ Do not operate the controls.
  - ✓ Wait until power has been isolated before leaving the equipment, unless directed otherwise by emergency responders or it is no longer safe to remain in the unit.

21. Respond to Rapid Fluid Spill

Yes N/A

| ☐ | ☐ | Explains the suggested practice for handling a rapid fluid spill.

- Stop the equipment as soon as possible in a safe area.
- Bring the engine speed to idle.
- Lower all raised implements to the ground.

- Place controls in neutral / park position.
- Call supervisor or dispatch.
- Turn ignition OFF.
- Use supplied spill kit (if equipped).
- Monitor the spill until assistance arrives.

22. Onboard Fire and Hot Tire

Yes N/A

| ☐ | ☐ | Explains the suggested practice for dealing with an onboard fire or hot tire.

- Onboard Fire
  - ✓ Bring equipment to a stop as quickly as possible.
  - ✓ Place controls in neutral / park position, after lowering implement if situation permits.
  - ✓ Complete emergency shut down of engine.
  - ✓ Use the two-way radio emergency procedure.
  - ✓ Dismount at the safest exit point away from the fire.
  - ✓ Use the hand-held fire extinguisher if trained and it is safe to do so.
  - ✓ Move away from the equipment to a safe location – upwind, when possible
- Hot Tire
  - ✓ Follow hot tire procedure if the smell of burning rubber or smoke is present.
  - ✓ Park the equipment in a safe or designated area with tire facing away from the infrastructure and other equipment (if possible).
  - ✓ Call on two-way radio if emergency permits or another operator will do so from a safer location.
  - ✓ Turn off equipment.
  - ✓ Dismount at the safest exit point away from the tire, and evacuate the area.
  - ✓ Do not attempt to extinguish fire.
  - ✓ Do not introduce more oxygen to the tire.

Section Comments:

COMMENTS & OBSERVATIONS

Possible Observations During Assessment:

- Clean up
- Winching
- Stockpiling
- Road, Ramp or Pad Construction
- Cut & Fill
- Benching
- Spreading
- Stripping
- Sloping
- Ripping
- Truck spotting

Section Comments:

APPENDIX G –STEEP SLOPE WORK PLAN MINIMUM CONTENT

Purpose

Description of scope of work

Slope Number and KP Notation

High level methodology - high level description of planned methodology for execution, further detailed as required by this criteria document

Key roles and responsibilities

Listing of all applicable regulatory body requirements / sections

Listing of all applicable Health and Safety documents that will be present and available for viewing by workers on site at all times

List of required signage

Timeline to complete scope of work

Hazard Assessment Protocol

Environment Assessment Details

Detailed parameters of each steep slope

All procedures must include

- Step by step procedure indicating how each activity will take place
- Procedures shall consider the following at a minimum:
- Gradient (in degrees) of slope
- Length of slope
- Potential / anticipated ground conditions
- Roughness of terrain or surface
- Mounted equipment (e.g. winch etc.)
- Required operating technique
- Type of surface: rock, soft clay, frozen surface, etc.
- Shall be supplemented as required by supplementary documents

Activity specific procedures (minimum required)

- Clearing
- Topsoil Stripping
- Blasting (Include a sample daily blast plan which includes time of blast, location of blast, number of holes to be blasted, average hole depth, quantity of explosives to be used, and planned tie-in methods.
- Grading
- Barrier placement (as applicable)
- Stringing
- Trenching
- Welding
- Coating
- Lowering-in
- Breaker installation

- Backfill
- Any other activities that will be undertaken on steep slopes

Communication plan (Signal, 2-way Radios channel)

Security Plan – applicable to specific steep slope covered

Specific Steep Slope Emergency Response Plan

- Site muster point and meeting point
- Worker extraction plan
- High angle rescue protocol and procedure
- Medevac helicopter extraction (if necessary)
- First Aid/CPR response and personnel plan
- Simulation protocol

Supplementary documents:

- Hazard Assessment
- Relevant engineered drawings including but not limited to:
- Related to the specific steep slope(s) covered within the steep slope safe work plan
- Operation detail drawings – for all winching, tethering, anchoring operations
- Equipment specific detail, such as make, model, and series indicating specifically which equipment the detail drawing covers
- All rigging to be utilized
- Plan and cross section views as required to clearly depict attachment points and rigging methods
- Indication of cable diameters, as well as all specific rigging for operations
- Force Calculations
- Equipment make, model, and weight information
- Weight of load to be added to equipment weight
- Winch cable diameter(s), capacity and associated rigging
- Slope in degrees
- Friction coefficient used in calculations
- Safety factor applied to operations including rigging
- Contrasting friction force on working equipment
- Anchor force available to contrast working equipment weight
- Component weights of equipment
- Provide worst case scenario forces that all cables, rigging, and equipment attachment points will be subjected to include all relevant force calculations and assumptions (coefficient of friction, etc.), based on known and accurate equipment weights.
- Calculations shall be based on gross machine weights
- Provide the equation(s) and any other factors used to determine forces
- List all assumptions

Winching, tethering, anchoring detail

- Detailed description of methods to be employed. Provide anchor capability (force) information for the specific equipment, position, environment, and slope.

- Force calculations - provide the forces that all cables, rigging, and equipment attachment points will be subjected to. Include all relevant force calculations and assumptions (coefficient of friction, etc.), based on known and accurate equipment weights.
  - Provide drawings.
  - PDF
  - Ledger / Tabloid size

Rigging

- Detailed listing of ALL rigging and method of application with drawings as required, specific to each steep slope encountered.
- Description of method of protection / storage for rigging.
- Complete rigging inspection criteria and procedure for inspection of all rigging

Profile drawing

- Pre-grade and post grade
- PDF
- Large size
- Ledger / Tabloid size

Sequencing drawings / detail

- PDF
- Ledger / Tabloid size

Rigging and method of application drawings (can be part of force calculation drawing)

- PDF
- Ledger / Tabloid size

All other drawings as required to clearly depict the operation to be undertaken

- PDF
- Ledger / Tabloid size

Equipment brake test procedures (where applicable to equipment type)

Equipment List – All equipment to be used on slope(s)

Equipment Specifications

- Require make, model, series, and manufacturer's serial number (optional) of all equipment to be used on the slope(s).
- Specifications (brochures or spec sheets with data such as weight, ground pressure, track widths, etc.) for each type of equipment to be used on the steep slope(s). Specifications shall be the make, model, and series specific and shall relate to the manufacturer's serial number for the equipment actually being used.
- Maximum slope gradient capabilities of all equipment to be deployed to steep slope(s) shall be stated. A copy of the source of this information (e.g. equipment manufacturer) shall be included.

- Copies of all wire rope specifications including date of installation (e.g. diameter, working load limit etc.)
- Only equipment where the required information has been provided shall be used in steep slope operations.

Attachment Points

- Detail on all attachment point capacity, including copies of the source(s) of this information shall be provided and shall include any qualifications to capacities (such as those from manufacturer).
- For all custom-made attachment points, include engineered design documents as well as documents.
- For all custom-made attachment points provide copies of successful NDE testing of the attachment points just prior to initial deployment to the steep slope(s) on the TMEP.

Copies of worker Competency

- Competency declarations for all workers who will be working on steep slope(s) required prior to deployment to the slope.
- Equipment Operators.
- Rigging Supervisor.
- Other workers.

Appendix J – Traffic Management Plan

Trans Mountain Expansion Project

Traffic Management Plan

TMEP Document # 01-13283-SG-M000-PL-PLN-0003 R3

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
E. ANSARI PIRSARAEI
35663
July 7/2020

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	Reviewed by TMEP / Date	Details of Revision	Issue Purpose
3	E. Kibambe 2020-07-04	G. Roda 2020-07-04	M. Granger 2020-07-04	Patrick McTiernan Senior Traffic Manager 2020-07-08	Updated from TMEP & MoTI feedback	Issued for Use
2	E. Kibambe D. Royle 2020-05-27	G. Roda 2020-04-29	M. Grange 2020-04-29		Updated from TMEP & MoTI feedback	Issued for Use
1	E. Kibambe 2018-11-06	G. Roda 2018-11-06	M. Granger 2018-11-06		Updated from TMEP TACMP	Issued for Use

Ledcor Sicim Limited Partnership
Trans Mountain Expansion Project
Traffic Management Plan Update
Spreads 3 & 4A – Rev 3

Prepared For: Ledcor Sicim Limited Partnership

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Allnorth Contact: Elnaz Ansari, P.Eng.

Project Number: 19KM00071

Date: July 04, 2020

CONTENTS

TABLE OF CONCORDANCE

No.	Document	Section	Page	Previous Text	Revised Text	Comment
1	TMP	1.2	12	N/A	The LSLP Traffic Management Plan is prepared in isolation of the other General Contractors for the TMEP Project. The traffic planning and management, within the Spread 3/4A segment, will be conducted in collaboration with the TMEP Traffic Management Team and the TMEP Engineer of Record (EOR), to ensure all the requirements of the BC Traffic Management and Coordination Plan. The TMEP Traffic Management Team will coordinate information from all the General Contractors, to monitor the work activity throughout the project, the impact of traffic control plans and ensure the delay restrictions are met. The site-specific Traffic Control Plans will address the immediate requirements of the traffic access point and the ensure both the safety of the public and worker safety. The daily management of each Traffic Control Plan will provide continuous updates on the effectiveness and impact each site is experiencing. This information will be relayed to the TMEP Traffic Management for execution of the BC Provincial Traffic Management and Coordination Plan to ensure the restrictions around 20-minute delays within the MoTI District and the 60-minute overall Project delay requirements are met.	Included BC Provincial Traffic Management and Coordination Plan

No.	Document	Section	Page	Previous Text	Revised Text	Comment
2	TMP	4.1.3	23	N/A	LSLP will be responsible for winter maintenance within the Right of Way and TMEP Access Roads including but not limited to removal of loose snow, slush, and compact snow and to apply winter abrasive and chemical snow and ice control applications to protect highway users from situations that are unsafe	Added wording to specify that winter maintenance by LSLP is on ROW and TMEP Access Roads. MoTI winter maintenance will be by the road maintenance contractors
3	TMP	4.1.4	24	N/A	LSLP Traffic Control Manager will ensure that there is a sufficient amount of traffic control devices for all working set ups and a stockpile to replace any broken, missing, or malfunctioned equipment.	
4	TMP	5.9	29	Tracked equipment loading and unloading will be completed using mats to protect the surface of the paved roads in the village of Valemount, Blue River, and Regional District Roads.	LSLP anticipates a number of locations where heavy equipment crossings may be required to accommodate the effective movement of machines and inventory over paved roads. These crossings will be impacted by terrain, type of equipment being moved, crossing processes, environment, traffic volumes and other criteria. These heavy equipment crossings will be addressed on an individual basis through a process developed and approved by BC MoTI. That process will ensure the requirements, restrictions and concerns of the Ministry have been addressed and are within acceptable guidelines or directives.	

No.	Document	Section	Page	Previous Text	Revised Text	Comment
5	TMP	5.11	30	N/A	LSLP will take measures to: · Minimize the tracking of mud from vehicles leaving the construction site. Maintain the cleanliness and visibility of all signage through all seasons. · Clear all snow and ice from access. · Perform additional inspections for Signage and TCD is required during weather events such as snow, rain, and wind. Take all appropriate measures as per the governing authority and TMEP.	Added Requirement for Ancillary Traffic Effects as 5.11
6	TMP	6.1.7	37	N/A	LSLP will work with the TMEP to accommodate the requirements of any blasting plans. The geological evaluation of the actual pipeline path has yet to be completed. Currently LSLP has not identified any areas where blasting will be required in close proximity to the highway. Accordingly, any impacts to regular traffic patterns as a result of blasting cannot be established at this time. LSLP is committed however to a protocol of ensuring traffic is not stopped at any location for more than 20 minutes should that consideration materialize. The vehicle queues will be monitored, and timelines adjusted to ensure public safety. Any blasting activity, which might impact the highways will be communicated and coordinated through the TMEP Traffic Management Team. This will permit the appropriate adjustments for other traffic control measures throughout the district. In each case, a Blasting Plan will be developed for the blasting activity. If the blasting will impact highway traffic, in any way, an additional Blasting Traffic Control Plan will be developed to accommodate and	Added details in regard to blasting

No.	Document	Section	Page	Previous Text	Revised Text	Comment
					mitigate any impact on the travelling public.	

No.	Document	Section	Page	Previous Text	Revised Text	Comment
7	TMP	7.3.2	42	Valemount – Slocan Access Road: This site is located east of the Highway 5 at Cedarside Road, and then east on the Slocan Group Sawmill access road along an existing gravel road in Valemount, BC (see Figure 7-1).	This site is located is located to the northwest of the proposed Camp site (VAL028) site. The Valemount stockpile yard site connects to Highway 5 via the Slocan Group Sawmill Access Road, which connects to Cedarside Road just west of its intersection with Highway 5 (opposite to Cranberry Lake Road). Stockpile materials are already present at the site. The Valemount Stockpile site is an 8.0-hectare parcel of level land primarily used for pipe stockpiling during construction of Spread 3 of the TMEP. The Valemount stockpile site is already in use, with pipe suppliers having delivered pipe for storage at the site. Pipe will be loaded onto flat-bed trucks and highway tractors with pole trailers at the site, transported to the spread, then “strung” for installation. Trips associated with picking up pipe from the site and distributing these to the spread will occur cyclically during daylight hours, with little to no clustering of truck trips. The site is proposed to be used for less than a one-year period as the full length of pipe currently stored at the site is transported to the spread for stringing. NOTE: Due to safety concerns related to line of sight limitation following the traffic assessment at intersection of Highway 5 and Whiskey Fill Road, Access from Highway to the Valemount Stockpile yard (VAL025) and worker camp (VAL028) for construction activities will be via Cedarside Road. A turn right sign will be installed at the Worker camp (VAL028) access to force traffic through Cedarside Road	

No.	Document	Section	Page	Previous Text	Revised Text	Comment
8	TMP	7.3.2	43-45	N/A	Note: A high-level sight distance review was conducted with reference to the guidelines set forth in the Transportation Association of Canada's Geometric Design Guide for Canadian Roads (2017). The location of the sight distance review was conducted at the KP Road on Highway 5 south of Vavenby, BC for entering and exiting movements. Exiting Movements " - For movements exiting KP Road to southbound Highway 5, the sightline from the stop-bar on KP Road towards the north on Highway 5 is approximately 165 meters and does NOT provide adequate sightlines for public use and project traffic. The minimum intersection turning sight distance for a 100 km/h posted speed is 320 meters. Site improvements are not available due to the Highway 5 horizontal curvature in the road alignment. The lack of existing sightline does not make the exiting movements from KP Road to southbound Highway 5 safe and is NOT RECOMMENDED for project use. This will be reflected in the site-specific TCP. "- Outbound Right (KP Road to Northbound Highway 5) - For movements exiting KP Road to northbound Highway 5, the sightline from the stop-bar on KP Road towards the south on Highway 5 is approximately 155 meters and does NOT provide adequate sightlines for public use and TMEP traffic due to site vegetation and horizontal highway curvature. The minimum intersection turning sight distance for a 100 km/h posted speed is 320 meters. Site improvements are not available due to the Highway 5 horizontal	

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					curvature in the road alignment. The lack of existing sightlines does not make the exiting movements from KP Road to northbound Highway 5 safe and is not recommended. We must also consider the increasing longitudinal gradient of northbound Highway 5 and the need for longer sightlines for traffic gaining speed on side road access onto the highway. Improvements may be made to remove vegetation along the east side of the MoTI right-of-way and MAY extend the sightlines to an estimated 225 meters. An on-site assessment will need to be conducted to identify the potential gain in sightlines and recommendation addressed in the site-specific TCP. Entering Movements "- Inbound (Northbound) Right Turn from Highway 5 to KP Road – There is an existing northbound right turn lane with an approximate length of 65 meters with the taper, or a full lane width of approximately 20 meters. The existing length of the right-turn lane does not currently meet the minimum requirements for an appropriate deceleration lane but does allow for right-turning vehicles to pull off the highway prior to the slow-moving turning movement. The deceleration lane is also on an increasing gradient and enhances deceleration of the vehicles due to local topography. In consideration of the existing on-highway traffic volumes and the existing right-turning volumes, the risk tolerance is acceptable for background traffic conditions. For TMEP needs, this northbound right-turning movement is to be severely	

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					restricted due to sight conditions, with no large commercial truck movements permitted. This northbound right-turn movement will be restricted to a smaller contingent of TMEP traffic, including passenger vehicle and small trucks with the potential for use of TMEP buses and collapsed pipe trucks. On-site traffic operational conditions will be monitored to ensure the intersection conditions are safe and appropriate with special attention to the northbound right-turn volume. If deemed unsafe based on the TMEP volumes (time of day, total right-turn volumes), additional restrictions will need to be employed including elimination for KP Road for use of collapsed pipe trucks, buses and light commercial vehicles and, if required, reduction in passenger vehicle use. All vehicles will be deferred to use the channelized intersection at Vavenby Bridge Road. These conditions would be reflected in a site specific TCP. "-Inbound (Southbound) Left Turn from Highway 5 to KP Road – Currently, there is no left-turn lane available on Highway 5 and there is a decreasing longitudinal gradient on Highway 5 estimated at – 4.0-6.0%. There is also the horizontal curvature on Highway 5 in this zone and a posted speed of 100 km/h. Should a southbound left turning vehicle be stopped on Highway 5 at KP Road to wait for gaps in traffic, vehicles behind the stopped vehicle (heading southbound) have a sightline at approximately 230 meters; inadequate for a fully loaded commercial truck to identify the hazard and stop	

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					effectively on a decreasing longitudinal gradient. With the host of poor conditions, the appropriate safety considerations are not in-place and the southbound left-turn movement is NOT RECOMMENDED for project use. This will be reflected in the site-specific TCP.	

No.	Document	Section	Page	Previous Text	Revised Text	Comment
9	TMP	7.4.2	47	Valemount Camp (full service): Whiskey Fill Road (see Figure 7-3)	Valemount Worker Camp (VAL028): The Valemount Worker Camp is an area of 14.08 hectares proposed for development out of a total proposed lease area of 17.89 hectares. The site is proposed to serve as both a full-service temporary work camp and parking area. As this will be a full-service work camp, the hours of operations will be 24 hours, seven days a week. The camp will consist of parking spaces and ATCO trailers used as dormitories, kitchens, and recreational rooms. The capacity of the site is proposed as 600 people, with the option to expand capacity to 900. Whiskey Fill Road (see Figure 7-3) NOTE: Due to safety concerns related to line of sight limitation following the traffic assessment at intersection of Highway 5 and Whiskey Fill Road, Access from Highway to the Valemount Stockpile yard (VAL025) and worker camp (VAL028) for construction activities will be via Cedarside Road. A turn right sign will be installed at the Worker camp (VAL028) access to force traffic through Cedarside Road. Off project traffic from camp to town will be permitted on Whiskey Fill Road to minimize traffic on Cedarside Road.	

No.	Document	Section	Page	Previous Text	Revised Text	Comment
10	TMP	7.4.2	48	Blue River Camp (full service): Cedars St. Camp and Murtle Lake Road Camp (See Figures 7-4)	Blue River Camp (BLU007): The Blue River Worker Camp is an area proposed for development out of both a full-service temporary work camp and parking area. As this will be a full-service work camp, the hours of operations will be 24 hours, seven days a week. The camp will consist of parking spaces and ATCO trailers used as dormitories, kitchens, and recreational rooms. The capacity of the site is still to be determined and tentative timeline for camp use is Q1 OF 2021. Location is at Cedars St. Camp and Murtle Lake Road Camp (See Figures 7-4) Note: Use 2 Blue Lake Road access points to the site. Maple St AP3-C-80-2-A may not needed.	
11	TMP	7.4.3	49	Camp construction and use dates are being finalized but will be in place for peak person-hour use during mainline pipeline construction.	Camps construction and use dates for Valemount (VAL028) is July 2020 and for the Blue River Worker camp are being finalized but will be in place for peak person-hour use during mainline pipeline construction and is tentatively as early 2021.	
12	TMP	7.5.2	51	Valemount 17th Avenue site is located off 17th of Highway 5S (Southern Yellowhead) in Valemount, BC across the Highway from the Best Western hotel. The approximately 20.7 ha site is undeveloped requiring some site preparation, granular material and fencing. (see Figure 7-5)	Valemount (VAL 26.1) 17th Avenue site is located off 17th of Highway 5S (Southern Yellowhead) in Valemount, BC across the Highway from the Best Western hotel. The site is currently being developed and will be finalized by July 2020. The site required some site preparation, granular material, and fencing. (see Figure 7-5). Note: Access Point 3-B-22-B is proposed to be built to accommodate traffic into the site from both north and southbound traffic.	

No.	Document	Section	Page	Previous Text	Revised Text	Comment
13	TMP	7.5.2	52	Blue River site is located off of Highway 5, east on Angus Horne Street, and south on Cedar Street in Blue River, BC. The approximately 5.3 ha site is in a level, forested area and may require site preparation and granular material. (see Figure 7-6)	Blue River site is located off of Highway 5, east on Angus Horne Street, and south on Cedar Street in Blue River, BC. The approximately 5.3 ha site is in a level, forested area and may require site preparation and granular material. (see Figure 7-6) Note: The Highway 5 at Stewart Street intersection does not present any significant safety issues or capacity concerns. The presence of auxiliary lanes significantly reduces conflicts with Highway 5 through traffic. Turning traffic from Stewart Street or Frontage Road West are expected to be sufficiently low as to avoid any significant driver impatience or insufficient gap taking.	
14	TMP	12.1	62	The BC MoTI sub-plan have been prepared and included in Appendix H of this TMP.	The BC MoTI sub-plan have been prepared and included in Appendix G of this TMP.	
15	TMP	13.2.9	71	N/A	Traffic Engineer – Construction Contractor LSLP will employ an Allnorth as the purpose of traffic engineering consultation. Allnorth will LSLP with the assessment, development, review, and implementation of any Engineered drawing created for LSLP, as required.	Added description of Contractor Traffic Engineer scope.

No.	Document	Section	Page	Previous Text	Revised Text	Comment
16	TMP	13.3	73	Traffic Control Persons are used only when all other traffic control methods are considered inadequate to warn, direct, and regulate road users within a work zone. Traffic Control Persons are used to regulate traffic within a work zone, thereby preventing conflicts between the movements of pedestrians, vehicles, workers, and work zone equipment. Traffic Control Persons shall not control traffic within speed limits greater than 50 km/h.	Traffic Control Persons are used only when all other traffic control methods are considered inadequate to warn, direct, and regulate road users within a work zone. Traffic Control Persons are used to regulate traffic within a work zone, thereby preventing conflicts between the movements of pedestrians, vehicles, workers, and work zone equipment. Traffic Control Persons shall not control traffic within speed limits greater than 70 km/h.	
17	TMP	15.1	79	N/A	Following any incident, the work will be immediately stopped, and the scene protected, to ensure any evidence is immediately preserved. This will further ensure that all applicable information is preserved for assessment by the Supervisors, Managers, and other responsible management personnel. The scene will be assessed to establish the response level and the action required to ensure safety, scene management, traffic control and the appropriate reporting protocols. Only after the assessment has been made and a discussion with the relevant level of Supervision or Management has occurred, will the approved plan be initiated. That assessment, discussion, planning, implementation, and reporting process will ensure all relevant considerations have been addressed in any incident.	Added details in regard to incident management/ assessment
18	TMP	16	87	N/A	BC Traffic Management and Coordination Plan, Trans Mountain Expansion Project	Added BC Provincial Traffic Management Coordination Plan

ACRONYMS

AADT	Average Annual Daily Traffic
AMP	Access Management Plan
BC	British Columbia
BC MoTI	British Columbia Ministry of Transportation and Infrastructure
BC MoTI TMM	British Columbia MoTI Traffic Management Manual for Work on Roadways – 2015
CCP	Construction Communications Plan
CER	Canadian Energy Regulator (Formally CER)
CN	Canadian National (Railway)
CVSE	Commercial Vehicle Safety and Enforcement
DMS	Dynamic Message Signs
HOV	High Occupancy Vehicle
IMP	Incident Management Plan
TMEP	Trans Mountain Expansion Project
KP	Kilometer Post
LCR	Lane Closure Request
MUTCD	Manual of Uniform Traffic Control devices of Canada
CER	Canada Energy Regulator (Currently CER)
OH&S	Occupational Health & Safety
OM&R	Operations, Maintenance and Rehabilitation
PIP	Public Information Plan
ROW	Right-of-Way
SLAT	Single Lane Alternating Traffic
TACMP	Traffic and Access Control Management Plan
TAS	Traffic Accommodation Strategy
TBD	To Be Determined
TCP	Traffic Control Plan

TCPr	Traffic Control Personnel
TCS	Traffic Control Supervisor
TE	Traffic Engineer
TI	Traffic Inspector
TM	Traffic Control Manager
TMPL	Trans Mountain Pipeline System
TMP	Traffic Management Plan
TQCP	Traffic Quality Control Plan
TWG	Technical Working Group (With government stakeholders)
VFD	Variable Frequency Drive

1 INTRODUCTION

1.1 Introduction

The Trans Mountain Expansion Project (TMEP) includes the twinning of this existing 1,150-kilometre pipeline between Strathcona County (In Edmonton), Alberta and Burnaby, BC which was originally built in 1953. The project includes the construction of approximately 980 km of new pipeline with the majority of the route being constructed within the existing right-of-way. The construction activities will require numerous highway access points for permitting by the appropriate Road Authority.

1.2 Purpose of Traffic and Access Control Management Plan

The overall philosophy of a Traffic Management Plan (TMP) to consider the preservation of mobility and of safety to the travelling public and workers. This is achieved through the application of traffic management procedures between pipeline spread corridor segments and local governments, while also accommodating the specific requirements of discreet roadway authorities and agencies. This TMP is specific for Spreads 3 and 4A and is a dynamic document that will be modified as required to reflect changes in project planning to provide opportunities for improvement as they evolve through ongoing communication with Indigenous groups, regulatory bodies, landowners and other stakeholders including the following:

- British Columbia Ministry of Transport and Infrastructure (MoTI)
- Regional District of Fraser-Fort George
- Thompson Nicola Regional District
- District of Barriere
- Simpwc First Nation

This TMP uses the Traffic Management Plan Template and Traffic and Access Control Management Plan, August 2019 (TACMP) provided by the TMEP. It includes an overview of the public information and communication planning, incident management protocols, roles of traffic management team members, and other aspects of traffic control that must be taken into consideration. An overview and summary of the proposed work is presented to support the future specific traffic control/work permits.

This traffic management plan was developed using the following guidelines:

1. TMEP Traffic and Access Control Management Plan (TMEP TACMP R1 2019)
2. TMEP BC Traffic Management and Coordination Plan
3. BC MoTI Traffic Management Manual for Work on Roadways (BC MoTI TMM) (BC MoTI 2020);
4. BC MoTI Traffic Management Manual for Work on Roadways (BC MoTI TMM) (BC MoTI 2015);

The LSLP Traffic Management Plan is prepared in isolation of the other General Contractors for the TMEP Project. The traffic planning and management, within the Spread 3/4A segment, will be conducted in collaboration with the TMEP Traffic Management Team and the TMEP Engineer of Record (EOR), to ensure all the requirements of the BC Traffic Management and Coordination Plan. The TMEP Traffic Management Team will coordinate information from all the General Contractors, to monitor the work activity throughout the project, the impact of traffic control plans and ensure the delay restrictions are met. The site-specific Traffic Control Plans will address the immediate requirements of the traffic access point and the ensure both the safety of the public and worker safety. The daily management of each Traffic Control Plan will provide continuous updates on the effectiveness and impact each site is experiencing. This information will be relayed to the TMEP Traffic Management for execution of the BC Provincial Traffic Management and Coordination Plan to ensure the restrictions around 20-minute delays within the MoTI District and the 60-minute overall Project delay requirements are met.

1.3 Trans Mountain Expansion Project Responsibilities

Trans Mountain Pipeline System (TMPL) is regulated by Canadian Energy Regulator (CER), formally known as the National Energy Board (NEB), a fully independent agency of the Government of Canada. As CER is a federally regulated entity, TMPL requires approval from the CER prior to the construction of the TMEP. TMPL also complies with all ancillary legislation unless it conflicts with or frustrates federal legislation, in which case TMPL will comply with federal legislation as determined by the CER. TMEP will primarily assist Contractors in completing work involving traffic management safely and efficiently in various jurisdictions through the following means

- TMEP is applying for all Provincial permits on behalf of the Construction Contractors. For Spreads 3 & 4A, TMEP will provide overall traffic oversight and coordination of all traffic concerns with BC MoTI as described in the TACMP.
- Provide overall traffic oversight and coordination of all traffic concerns as described in the TACMP.
- Work in a meaningful way with local communities, including affected Indigenous Groups, and other road user groups through the parameters of the Construction Communications Plan (CCP) to ensure that road effects are communicated, and public issues are addressed.

Use audit and oversight on a regular basis to ensure that the contractor is adhering to the requirement of this TMP.

The Construction Contractor will provide information to Trans Mountain regarding all major traffic control changes on provincial roadways, such as major stoppages, lane closures, and new detour alignments in the form of an advance multi-week schedule that includes the locations of each construction work zone. The TMEP Stakeholder Engagement Team will inform the public with regular radio and newspaper advertisements.

1.4 Contractors Responsibilities

The Contractor, Ledcor Sicim Limited Partnership (LSLP) is undertaking construction of the TMEP from the Hargreaves Trap site east near Mount Robson to Vavenby, Spreads 3 & 4A. The construction will require approximately 525 highway access points along with road crossings, temporary workspaces and other work within the road right of way (ROW) for permitting by the appropriate Road Authority.

The Contractor is responsible for:

- The development, implementation, and maintenance of an overall Contractor TMP; the TMP should similarly mirror the TMEP TACMP, June 2017 document;
- Incorporation of the information contained within the traffic assessment sections of this TMP into work site-specific Traffic Control Plans (TCPs) necessary for construction;
- General notifications to TMEP management pertaining to effects on traffic including incidents;
- Public information and notifications to TMEP in advance of any detour implementation;
- Preparing application submissions for municipal roadway use and any engineering or other requirements for the application;
- Providing and maintaining all signage in good, working condition required to execute all aspects of traffic management including provincial/municipal specific signage, signboards, vehicles with appropriate equipment, etc.;
- Conducting audits and inspections of work sites and traffic control zones as required by regulation and safe work practice and otherwise correcting any non-compliance issues in a timely manner;
- Communicating, prior to the start of work and regularly throughout the work duration, with emergency responders (fire/ambulance/police) services to ensure prompt response to and through work zones;
- Communicating and coordinating with the TMEP Traffic Inspector and other work groups nearby;
- Ensuring a protocol is in place to deal with non-Project, third-party roadway motor vehicle accidents, specifically those in rural areas where other emergency services may not be immediately available;
- Ensuring commitments are adhered to; and
- Participating in Technical Working Group (TWGs) with municipalities and regional districts where construction execution planning, including work on roadways, is communicated in a productive, pro-active manner.

LSLP is only responsible for incidents that occur as a result of the Contractor's work activities or associated traffic control activities. This is generally limited to permitted work zones or traffic control areas as defined by the permit documents. LSLP will endeavor to support emergency services, road

authorities, maintenance contractors and the public in the restoration of normal traffic flow following an incident adjacent to the work zones where needed.

Where Contractor traffic management cannot conform to the minimum specifications of this document, (roadway use application requirements, engineering limitations, etc.), a variance process is to be followed, including approval from TMEP Management prior to the Contractor conducting work.

1.5 Links to the TMEP Traffic Management Plan

Relative TMEP Plans linked to this plan:

- Health and Safety Management Plan (HSMP) – CER Condition 64a
- TMEP Emergency Response Plan (TMEP ERP – CER Condition 8
- Environmental and Socio-Economic Assessment – CER Condition 60
- List of Temporary Infrastructure Sites – CER Condition 61
- Worker Accommodation Strategy – CER Condition 59
- Facilities EPP – CER Condition 78
- Access Management Plan (Volume 6 of the Environmental Plans) – CER Condition 47

2 TRAFFIC MANAGEMENT STRATEGY

2.1 Project Category Determination

The requirements of the BC MoTI Traffic Management Manual for Work on Roadways (TMM) were followed in the development of the Traffic Management Strategy for this TMP. The BC MoTI TMM uses a structured process to determine the Project Category for each specific road access or groups of accesses.

1. Initial Category Assessment	Assess the roadway and traffic features.
2. Risk Analysis	Identify the project-specific risks.
3. Final Category Determination	Combine the initial project assessment with the risk analysis to determine the final project category.

Project Categories are defined as:

- Category 1 - minimal impact on the travelling public, are typically located on simple terrain, and involve two-lane highways or roads, often with lower speeds and traffic volumes.
- Category 2 - may be located on higher-speed or higher-volume corridors and involve some complexity. Impacts on the travelling public may be moderate because of the roadway characteristics or the type of work.
- Category 3 - complex and have a significant impact on the travelling public because of factors such as higher volumes and speeds, project duration, active night work, mountainous terrain, and/or a requirement for lane closures and/or detours.

All highway access points for Spreads 3 & 4A are assessed at a Category 3 due to, overlapping work zones, potential traffic impacts to local users, project duration, and mountainous terrain. Other works impacting traffic along the work may be rated lower.

A Category 3 project requires the following:

- Traffic Control Plan
- Public Information Plan
- Incident Management Plan
- Implementation plan

Table 2-2 of the TACMP shows the initial category assessment for each MoTI roadway. The initial category assessments table has also been included in Appendix A of this TMP for ease of access. A sample BC MOTI Initial Category Assessment Table and Project Risk Analysis for access point AP-4-A-17-A has also been included in Appendix C for reference. This sample was included to show how access points have been categorized. Although the quantitative classification show the access point as a Category 2 access point; all access points in Spreads 3 & 4A are considered as the more stringent Category 3.

2.2 Potential Pipeline Construction Impacts (Traffic Reroutes and Delays)

Construction activities have been planned with an objective to minimize adverse impacts on the traffic flows. A pipeline ROW is to be established along the entire length. Pipeline equipment and vehicles use this pipeline ROW to limit impact to existing roads and infrastructure. All highway and major roadway crossings are to be constructed using trenchless techniques where practical and executed away from existing travel lanes. In any area where open-trench construction is across and within the roadway, traffic impacts will be planned in coordination with Municipalities and authorities having jurisdiction.

The influence of other nearby or adjacent work zones and lane closures will also be considered in the overall evaluation of traffic impacts. Information will be gathered from TMEP regarding provincially regulated roads and through Technical Working Groups (TWGs) regarding municipal roadways.

Traffic Control Plans (TCP) for each impacted area will be submitted to applicable municipal jurisdictions along with permitting applications. TCPs for applicable provincial, MoTI jurisdictions along with permitting applications will be the responsibilities of TMEP who will submit to LSLP for implementation.

Potential effects to traffic, and requirements of key construction activities and key construction locations, are further discussed in Sections 6 to 10 of this TMP.

The majority of Spreads 3 & 4A scope of work will occur within the TMEP ROW. Roadways will be used for transport of personnel and material from yards to the TMEP ROW daily. Foreseeable effects to traffic will be planned for in coordination with local governments through Technical Work Groups (TWGs).

For areas where there may be potential effects to traffic and peak traffic periods exist, the LSLP overall strategy will be based on maintaining existing roadway capacities to the greatest extent feasible, and in

continued communication with TMEP who will communicate with appropriate government authorities through TWGs and other methods.

In general, the construction activities involve the following conditions:

- Adjacent Construction Activities: most of the construction activities carried out in the vicinity of public routes are not expected to have a direct effect on the travelled lane utilization. For these activities, the associated work zone(s) will be planned and implemented with sufficient clearance distance (Clear Zone) as set by the road authority guidelines. This may include lane off-sets with reduced widths and speed zones but are otherwise expected to have a minimal effect on the travelling public.
- Partial Lane Closure: construction activities along travelled lanes may involve partial lane closures, which may create potential traffic delays. In order to reduce disruptions, the specific TCPs will include analysis of the potential effects with practical solutions to ensure mitigation or reduction and will be reflected in appropriate TCPs. Activities that may require to create partial closures are typically carried out along sections of the roadway, with work zones not having sufficient clearance distances. The partial closures will consequently allow sufficient clearance distances for the duration of the activities.
- Full Lane Closure: construction activities within travelled lanes will involve full lane closures, which will result in short term traffic delays. In order to reduce disruptions, the LSLP specific TCPs will include analysis of the potential effects with practical solutions to ensure mitigation or reduction and will be reflected in appropriate TCPs. Delays will be monitored and discussed with affected parties (TMEP, MOTI, others). Full lane closures may be required to accommodate pipe trucks and large commercial vehicles access and egress.

  Lane closures (partial or full) application will be requested using the MoTI Work Notification/Lane Closure Request and Approval form (H1080) that will be prepared by LSLP Traffic Manager and submitted to TMEP and subsequently to MoTI for approval.
- The pipeline construction activities adjacent to provincial highways and municipal roadways, are planned with an objective to avoid adverse effects on the traffic flows. LSLP has identified these locations as Key locations in Section 5.2.

The following steps will be taken by the LSLP for each work zone for activities requiring partial or full lane closures:

- Review the construction activity, its planned work zone, and required clearance spaces based on which potential lane closures are designed;
- Plan and design solutions to reduce the effect for the duration of the activity in each work zone. These solutions may include alternative use of available lanes, detours, additional traffic signs, using traffic persons;
- Follow the developed TCP for each work zone for the duration of the construction activities; and

- Ensure appropriate roadway use application submissions are in place prior to conducting the work including, and as may be required, appropriate communication or consultation being conducted with appropriate government authorities.

The influence of other nearby or adjacent work zones and lane closures will also be considered in the overall evaluation of effects to traffic within the LSLP TMP. Information of adjacent work zones will be gathered prior to project mobilization. Where LSLP traffic work zones will conflict with already implemented work zones, LSLP Traffic Control Manager will contact the contractor working in the area and develop a plan to incorporate one work zone or to ensure public safety is assured and there is a minimal impact on the flow of traffic.

3 PROJECT RISK ASSESSMENT

3.1 Pipeline Construction Risk

The project risk analysis is the process of reviewing site-specific characteristics and considering the likelihood and consequence of each item listed. It is able to highlight potential hazards that are not captured in the Initial Project Category Assessment. Each project has a unique combination of site-specific characteristics, and the risk analysis considers potential hazards associated with the specific project and/or location. Table 3-1 of the TMEP TACMP shows the risk assessment for the entire project corridor. This table has been included in Appendix D of this TMP for ease of access. Table 3.2 of the BC MOTI Traffic Management Manual for Work on Roadways is used to determine whether each potential hazard creates a low, medium, or high risk for the project and location. The total point value calculated at the end of Table 3.2 will indicate that the project is assessed as a low-risk, medium-risk, or high-risk project. Combining the results of the initial project category assessment and the risk analysis will determine the final project category. A sample BC MOTI Initial Category Assessment Table and Project Risk Analysis for access point AP-4-A-17-A has been included in Appendix C for reference. Assessments for each access point has been completed prior to the preparation of individual Traffic Control Plans.

Based on the steps outlined in the above Category Determination, key construction worksites and key Highway 5 access points identified in Section 5.2 are considered Category 3 as the rest of the TMEP corridor due to traffic volumes, potential overlapping work zones, lane closures and mountainous terrain. Other worksites and access points in Spreads 3 and 4A may be rated lower however all MoTI access points will be managed as Category 3.

3.2 Stakeholders Identified Risks

The TMEP Stakeholder Engagement Team is responsible for global communication and communication with key stakeholders. The Construction Contractor will provide information to TMEP regarding all major traffic control changes on provincial roadways, such as major stoppages, lane closures, and new detour alignments in the form of an advance multi-week schedule that includes the locations of each construction work zone. The TMEP Stakeholder Engagement Team will inform the public with regular radio and newspaper advertisements. Stakeholders included in this Spread are:

- Emergency Response Services (RCMP, Fire Department, BC Ambulance Service)
- Ministry of Transport and Infrastructure (MoTI)
- Regional District of Fraser-Fort George
- Thompson Nicola Regional District (TNRD)
- District of Barriere
- The Village of Valemount
- The School District #57 (Elementary & High School in Valemount)
- The community of Blue River
- The School District #73 (Blue River Elementary School)
- The Community of Avola
- Simpwc First Nation
- Other Indigenous Communities
- Utilities (BC Hydro, Telus, Fortis)
- Highway Maintenance Contractors
    - Service Area 20: Lakes District Maintenance
    - Service Area#15: Argo Roads Thompson

Potential concerns addressed include but are not limited to, the following (see Appendix E of the TACMP for additional details):

- inquiries about the minimization of traffic disruption.
- inquiries about how construction methods will be employed to reduce effects on traffic flow, and avoid dust and noise;
- inquiries about how public safety will be ensured; and
- requests that TMPs be communicated to local municipalities, counties, and regional districts that currently being discussed in TWG's with municipalities

Both TMEP and LSLP will continue to interact with stakeholders to address public concerns including emergency and safety management requirements, and site-specific TCPs. TMEP and LSLP are committed to communicate any Project changes to affected stakeholders so that safety, traffic pattern changes, local and regional TMPs, and emergency services requirements are well understood. This proactive communication outreach will help to reduce traffic-related risk. As provincial and local roadway use application submissions are being submitted, related stakeholder issues raised will be recorded and managed by the Project Team.

4 CONTRACTOR TRAFFIC MANAGEMENT PLAN

The TMP considers the preservation of mobility and of safety to the travelling public and workers through the application of traffic management procedures between pipeline spread corridor segments, cities and municipalities. It accommodates the specific requirements of roadway authorities and agencies.

The TMP is created at a strategic level, and considers the following:

- Reduce project effects on public roadways, including drivers, walkers, cyclists or transit users
- School and playground zones and areas
- Public protection measures
- Security and safety of any given work area

Copies of the TMPs will be retained on-site by the LSLP Superintendent, the Traffic Control Manager (TCM), the supervisor or TCPr will have a copy of the specific TCP applicable to the work area(s) under their control.

4.1 Traffic Management Considerations

4.1.1 General

Traffic Management is defined as the strategies designed to safely mitigate the impact of construction and incident management on roadways to maintain mobility and worker safety. The documentation of strategies is completed using a TMP. For the purpose of this TMP, all work zones within Spread 3 & 4A are considered category 3 as per MoTI TMM. As such the TMP will include as a minimum the following:

- Traffic Control Plan
- Incident Management Plan
- Public Information Plan
- Implementation Plan

Traffic Control is the effective use of temporary traffic control devices to protect workers and move road users safely through a work zone. Traffic Control is implemented using a Traffic Management Plan. Specific Traffic Control Plans (TCP) for MoTI impacted roads have been developed and provided in the form of eDAS submissions by TMEP. These site-specific drawings showing specific traffic control have been submitted on an individual basis for specific permits to MoTI.

Works that may impact traffic include the following:

- Access Point Construction
- Access Point Use
- Pipeline Crossings (open cut or trenchless)

- Temporary Workspaces within the road ROW
- Excavations or Drop-Offs
- Others

The Traffic Management Plan (TMP) provides for implementation of Traffic Control during construction activities on the TMEP Spreads 3 & 4A. The TMP is a dynamic document that will be modified as required to reflect changes in project planning to provide opportunities for improvement as they evolve through ongoing communication with Indigenous groups, regulatory bodies, landowners, and other stakeholders.

4.1.2 Planning & Scheduling

This Traffic Management Plan will meet the provisions of the TMEP TACMP CER Condition 73 and the Road Authority's requirements. This Traffic Management Plan will serve as the guiding document for traffic control around approximately 525 access points and various work zones within the MOTI and municipal jurisdictions. This Traffic Management Plan, which is certified by a professional engineer as per TMEP TACMP, consist of the following:

a) Traffic Control Plan (TCP)

LSLP developed TCP for municipalities or as supplied by TMEP for provincial compliance, will accommodate requirements in Part C of the BC MoTI TMM: Traffic Management Operational Details of these Special Provisions.

b) Incident Management Plan (IMP)

The IMP will include LSLP's plan to adequately store and/or redirect highway vehicles both on and off the Site in the event the highway is closed for longer than 1 hour and an alternate-route detour plan in the event the highway is closed for a period longer than 2 hours.

c) Public Information Plan (PIP)

A PIP will be developed by LSLP for their work scope. Prior to implementing a pre-approved Lane Closure or delay, LSLP will provide advance notification to the public by means of advertisement or public messaging through TMEP. Advance notice will be with sufficient, advanced notice, prior to any planned delays longer than 10 minutes and/or a major shift in roadway alignment or traffic pattern change.

d) Implementation Plan

An Implementation Plan will be prepared by each contractor for each work spread and be based on Section 3.2.4 of the BC MoTI TMM. The Contractor is required to coordinate traffic management with adjacent projects. The coordination may require LSLP to revise its TMP accordingly. Pursuant to SS 194.51 of the TMEP TACMP, the Implementation Plan will provide site-specific monitoring strategies for the duration of active and inactive work.

The process of documenting and accepting the Traffic Management Plan is as follows:

- LSLP will designate a certified professional engineer for the project and that person designs and approves the Traffic Management Plan for the Construction Contractor. LSLP will seek the services of a traffic engineering firm for the development of the TMP and design of TCPs as required
- TMEP reviews LSLP's Traffic Management Plan. If it is acceptable, the TMP is submitted to the Road Authority for review. The Traffic Management Plan is reviewed for completeness, but the Construction Contractor is responsible for the content.
- If the Road Authority has concerns about the Traffic Management Plan, it may be returned to TMEP and LSLP for amendment and re-submission. Before submitting a Traffic Management Plan to the Road Authority, TMEP shall consider stakeholder input, including municipalities and/or regional districts, for the impact of the work.

4.1.3 Traffic Management Operations Details

Traffic management operations details are listed below per the TMEP TACMP.

General:

- Provisions to accommodate commercial vehicle truck traffic on steep grades will be demonstrated in the individual TCPs, to achieve the allowable closures and delays. The Contractor will ensure that no traffic queues are allowed through rock fall and/or avalanche zones and that no truck traffic will be queued on grades 6% or greater. LSLP will not require queue staging areas as the construction yards and stockpiling yards will be utilized for this purpose on Spread 3 & 4A and the ROW after stockpiling yards.
- The Contractor must maintain reasonable access to all truck runaway lanes, public roads, intersections, highway ramps, businesses, and residences, affected by the Work. LSLP does not anticipate long term closures of MoTI roads as the MoTI roads will be crossed using trenchless method. It is recognized that short-term highway closures will be required during the use of access points by the largest commercial vehicles (i.e. pipe truck and Oilfield Low Boy).
- LSLP does not anticipate the need to establish temporary pavement markings at this time. If this is later identified, it will be part of the TCP for the specific location which will be subject to TMEP and MoTI approval. If temporary pavement markings are required, it will be in accordance with BC MoTI TMM Section 4.4 and identified in the TCP.

Speed Zones:

- Speed zones will be implemented where applicable and based on TCPs.

Closures and Delays:

- Highway interchanges will remain open to the public. LSLP will communicate with TMEP to ensure that TMEP as the information to ensure that traffic delays do not exceed the allowed

time throughout the TMEP corridor as per the CER commitments. This will be achieved through communication with TMEP traffic department who will monitor the delay throughout the entire project corridor.

Long Weekend/Special Event Days:

- The current proposed schedule takes in consideration long weekends. For these periods, a reduced labour force and ROW activities are planned to maintain work phase that cannot be completely shutdown such as HDD, Road/ Rail Bores, Major creek and river crossings. Work that affects traffic will be coordinated with TMEP for notification to appropriate government authorities and will not be conducted unless the Contractor has obtained proper approvals from TMEP and regulatory authorities.

Table 4.1.3 Holiday schedule 2020-2021

Holiday	**Date**
Canada Day 2020	July 1st, 2020
BC Day (August long) 2020	August 3rd, 2020
Labour Day 2020	September 07th, 2020
Thanksgiving 2020	October 12th, 2020
Remembrance Day 2020	November 11th, 2020
Christmas/ New Years Holidays 2020-21	December 24 to Jan 02nd, 2021
Family Day 2021	February 15th, 2021
Easter Holiday 2021	April 02nd, 2021
Victoria Day 2021	May 24th, 2021
Canada Day 2021	July 1st, 2021
BC Day (August long) 2021	August 2nd, 2021
Labour Day 2021	September 06th, 2021
Thanksgiving 2021	October 11th, 2021
Remembrance Day 2021	November 11th, 2021
Christmas/ New Years Holidays 2021-22	December 24 to Jan 02nd, 2022
Family Day 2022	February 21st, 2022
Easter Holiday 2022	April 15th, 2022
Victoria Day 2022	May 23rd, 2022
Canada Day 2022	July 1st, 2022
BC Day (August long) 2022	August 1st, 2022

Labour Day 2022	September 05th, 2022
Thanksgiving 2022	October 10th, 2022
Remembrance Day 2022	November 11th, 2022
Christmas/ New Years Holidays 2022-23	December 24 to Jan 02nd, 2022

Road Maintenance during Active Work (Construction/ Winter):

MoTI Roads:

- LSLP will coordinate with the road maintenance contractor (Lakes District Maintenance and Argo Roads Thompson) to ensure of the work zones by the maintenance contractors is not impeded. LSLP will ensure the active work zones are free of mud, debris and ensure traffic devices are not obstructing.

LSLP Access Roads:

- LSLP will be responsible for winter maintenance within the Right of Way and TMEP Access Roads including but not limited to removal of loose snow, slush, and compact snow and to apply winter abrasive and chemical snow and ice control applications to protect highway users from situations that are unsafe.
- LSLP access roads will be maintained regularly using various equipment such as grader or skid steer to remove accumulation of snow. Where accumulation of 60 cm or more happens, the site supervisor will coordinate the maintenance of the access road with the superintendent prior to mobilizing crews onto the site.

4.1.4 Traffic Control Devices

Traffic control devices will be setup in advance of the planned work. The signage will be post-mounted for long duration work scopes and portable sign supports used for short duration work such as vehicle repairs on the shoulder of the road. The signage will meet the minimum requirement for signage as per *MoTI TMM*.

All signs, markings, dynamic message signs, and speed reader boards will be placed in accordance with the MoTI TMM. Treatment of drop-offs and travel lane excavation and the installation of idle reductions signs will also be placed per the MoTI TMM.

LSLP will utilize Portable Dynamic Message Signs located at major intersections, centers, and corridors to communicate with the travelling public of any unscheduled traffic delays.

LSLP Traffic Control Manager will be responsible for updating the sign messages and to ensure local emergency agencies have been made aware of the unscheduled delays and any unexpected traffic impositions on the public.

LSLP Traffic Control Manager will ensure that there is a sufficient amount of traffic control devices for all working set ups and a stockpile to replace any broken, missing, or malfunctioned equipment.

4.1.5 Over-Dimension Loads

Over-dimension loads will be planned and accommodated as required throughout the Project delivery. All applicable over-dimension load permits and/or other required permits will be obtained in accordance with the BC Motor Vehicle Act and/or other applicable BC Acts and are the responsibility of LSLP. Trucks turning paths at access roads will be presented and accounted for on the TCPs. If situations arise where it may not be practicable to maintained over-dimensional loads thru the work area; LSLP will plan for these periods and provide advance communication with those affected stakeholders through the TMEP Communication.

5 CONTRACTOR TRAFFIC CONTROL PLANS – GENERAL

5.1 Traffic Control Plan – Introduction

A TCP is required for every roadway project on or near provincial roadways, which may affect public roadway use or safety. The number of TCPs required has been determined and submitted as part of eDAS submissions by TMEP to MoTI. See appendix E identifying Spread 3 & 4A MoTI access points which have been submitted for approval. LSLP anticipate the use of 202 MoTI access points along Highway 5.

Traffic control plans must be created and approved by a Certified Professional Engineer. The main objective of work zone specific Traffic Control Plans (TCP) is to minimize the effects of construction activities on public safety and mobility. TCPs will include the following:

- A description of the work zone or work site
- Proposed work activities
- Proposed traffic control measures
- Ancillary control measures
- Specific work dates and times
- Site specific Schematic diagrams or drawings showing site, placement, and general arrangement of traffic control devices.
- TCPs are scaled drawings, showing dimensions
- Placement and use of Traffic Control Personnel
- Vehicle clear or buffer zone along the road edge within the construction zone.

5.2 Key Construction Activity and Key Construction Location TCPs

Key construction activities and areas in Spreads 3 & 4A are defined as the following:

- mainline pipeline construction activities.
- highway crossings
- equipment mobilization and staging from construction yards;
- pipe stockpiles and Project camps;
- facilities including pump station construction, modification, and decommissioning; and

The following table shows the key construction locations for Spread 3 and 4A outside of the MoTI access roads which are identified in Appendix E:

Table 5-1: Key Construction Locations

Spread	Location / Coordinate	Type of location	Approximate ROW KP
3	Loseth Road	Trenchless crossing under Highway 5.	KP 517.5
3	Highway 5, 400 m south of 17 Ave in Valemount.	LSLP Valemount Office and yard location	KP 520.0
3	Highway 5 and Cedar side Road	Valemount stockpile and Valeount camp	KP 523
3	Highway 5 and Whiskey Fill Road	Trenchless crossing under Highway 5.	KP 525.2
3	Highway 5 and Albreda station access Road	Trenchless crossing under Highway 5.	KP 541.1
3	Highway 5, 6.54 Km south of Albreda Station / 52.613545, -119.129687	Trenchless crossing under Highway 5.	KP 548.1
3	Highway 5, 2.7 Km North of Pyramid Creek Falls Provincial Park / 52.376447, -119.184077	Trenchless crossing under Highway 5.	KP 578.5
3	Highway 5, 3.7 Km North of Mud Lake Forest Service Road	Trenchless crossing under Highway 5	KP 604.1
3	Mud Lake Forest Service Road	Trenchless crossing under Mud Lake Forest Service Road	KP 608.7
3	Highway 5 and new access, 600 m north of Hardwood Drive	Access to ROW and HDD site exit side	KP 609.8

Spread	Location / Coordinate	Type of location	Approximate ROW KP
3	Highway 5 and Hardwood Drive	Access to ROW and HDD site entry side	KP 610.4
3	Maple Street and Murtle Lake Road	LSLP Blue River camp	KP 610.0
4A	Highway 5 and Stewart Street and Cedar Street	LSLP Blue River Office and Yard	KP 611.7
4A	Highway 5 and new access 4 km south of Stewart Street in Blue River	Access to HDD site	KP 615.8
4A	Highway 5 and Smoke Creek Forest Road	Trenchless crossing under Highway 5	KP 621.7
4A	Highway 5 / 51.971977, -119.348177	Trenchless crossing under Highway 5	KP 627.1
4A	Highway 5 / 51.961105, -119.345237	Trenchless crossing under Highway 5	KP 628.4
4A	Highway 5 / 51.924445, -119.329792	Trenchless crossing under Highway 5	KP 633.0
4A	Highway 5 / 51.815660, -119.295037	Trenchless crossing under Highway 5	KP 646.2
4A	Highway 5 / 51.785159, -119.323077	Trenchless crossing under Highway 5	KP 650.7
4A	Highway 5 / 51.738717, -119.340003	Trenchless crossing under Highway 5	KP 656.3
4A	Highway 5 / 51.671993, -119.649881	Trenchless crossing under Highway 5	KP 682.1
4A	Highway 5 / 51.664657, -119.668525	Trenchless crossing under Highway 5	KP 683.6
4A	Highway 5 / 51.658509, -119.674172	Trenchless crossing under Highway 5	KP 684.6
4A	Highway 5 / 51.631544, -119.695759	Trenchless crossing under Highway 5	KP 688.1

5.3 Traffic Control Plans in Rural Areas – General

Most of Spreads 3 & 4A pass through rural areas through the Thompson Nicola and Fraser Fort George Regional Districts where the pipeline will only cross highways and roads and be constructed outside of existing highway ROW's. The routing of the project follows Hwy 16 and Hwy 5, the two major highways in the area. Pipeline crossings of existing highways and major roadways will be constructed using trenchless techniques. Some municipal roadway crossings will be open cut. TCPs to address most of these construction scenarios are shown in Appendix G. The typical traffic control layouts address the following construction scenarios:

- Directional drilling and bored crossings;
- Ingress and egress along highway shoulders; and
- Equipment crossing of roadways (Non-MoTI Roads).

5.4 Traffic Control Plans in Cities and Municipalities – General

Spreads 3 & 4A pass through multiple (7) smaller sized communities including the Village of Valemount, and the town of Blue River which offer a variety of essential services to not only local residences but also to the travelling public. In limited areas, impacts will come from movement of vehicles and equipment. Peak period restrictions may be required for the transport of large equipment and materials, or both, so as not to impede regular traffic operations. Consultation with local government staff will be conducted prior to starting the work in order to determine whether any specific peak period road restrictions or other controls are required. Where open-trench construction is required, LSLP will prepare a TCP and submit to the municipality for approval prior to starting the work.

5.5 Work Zones in Close Proximity

Separate work zones within close proximity of, or directly overlapping each other have the potential to create safety risks for pedestrians, cyclists and motorists proceeding through the corridor. If separate work zone(s) are set up within a relatively short distance of each other, it could create inconsistent cross-section(s) and speed zone(s) resulting in a confusing or frustrating driving experience for the motorists or other roadway users.

Situations are anticipated to be encountered during Project construction where work zones requiring traffic control layouts are overlapping with external contractors work zones. In these situations, the LSLP Traffic Control Manager will contact the TMEP TI and work with the traffic control team to identify a solution and mitigate the impacts of overlapping work zone within Spread 3 and 4A or an adjacent General Contractor work zone.

LSLP Traffic Control Supervisors' are required to ensure that traffic is monitored between work zones when in proximity and whereby traffic interaction between work zones could be negatively affected. The Traffic Control Supervisors' will ensure that impacts between work zones are appropriately mitigated and communicated with the TMEP TI for appropriate dissemination.

Work zones within 2km of each other will be combined into a single Traffic Control Plan in order to reduce message conflicts, prevent driver confusion and frustration, increase maintenance efficiencies for signs and devices and contribute to safer traffic control. 2km spacing will be measured from the traffic control device spacing. The combination of close proximity work zones will be determined following construction scheduling as individual traffic control plans in close proximity of each other may not be in use at the same time.

LSLP is not aware of any close proximity work zones at this time.

5.6 Pedestrian & Cyclist Accommodations

Under the Motor Vehicle Act of British Columbia, cyclists have the same rights and duties as the operators of motor vehicles. Signage and traffic control measures used for drivers also apply to cyclists.

LSLP does not anticipate the need to redirect pedestrians around work zones within the Village of Valemount and the Town of Blue River as the scope of work for the traffic management plan will be limited to accessing the ROW and camps. Provisions will be made to warn pedestrians of any sidewalk or path closures, and safe detours will be provided, as required.

If crosswalks, sidewalks, or other pedestrian facilities are blocked, closed, or relocated, temporary facilities will include accessibility features consistent with the features present in the existing pedestrian facility. These features would be included in the site-specific TCPs.

Consultation and liaising with the village of Valemount, the town of Blue River, and the road agency will be important. Where cyclists or pedestrians need to take an alternate route details will be included on a specific traffic control layout plan and detour design drawings. Pedestrian fencing may be considered.

5.7 School Zones

Valemount Elementary School and Valemount Secondary School are 0.5km to 1.5km off Highway 5 and construction activities are not expected to impact the schools.

In Blue River, the Blue River Elementary School which is located on 3 Ave near Cedar St and Angus Horne St which are designated as Access Roads. A specific traffic control plan is considered for this school zone. The alternative street south of the school zones (Stewart St) that will be considered for access to the Blue River yard and ROW if necessary.

As such, the identified school zone will be communicated to all Project personnel through orientation to avoid. Detailed maps will be supplied to all trucking companies to help communicate which streets will be used as part of the Project hauling requirements.

5.8 Transit and School Bus Accommodation

LSLP does not anticipate to impact Transit & School Bus Routes with its construction activities within the village of Valemount. In Blue River, Cedar St and Angus Horne St near the Blue River Elementary School will be coordinated through TMEP stakeholder communication team who will communicate with

the local transit authority and school districts representative to ensure traffic impacts are minimized. Communication with TMEP TI will allow for the updating of the TMP. As required LSLP will limit its traffic around school bus routes during peak school times.

In the event that rerouting of transit bus services is required, sufficient advance warning and communication will be provided to prevent adverse effects on transit or school bus operating schedules.

5.9 Construction Vehicle and Equipment Access and Egress

In rural areas, access and egress for construction vehicles and equipment will primarily be via existing highway and roadway shoulders and will require assistance from Traffic Control Personnel (TCPr), appropriate warning signage and speed reduction. Where this is not feasible, lane closures may be necessary or involve the temporary construction of widened shoulders for construction vehicle acceleration and deceleration purposes. It is anticipated that some long sections of pipe will be transported via tractor-trailer trucks to the work sites, and the access and egress designs will need to accommodate these vehicle load lengths. At this time, approximately 525 site access points have been identified and are listed in Appendix E of this TMP.

In urban areas, peak period restrictions may be required for the transport of large equipment and materials, or both, so as not to impede peak traffic operations. Consultation with local government agency staff will be required to determine whether any specific peak period road restrictions apply.

LSLP anticipates a number of locations where heavy equipment crossings may be required to accommodate the effective movement of machines and inventory over paved roads. These crossings will be impacted by terrain, type of equipment being moved, crossing processes, environment, traffic volumes and other criteria. These heavy equipment crossings will be addressed on an individual basis through a process developed and approved by BC MoTI. That process will ensure the requirements, restrictions and concerns of the Ministry have been addressed and are within acceptable guidelines or directives.

5.10 Traffic Control Devices and Temporary Pavement Markings

Effective use of traffic control devices is critical to advise, warn, and direct motorists safely through the work area as appropriate for site conditions. LSLP will be responsible to supply traffic control devices and other traffic control implementation equipment.

Signs and other traffic control devices not applying to existing conditions will be removed, or if required for subsequent traffic control measures, covered temporarily to conceal the sign information. The temporary traffic signage consists of construction, temporary warning, and regulatory type signs, and these will be clearly shown on the Contractor's TCP drawings.

LSLP will also provide Portable Dynamic Message Signs (DMS) where required and use the signs to provide advance notification of planned traffic pattern changes. Sign locations and messages will be

shown on the TCPs. In addition, the LSLP will use the DMS to provide notification of incidents or unplanned traffic pattern changes, as part of the Implementation Plan.

At this time, LSLP is not anticipating the need to modify existing pavement markings. However, where existing pavement markings are in conflict with temporary lane alignments, the existing markings will be removed, and adequate delineation installed along the temporary alignments. The temporary lane delineation may be in the form of flexible drums, traffic cones, tubular markers, or temporary pavement markings. With the application of temporary pavement markings, reflectorized raised pavement markings will also be installed to provide proper visibility during evening traffic operations as required.

The application of temporary traffic control devices, signing, and pavement markings will be in accordance with the MoTI TMM.

Where operations are carried out in stages, only those traffic control devices that apply to the current stage should be left in place. Any traffic control devices not required for work area protection must be removed or covered immediately.

5.11 Requirements For Ancillary Traffic Effects

LSLP will take measures to:

- Minimize the tracking of mud from vehicles leaving the construction site. Maintain the cleanliness and visibility of all signage through all seasons.
- Clear all snow and ice from access.
- Perform additional inspections for Signage and TCD is required during weather events such as snow, rain, and wind.
- Take the appropriate measures to clean the road if mud have been tracked.
- Take all appropriate measures as per the governing authority and TMEP.

5.12 Commitments

LSLP is committed to protecting and maintaining the health and safety of our employees, workers, clients, members of the public by adhering to the relevant commitments and requirements of this document such as but not limited to;

- LSLP Health and Safety Policy
- LSLP Project Specific Safety Plan – Spread 3 & 4A
- LSLP Emergency Response Plan - Spread 3 & 4A
- TMEP Traffic and Access Management Plan CER Condition 73
- MoTI Traffic Management Manual for Work and Roadways 2020
- Applicable municipal bylaws

LSLP will ensure methods and procedures are in place for resolving issues and concerns from stakeholders, including the travelling public and Road Authorities.

6 TRAFFIC ASSESSMENT OF MAINLINE PIPELINE CONSTRUCTION

6.1 Traffic Assessment Key Construction Activities

6.1.1 Introduction

Key construction activities in Spreads 3 & 4A are listed in Table 6-1.

Table 6-1: Sequential Pipeline Construction Activities (Source: TMEP TACMP)

Activity #	Activity Type	Activity #	Activity Type
1	Clearing	7	Back-Fill (of ditch)
2	Grading	8	Rough Clean Up
3	Stringing	9	Final Clean Up (as required)
4	Ditching	10	Hydro-Test
5	Welding	11	Reclamation/Restoration
6	Lowering In	Main Pipeline Construction Activities	

Notes: Grey indicates Main Pipeline Construction Activities

Each of the mainline construction crews will consists of personnel, transportation and heavy pipeline equipment and will generally access the pipeline ROW at the start of each day and use the pipeline ROW as an access track.

The general effects on public roadways pertaining to mainline pipeline construction will be mostly focused on travel to and from the work site and accesses from the Highway system or side roads. Work around the highway for actual construction is expected to be minimal as most work will be away from the roadway a safe distance and outside of road prisms. Where work is in direct proximity to roadways, appropriate roadway use application submissions will be completed with site-specific traffic control plans. Travel to and from the TMEP ROW will mostly be off of major roadways and highways. Work crossing major highways are to be crossed using trenchless impacts and direct impacts will be minimal for the actual construction work.

6.1.2 Provincial and Municipal Roadway Use Application Submissions for Access Points

Provincial roadway use application submissions will be conducted by TMEP. It is anticipated that all required roadway access point application submission packages will be complete prior to construction and that submission of the roadway use application affirms appropriate safety and consultation measures have been incorporated regarding public road interaction.

Municipal roadway use application submissions will be conducted by the LSLP. LSLP will be engaged on a regular basis through TWGs to communicate with municipal government authorities and engineering departments to prepare roadway use application submissions. It is anticipated all required roadway use application submissions will affirm that appropriate safety and consultation measures have been taken regarding public road interaction. Many of the roadway use application submissions will be for access

points (See Appendix E for a list of access points for Spreads 3 & 4A) for mainline pipeline construction and will require engineered TCP drawings or sketches (See Appendix B-1 of the TACMP for examples) submitted as part of the application process. Access points have been selected and applied for based on a number of safety criteria including sightlines, traffic speeds, etc. This approach will ensure locations are selected and addressed in roadway use application submissions to reduce public roadway effects and maximize roadway safety.

6.1.3 Timing of Key Construction Activities

The timing of the various pipeline construction activities in Spreads 3 & 4A are detailed in the construction schedule found in Appendix H. Note that this schedule is subject to change.

6.1.4 Hours of Work

The construction of the mainline is generally planned for daytime hours only. The workday typically consists of a 12 hour per day shift (6:00am to 6:00pm or 7:00am to 7:00pm). Non-mainline construction activities, such as hydrostatic testing or river crossings will run 24-hours per day, 7-days per week through to completion of individual tasks. Night shift work may include clearing activities, hydro-testing, HDD crews, and construction activities that require continuation through to completion once initiated.

Late evening or night shift work may consist of specialized work crews completing construction work within a limited window due to the nature of the work or imposed environmental restrictions such as the noise bylaw of the Village of Valemount (Bylaw 306 Noise) and of Thompson-Nicola Regional District (Bylaw # 2480). Such work would include stream crossings where stream isolations are required, and work must take place continuously (24-hours/day) until it is finished due to water handling concerns. This type of work typically requires pumps, generators, and five to ten pieces of heavy equipment. Work crew arrival is in a limited number of vehicles, usually two to three light vehicles or a small van, and the disruption to public roadways is negligible due to the small number of personnel and equipment at the work site.

6.1.5 Traffic Flows

Key construction activities will require the use of construction vehicles accessing the Project ROW from public roads. Traffic directional flow will be off the public road onto construction access roads towards the ROW when entering and going in an opposite/reverse direction when leaving the ROW. Access points in Spreads 3 & 4A are listed in Appendix E.

6.1.6 Construction Vehicle Types and Volumes with Roadway Impacts and Mitigation

Individual activities in mainline pipeline construction do not take place in isolation. Mainline pipeline construction activities take place sequentially with some overlap to ensure maximum efficiency. As such, the cumulative effects of traffic are considered by area rather than by individual construction activity. Estimated, maximum, mainline pipeline construction traffic, including clearing, is noted below.

Estimated Maximum Mainline Pipeline Construction Traffic

Mainline Clearing (4 Clearing Lines w/ Brushing, Piling, Burning)

Vehicle Description	AM Trips (1-way – in or out)	PM Trips (1-way – in or out)
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	75	75
Passenger Busses (24 & 48 Passenger)	0	0
Service Trucks (Fuel/Lube Trucks, Mechanics, etc.)	2	2
Truck-Trailers (Low-boys) (*Note: select days only; not for full duration – mob, demob, move days)	48*	48*
Logging Trucks	18	18

Grade Rock Strip & Blast

Vehicle Description	AM Trips (1-way – in or out)	PM Trips (1-way – in or out)
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	14	14
Passenger Busses (24 & 48 Passenger)	0	0
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	2	2
Truck-Trailers (Low-boys) (*Note: select days only; not for full duration – mob, demob, move days)	15*	15*

Mainline Grade & End Haul

Vehicle Description	AM Trips (1-way – in OR out)	PM Trips (1-way – in OR out)
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	9	9
Passenger Busses (24 & 48 Passenger)	1	1
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	3	3
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	37*	37*

Ditch Rock Stripping & Blasting

Vehicle Description	AM Trips (1-way – in OR out)	PM Trips (1-way – in OR out)

Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	18	18
Passenger Busses (24 & 48 Passenger)	0	0
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	2	2
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	10*	10*

Mainline Stringing

Equipment Description	**AM Trips (1-way – in OR out)**	**PM Trips (1-way – in OR out)**
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	4	4
Passenger Busses (24 & 48 Passenger)	0	0
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	2	2
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	2*	2*
Pipe Trucks	9	9

Welding

Vehicle Description	**AM Trips (1-way – in OR out)**	**PM Trips (1-way – in OR out)**
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	20	20
Passenger Busses (24 & 48 Passenger)	1	1
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	3	3
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	4*	4*

Ditching

Vehicle Description	**AM Trips (1-way – in OR out)**	**PM Trips (1-way – in OR out)**
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	4	4
Passenger Busses (24 & 48 Passenger)	1	1
Service Trucks	3	3

(Hydrovac, Fuel Trucks, Mechanics, etc.)		
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	20*	20*

Lowering In

Vehicle Description	**AM Trips (1-way – in OR out)**	**PM Trips (1-way – in OR out)**
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	4	4
Passenger Busses (24 & 48 Passenger)	1	1
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	2	2
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	10*	10*

Backfill

Vehicle Description	**AM Trips (1-way – in OR out)**	**PM Trips (1-way – in OR out)**
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	4	4
Passenger Busses (24 & 48 Passenger)	1	1
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, etc.)	2	2
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	11*	11*
Tandem Dump Trucks	5	5

Hydrotest

Vehicle Description	**AM Trips (1-way – in OR out)**	**PM Trips (1-way – in OR out)**
Light Duty Vehicles (Crew Cabs, Vans, Pilot Trucks, etc.)	9	9
Passenger Busses (24 & 48 Passenger)	0	0
Service Trucks (Hydrovac, Fuel Trucks, Mechanics, Hot Oiler, etc.)	7	7
Truck-Trailers (Low-boys) (*Note: select days & locations only; mob, demob, moves)	5*	5*

Roadway impacts associated with each key construction activity include:

Clearing: The main effect of clearing activities to roadways will be falling trees in proximity to the highway where the pipeline route parallels or crosses the roadway and logging trucks entering and exiting the highway. Mitigation will be completed by ensuring appropriate signage is in place warning traffic of any issues and using TCPr as necessary in conjunction with specific traffic control plans per the MoTI Traffic Management Manual for Work on Roadways.

Grading: There is generally no direct effect of grading activities beyond entering and exiting the Project ROW onto public roads. Minimal, ancillary effects may include the storage of soil in temporary workspaces along roadways with enough distance from the road prism to ensure no effects in the event a vehicle travelling on the roadway should have an exit and leave the roadway surface.

Stringing: The major risk to public roadways with stringing activities is interaction with public traffic while entering and exiting the roadway at access points. The risk is mitigated by using TCPr and signage in a TCP configuration to allow for safe movement of stringing trucks to exit and enter off public roadways. Onsite equipment to load and off-load pipe trucks generally consists of one or two pieces of hoisting equipment with vacuum lift attachments or alternative lifting equipment. This equipment poses minimal to no risk to public roadways.

Ditching: Mobilization and demobilization of equipment will have effects to public roadways and will be mitigated as necessary using traffic control plans per the MoTI Traffic Management Manual for Work on Roadways. TCPr are used as required when entering and exiting off of public roadways. Light vehicle traffic of the work crew is anticipated to have low effect on public roadway use given the minimal number of vehicles trips to and from the work site.

Welding: Welding activities on the mainline pipeline construction consist mainly of the arrival and departure in the morning and evening of light vehicles including pickup trucks and welding trucks (one to two tonne vehicles with mounted welding equipment). Mitigation of effects to traffic would be primarily in the form of signage on the public roadways noting that truck traffic may be entering or exiting the roadway per the MoTI Traffic Management Manual for Work on Roadways.

Lowering-In & Back-Fill (including rough clean up) & Final Clean Up: The overall traffic volume associated with these activities is not anticipated to have direct effects to the travelling public. The disruption on public roadway associated with these activities are linked to entering and exiting off public roadways. Mitigation for mobilization and demobilization of heavy equipment from access points to the ROW will include the use of TCPr and signage per the MoTI Traffic Management Manual for Work on Roadways. Mitigation for transport of workers will be primarily in the form of signage on the public roadways noting that traffic may be entering or exiting the roadway.

6.1.7 Non-Mainline Pipeline Construction Activities

HDD and Bored Crossings: HDDs and bored crossings are a trenchless form of non-mainline pipeline construction, which occur generally under water bodies such as rivers or lakes, or under high volume roadways. The entry and exit points of HDD and bored crossings are located considering public roadway use and safety. Roadway use application submissions specific to the crossing along with TCPs are submitted to MoTI as part of the eDAS submission by TMEP for MoTI affected roads.

A list of bored crossings in Spreads 3 & 4A is provided in Appendix E.

Hydro-Test: Hydro-test activities will be scheduled after final clean following completion of construction of pipeline segments. The crews and equipment used for this activity will be minimal. They will continue to use the access points noted in Appendix E of this TMP and as listed in Appendix A-3 of the TMEP TACMP. Mitigation to traffic will be in the form of a TCP with TCPr to direct construction traffic on and off of public roadways or in the form of "trucks turning" signs on the public roadway. The activity of hydro testing itself takes place on the construction ROW and does not directly affect public roadways. Public roadways may be indirectly impacted by hydro testing of the pipeline. A hydro test plan will be developed prior to hydro testing by the Contractor and will address any direct/indirect roadway impacts. Water trucks may be required in some areas where other water sources are not available along the ROW. Where larger volumes of water are required and a steady flow of water trucks delivering the water to the work sites, on and off of public roadways, TCPs with TCPr may be required to temporarily stop traffic for a very short duration to allow safe access and egress.

Blasting: Blasting is a key component of pipeline construction ROW grading and ditching activities in areas through rock substrates. Blasting locations in proximity to highways will not be finalized until construction activity begins and is based on rock studies in the corridor and whereby mechanical excavation is the preferred construction method over blasting of rock. Blasting is likely to be intermittent in Spreads 3 & 4 based on the TMEP TACMP.

In general, the overall effects to public roadway safety and use will be minimal and localized. The Communications and Notification plan will be implemented for communicating with the public any potential issues resulting, including short duration road closures, from blasting.

LSLP will work with the TMEP to accommodate the requirements of any blasting plans. The geological evaluation of the actual pipeline path has yet to be completed. Currently LSLP has not identified any areas where blasting will be required in close proximity to the highway. Accordingly, any impacts to regular traffic patterns as a result of blasting cannot be established at this time. LSLP is committed however to a protocol of ensuring traffic is not stopped at any location for more than 20 minutes should that consideration materialize. The vehicle queues will be monitored, and timelines adjusted to ensure public safety. Any blasting activity, which might impact the highways will be communicated and coordinated through the TMEP Traffic Management Team. This will permit the appropriate adjustments for other traffic control measures throughout the district. In each case, a Blasting Plan will be developed for the blasting activity. If the blasting will impact highway traffic, in any way, an additional

Blasting Traffic Control Plan will be developed to accommodate and mitigate any impact on the travelling public.

Open Cut Crossings across Lower Volume Traffic Roads: Open cut roads are primarily dirt or gravel surfaced roads although some low volume paved roads may be considered for this method of crossing. A list of open-cut roads is provided in Appendix A-2 of the TMEP TACMP.

Construction of Access Points: Appendix A3 provides a list of access points. Where new access points are required off public roadways, they will conform to TMEP specifications in coordination with regulatory agencies as required.

Most new accesses will require roadway use application submissions, which will be completed. Appropriate drawings will be supplied when submitting a request to regulatory agencies and as required. See example drawing AR-001 in Appendix B-2 of the TMEP TACMP reflecting typical highway access point entrance sketches.

During construction of these accesses, traffic control will be required. Traffic control will consist of signage similar to those noted in Appendix B-1 of the TMEP TACMP and TCPr will be used.

Construction of access points will generally occur during daylight hours only for public safety purposes, although in some cases may extend into early evening depending upon safety factors. Noise, dust, or light issues will be negligible

6.1.8 Current Traffic Volumes on Public Roads

Spreads 3 & 4A will be constructed along Highway 16 and Highway 5 from Valemount to Blackpines. Per the TMEP TACMP, existing (2015) traffic volumes along Highway 16 are about 3,100 per day. Along Highway 5, traffic volumes range between 2,200-3,500 per day.

6.1.9 Impacts to Provincial Regions by Pipeline Spread for Mainline Pipeline Construction Activities

Impacts and mitigation measures related to mainline pipeline construction spread activities are summarized in Section 6.1.6.

Use of the Highway 5 and Highway 16 corridors will likely be two of the corridors of highest effect by Spreads 3 & 4A to public roadways. Major public roadway disruptions will be due to vehicles entering and exiting the roads at access points rather than as a direct result of vehicle travel on the roadways on the higher volume roads. This effect will be mitigated by:

- Use of engineered access points at the most effective locations;
- Use of signage noting that trucks will be entering and exiting off of the main roadway; and
- Use of TCPs and TCPr when large construction vehicles or vehicle volumes in short sections of roadway are entering and exiting the roadway.

6.1.10 Impact for Ancillary Traffic effects (Noise, Dust, Light) and Mitigation Measures

As most mainline pipeline construction activities take place outside of municipal limits, the effects of noise, dust, and light on or to public roadways will be minimal. Mainline pipeline construction activity will primarily take place during daylight hours to a maximum of 12-hours/day. Some work during non-daylight hours may occur at the beginning or end of construction shifts for an hour or two.

Noise: to mitigate potential noise issues, work will primarily take place during daylight/daytime hours, and engine retarder brakes will not be permitted within residential areas or municipalities where they are not otherwise permitted.

Dust: Dust from the project traffic will be mitigated by water trucks in areas where it may affect public health or public visibility, where practical.

Light: Light plants, when used in proximity of the roadway, will have lights directed so as not to impact travelling vehicles. Light blinds/screens may be required in close proximity to public roadways to ensure public roadway users are not impacted.

Debris on the Highway: Roads and accesses will be swept mechanically or manually to keep debris off of the roadway. Trucks will be maintained in as clean a possible condition for the given weather conditions. All vehicles will secure loose materials or equipment in truck boxes or trailers using positive tie-down to ensure they do not come loose while travelling on a roadway

6.2 Traffic Assessment of Key Construction Locations

Spread 3 is approximately 121.4 km in length and traverses almost entirely through rural areas. Its northern end is situated near the Highway 5 and Highway 16 juncture, and mainly runs parallel and adjacent to Highway 5 along its length, where it bypasses Valemount but traverses through Blue River.

Spread 4A is approximately 79.6 km in length and also traverses almost entirely through rural areas, with transit through the community of Blue River and Avola ending on the North side of Highway 5 just north of the community of Vavenby. The alignment runs parallel and adjacent to Highway 5.

The BC MoTI sub-plans in Appendix B provide more information on the key construction locations.

6.2.1 Hargreaves to Tete Jaune Cache (Fort George District)

This section of the pipeline ROW parallels Highway 16 from KP 488 near Hargreaves, BC to KP 503 near Tete Jaune Cache, BC where it turns south and parallels Highway 5. Based on the Project Category Determination in the BC MOTI's Traffic Management Manual for Work on Roadways 2015, the TMEP Spread 3 has been classified as Category 3 due to high traffic on both Highway 16 and Highway 5, accesses off Highways 16 & 5 which are high speed (up to 100 km/h), and high impacts to the travelling public. Highway 16 and Highway 5 through Spread 3 have minimal changes in elevations. The highways are slightly hilly with narrow shoulders and some curves. Both highways are single lane undivided with alternating additional passing lanes. The ROW does not travel through residential areas where cyclists/pedestrians may be present.

6.2.2 Tete Jaune Cache to Valemount (Fort George District)

This section of the pipeline ROW parallels Highway 5 from KP 503 near Tete Jaune Cache and ends at KP525, South of Valemount, BC. Based on the Project Category Determination in the BC MOTI's Traffic Management Manual for Work on Roadways 2015, the TMEP Spread 3 has been classified as Category 3 due to high traffic on Highway 5, accesses off Highways 5 which is high speed (up to 100 km/h), and moderate impacts to the travelling public. Highway 5 through Spread 3 has minimal changes in elevations. It is single lane undivided with alternating additional passing lanes, narrow shoulders and some curves. Highway 5 is free of any obstructions that may limit visibility. The pipeline ROW parallels West of Highway 5 through the municipality of Valemount with minimal impact to the residential area that is mostly East of Highway 5. Loseth Rd, Stone Rd, Pine Rd, Cranberry Lake Road, Bear Rd all West of Highway 5 are residential with approximately 10 homes near the ROW. Pedestrians and cyclists may be present near these homes.

6.2.3 Valemount to Blue River (Fort George District)

This section starts at KP 525, South of Valemount, and ends at KP 610, North of Blue River. Based on the Project Category Determination in the BC MOTI's Traffic Management Manual for Work on Roadways 2015, the TMEP Expansion Spread 3 has been classified as Category 3 due to high traffic on Highway 5, accesses off Highways 5 which is high speed (up to 100 km/h), and moderate impacts to the travelling public. Highway 5 through Spread 3 has minimal changes in elevations. It is single lane undivided with alternating additional passing lanes, narrow shoulders and some curves. Highway 5 is free of any obstructions that may limit visibility. The ROW does not travel through residential areas where cyclists/pedestrians may be present.

6.2.4 Blue River to Vavenby (Fort George/Thompson Nicola District)

This section of the pipeline ROW parallels Highway 5 from KP 610 North of Blue River, B.C. The ROW will continue to parallel East of Highway 5 through the town of Blue River crossing Harrwood Dr, Cedar St, Angus Horne St, Stewart St, Cedar St, Dairy Rd in this order. The ROW will continue to parallel Highway 5, crossing it at KP 621.5, KP 627, KP 628.5, KP 633, KP 646, KP 650.8, KP 656.3, KP 682.1, KP 683.6, KP 684.6, KP 688.2, KP 690.5 to end the section at KP 691 which is approximately 3 km North of Vavenby, B.C. in the Thompson Nicola Regional District. Based on the Project Category Determination in the BC MOTI's Traffic Management Manual for Work on Roadways 2015, the TMEP Expansion Spread 4A has been classified as Category 3 due to high traffic on Highway 5, accesses off Highways 5 which is high speed (up to 100 km/h), and moderate impacts to the travelling public. Highway 5 through Spread 4A has minimal changes in elevations. It is single lane undivided with alternating additional passing lanes, narrow shoulders and many curves. The ROW travels through residential areas where cyclists and pedestrians may be present within the Town of Blue River at Harrison Rd, Harwood Rd, and Cedar St.

7 TRAFFIC ASSESSMENT OF KEY CONSTRUCTION LOCATIONS – STOCKPILES, CAMPS, OFFICE CONSTRUCTION, CONSTRUCTION YARDS AND BORROW PITS

7.1 Overview of Temporary Facilities

Temporary construction sites and infrastructure including stockpile sites, camps, and office/construction yards for Spreads 3 & 4A are listed in Table 7-1.

7-1: Stockpile Camps and Office/Construction Yards Locations for Spreads 3 & 4A

Spread	Stockpile	Office/Yard	Camp
3	Valemount –	Valemount – Yellowhead	Valemount – Whiskey Fill Road
4A	Vavenby	Blue River – Cedar St.	Blue River – Murtle Lake Road

7.2 Introduction to Traffic Management Associated with Temporary Facilities

Per the TMP TACMP, the construction roadway impact analysis for each facility is developed based on the anticipated traffic additional pressure on the adjacent network elements including intersections as well as the likelihood interaction between the construction traffic with road users including cyclists and pedestrians were applicable. The analysis reviews the construction effects on public service elements including parking stalls and transit, where applicable.

7.3 Pipe Stockpiles – General

7.3.1 General Work Scope

Pipe stockpiles will store pipe lengths brought to spread areas via rail and off-loaded at rail sidings. The pipe supplier is responsible for off-loading trains at the rail sidings and delivering the pipe via truck to pipe stockpile yard, (stockpiles) with public roadway effects being considered. Pipe delivery from rail sidings will be primarily via commercial trucking routes, as practical, to reduce traffic effects to public roadways. Effects to roads, including access points and access roads, from stockpiles to the work site have been considered for traffic management in this section.

In general, the work scope at each stockpile will have flat-bed transport trucks or highway tractors with pole trailers arriving at the stockpile sites and picking up pipe for transportation to the Project ROW. Pipe will be loaded onto the truck at the secure stockpile yard and loaded using hoisting equipment, typically using a deck hand attachment. Each truck, depending upon road bans, will carry approximately 75 m of pipe (as an estimate for traffic volume effects) and travel to the Project ROW. Trucks are off-loaded on the ROW using hoisting equipment and the truck will proceed back to the stockpile yard for

another load. This is done in a cyclical manner, until enough pipe is “strung” onto the ROW for placement, welding, and eventual lowering into the pipeline trench in the immediate future.

The stockpile scope of work will be the responsibility of TMEP and the designated subcontractors.

7.3.2 Stockpile Location

Final stockpile sites are listed below for Spreads 3 & 4A.

Spread 3: Valemount – Stockpile Yard (VAL025): This site is located to the northwest of the proposed Camp site (VAL028) site. The Valemount stockpile yard site connects to Highway 5 via the Slocan Group Sawmill Access Road, which connects to Cedarside Road just west of its intersection with Highway 5 (opposite to Cranberry Lake Road). Stockpile materials are already present at the site. The Valemount Stockpile site is an 8.0 hectare parcel of level land primarily used for pipe stockpiling during construction of Spread 3 of the TMEP. The Valemount stockpile site is already in use, with pipe suppliers having delivered pipe for storage at the site. Pipe will be loaded onto flat-bed trucks and highway tractors with pole trailers at the site, transported to the spread, then “strung” for installation. Trips associated with picking up pipe from the site and distributing these to the spread will occur cyclically during daylight hours, with little to no clustering of truck trips. The site is proposed to be used for less than a one-year period as the full length of pipe currently stored at the site is transported to the spread for stringing.

NOTE: Due to safety concerns related to line of sight limitation following the traffic assessment at intersection of Highway 5 and Whiskey Fill Road, Access from Highway to the Valemount Stockpile yard (VAL025) and worker camp (VAL028) for construction activities will be via Cedarside Road. A turn right sign will be installed at the Worker camp (VAL028) access to force traffic through Cedarside Road.

- **Figure 7-1: Valemount Stockpile (VAL025) & Camp (VAL 028)**

Spread 4A: Vavenby stockpile site: This site is located off of Highway 5, and east on KP Road along an existing paved road in Vavenby, BC (See Figure 7-2).

Note: A high-level sight distance review was conducted with reference to the guidelines set forth in the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads* (2017). The location of the sight distance review was conducted at the KP Road on Highway 5 south of Vavenby, BC for entering and exiting movements.

Exiting Movements

- *Outbound Left (KP Road to Southbound Highway 5)* - For movements exiting KP Road to southbound Highway 5, the sightline from the stop-bar on KP Road towards the north on Highway 5 is approximately 165 meters and does NOT provide adequate sightlines for public use and project traffic. The minimum intersection turning sight distance for a 100 km/h posted

speed is 320 meters. Site improvements are not available due to the Highway 5 horizontal curvature in the road alignment. The lack of existing sightline does not make the exiting movements from KP Road to southbound Highway 5 safe and is NOT RECOMMENDED for project use. This will be reflected in the site specific TCP.

- *Outbound Right (KP Road to Northbound Highway 5)* - For movements exiting KP Road to northbound Highway 5, the sightline from the stop-bar on KP Road towards the south on Highway 5 is approximately 155 meters and does NOT provide adequate sightlines for public use and TMEP traffic due to site vegetation and horizontal highway curvature. The minimum intersection turning sight distance for a 100 km/h posted speed is 320 meters. Site improvements are not available due to the Highway 5 horizontal curvature in the road alignment. The lack of existing sightlines does not make the exiting movements from KP Road to northbound Highway 5 safe and is *not recommended*. We must also consider the increasing longitudinal gradient of northbound Highway 5 and the need for longer sightlines for traffic gaining speed on side road access onto the highway. Improvements may be made to remove vegetation along the east side of the MoTI right-of-way and MAY extend the sightlines to an estimated 225 meters. An on-site assessment will need to be conducted to identify the potential gain in sightlines and recommendation addressed in the site specific TCP.

Entering Movements

- *Inbound (Northbound) Right Turn from Highway 5 to KP Road* – There is an existing northbound right turn lane with an approximate length of 65 meters with the taper, or a full lane width of approximately 20 meters. The existing length of the right-turn lane does not currently meet the minimum requirements for an appropriate deceleration lane but does allow for right-turning vehicles to pull off the highway prior to the slow moving turning movement. The deceleration lane is also on an increasing gradient and enhances deceleration of the vehicles due to local topography. In consideration of the existing on-highway traffic volumes and the existing right-turning volumes, the risk tolerance is acceptable for background traffic conditions. For TMEP needs, this northbound right-turning movement is to be severely restricted due to sight conditions, with no large commercial truck movements permitted. This northbound right-turn movement will be restricted to a smaller contingent of TMEP traffic, including passenger vehicle and small trucks with the potential for use of TMEP buses and collapsed pipe trucks. On-site traffic operational conditions will be monitored to ensure the intersection conditions are safe and appropriate with special attention to the northbound right-turn volume. If deemed unsafe based on the TMEP volumes (time of day, total right-turn volumes), additional restrictions will need to be employed including elimination for KP Road for use of collapsed pipe trucks, buses and light commercial vehicles and, if required, reduction in passenger vehicle use. All vehicles will be deferred to use the channelized intersection at Vavenby Bridge Road. These conditions would be reflected in a site specific TCP.

- *Inbound (Southbound) Left Turn from Highway 5 to KP Road* – Currently, there is no left-turn lane available on Highway 5 and there is a decreasing longitudinal gradient on Highway 5 estimated at – 4.0-6.0%. There is also the horizontal curvature on Highway 5 in this zone and a posted speed of 100 km/h. Should a southbound left turning vehicle be stopped on Highway 5 at KP Road to wait for gaps in traffic, vehicles behind the stopped vehicle (heading southbound) have a sightline at approximately 230 meters; inadequate for a fully loaded commercial truck to identify the hazard and stop effectively on a decreasing longitudinal gradient. With the host of poor conditions, the appropriate safety considerations are not in-place and the southbound left-turn movement is NOT RECOMMENDED for project use. This will be reflected in the site specific TCP.

Figure 7-2: Vavenby Stockpile Site

7.3.3 Schedule

The current LSLP Construction Schedule has been included in Appendix H. Note that this schedule is subject to change.

7.3.4 Construction Vehicle Road Usage

The construction vehicle traffic to and from the pipeline stockpiles will be almost exclusively stringing trucks with a pilot as required by the permit. The number of trucks traveling to and from the site on a daily basis is dependent on the total pipe to be stockpiled in a given location for use in a linear section

of the pipeline construction, and the total duration during which stringing activities will be conducted from the stockpile. See section 6.1.6 for estimated stringing traffic.

7.3.5 Construction Traffic Roadway Impact

The stockpile sites are located in rural areas with relatively low urban traffic activities. Truck traffic generated by the stockpile sites during the construction activities is negligible when compared to the current traffic carried by the adjacent public roadways. Furthermore, the truck activities to/from stockpile sites are spread throughout the working days and therefore will not intensify during the morning and evening peak hours along adjacent transportation network elements.

Adjacent Network Element(s): It is anticipated truck activities generated by travel to and from the stockpile sites considered to the stockpiles will not affect the transportation network, and more specifically, will not add operational pressure on adjacent network element capacities.

Active and Public Transportation Element(s): The areas adjacent to the stockpiles are rural with no significant public facilities including sidewalks, crosswalks, and/or dedicated cycling lanes that may be affected by construction traffic. There are no identified public transportation facilities, stations, or bus bays that will be affected as the result of truck activities. If rare occasions are identified, the Contractor will be responsible to relocate the affected facilities and provide a safe environment with the same capacity as well as convenience for the commuters.

Parking: The sites under consideration for stockpiles will accommodate the parking requirements for the transport trucks, heavy, and light vehicles. Construction vehicles will not occupy off-site public parking spaces.

7.3.6 Construction Traffic Ancillary Effects

Ancillary effects are expected to be minimal at stockpiles given that noise and light effects will be almost exclusively during daytime hours and the stockpiles are generally located in non-residential, rural areas. Dust, if present, will be controlled using water trucks on the short, gravel access roads leading to stockpiles. For debris on the highway arising from construction traffic, trucks will be maintained as clean as feasible (as weather allows) and roads and shoulders will be swept, as required.

7.4 Camps – General

7.4.1 General Work Scope

Camps in Spreads 3 & 4A are classified as either full service or as sleeper camps. Full-service camps are located in areas with little local infrastructure to ensure community services are maintained for local residents. Sleeper camps are located in areas with established infrastructure to support camp residents and to maximize local commercial benefits.

Camps will be occupied during construction primarily during mainline pipeline construction activity timeframes and in direct correlation with person-power requirements.

- Full-service camps: house workers including food and beverage service

- Sleeper camps: house workers providing rooms and washrooms/showers only

7.4.2 Location

Camp locations in Spreads 3 & 4A include:

Valemount Worker Camp (VAL028): The Valemount Worker Camp is an area of 14.08 hectares proposed for development out of a total proposed lease area of 17.89 hectares. The site is proposed to serve as both a full-service temporary work camp and parking area. As this will be a full-service work camp, the hours of operations will be 24 hours, seven days a week. The camp will consist of parking spaces and ATCO trailers used as dormitories, kitchens, and recreational rooms. The capacity of the site is proposed as 600 people, with the option to expand capacity to 900. Whiskey Fill Road (see Figure 7-3**)**

NOTE: Due to safety concerns related to line of sight limitation following the traffic assessment at intersection of Highway 5 and Whiskey Fill Road, Access from Highway to the Valemount Stockpile yard (VAL025) and worker camp (VAL028) for construction activities will be via Cedarside Road. A turn right sign will be installed at the Worker camp (VAL028) access to force traffic through Cedarside Road. Off project traffic from camp to town will be permitted on Whiskey Fill Road to minimize traffic on Cedarside Road.

Figure 7-3: Valemount Worker Camp (VAL028) - Whiskey Fill Road

Blue River Camp (BLU007): The Blue River Worker Camp is an area proposed for development out of both a full-service temporary work camp and parking area. As this will be a full-service work camp, the hours of operations will be 24 hours, seven days a week. The camp will consist of parking spaces and ATCO trailers used as dormitories, kitchens, and recreational rooms. The capacity of the site is still to be determined and tentative timeline for camp use is Q1 OF 2021. Location is at Cedars St. Camp and Murtle Lake Road Camp (See Figures 7-4)

Note: Use 2 Blue Lake Road access points to the site. Maple St AP3-C-80-2-A may not needed.

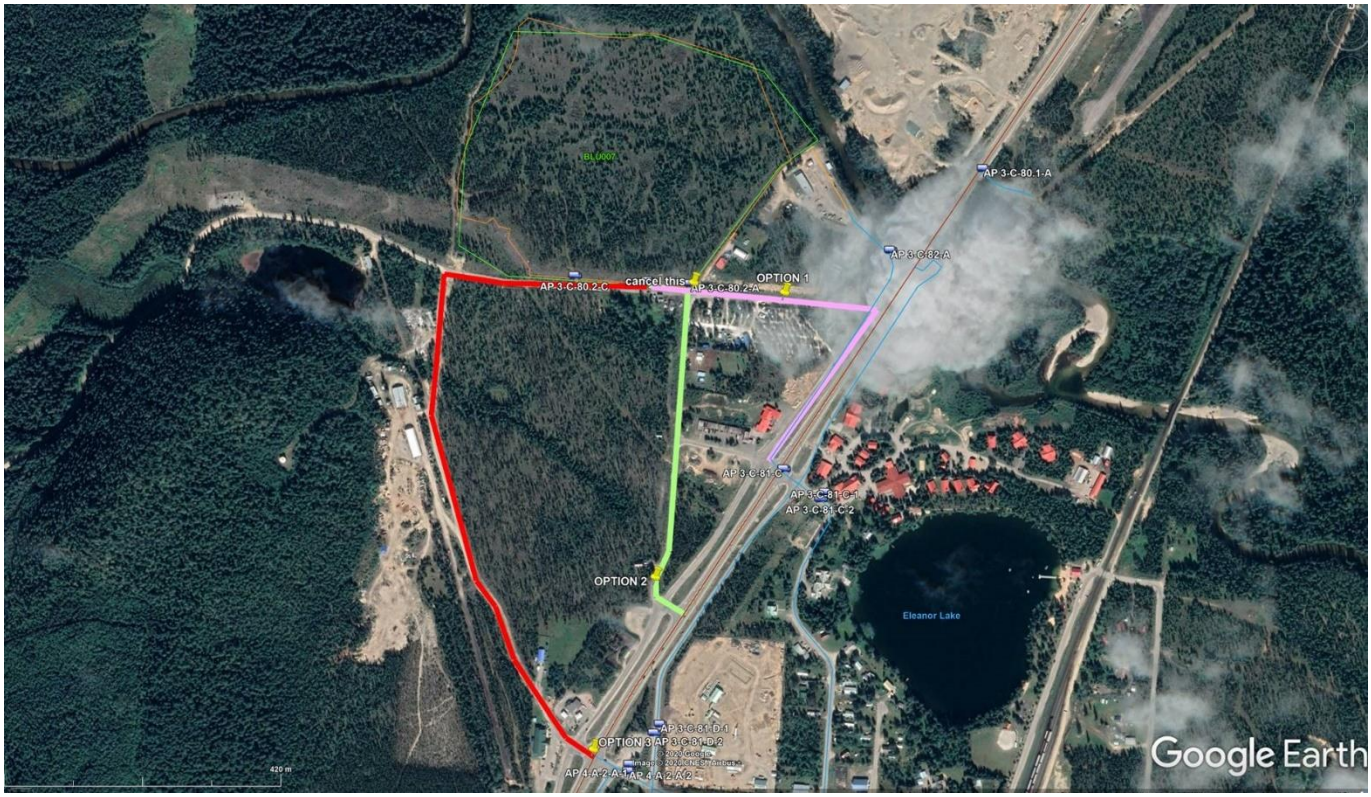


Figure 7-4: Blue River Worker Camp (BLU007) Murtle Lake Rd.

7.4.3 Schedule

Camps construction and use dates for Valemount (VAL028) is July 2020 and for the Blue River Worker camp are being finalized but will be in place for peak person-hour use during mainline pipeline construction and is tentatively as early 2021.

7.4.4 Construction Vehicles Road Usage

Construction vehicle traffic will be primarily made up of light vehicles used to transport workers to and from the construction site. Some transport truck traffic will also be generated when equipment and materials are mobilized to the sites. The transport trucks will operate mostly during the off-peak hours to ensure minimal effects. It is anticipated that the construction activities associated with the camps upgrade will generate negligible traffic volumes when compared to the adjacent network current traffic flows. Additionally, any upgrade activities will be completed entirely inside the camps, and therefore, will not affect public traffic.

7.4.5 Construction Traffic Roadway Impacts

The potential sites selected for camps may require some upgrades. The construction activities associated with the camps upgrade will generate negligible traffic volumes when compared to the adjacent network current traffic flows. In addition, the camp sites are selected in rural areas, at previously disturbed sites, and close to the pipeline construction activities. Any upgrade activities will

be completed entirely inside the camps, and therefore, will not affect public traffic. The transport trucks will operate mostly during the off-peak hours to ensure minimal effects.

The camps, once operational, will be used to accommodate the pipeline construction workforce. Workers will be transported to/from work zone(s) using mostly high occupancy vehicles (HOVs) including buses, minibuses and multiple passenger pickup trucks. Use of single occupied vehicles will be minimized. In addition, the majority of the HOVs will leave/arrive to the camps during the off-peak hours. Therefore, the effects on the adjacent traffic network will be negligible.

The current zoning of the camps in Spreads 3 & 4 are industrial and agricultural which reflects the rural nature of the adjacent transportation elements. TIA for these sites are being conducted by TMEP and will be included in the TMP once finalized.

Adjacent Network Element(s): The traffic generated from potential camp sites would peak during off-peak hours of public traffic flow. The labor shifts are planned in a way that the labor will arrive and leave the field at the shortest time to ensure utilization maximization. Therefore, the anticipated traffic to/from campsites will have negligible pressure on the adjacent transportation elements' capacities

Access point(s): The current zoning of the camps includes industrial and agricultural zones which reflect the rural nature of the adjacent transportation elements. Therefore, it is anticipated that the existing lane geometries at the access points will provide sufficient sight distances and turning radiuses.

Active and Public Transportation Element(s): The areas adjacent to the camps are generally rural with no or significant public facilities including sidewalks, crosswalks, and/or dedicated cycling lanes that may be affected by the construction traffic. There are no identified public transportation facilities, stations, bus bays, etc. that will be affected as the result of truck activities. If situations arise, the Contractor will be responsible to relocate the affected facilities and provide a safe environment with the same capacity as well as convenience for the commuters.

Parking: The sites under consideration for camps will accommodate the parking requirements for buses, minibuses, and pickup trucks. The traffic generated to/from camp sites will not occupy off-site public parking spaces.

7.4.6 Construction Traffic Ancillary Effects

Ancillary effects are expected to be minimal at camps given that noise and light effects will be almost exclusively during daytime hours and the camps are generally located in non-residential, rural areas. Dust, if present, will be controlled using water trucks on the short, gravel access roads leading to camps. For debris on the highway arising from construction traffic, trucks will be maintained as clean as feasible (as weather allows) and roads and shoulders will be swept, as required.

7.5 Construction Yards/Offices – General

7.5.1 General Work Scope

Construction yards/offices will be used for many functions including housing the main Spread offices storing equipment for mobilization and demobilization activities where equipment cannot be directly

mobilized or demobilized from its point of origin to the Project ROW, providing warehouse areas, and providing an area for equipment repair. Some parking will also be available in these areas but is to be limited to the extent practical

7.5.2 Location

Two Yard/Office locations have been selected for Spreads 3 & 4 including:

- **Valemount (VAL 26.1) 17th Avenue** site is located off 17th of Highway 5S (Southern Yellowhead) in Valemount, BC across the Highway from the Best Western hotel. The site is currently being developed and will be finalized by July 2020. The site required some site preparation, granular material, and fencing. (see Figure 7-5)

Note: Access Point 3-B-22-B is proposed to be built to accommodate traffic into the site from both north and southbound traffic.

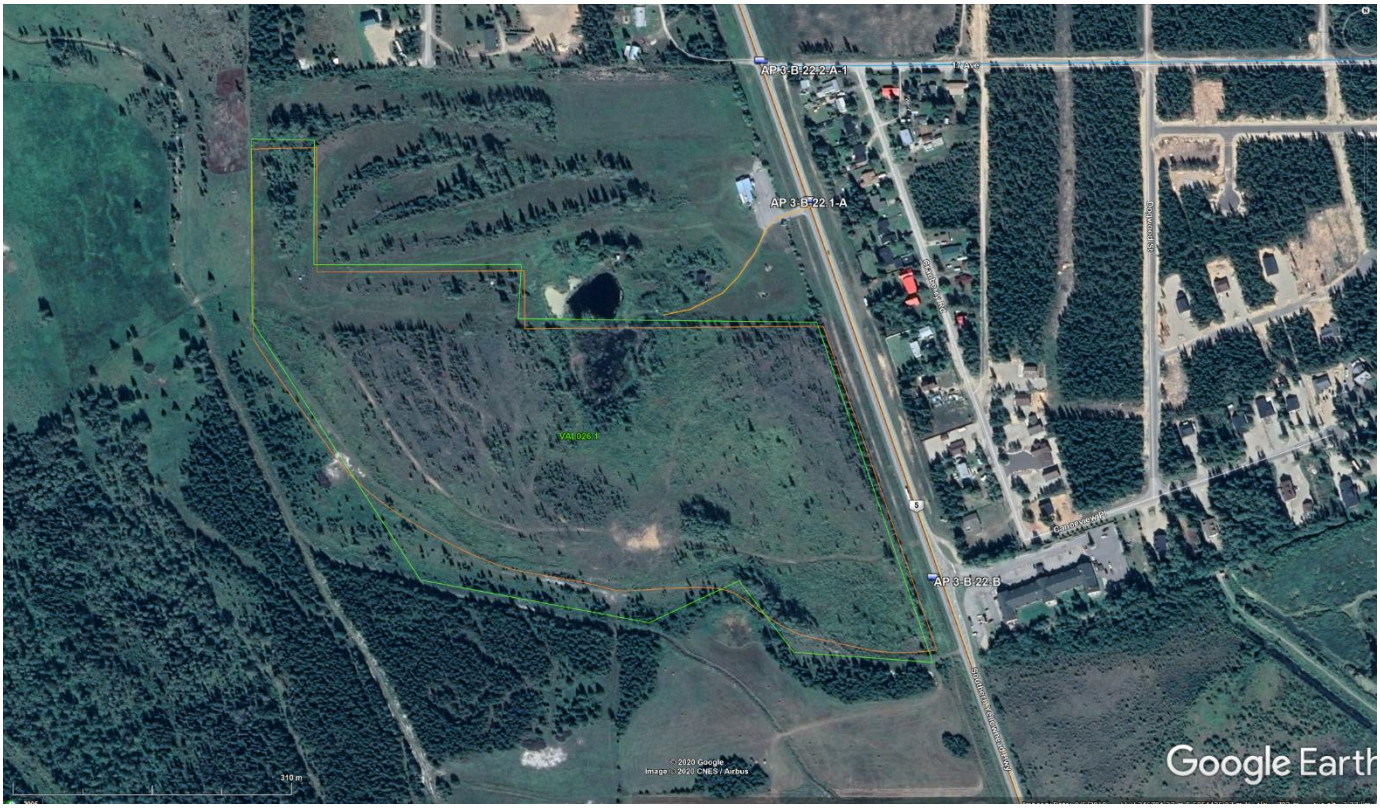


Figure 7-5: Valemount 17th Avenue Yard/Office

- **Blue River** site is located off of Highway 5, east on Angus Horne Street, and south on Cedar Street in Blue River, BC. The approximately 5.3 ha site is in a level, forested area and may require site preparation and granular material. (see Figure 7-6)

  Note: The Highway 5 at Stewart Street intersection does not present any significant safety issues or capacity concerns. The presence of auxiliary lanes significantly reduces conflicts with Highway 5 through traffic. Turning traffic from Stewart Street or Frontage Road West are expected to be sufficiently low as to avoid any significant driver impatience or insufficient gap taking.

  The Highway 5 at Angus Horne Street intersection does not present any significant safety issues or capacity concerns. The presence of auxiliary lanes significantly reduces conflicts with Highway 5 through traffic. Turning traffic from Angus Horne Street or Frontage Road West are expected to be sufficiently low as to avoid any significant driver impatience or insufficient gap taking.

  A sightline assessment was completed and throughout the study and assessed these in relation to the guidelines set forth in the Transportation Association of Canada's Geometric Design Guide for Canadian Roads (2017).

  Sightlines were assessed at the two key study intersections, finding that there were no significant sightlines restrictions.

Figure 7-6: Blue River Yard/Office (BLU008)

7.5.3 Construction Vehicles Road Usage

Traffic to and from construction yards will vary greatly. Total traffic volumes will be dependent on day to day activities and whether workers can be staged directly to the work site from camp sites, or if parking and staging to the work site is required at construction yards. Also, of note is that fuel storage capacity will be located at the Construction yards. For that reason, additional, non-peak hour traffic during the day or increased traffic in the mornings or evenings may result in construction vehicles fueling up in the construction yards.

7.5.4 Construction Traffic Roadway Impact

Office/yard upgrades are estimated to have moderate effect on public roadways in rural areas and minor effect in urban areas. Most traffic traveling to and from construction yards will occur in the morning (7:00 AM to 9:00 AM) and in the evening (5:30 PM to 7:30 PM). Further, existing roads are in place with few, if any, upgrades currently being contemplated to each office/yard access. Construction yard upgrades may be necessary at some locations where the area is not previously constructed to accept commercial vehicle use pertaining to overall site suitability (such as, drainage, gravel base, etc.). Upgrade construction to and from the location will be minimal consisting of a few pieces of heavy equipment working on the stockpile location and a few light vehicles travelling to and from the location on a daily basis with supervision and equipment operators.

Adjacent Network Element(s): The estimated distance between the yard/office sites in Spreads 3 & 4A and the associated Project ROW for which they provide services are within the 0.4 and 2.4km range.

These distances show that the yard/office sites are selected with shortest distances with respective service areas. The anticipated traffic listed in Section 7.5.4 is negligible when compared to the general public traffic carried by the adjacent transportation elements. The relatively low traffic volume generated to/from the yard/office sites, coupled with relatively short driving distances to/from the Project ROW, will reduce traffic effects on the adjacent transportation network elements.

Access Point(s): The yard/office sites are located in rural areas with industrial or agricultural zonings. Therefore, the natural land patterns as well as the access points existing lane geometries provide with sufficient sight distances and turning radiuses. The Contractor will review the access point's geometry and will implement upgrades where applicable to ensure public traffic safety is preserved.

Active and Public Transportation Element(s): The sites anticipated for yard/offices are located within rural settings with no significant public facilities including sidewalks, crosswalks and/or dedicated cycling lanes. There are no transit facilities in close vicinity to yard/office sites.

Parking: The sites for yard/office use have sizable vacant land that will be used to accommodate the parking needs for the construction related traffic. The anticipated traffic generated during the construction will not occupy off-site public parking spaces.

7.5.5 Construction Traffic Ancillary Effects

Ancillary effects are expected to be minimal at offices/yards given that noise and light effects will be almost exclusively during daytime hours and the offices/yards are, generally, located in non-residential, rural areas. Dust, if present, will be controlled using water trucks on the short, gravel access roads leading to the offices/yards. For debris on the highway arising from construction traffic, trucks will be maintained as clean as feasible (as weather allows) and roads and shoulders will be swept, as required.

7.6 Borrow Pits - General

Borrow pit and gravel pit trucking using local roadways will be minimized to the extent possible. Trucking of material to and from commercial borrow pits and gravel pits will include on-ROW trucking and transportation from existing commercial sites on highway to the nearest access where material is required. TMEP plans to use commercial borrow pits to the extent feasible.

Existing commercial borrow pit or material locations within the construction footprint or in direct proximity to the footprint, will be used to the extent practical, although it may be necessary to truck in material to or from the ROW on occasion using public roads. Planning is being conducted to limit the movement of any and all such earthen material intra-ROW, not using public roads. The intent is to reduce hauling distances and effects on roads by moving material around site, on the ROW, using 20 tonne to 40 tonne off-highway rock trucks. Sands and aggregates are intended to be produced on-ROW as well using in situ material and on-ROW crushing and screening activities. Using gravel trucks on public roads to haul material back and forth to the ROW from off-ROW areas is a possible, secondary method for aggregate material sourcing.

8 TRAFFIC ASSESSMENT OF MAJOR FACILITIES AND PUMP STATIONS

LSLP will be involved in tie-in work relating to two pump stations: McMurphy Pump Station and Blue River Pump Station.

8.1 Pump Stations—General

8.1.1 General Work Scope

The general work scope at each pump station will be as follows:

- Civil work including gravel trucks hauling materials on-/off-site, fencing, pile driving, and concrete work for pump building;
- Building erection and modular buildings brought to site;
- Pipe and valve installation;
- Mainline pump and motor installation; and
- Significant electrical installation of tray, cable, and substation equipment.

8.1.2 Schedule

Pump Station work is currently scheduled to occur as follows:

8-1: Pump Station Construction Schedule for Spreads 3 & 4

Location	Construction Schedule
McMurphy	TBD
Blue River	TBD

8.1.3 Construction Vehicles Road Usage

Except as otherwise noted, general traffic volumes to each of these pump stations can be expected as detailed in Table 8-2.

8-2: Pump Station Construction Vehicle Traffic

Vehicle Type	Average Construction Activities	Peak Construction Activities
Bus (15 Pass Van)	1-3 trips during AM 1-3 trips during PM	3 trips during AM 3 trips during PM
Light Vehicles	10-15 trips during AM 10-15 trips during PM	15 trips during AM 15 trips during PM
Transport Trucks	2-5 loads	10 loads per day
Gravel Trucks	5-10 trips during AM 5-10 trips during PM	20-30 loads per day

8.1.4 Construction Traffic Roadway Impacts

Pump Station upgrades will have negligible traffic effects on public roadways considering that most will have minimal traffic going to and from the pump station overall, or on a daily basis, and will not have major construction activities taking place. Higher levels of civil work may be required at McMurphy requiring gravel trucks to haul material on-/off-site. Further, existing roads are in place with few, if any, upgrades currently being contemplated to each pump station access. The one exception to the above is for Black Pines Pump Station which will be a completely new pump station where an access road will need to be constructed and, because there is nothing currently on the site, complete infrastructure will need to be built requiring more traffic.

8.1.5 Construction Traffic Ancillary Effects

Ancillary effects are expected to be minimal at pump stations given that noise and light effects will be almost exclusively during daytime hours and the pump stations are, generally, located in non-residential, rural areas. Dust, if present, will be controlled using water trucks on the short, gravel access roads leading to pump stations.

8.2 Blue River Pump Station

8.2.1 Overview

Blue River Pump Station is located in the town of Blue River, BC, on Blue River East Frontage Road and Angus Horne Street. The exact location can be seen below in Figure 8-1. It will entail the standard construction scope as discussed in Section 8.1

Figure 8-1 – Blue River Pump Station

8.2.2 Current Traffic and Anticipated Traffic Volumes

Figure 8-1 shows the current traffic data in the vicinity of the Blue River Pump Station along major corridors. Normally, the anticipated traffic volumes are the sum of the current traffic and the anticipated traffic generated from the construction activity. The anticipated traffic from the construction activities to/from the Blue River Pump Station, are shown in Table 8-2.

8.2.3 Construction Traffic Roadway Impacts

8.2.3.1 Adjacent Network Element(s)

The Blue River Pump Station is located to the northeast corner of Angus Horne Street and Cedar Street intersection, west of Highway 5 (Southern Yellowhead Highway). Figure 8-1 shows the potential access routes to/from the Blue River Pump Station. There are two-lane frontage roads running parallel to

Highway 5 and provide access to the adjacent sites. The intersections of Highway 5 with Angus Horne Street, Blue River East Frontage Road, Cedar Street, and Hardwood Drive are unsignalized with stop signs. The area is generally rural, with low density commercial and residential land uses in the vicinity of the proposed site for the Blue River Pump Station.

As shown in Figure 8-1, the current peak hour traffic along Highway 5 is 480 vehicles/hour bidirectional. The collective anticipated traffic volumes (bus, light vehicles and transport trucks) are negligible when compared to the current traffic. Therefore, the additional traffic is not expected to add significant pressure on Highway 5 traffic or Highway 5 intersections with Angus Horne Streets and Hardwood Drive.

The construction traffic will access the site via a new access road. There will be no reroutes for public traffic as a result of construction activities.

The construction activities are not expected to cause a disruption to provincial and local speed zones.

8.2.3.2 Access Point(s)

The construction traffic, as shown in Table 8-2, will access the Blue River Pump Station site via Highway 5, Angus Horne Street, Blue River East Frontage Road, Harwood Drive, and Cedar Street. The intersections are unsignalized and are controlled with stop signs. The access point geometries as well as natural patterns, which are generally flat, provide sufficient sight distances as well as turning radiuses.

8.2.3.3 Active and Public Transportation Element(s)

The area is rural with no significant public facilities including sidewalks or dedicated cycling lanes that may be affected by the construction traffic. There is no public transit in the vicinity of the Blue River Pump Station.

8.2.3.4 Parking

The targeted site for the Blue River Pump Station has sizable vacant lands that can potentially be used for labor transport and truck parking. Heavy transport trucks will access the site using existing facility accesses and could be parked within the construction site boundaries. The construction activities, as well as the traffic generated due to the activities, are not expected to affect off-site public parking spaces, if any. Designated on-site parking areas are to be determined as construction planning progresses.

8.3 McMurphy Pump Station

8.3.1 Overview

McMurphy Pump Station is located in Northern BC, west on Highway 5, 16 Km south of the town of Avola and approximately 29km North of Vavenby. It will entail the standard construction scope as discussed in Section 8.1.

Figure 8-2 – McMurphy Pump Station

8.3.2 8.9.2 Current Traffic and Anticipated Traffic Volumes

Figure 8-2 shows the current traffic data in the vicinity of the McMurphy Pump Station along major corridor(s). Normally, the anticipated traffic volumes are the sum of the current traffic and the anticipated traffic generated from the construction activity. The anticipated traffic from the construction activities to/from the McMurphy Pump Station, are shown in Table 8-2.

8.3.3 Construction Traffic Roadway Impacts

8.3.3.1 Adjacent Network Element(s)

The McMurphy Pump Station is located to the north of Highway 5 (Southern Yellowhead Highway) with a relatively short driveway providing access directly to/from the highway. The existing facility is a rural area, with no developed land use in visible vicinity.

As shown in Figure 8-2, the current peak hour traffic along Highway 5 is 420 vehicles/hour bidirectional. The collective anticipated traffic volumes (bus, light vehicles, and transport trucks) are negligible when compared to the current traffic. Therefore, the additional traffic will not add significant pressure on Highway 5 traffic.

8.3.3.2 Access Point(s)

The construction traffic, as shown in Table 8-2, will access the targeted site for McMurphy Pump Station via a driveway to/from Highway 5. Since this is an existing industrial facility, the driveway geometry should already provide sufficient sight distance and turning radiuses.

8.3.3.3 Active and Public Transportation Element(s)

The area is rural with no significant public facilities including sidewalks or dedicated cycling lanes that may be affected by the construction traffic. There is no public transit in the vicinity of the McMurphy Pump Station.

8.3.3.4 Parking

The targeted site for the McMurphy Pump Station will be used for labor transport and truck parking. Heavy transport trucks will access the site using existing facility accesses and will be parked within the construction site boundaries. The construction activities, as well as the traffic generated due to the activities, are not expected to affect off-site public parking spaces, if any. Designated on-site parking areas are to be determined as construction planning progresses.

9 TRAFFIC ASSESSMENT OF FIRST NATIONS RESERVE LANDS

The Spreads 3 & 4A alignment does not travel through any First Nations Communities.

10 TRAFFIC ASSESSMENT OF PIPELINE REACTIVATION SECTIONS CONSTRUCTION

LSLP will not be involved in reactivation of pipelines.

11 TRAFFIC CONTROL MONITORING, DOCUMENTATION AND QUALITY MANAGEMENT

11.1 Traffic Control Monitoring

Once a work zone TCP is installed, it is important to verify that it functions as intended. Installed equipment shall be serviceable and fully maintained. Modifications may be required due to changes in conditions. The Traffic Control Manager (TCM) will ensure the inspection and maintenance of traffic control devices and plans with the support of LSLP construction supervisors.

The TCM is also required to ensure that traffic is monitored between work zones. The TCM will ensure that impacts between work zones are appropriately mitigated with the support of LSLP construction supervisors. Where an elaborated Traffic Control Plan is required due to the proximity of the work to the public or impact to the motorist, a designated traffic control supervisor will be employed to monitor the implementation of the traffic control strategies. As the majority of the traffic control plans will be for the access and egress of project vehicles off of the Highway into the designated access roads, a Traffic Control Supervisor will not be required. The traffic control manager with the support of the construction supervisors will ensure the compliance and monitoring of the traffic control strategies which include traffic control devices installation and maintenance.

Where active work zones will have impact on traffic, LSLP traffic control supervisor will visually monitor the impact and update the TCP to minimize vehicular queue. Should the traffic control appear to be causing unnecessary delays or safety issues, the TCS will be responsible to correct the issues and potentially remove the traffic control, when it is practical and safe to do so to restore acceptable traffic flow.

11.2 Traffic Control Documentation

In compliance with the TCPs, the TCM or their designate will monitor traffic and construction activities on sites and between sites and record any impacts.

Documentation will include:

- TCM daily traffic control log.
- Video or photo log of traffic control; and
- Incident reports.

Any changes must be documented into the daily traffic log and photo/video log updated to capture the new changes. Where changes are implemented, it will be evaluated to ensure effectiveness

11.3 Traffic Quality Control

The Traffic Control Manager will be responsible for the completion of traffic control inspection and maintenance, traffic control documentation, audits of the traffic management and traffic control documentation, and field audits of the implemented LSLP will record queue length/delays and

clearance times for each of specific traffic control measures at all active sites. These documents will be made available to the TMEP representative as required.

LSLP will utilize a Daily Activity Report found in Appendix E to document traffic control delays, queue length or any other traffic challenges that may arise on active work zones.

11.4 Traffic Quality Assurance Management

Information gathered will be summarized weekly to ensure overall traffic management. If excessive delays are recorded / observed, options to reduce these overall impacts will be reviewed on a case-by-case basis in an effort to minimize any impacts to those stakeholders affected. Mitigations measures may include changing working hours and onsite traffic control measures / devices which can bring attention to those details required to ensuring a safe and efficient overall traffic management project delivery. TMEP Traffic Inspectors (TIs) will be used for quality assurance on the Project primarily focused on traffic oversight. The Traffic Manager and where required Traffic Supervisors will complete compliance inspections weekly as per LSLP leading indicator calendar. The overall framework of quality assurance will be followed by evaluating the implementation of the TCP, identified the required changes, implement the changes and evaluate the effectiveness of the changes. The TCM will be responsible to ensure this is occurring in a timely manner.

12 ACCESS MANAGEMENT

12.1 Access to sites

Main highways and roads parallel to the pipeline route will be used for traffic movement along the length of the Project. A network of roads that feed off the main highways will be used to provide additional access to the pipeline spread. These consist of local and forestry roads that may require upgrading. Access points are listed in Appendix E.

TMEP has submitted permit requests in the form of eDAS for the use of MoTI roads. The list of the requested access roads and their status are also included in Appendix E

Except for major highway crossings, access points will be constructed to allow vehicles to enter and exit the pipeline ROW and to allow heavy construction equipment to cross over.

Existing access roads and access points off main roads which are not on the pipeline ROW (off-easement accesses) may need to be upgraded or developed to allow travel to the pipeline ROW.

Traffic management measures will be implemented on roads and access points to mitigate risks to the public and personnel.

To allow access to the pipeline spread, temporary access points will be constructed as per approved eDAS submissions. This construction activity will affect traffic as accesses are prepared just off the edge of roads and temporary traffic control may be required. Approach design will need to consider existing infrastructure, line of site, existing pavements, obstruction, and traffic considerations. An assessment of

individual access points will be conducted as to the suitability of vehicles that will be able to use the access points from the existing road. The access points will be used for all mainline construction equipment to cross the roads as well as an access to the ROW.

Access points have been categorised depending on the existing road category. Accesses will be designed so that vehicles are able to exit and enter the pipeline ROW efficiently and minimise disruption. Access points will be built to typical Traffic Control Plans drawings where possible, however some site-specific TCP drawings will need to be developed.

The BC MoTI sub-plan have been prepared and included in Appendix B of this TMP.

12-1 Spread 3 & 4A - Number of Access Roads by Type

Access Point Type	Estimated Number
Existing Major Access (EMA) Roads	225
Existing Secondary Access (ESA) Roads	221
Deactivated and Overgrown Access (DAOA) Roads	281
New Temporary Access Roads	104

13 IMPLEMENTATION PLAN

13.1 Implementation Plan – General

This Implementation Plan identifies responsibilities and procedures for ensuring that the TMP is developed and implemented in a coordinated manner. The Implementation Plan consists of three steps, which will be completed every day that activities occur on the construction site.

The three steps are:

- Pre-implementation
- Implementation
- Post-implementation

BC MoTI TMM have been referenced in the development of this Implementation Plan. The BC MoTI sub-plans (including the Implementation Plan) have been prepared and included in Appendix H of this TMP.

13.1.1 Pre-Implementation

Prior to the start of the operations, the Traffic Manager will meet with the Project Superintendent and construction supervisors to discuss the planned construction activities for the day. The planned activities and timing will be outlined and the appropriate specific traffic control plans/drawings to be

used will be decided on. The Traffic Manager will then meet with the Traffic Control Persons and if required, a Traffic Control Supervisor, to discuss what traffic control plans will be used during the day and when. The meeting will be used to:

- Ensure that the necessary signs and personnel required to carry out the plans are ready,
- That everyone understands the Incident Management Plan and emergency procedures to be followed if an emergency or incident occurs,
- If radios are to be used, a radio check is to be done,
- Ensure that all Traffic Control Personnel understand the plans,

After the meeting, the Traffic Manager/Supervisor (or designate) will drive through the site to:

- Ensure that the correct signage and traffic control devices are in place,
- Inspect the condition of all signs. Any signs that require maintenance are to be fixed,
- Ensure that all Traffic Control Personnel are in their proper locations.

The Traffic Manager/Supervisor (or designate) will complete ongoing monitoring of the site during active works, and complete spot checks after hours if traffic control devices are left in place during periods of inactivity.

13.1.2 Implementation

Implementation of the plan will consist of carrying out the plan as discussed. Any changes or conditions that are encountered that are outside of expected parameters are to be brought to the Traffic Control Manager's attention. The TCM or if required the TCS, will then decide if the plan must be adjusted and will make any necessary changes. The TCM or if required the TCS, will also keep documentation of traffic control plant set up, the positioning of traffic control devices, and other measures.

13.1.3 Post Implementation

At the end of the construction day, the Traffic Control Manager/Supervisor (or designate) will drive through the site and cover up any signage or remove any traffic control devices that are not required when construction is not taking place.

13.1.4 Documentation

During the course of this project, the Traffic Control Manager/Supervisor will provide the following documentation of the implementation of the traffic control measures:

Daily Activity Report/Traffic Control Plan/Drawing

- These reports will be a summary of all traffic management activities during the day.
- They will be completed on the sample forms in Appendix F and video logged.
- They will be completed on a daily basis

- They will be submitted to the Road Authority Representative and the Project Superintendent the next business day.

Record of Traffic Control Equipment

- This record will be an up to date record of all traffic control equipment that has been installed within the Work Zone. The record will have as much detail as necessary to enable the TMEP Traffic Management Representative and Road Authorities to review the record and know the location and type of equipment that was in place at any time during the contract.
- It will be completed on the sample form in Appendix F.
- It will be updated each time construction related traffic control devices are installed, moved or removed.
- It will be available upon request.

Non-workday Inspection Report

- The report shall address road and safety conditions at the time of the inspection
- The report shall detail any action taken to ensure the safe passage of the traveling public.
- It will be completed on the sample form in Appendix F or Video logged as required.
- It will be completed on every non-working day
- It will be submitted to the Road Authority Representative the next business day.

13.1.5 Traffic Control Schedule

Appendix H – LSLP Schedule provide an overall project schedule. Anticipated work, location, approximate implementation date, and duration will be communicated during the project execution to provide accurate timelines. The Road Authority Representative will also be informed of traffic control activities on a weekly basis and immediately in the event of changes to the schedule or plans. This information will be provided to TMEP who will communicate with MoTI.

13.2 Key Traffic Management Personnel

The following positions will be required to form LSLP Project Team for Traffic Control group.

- Traffic Control Manager
- Traffic Control Persons
- Site Supervisor
- Traffic Control Supervisor (Can be subcontracted for complex traffic scopes)

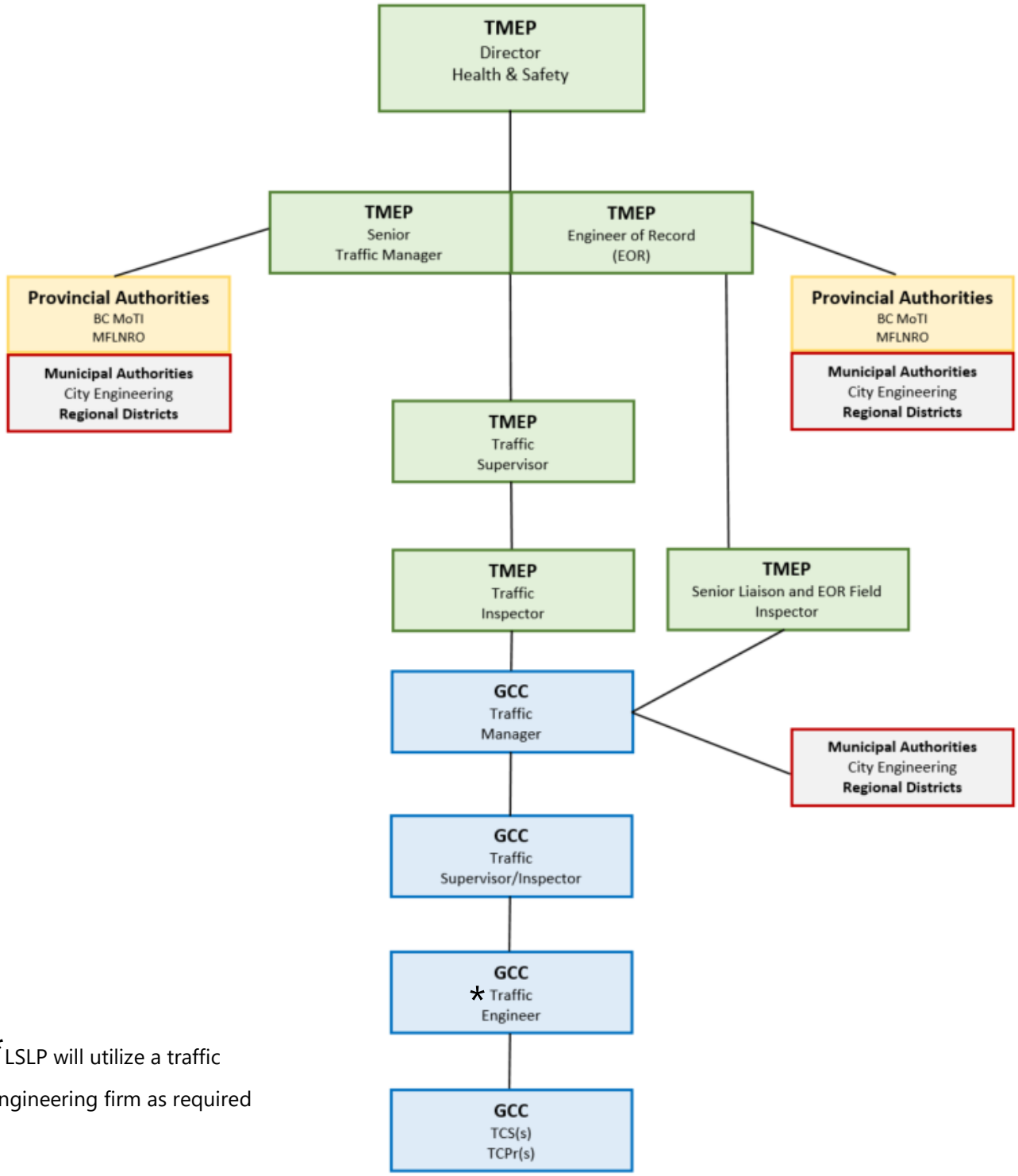
Traffic control activities associated with work must have a management structure for these activities to ensure that all supervisors and workers are thoroughly familiar with, and trained in, the applicable safe work practices. Management and site supervision personnel shall monitor the effectiveness of traffic

control, take immediate and decisive action when safe and approved work methods are not followed, and document and make necessary changes as issues arise.

Individuals assigned traffic control responsibilities shall have adequate knowledge and training in all facets of traffic control, including:

- Traffic control operations (those conducting traffic control shall be trained in a manner acceptable to MoTI TMM via approved trainers.
- The contents of this TMP, other relevant publications and technical circulars, and manuals and regulations that govern other jurisdictions (when and where required by particular projects)

Figure 13-1 shows an elaborated hierarchy of key traffic management personnel. Note: Staffing will be subject to owner approval and it will be adapted to the volume of the traffic related activities being performed throughout the project life and the ramp up of the direct resources.



*LSLP will utilize a traffic engineering firm as required

Figure 13-1 Hierarchy of Key Traffic Management Personnel (Source: TMEP)

13.2.1 TMEP Traffic Engineer of Record (EOR)

The TMEP Traffic Engineer of Record (EOR) is a technical review, management and oversight position for the TMEP Traffic Management Program to ascertain that the EOR's final design, including any changes made during construction, meets applicable design standards, criteria and guidelines, and is not responsible for the quality of construction.

This position is the TMEP technical traffic liaison to the Regulatory Road Authorities, including the BC Ministry of Transportation and Infrastructure (MoTI), the Municipal Road Authorities, Forestry and the Indigenous Communities. The EOR reviews the Traffic Management Plans (TMP), the Traffic Control Plans (TCP) and technical drawings, to ensure they meet engineering guidelines, meet the MoTI Traffic Management Manual (TMM) guidelines and receive technical approval by TMEP and are suitable for submission to the Regulatory Road Authorities. This position will provide guidance and direction to the Contractors, relative to Traffic Control Plans and will liaise with the Road Authorities regarding any required modifications. The EOR, or their designate, further reviews and manages the submissions of the H1080's relative to partial lane closures and full land closures. The coordination of lane closures, traffic delays and commitments to BC MoTI, throughout the Spreads, will be a collectively managed by the TMEP Senior Traffic Manager and the EOR. The coordination of adjacent work zones and overlapping TCP's will be managed and coordinated through the collective efforts of the EOR, the Senior Traffic Manager and the Contractor, all in an effort to ensure public safety. Modifications to Traffic Control Plans, requiring changes to drawings and structure will be approved by the EOR.

13.2.2 TMEP Senior Traffic Manager (TM)

The TMEP Senior Traffic Manager (TM) position provides management oversight for the TMEP Traffic Safety Program. The TM is responsible for overseeing the development of effective safety strategies, which are aligned with the TMEP Safety goals and objectives. This role liaises with Provincial Regulators, including BC MoTI, to ensure the Traffic Management Plans, Traffic Control Plans and Safety Protocols are reviewed confirming TMEP adherence to regulatory requirement and submitted for approval. The TM position also serves as a liaison to the Emergency Services Management, in the event of a Traffic Incident. The TM acts as a managerial liaison with the General Construction Contractors (GCC), in multiple Spreads, to ensure the coordination and delivery of the TMEP Traffic Safety Program between Trans Mountain and the all contract partners. The TM is responsible for supervising and communicating with the Traffic Supervisors, to correlate traffic information relative to all the Spreads. This includes the coordination of information, with the EOR, from the traffic personnel, through the GCC's, relative to partial and full-lane closures, documented on form H1080. The TM reviews the Project Traffic Program reports, analyzes the information provided by the Traffic Supervisor, and reports to the TMEP Health & Safety Directors on its status. In the event of a traffic incident, the TM communicates with the Traffic Supervisors to ensure a comprehensive and detailed investigation is undertaken. The TM will also be involved in a causal analysis review, when incidents occur, providing a report to TMEP Management.

13.2.3 TMEP Traffic Supervisor (TS)

The TS provides supervisory oversight for the TMEP Traffic Safety Program in the field. The TS liaises with BC MoTI to ensure the Traffic Management Plans, Traffic Control Plans and Safety Protocols are submitted and approved. The TS is also responsible for working, engaging, and communicating with the General Construction Contractors (GCC), in multiple Spreads, to ensure the coordination of partial and full lane closures, while ensuring the appropriate notifications are made. This position is responsible for communicating with the other Traffic Supervisors to correlate traffic information relative to all the Spreads. This includes planning traffic management strategies, pertaining to the overall impact of the pipeline construction traffic on the motoring public. The management of those strategies, throughout the supervision of Traffic Inspectors, must be implemented in safe, timely and efficient manner in coordination with the General Contractors. The TS provides supervision and review of field audit reports, while providing direction, guidance and knowledge, to ensure traffic audits are being conducted on work sites, confirming compliance with the Contractor's Traffic Management Plan (TMP).

The TS is responsible for the supervision and oversight of the Trans Mountain Traffic Inspector's Traffic Management Program and reports to the Senior Traffic Program Manager. This includes conducting daily reviews of traffic safety documentation and ensuring Contractor compliance in traffic control plan implementation and management. This position will provide oversight, direction and guidance on traffic related incidents. This includes regular communication with the General Contractors to ensure their compliance with the Spread Traffic Management Plans, liaising with neighboring Trans Mountain Traffic Supervisors to ensure current, timely and accurate knowledge of construction issues which may result in traffic delays. The supervision, oversight and direction will ensure TMEP work sites are being operated in a safe and efficient manner for both the motoring public and TMEP workers.

The TS will coordinate communications with BC MoTI. The TS will coordinate the activities of the TMEP Traffic Inspectors to ensure constant communication with the Contractor's Traffic Managers as dictated by the TMEP Project requirements.

TS's will review field inspections daily, ensuring all appropriate reporting protocols are followed relative to each respective incident. The results of the daily field inspections will be culminated into a weekly report, which will provide the Senior Traffic Manager an informative overview of the Traffic Management activity in the field.

13.2.4 TMEP Traffic Inspector (TI)

The TI provides traffic management oversight for the Trans Mountain Expansion Project (TMEP) Traffic Safety Program in the field. The TMEP TI is responsible for the audit and oversight of the Contractor and reports to the TMEP Traffic Supervisor. This includes conducting regular inspections on documentation and on field activities to ensure that the Contractor's work sites requiring traffic control are being operated in a safe and efficient manner for both the public and workers. This position liaises with BC MoTI, to ensure the Traffic Control Plans and Safety Protocols are approved and are adhered to, and the delays are being managed appropriately and reported to MoTI.

The TMEP TI will coordinate communications with BC MoTI. The TMEP TI will coordinate the activities of the Contractor's TM, as dictated by the Project requirements and progress.

TIs will complete field inspections on a daily basis and keep a journal. The results of the daily inspection and any major concerns will be communicated directly to the contractor for immediate corrective action. TIs will complete a daily report of their findings and submit to TMEP Traffic Supervisor, who will accordingly report through to the TMEP Senior Traffic Manager. TIs will complete a similar report for each contractor on a monthly basis. TIs will complete a monthly audit on the TMP to ensure it is being implemented effectively. Any deficiencies noted by the TI will be communicated to the contractor and the TMEP Traffic Supervisor who will be required to complete a corrective action plan to ensure timely resolution of any traffic safety issues.

In the event of a Traffic Incident, the TI provides guidance, direction, knowledge and oversight to the GCC investigating team, thereby ensuring a comprehensive, detailed and complete investigation is conducted.

In areas of construction where, due to the complexity of traffic control requirements, the duration of the construction work, or where emergency vehicle routes have a higher potential to be affected, the TI will review such locations to ensure that the localized emergency response plan for emergency vehicles to and through the work zone is effective. Corrective actions must be conducted as soon as is practicable and the TI will keep notes in their journal with summarized findings in their daily report to the Traffic Supervisor.

13.2.5 Traffic Control Manager – Contractor

The Traffic Control Manager is appointed by LSLP, and is responsible for preparing, implementing, and managing the LSLP Traffic Management Plan and sub-plans. This includes reviewing and evaluating, the details in the Traffic Control Plan, including the traffic control layouts. These are the typical duties and responsibilities of the Traffic Control Manager:

- Fully implements the Traffic Control Plan
- Monitors traffic operations to determine the effectiveness of the Traffic Control Plan
- Ensures that the Traffic Management Plan remains current
- Oversees modifications to the Traffic Management Plan as required by changes to the construction schedule, accommodation of special events, and changes to sub-plans
- Ensures that daily traffic control logs are maintained
- Exercises full line authority over all Traffic Control Persons on the work site
- Finalizes traffic control measures with the Construction Contractor's Traffic Engineer where these are required by TMEP
- Sets up and implements a monitoring schedule for both active and inactive work periods throughout the course of the project
- Directs the Construction Contractor's Incident Management Plan
- Directs the Construction Contractor's Public Information Plan

- Directs the Construction Contractor's Implementation Plan
- Attends regular meetings with the TMEP Traffic Inspector and the Road Authority Representative on behalf of the Construction Contractor to discuss project performance, issues, and plans

The role of Traffic Control Manager should be assigned only to a qualified person who is knowledgeable about traffic management principles and requirements, and who has suitable traffic management work experience or training. The Traffic Control Manager may be an employee of the Construction Contractor or a sub-contractor to the Construction Contractor and may be the designated Traffic Control Supervisor or another qualified person.

13.2.6 Traffic Control Supervisor – Contractor

The Construction Contractor shall designate a Traffic Control Supervisor who is qualified to assume the responsibilities of this function. It cannot be the Site Supervisor, Superintendent, or Foreman unless the designation is authorized by TMEP. The Traffic Control Supervisor may be an employee of the Construction Contractor or a sub-contractor to the Construction Contractor. It may be the Traffic Control Manager for the project or an onsite Traffic Control Person if circumstances allow. If the traffic management responsibilities for the project require full-time or frequent attention, a different person should be assigned to this role. Traffic Control Supervisor duties shall include:

- Oversee traffic control operations, ensuring traffic control is executed in accordance with the Traffic Control Plan, and updated as necessary. If the traffic control measures in place are not achieving the desired effect, the Traffic Control Supervisor will make the appropriate modifications in the field and communicate those changes to the TM & EOR for approval.
- Ensure compliance with Part 18 of WorkSafeBC's Occupational Health and Safety Regulation regarding supervision of Traffic Control Persons in the work zone
- Inspects night-time lighting and glare on approaching general public traffic
- Monitors queue lengths and manages lane closures
- Provide direction to Traffic Control Persons
- Required traffic control devices are in place
- Signs are checked, maintained, and moved as required
- Daily traffic control setups are documented, and changes are identified in the Traffic Control Plan or logbook
- Traffic concerns are reported to the Traffic Control Manager or Site Supervisor
- Ensures each member of the traffic control crew wears the required personal protective clothing and equipment

The Traffic Control Supervisor shall also ensure that all TCPs are:

- Carrying evidence of current BC TCP certification
- Equipped with all necessary equipment, including, radios, spare batteries, chargers, and red signalling wand

- Performing traffic control duties competently and safely
- Positioned in safe locations that are clear of potential environmental hazards, such as a slide or avalanche
- Provided with rest breaks

If two or more TCPs work as a team, the employer of the traffic control personnel and the Traffic Control Supervisor should ensure that the responsibility for coordinating changes in traffic flow is assigned appropriately. The Traffic Control Supervisor shall have TCP certification in order to assume the duties of a TCP and direct traffic.

13.2.7 Site Superintendent – Construction Contractor

The Site Superintendent shall ensure that:

- Each crew member is familiar with the Traffic Control Plan.
- Each crew member wears the required safety apparel and uses the required equipment when working on or crossing the highway.
- The work zone is protected by implementing the Traffic Control Plan, which uses various signs, channelizing devices, flashing lights, and other temporary traffic control devices and measures described in this Manual.
- The Traffic Control Supervisor is informed to know what construction activities will be taking place and that the appropriate traffic control procedures are decided on.
- Ensure compliance with Part 18 of WorkSafeBC's Occupational Health and Safety Regulation regarding supervision of Traffic Control Persons in the work zone
- Ensure that emergency traffic control operations are carried out in accordance with the Incident Response Plan;
- Attend regular meetings with the Road Authority representative on behalf of the Construction Contractor to discuss performance, issues and planned changes.

13.2.8 Safety Manager – Construction Contractor

Any and all safety related issues should be immediately referred to the Project Safety Manager

13.2.9 Traffic Engineer – Construction Contractor

LSLP will employ Allnorth for the purpose of traffic engineering consultation. Allnorth will support LSLP with the assessment, development, review, and implementation of any Engineered drawing created for LSLP, as required.

13.3 Traffic Control Personnel – Contractor

LSLP Traffic Control Personnel (TCPr) will report to the LSLP Traffic Control Supervisor.

TCPr may be required to review, recommend amendments, and document Traffic Control Plans as part of their daily activities. In order to do so, they shall carry valid BC TCP certification on the work site at all times and have a good working knowledge of the TCP.

TCPr shall communicate instructions and directions to drivers effectively by using standard traffic control motions and signals that are precise and deliberate to be clearly understood by road users.

TCPr quickly become familiar with their work zone and should try to assess the layout through the eyes of a road user who is arriving at the zone in the worst foreseeable conditions. This will help them to anticipate traffic control issues and identify required changes to the Traffic Control Plan. TCP training and performance should emphasize:

- The importance of the job
- Alertness and attentiveness – the use of electronic devices including headphones is prohibited while conducting traffic control duties
- The need for a courteous but firm manner
- Proper TCP positioning in relation to the work activity area in order to achieve effective traffic control and ensure the safety of the public, workers, equipment, and all TCPs
- Sufficient discipline to prevent others from loitering near the TCP location
- Sufficient discipline to remain in position until relieved by other personnel or until the conflict being controlled no longer exists
- The requirement to remove or cover Traffic Control Person Ahead C-001-1 signs whenever TCPs are not actively regulating traffic
- The requirement to comply with Part 18 of WorkSafeBC's Occupational Health and Safety Regulation regarding personal protective equipment (see Section 5.4: Work Zone Apparel and Equipment) and traffic control signals (see Section 5.6: TCP Positioning and Signals)
- The use of Personal Protective Equipment (PPE) per MoTI TMM Section 5.4

Among other requirements specified in Part 18.4 of WorkSafeBC's Occupational Health and Safety Regulation, employers and supervisors should ensure that:

- Traffic control arrangements and procedures for the work are made known to all personnel involved in the work.
- Required traffic control devices and procedures are in place before the work starts and are removed when they are no longer required.
- Any person assigned to be a TCP is adequately trained in a manner acceptable to WorkSafeBC and performs effectively in accordance with the traffic control arrangements and procedures for the work.

Use of Traffic Control Persons in Work Zones

Traffic Control Persons are used only when all other traffic control methods are considered inadequate to warn, direct, and regulate road users within a work zone. Traffic Control Persons are used to regulate traffic within a work zone, thereby preventing conflicts between the movements of pedestrians, vehicles, workers, and work zone equipment. Traffic Control Persons shall not control traffic within speed limits greater than 70 km/h. Common applications for Traffic Control Persons include:

- Control of alternating one-way traffic through sections of a two-way road that is temporarily reduced to one lane (single lane alternating traffic or SLAT)
- Stopping public traffic to permit equipment to cross or enter onto a road, structure, or other work zone feature
- Stopping traffic in both directions to allow pipe trucks to access and egress the site where tracking into the opposing lanes may occur.
- Providing information to drivers or pedestrians regarding road closures, wait times, route options, etc.

On Non-MoTI regulated roads, one or both Traffic Control Persons may be omitted in the following situations:

- The self-regulated section does not extend through an intersection; or
- Where an open, one-lane section is sufficiently short (e.g., a spot obstruction), sight distance is adequate, and traffic volumes are light.

If one Traffic Control Person is omitted, the Traffic Control Person Ahead C-001-1 signs remain to warn of the one Traffic Control Person ahead. If both Traffic Control Persons are omitted, the Traffic Control Person Ahead C-001-1 signs are removed and a Yield to Oncoming Traffic R-056 sign is posted in the closed lane or the lane affected by the works.

Traffic Control Persons are not generally required as a traffic control measure for reducing speed or for reducing the number of lanes on multilane roads.

13.4 Coordination Lane Closures

Lane Closure Requests (LCR) will apply to situations where the Contractor is planning, in advance, to incorporate the partial-use or full-use of a vehicle travel lane. If the Contractor has advance plans to impact the motoring public through partial lane closures, or full lane closures, an LCR is required on Form H1080, for processing through to the BC Ministry of Transportation and Infrastructure (MoTI) for approval. LSLP will prepare the H1080 form, submit to TMEP and TMEP will submit to MoTI for approval. An LCR is not required for an unplanned or unforeseen incident, which results in a lane closure.

Trans Mountain will implement a lane closure request (LCR) procedure to manage lane closures for work zones in close proximity on provincial roads, as well as monitor delays to motorists across all construction spreads on provincial roads. The Contractor is responsible for submitting LCR submission packages to municipalities, after the review by the TMEP EOR. The Contractor must also ensure that

provincial LCR (H1080) packages are prepared and submitted with enough notice to TMEP to allow for internal approval by the TMEP Traffic EOR and Traffic Manager before they can be forwarded to appropriate Regulatory Road Authorities.

The Contractor will submit the LCR's to the TMEP Traffic Management with reasonable advanced notice. The TMEP EOR will approve, request changes, or reject the Contractor LCR's. Once approved by the TMEP, the LCRs will be submitted to the Road Authority for final approval through the TMEP EOR. The TMEP Traffic Management will provide the Contractor with the Road Authorities LCR response. Once the LCR's are approved by the Road Authority, the TMEP Traffic Inspector (TI) will monitor the implemented LCR's to ensure there is no significant delays to motorists across the entire project. If a work zone(s) is identified as causing significant delay, the TMEP TI will coordinate with the Contractor to mitigate delays, while in communication with the TMEP EOR and the Road Authority.

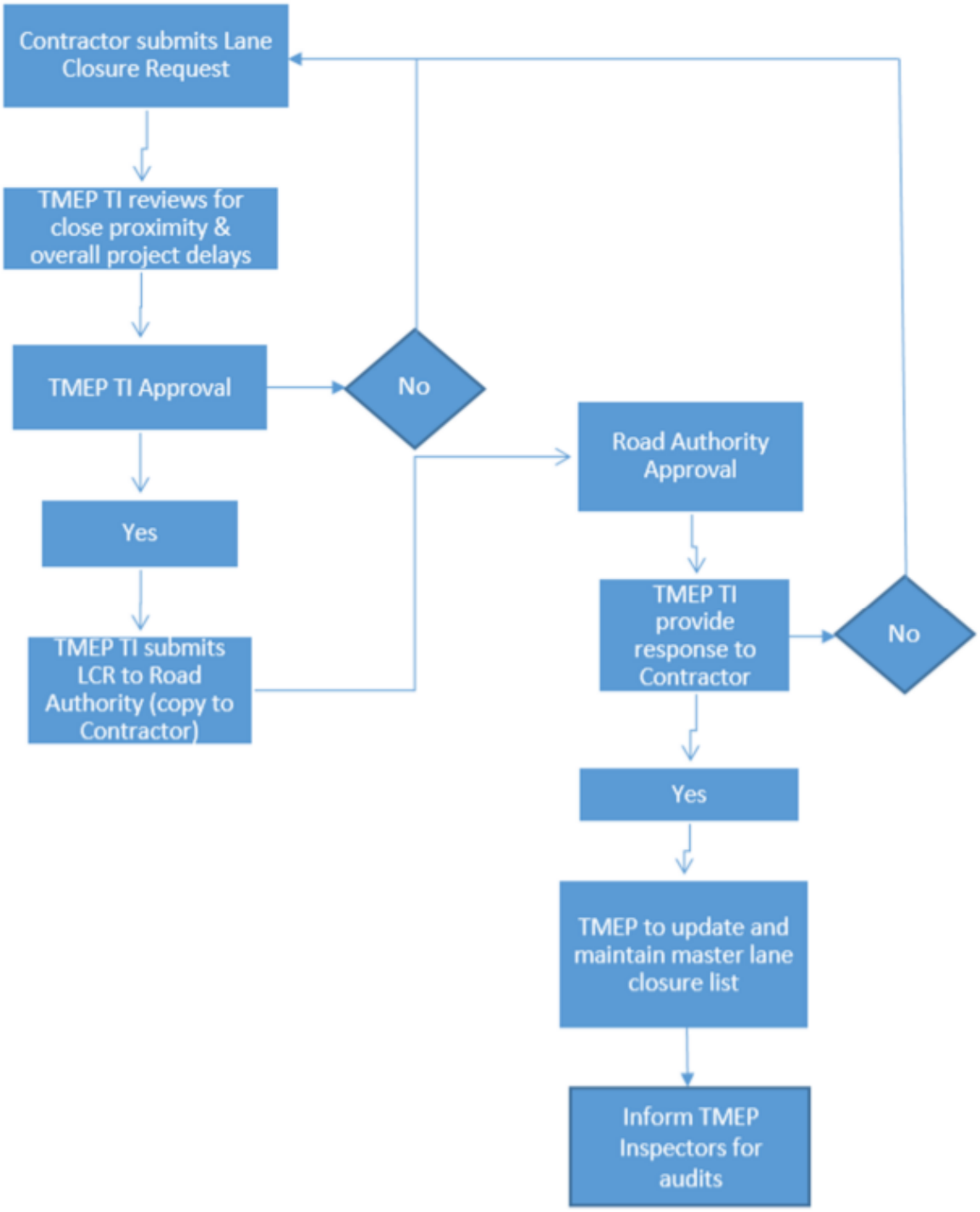


Figure 13.2 - Work Flow for Lane Closure Requests

14 CONSTRUCTION COMMUNICATION PLAN

14.1 Public Information Plan – General

The purpose of the Public Information Plan is to:

- Ensure that all emergency services/major user groups are aware of the project and the nature of the type of work being undertaken and have advance warning of any changes to traffic patterns.
- Provide information to the traveling public once they approach the project.
- Inform the Road Authority of current traffic operations and planned changes.
- Ensure methods and procedures are in place for resolving issues and complaints from stakeholders, including the travelling public and the Road Authorities

The BC MoTI sub-plans (including the Public Information Plan) have been prepared and included in Appendix B of this TMP.

14.2 Public Information – TMEP and LSLP Responsibilities

Updates regarding planned traffic pattern changes will be provided by the TMEP Traffic Inspector to the Road Authority Representative via H1080 forms so that DriveBC can be updated by MoTI.

Media requests will be referred to TMEP from the TMEP Traffic Inspector.

LSLP will support TMEP during implementation of the Construction Communications Plan by responding through TMEP to public enquiries where applicable and working with TMEP to resolve traffic management issues. TMEP will be responsible for the implementation of notifications, including the format, timing and frequency of traffic notifications. The Contractor will provide content for the notifications.

Where required, in collaboration with TMEP, LSLP will develop site specific traffic control messages and communications to reduce expected traffic disruptions to stakeholders.

Traffic advisory signing will be used to assist in the comprehensive dissemination of information to affected stakeholders and the public. Advisory signs on Dynamic Message Signs will be positioned within key areas as identified in the TCP designs to communicate potential traffic disruptions resulting from the implementation of the Contractor's construction work zones.

The Contractor will provide information to TMEP regarding all major traffic control changes on provincial roadways, such as major stoppages, lane closures, and new detour alignments in the form of an advance schedule that includes the locations of each construction work zone. This schedule will be reviewed regularly between the Contractor and TMEP and submitted to stakeholders until completion of the construction scopes of work.

The TMEP Stakeholder Engagement Team will inform the public with regular radio, newspaper and social media/website advertisements of project traffic information.

14.3 Appropriate Government Authorities, Indigenous Groups and Stakeholders

TMEP will continue leading all engagements with appropriate Government Authorities, Indigenous Groups and Stakeholders. Concerns have been addressed in the TMEP TACMP and include requests that:

- Traffic disruption be limited;
- Traffic plans and construction work schedules are communicated early to ensure community readiness;
- Construction methods are used to reduce effects on traffic flow, dust, and noise management; and
- Activities are conducted to restore traffic access and flow.

14.4 Emergency Service/Major User Group Notification

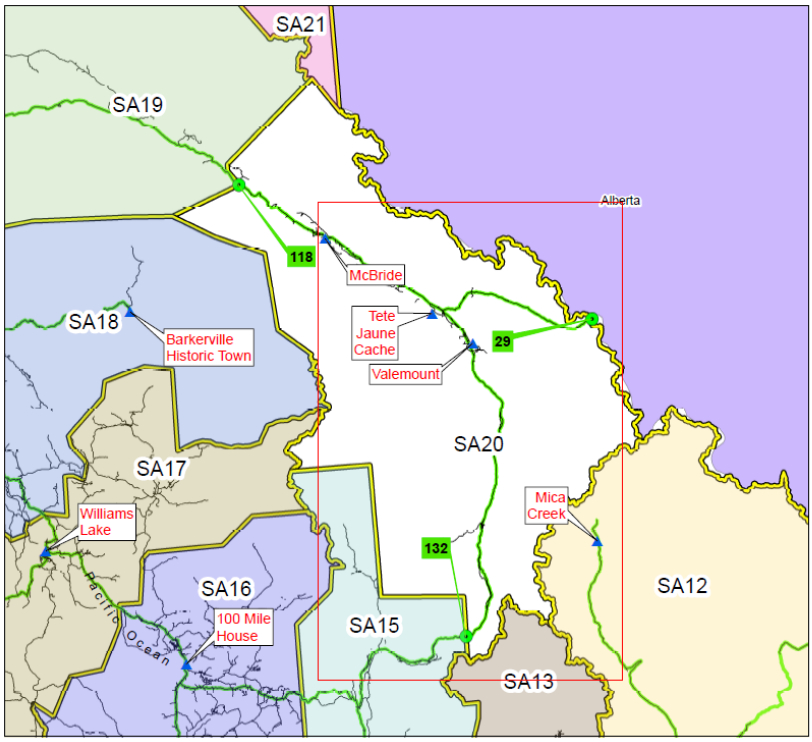
The Emergency Services/Major User Group Notification portion of the Public Information Plan provides a mechanism to inform the emergency services and major user groups in the area (e.g. School buses) of the nature of the project and type of work that will be carried out. This notification will take the form of a letter faxed/e-mailed to the various emergency services/major user groups.

TMEP with support from the Construction Contractor will send out notification letters or emails prior to the start of the project and whenever a change to traffic patterns affecting the free passage through the site will occur. Sample notifications can be found in Appendix F. A notification will be faxed or emailed to the following:

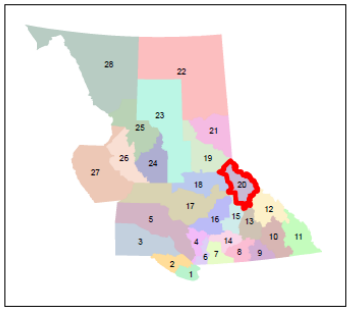
- Emergency Response Services (RCMP, Fire Department, BC Ambulance Services)
- BC Trucking Associations
- Commercial Vehicle Safety and Enforcement
- Valemount and Blue River Schools
- Utilities (Telus, Fortis, BC Hydro)
- Highway Maintenance Contractors
    - Service Area 20 (McBridge Area Office) - Lakes District Maintenance Inc.
    - Service Area 15 (Thompson-Nicola District Office) - Argo Road Maintenance (Thompson) Inc

Figure 14.1 MoTI Highway Service Area Boundary

Service Area: Robson



Service Area Boundary Crossing	HWY	Longitude	Latitude	Description at Crossing
29	0016	118 26' 57.70" W	52 52' 54.99" N	Highway 16 EB 2 Km east of Boundary Road Intersection
118	0016	120 49' 11.04" W	53 30' 25.57" N	Highway 16 EB 800m West of Loos Road Intersection
132	0005	119 28' 31.12" W	51 40' 17.31" N	Highway 5 NB 4.220 km southwest of Wire Cache Rest Area

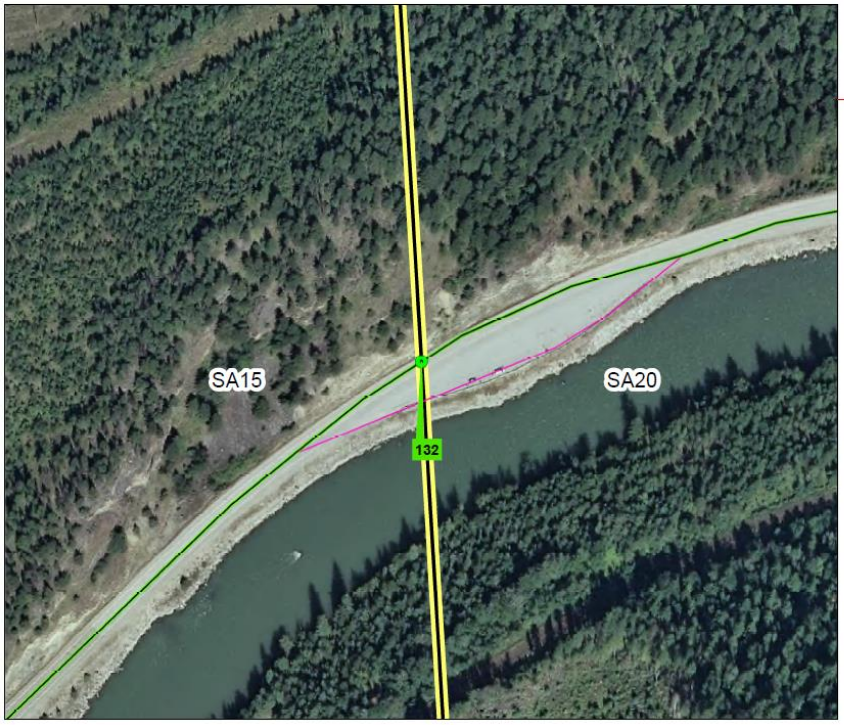


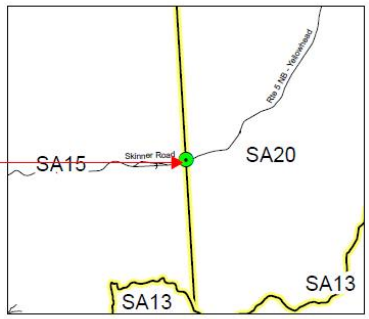
City/Town
Service Area Boundary Crossing
Major Highway
Ministry Owned Side Road
Service Area Boundary

British Columbia | Ministry of Transportation and Infrastructure

Crossing: 132 **MoTI Road/Hwy:** 20-B-C-00005 **Service Area:** Robson

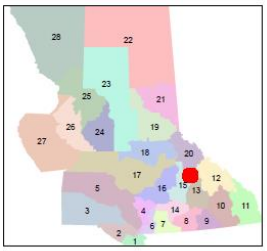
Crossing Description:
Highway 5 NB 4.220 km southwest of Wire Cache Rest Area





Latitude: 51° 40' 17.31" N

Longitude: 119° 28' 31.12" W



Crossing/Intersection
Major Highway
Ministry Owned Road
Rest Area
Non Ministry Owned Road
Service Area Boundary

British Columbia | Ministry of Transportation and Infrastructure

April 2017

15 INCIDENT MANAGEMENT PLAN

15.1 General

Incident management is an essential component of the overall project plan, as it will provide guidance when an incident occurs. An incident can be defined as an accident, vehicle breakdown, spill, or other event that impedes the normal traffic flow.

The Incident Management Plan defines processes for responding to unplanned events or traffic incidents in the work zone so that incident response operations within the work site are managed effectively.

LSLP Traffic Management Emergency Response Plan includes directions for all emergency response activities; from identification to reporting/communication and from response to investigations/follow up. This plan will be reviewed through the project orientation with all project personnel and made available on all project vehicle. Emergency response and procedures is consistent with the LSLP overall Site-Specific Emergency Response Plan. The LSLP's Emergency Response Procedures for the Project will be in all Project vehicles and shall be followed. Emergency contact names and numbers will be noted in the emergency response procedures.

The BC MoTI sub-plan (including the Incident Management Plan) have been prepared and included in Appendix B of this TMP for the incident assessment. The individual traffic control plans will include work zones updated specific emergency contacts for active work zones.

Incident Traffic Control

The primary function of traffic control at an incident area is to move traffic safely and expeditiously through or around the incident and to provide access for emergency vehicles.

Following any incident, the work will be immediately stopped, and the scene protected, to ensure any evidence is immediately preserved. This will further ensure that all applicable information is preserved for assessment by the Supervisors, Managers, and other responsible management personnel. The scene will be assessed to establish the response level and the action required to ensure safety, scene management, traffic control and the appropriate reporting protocols. Only after the assessment has been made and a discussion with the relevant level of Supervision or Management has occurred, will the approved plan be initiated. That assessment, discussion, planning, implementation and reporting process will ensure all relevant considerations have been addressed in any incident.

Procedure

The following procedure is to be followed if an incident occurs:

1. Inform the appropriate supervisor
2. Contact appropriate Emergency Services
3. Relay information to TMEP Traffic Inspector

4. In the event of a major incident, if the TMEP Traffic Inspector cannot be immediately contacted, contact the TMEP Traffic Supervisor or the TMEP Senior Traffic Supervisor who will notify the local Road Authority Representative directly,
5. Deal with the Incident
6. Review the Incident Response
7. Incident Management Report within 24 hours

15.2 Incident Management Responsibilities

As per the project Emergency Response Plan, the supervisor (can be a Traffic Control Supervisor if it is a complex traffic control plan) responsible for the scope of work affecting the traffic will evaluate the event/ incident and initiate the response plan by contacting the Traffic Control Manager, Superintendent and the required Emergency agencies. The Traffic Control Manager will contact the TMEP Traffic Inspector as per Section 13.2 of the TACMP.

The supervisor responsible of the scope of work affecting the traffic make the initial call to emergency responder to ensure no delay in the response plan. Further communication with external agencies/ parties will be done by the TMEP Traffic Inspector.

15.2.1 Incident Levels

Some of the types of collisions or incidents that may occur in an active work zone are classified in this section.

Level 1 Incidents include:

- Motor vehicle collisions within an active work zone (with or without injury);
- Motor vehicle collisions adjacent to an active work zone (with or without injury);
- Construction vehicle collisions (with or without injury);
- Worker collisions with injuries;
- Debris or hazardous material spills on the roadway;
- Collisions involving animals;
- Emergency road repairs (with major effects);
- Passage of emergency vehicles;
- Unexpected natural events, such as heavy rainfall, extreme settlements, and washouts; and
- Unexpected construction issues, such as slope instability, and any other condition that may cause prolonged and unplanned closure of the highway.

Level 2 Incidents include:

- Disabled motor vehicles within an active work zone (without injury);

- Disabled motor vehicles adjacent to an active work zone (without injury);
- Motor vehicle collisions within an active work zone (without injury);
- Motor vehicle collisions adjacent to an active work zone (without injury);
- Construction vehicle collisions (minor, without injury);
- Emergency road repairs (with minor effects); and
- Collisions involving animals (with minor effects).

15.2.2 General Response to Level 1 Incidents

This section describes how to respond to Level 1 incidents (with or without injury) that occur in an active work zone.

General Response for All Level 1 Incidents:

- Have someone call 911 as required;
- Stop or detour all traffic;
- Give proper attention to all injured parties;
- Inform construction supervisor of the situation
- Contact TMEP Traffic Inspector
- TMEP Traffic Inspector inform the Road Authority;
- TMEP Traffic Inspector provide the Road Authority with regular updates;
- Photograph the scene of collision as soon as possible to preserve evidence;
- Provide a route for emergency vehicles to enter and leave the active work zone, using all available resources;
- Redirect traffic flow, if at all feasible, within the construction zone and away from the collision;
- Document information pertaining to the collision;
- Await recovery;
- Resume traffic flow, redirecting traffic as necessary; and
- Inform the Road Authority when the incident is cleared.

Response for Worker Accidents (Injury):

- Inform First Aid attendant and call 911;
- Assess seriousness of situation and, if necessary, stop or detour traffic;
- Determine if traffic must be redirected;
- Inform construction supervisor of the situation

- Contact TMEP Traffic Inspector
- TMEP Traffic Inspector inform the Road Authority;
- TMEP Traffic Inspector provide the Road Authority with regular updates;
- Photograph scene of the collision as soon as possible to preserve evidence; and
- Document information pertaining to the collision.
- For extended delays, inform stopped traffic of the situation and delay using PCMSs;

Response for Oils and Hazardous Materials Emergency:

- All roadway spills will be treated in accordance with the 2016 Emergency Response Guidebook (Transport Canada,); LSLP will provide hazardous material awareness training to all traffic personnel on-site as required; and,
- The following general guidelines should be followed with oils and hazardous materials emergency response if a spill occurs in an active work zone:
    - Identify the type of materials, if feasible, by confirmation of the dangerous goods placard located on the hazardous material carrier, or by the material safety data sheet;
    - Notify supervisor and relevant emergency contacts;
    - Notify TMEP Traffic Inspector
    - TMEP Traffic Inspector inform the Road Authority;
    - Redirect traffic flow within the construction zone, if at all feasible, away from the spill;
    - For extended delays, program PCMSs to notify motorists of the situation prior to their entry into the spill zone;
    - Provide necessary abrasives, if available, and apply to roadway surface and shoulders;
    - Provide material to block the flow of runoff contaminants from highways into sewers, drains, or bodies of water that would cause harm to human life, health, or the environment;
    - If required, assist in the evacuation of risk areas;
    - Photograph the scene of the spill as soon as possible to preserve evidence;
    - Document information pertaining to the spill;
    - Re-establish normal roadway operations after the spill site has been contained, provided the hazardous material poses no risk or danger to the public; and
    - Inform the Road Authority when the situation clears.

Hazardous Materials

- If hazardous materials are suspected to be involved in the incident, then extra precautionary measures are to be implemented.
- Inform supervisor of the situation
- Identify the material if it is safe to do so. All tankers have identification numbers on the back, side and manifest
- The material identification number should be phoned in to Alberta Environmental Response Line 1-800-222-6514.
- Hold all traffic until advised by the appropriate authorities. The standard safe distance for hazardous material is a 1km radius.
- Ensure that no one lights a flare or smokes near the hazardous material.

Response for Collisions Involving Animals:

- Assess seriousness of situation, and, if necessary, stop or detour traffic;
- Inform supervisor
- Contact the maintenance Contractor to initiate corrective action;
- Inform TMEP Traffic Inspector
- TMEP Traffic Inspector to inform the Road Authority;
- Document information pertaining to the collision.

Please refer to the TMEP Environmental Protection Plan for more details.

15.2.3 General Response to Level 2 Incidents

This section describes how to respond to Level 2 incidents that occur in an active work zone.

General Response for All Level 2 Incidents:

- Inform the supervisor of the situation
- Have someone call 911;
- Stop or detour all traffic;
- Supervisor to inform TMEP Traffic Inspector
- TMEP Traffic Inspector to inform the Road Authority;
- TMEP Traffic Inspector to provide the Road Authority with regular updates;
- Photograph scene of the collision as soon as possible to collect evidence;
- Document information pertaining to the collision;
- Provide a route for emergency vehicles to enter and leave the active work zone, using all available resources;

- Redirect traffic flow within the construction zone, if at all feasible, away from the collision;
- Await recovery;
- Resume traffic flow, re-directing traffic as necessary; and
- TMEP Traffic Inspector to inform the Road Authority when the incident is cleared.

Response for Disabled Motor Vehicle:

- Inform supervisor of the situation
- Call Emergency Services as required; and
- Notify TMEP Traffic Inspector
- Contact the operations, maintenance and rehabilitation (OM&R) Contractor.

Incident Management Report

Once the incident is dealt with, an incident management report is to be completed by the Site Safety Coordinator or Traffic Control Manager. A copy of the incident management report form is found in the Appendix F. The TMEP Traffic Inspector will distribute a copy of the report to the Road Authority representative and any other parties who may need to know the specifics of the incident on the next working day following the incident.

Review of Incident

After each incident the TMEP Traffic Inspector will review the incident with the Road Authority Representative, Project Manager, Project Supervisor and Traffic Control Supervisor. They will discuss the severity of the incident and if it is a reoccurring event. If it is deemed that the current plans, drawings and procedures in place are not functioning adequately to prevent the incident from reoccurring again, then the plans, drawings and procedures are to be modified accordingly. The revised plans, drawings and procedures will be submitted to the Road Authority Representative.

15.3 Response Improvement

To maintain a successful Incident Management Plan, LSLP will update and improve the plan on an ongoing basis. This will be achieved through ongoing monitoring and documentation of conditions along active work zones, proper training, and review of response procedures following each incident.

LSLP will, from time to time, review Incident Reports for trends in frequency, location, or types. The review will be followed-up with action plans or additional traffic control devices and procedures that will reduce the incidents or make the area safer from future potential incidents.

15.4 Coordination of Emergency Services

All emergency services will have priority access during incidents. In the event of an incident not occurring on the project site, but where emergency vehicles must pass through the project site, the following will occur:

- The Traffic Control Personnel will notify the Supervisor of the situation,
- The Supervisor who will ensure that any work vehicles blocking the traffic route will be removed.

The Supervisor will facilitate all emergency vehicle passage through the work zone.

Table 15-1 Emergency Contacts

Type of Emergency	Contact/ Organization	Numbers
Vehicular Incident	Local RCMP Detachment	Valemount - 250-566-4466 Blue River/Clearwater - 250-674-2237 For Emergency 9 - 1 - 1
Healthcare/ Injury	Ambulance Service	9 - 1 - 1
Environmental	Emergency Management BC	1-800-663-3456
Fire Department		9 - 1 - 1
Hit Phone Line	Local Telephone Provider (TELUS, Citywest, EnTel, etc.)	6 - 1 - 1
Hit Gas Line	Local Natural Gas Provider (PNG, Fortis	911 or BC One Call Emergency Line – 1-800-663 9111
Hit Electrical Line	BC Hydro	911 or 1-888-769-3766
Poisoning	Poison Control Center	1-800-567-8911
Locates	BC One Call	1-800-474-6886
Workplace safety	WorkSafe BC 1	1-888-621-SAFE (7233)
Rail Disruption	CN Rail Police (24 hour)	1-800-465-9239
	CN Rail Operations (24 hour)	1-800-661 3963
Hazardous Goods Spill	Canutec	(613) 996-6666 or *666 (on your cell)
Health/Hygiene Emergency	Emergency Management, BC Ministry of Health	250-952-1687

Table 15-2 TMEP Emergency Contacts

Position	Name	Email	Contact Number
TMEP Project Manager	Mike Zorniak	Mike_Zorniak@transmountain.com	403-554-9035
TMEP Construction Manager	Doug Stanyer	Doug_Stanyer@Transmountain.com	780-910-1301
TMEP Project Safety Lead	Steven Wrangler	Steven_Wrangler@Transmountain.com	587-335-9197
TMEP Senior Traffic Manager	Patrick McTiernan	Patrick_McTiernan@Transmountain.com	250-613-9633
TMEP Traffic Supervisor	Paul McGhie	Paul_McGhie@Transmountain.com	250-464-5585

Table 15-3 LSLP Emergency Contacts

Position	Name	Email	Contact Number
LSLP Project Director	Matt Granger	Matt.Granger@ledcor.com	780-232-8069
LSLP Project Manager	Giuseppe Roda	G.Roda@sicim.eu	780-860-7767
LSLP Superintendent	Lindsay Miller	Lindsay.Miller@Ledcor.com	780-385-1257
LSLP Safety Manager	Eddy Kibambe	Eddy.Kibambe@Ledcor.com	780-995-5635
LSLP Traffic Control Manager	Danielle Royle	Danielle.royle@Ledcor.com	587-784-7139
LSLP Traffic Control Supervisor	TBD		

Table 15-4 MoTI Emergency Contacts

MoTI Northern Region (KP 489.1 – KP 669.3)			
Position	**Name**	**Phone**	**Cell**
District Manager	Shaun Holahan	250-565-6090	250-613-5425
Operations Manager	Val Hunsaker	250-565-4411	250-613-8284
Maintenance Contractor (LDM)	Rod Saul	250-566-4474	250-566-1505
MoTI Southern Interior Region (KP 669.4 KP 690)			
Position	**Name**	**Phone**	**Cell**
District Manager	Trent Folk	250-371-3805	
Operations Manager	Graeme Schimpf	250-371-3809	
Maintenance Contractor (Argo Road Maintenance)	General Office	250-374-6690	

Table 15-5 - Other Major User Groups Contact List

Contact/ Organization	Numbers
CVSE (Fort George District)	250 565-7281
MoTI Road Maintenance Contractor (Lakes District Maintenance Ltd.)	1-888-255-8055
MoTI Construction Contractors	TBD
School District No. 057 (Prince George)	250 561-6802
Village of Valemount	250 566-4435
MoTI Construction Contractors	TBD
BC Hydro	1-800-224-9376
Telus	1-888-811-2323
Shaw	1-877-742-9778
Fortis	1-866-436-7847

16 REFERENCES

Traffic and Access Control Management Plan. June 2017. Trans Mountain Pipeline ULC. Trans Mountain Expansion Project

BC Traffic Management and Coordination Plan, Trans Mountain Expansion Project

British Columbia Ministry of Transportation and Infrastructure. 2020. Traffic Management Manual for Work on Roadways

Allnorth Consultants Limited. Ledcor Sicim Limited Partnership Trans Mountain Expansion Project Traffic Management Plan, Spreads 3 & 4A. September 11, 2018

APPENDICES

Appendix A Category Assessment Table

INITIAL CATEGORY ASSESSMENT – BRITISH COLUMBIA

Highway/Roadway	Category	Highway/ Roadway	Category	Highway/ Roadway	Category	Highway/ Roadway	Category
104 Ave	2	Cedar St	1	Jenkins Rd	1	Pine Rd / 5 Ave	1
177A St	2	Centennial Way	2	Joanita Pl	1	Popkum Rd S	1
179 St	1	Chilliwack Central Rd	1	Johnston Rd	1	Poplar Crt	1
182A St	1	Chilliwack River Rd	1	Juliet Creek Rd	1	Prairie Central Rd	1
197 St	1	Clayburn Rd	2	K P Rd	1	Prest Rd	1
201 St	2	Clearwater Village Rd	2	Keith Wilson Rd	2	Princeton-Kamloops Hwy / Hwy 5A	3
208 St	2	Clemina Creek Forest Service Rd	1	Kettle Valley Rd	1	Production Way	2
216 St	1	Coach Rd	1	Klassen Rd N	1	Raft River Rd	1
217A St	1	Coldwater Rd	2	Laidlaw Rd	2	Raft West Forest Service Rd	1
224 St	1	Comstock Rd	1	Lawrence Rd	1	Ray Rd	1
231 St	1	Coquihalla Hwy / Hwy 5	3	Leeder St	2	Reid Rd	1
232 St	2	Coyote Valley Rd	1	Lefeuvre Rd	2	Riverside St	1
240 St	2	Cranberry Lake Rd	1	Lemieux Creek Rd	1	Rogers Ave	3
258 St	1	Dairy Rd	1	Lickman Rd	3	Ross Rd	1
264 St	2	Deeg Rd	1	Little Fort Hwy / Hwy 24	2	S Fraser Perimeter Rd / Hwy 17	3
267 St	1	Diamond Dr	1	Llanberis Way	1	S Sumas Rd	2
272 St	2	Dixon Rd	1	Lloyd Rd	1	Schooner St	2
86A Ave	1	Dude Ranch Rd / Norris Rd	1	Loseth Rd	1	Shellmont St	2
88 Ave	2	East Mad Forest Service Rd	1	Lougheed Hwy / Hwy 7	3	Simmons Rd	1
96 Ave	2	Eckert St	1	Lumsden Rd	1	Siwash Creek Rd	1
98A Ave / 192 St	2	Elder Rd	1	Mann Rd	1	Skinner Rd	1
99A Ave	1	Eldridge Rd	1	Marion Rd	1	Smoke Creek Forest Service Rd	1
Abbotsford-Mission Hwy / Hwy 11	3	Estell Rd	1	Mary Hill Bypass / Hwy 7B	3	South Parallel Rd	2
Acacia Dr	1	Fairway St	1	McCorvie Lakes Forest Service Rd	1	Southern Yellowhead Hwy / Hwy 5	3
Agassiz-Rosedale Hwy / Hwy 9	3	Fancher Rd	1	McDermott Rd	1	Sowaqua Creek Rd	1
Airport Rd	2	Fawcett Rd	2	McElwee Rd	1	Sperling Ave	3

Highway/Roadway	Category	Highway/ Roadway	Category	Highway/ Roadway	Category	Highway/ Roadway	Category
Allen Meeker Rd	1	Ferry Rd / Blackpool Rd	1	McGuire Rd	1	Stewart Rd	1
Allingham Way	1	Finn Creek Forest Service Rd	1	McKay Rd	1	Stewart St	1
Angus Horne St	2	Flood Hope Rd / Water Avenue	1	McKee Rd	2	Stone Rd / Tinsley Pit Rd	1
Annis Rd	1	Floods Rd	1	McMurphy Station Rd	1	Sumas Mountain Rd	2
Aviation Way	2	Ford Rd	1	McQueen Creek Rd	1	Suttie Rd	1
Avola East Frontage Rd	1	Frontage Rd (Kamloops)	1	Messiter Station Rd	1	Telegraph Trail	1
Avola Village Rd	1	Gaglardi Way	3	Mill Creek Rd	1	Thompson Rd	1
Bain Rd	1	Gibson Rd	1	Mine Creek FSR	1	Thuya Creek Rd	1
Banford Rd	1	Gladwin Rd	2	Mine Creek Pit Rd	1	Tobena Rd	1
Batchelor Dr / Lac Du Bois Rd	1	Glenmore Rd	1	Mission Flats Rd	1	Tolmie Rd	1
Bates Rd	1	Glover Rd	2	Mt Hope Rd	1	Townshipline Rd	1
Belanger Dr	1	Golden Ears Way	3	Mt Lehman Rd	3	Tranquille Rd	2
Birchtrees Dr	1	Golf Course Dr	1	Mtn Saint Annes Forest Service Rd	1	Trans-Canada Hwy / Hwy 1	3
Bond Valley Rd	1	Goose Lake Rd	1	Mud Lake Forest Service Rd	1	Tyson Rd	2
Boundary Rd (Abbotsford)	2	Government St	2	Murtle Rd	2	Underhill Ave	2
Bowden Rd	1	Grimshire Rd	1	Nevin Rd	1	United Blvd	3
Bradner Rd	2	Hallert Rd	1	Nicola, Kamloops & Similkameen Rail Trail	1	Unsworth Rd	1
Brazier Rd	1	Harmon Rd	1	Noble Lake Rd	1	Valemount Disposal Area Access Rd	1
Bridal Falls Forest Service Rd	1	Harris Rd	2	Norfolk Rd	1	Vavenby Bridge Rd	1
Bridal Falls Rd	2	Harrwood Dr	1	North Parallel Rd	2	Veale Rd	1
Brigantine Dr	2	Hartley Ave	3	North Rd	2	Vedder Rd	3
Broadway	2	Hastings St	2	O'Connor Lake Rd	1	Ward Rd	1
Brunette Ave	3	Hillside Dr	2	Old Clayburn Rd	2	Watson Rd	1
Burbidge St	2	Hoirup Rd	1	Old Coquihalla Rd / Upper Coldwater Rd	1	Westsyde Rd	2
Burgess Ave	1	Hope-Princeton Hwy / Hwy 3	3	Old Hope Princeton Hwy	3	White Water Forest Service Rd	1
Burnaby Mountain Pkwy	2	Inks Lake Rd	1	Old North Thompson Hwy Rd	2	Wilson Rd	1
Candle Creek Rd	1	Inskip Rd	1	Ord Rd	1	Wright St	2
Carolin Mine Rd	1	Interprovincial Hwy	1	Othello Rd	1	Yarrow Central Rd / Vedder Mountain Rd	1
Caves Crt	1	Jamieson Creek Main Haul Rd	1	Park Dr	2		

Appendix B BC MoTI Sub-Plan

Ledcor Sicim Limited Partnership

Spread 3 & 4A

Category 3 - Traffic Management Plan
Fraser-Fort George & Thompson Nicola Regional District

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Table of Contents

1. Category Definition

Based on the steps outlined in Section 3.3: Project Category Determination in the **Ministry's Traffic Management Manual for Work on Roadways**, the Trans Mountain Expansion Spread 3 and 4A calls for a Category 3 Traffic Management Plan.

A Category 3 Traffic Management Plan is characterized by:

- High traffic on both highway 16 and highway 5
- The pipeline project accesses are off highways 16 & 5 that are high speed, up to 100 km/h.
- Impacts on travelling public will be moderate as the project will increase the traffic moderately with the workforce marshalling out of Valemount and Blue River.

A Category 3 Traffic Management Plan consists of:

- Traffic Control Plan
- Public Information Plan
- Incident Management Plan
- Implementation Plan

The aim of a Category 3 Traffic Management Plan is to minimize the site-specific risks that were identified for the project.

2. Traffic Control Plan

This appendix is based on schedule C from the BC MoTI Traffic Management Manual as presented here in tabular form.

Plan Date	**Date when plan was initiated** December 5th, 2019
Latest Revision	**Date of latest revision.** May 27th, 2020
Site Name	**Name of project.** Trans Mountain Expansion Project Spread 3 and 4A
Plan Developed By	**Name of person who developed the plan.** Eddy Kibambe
Exact location, direction, and distance to nearest landmarks	**Highway number and name of location, LKI, etc.** For the purpose of this Category 2 Traffic Management Plan, the Spread 3 and 4A is as follow; The pipeline ROW Parallels Highway 16 from KP 488 near Hargreaves, BC to KP 503 near Tete Jaune Cache, BC where it turns south and parallels Highway 5 to KP 691. This section of the pipeline passes through the town of Blue River and end approximately 3km north of Vavenby B.C. Please see Segment Unique ID numbers in Appendix E.
Project Superintendent	**Name of Project Superintendent.** Lindsay Miller; 780-385-1257
Prime Contractor	**Name of Prime Contractor.** Ledcor Sicim Limited Partnership (LSLP)
Traffic Control Manager	**Name of Traffic Control Manager (if applicable).** Danielle Royle 587-784-7139
Traffic Engineer	**Name of Traffic Engineer (if applicable).** LSLP will utilize traffic consultants to fulfill the responsibilities of the Traffic Engineer.
Traffic Control Supervisor	**Name of Traffic Control Supervisor and company.** To be determined
Traffic Control Persons	**Names of TCPs and company**.

	To Be Determined
Project Start Date	June 2020 (See Appendix H – LSLP Construction Schedule for more details)
Project Completion Date	December 2022

Site Factors (Risk Assessment)

Road Alignment	**Windy, straight, hilly, banked, etc.** BC Highway 16 and BC Highway 5 through Spread 3 and 4A has minimal changes in elevations. The highways are slightly hilly with narrow shoulders, with some curves.
Road Type	**Primary, secondary, urban, rural, divided, undivided, arterial, expressway, freeway, number of lanes**. Spreads 3 and 4A parallel Highway 16 to highway 5 Junction where it parallels Highway 5. Both these Highways are single lane undivided with alternating additional passing lanes.
Driver Sight Distances	See Segment Unique ID numbers in Appendix E Specific sight distances will be available through individual permits.
Approaches	See Segment Unique ID numbers in Appendix E. Approach information will be provided in TCPs.
Work Zone Length	See Segment Unique ID numbers in Appendix E. Specific work zone lengths will be provided in TCPs.
Regulated Speed	See Segment Unique ID numbers in Appendix E. Specific speed limits will be provided in TCPs.
Reduced Speed Limit	See Segment Unique ID numbers in Appendix E. Specific reduced speed limits will be provided in TCPs.
Traffic Volumes	See Segment Unique ID numbers in Appendix E. Specific traffic volumes will be provided in TCPs.
Shoulders	**Width, material, etc.** On Highway 16 and Highway 5, the shoulders are paved and varies on width. Municipality roads paved also have shoulders. Unpaved roads have minimal shoulder.

Surrounding Land Use	The Spread 3 and 4A of the project is mostly through Industrial land and undeveloped land. A potion Spread 4A runs through the town of Blue River.
Residential Areas	The ROW parallels east of Highway 5 through the town of Blue River. There are crossings Harrwood Dr, Cedar St, Angus Horne St, Stewart St, Cedar St, and Dairy Rd.
Pedestrians/Cyclists	Provisions will be made to warn pedestrians of any sidewalk or path closures, and safe detours will be provided, as required. See Section 5.6 for more details.
Weather Conditions	The project being in the interior of BC, LSLP is anticipating hot/ dry conditions in the summer months (May to Aug). Snowy/ Icy in winter months (Sept to April)
Site Hazards	**List of hazards within project limits.** Associated project traffic related hazards: • Increase of traffic on roadways (highway, municipal roads, some private roads) • Improper load securement • Dusts from unpaved roads in the summer. • Noise level in area close to the RoW. • Confusion due to added traffic signage. • Environmental hazards (rockslides, avalanches)
Concrete Roadside Barriers	**Will concrete barriers be removed?** The Spread 3 and 4A have no concrete barriers that will need to be removed.

Procedural Factors (Risk Assessment)

Work Activity	**Type of work: stationary, slow-moving, emergency, brief, short-duration, or long-duration work?** The project is anticipated to start in the first quarter of 2020 with a completion date around the fourth quarter of 2022 where approved access roads will be used to enter the Right Of Way. When there is no construction activity, signage will be covered.
Work On/Off Roadway	**Is the work on or off the roadway?** Most of the scope of work will occur within the RoW. Roadways will be used for transport of personnel and material from yards to RoW daily. Personnel may be present on roadways for the purpose of cleaning and maintaining road surfaces.
Site Access/Egress	**How will equipment access and exit from the site?**

	Equipment will be off/on loaded on transport trucks on the RoW. TCPs will be used to minimize disruption to normal traffic flow when necessary.
Intersections affected by work zone or traffic control devices	**<u>Intersections affected by Traffic Control devices for Spread 3 and 4A:</u>** See Appendix D for Segment Unique ID numbers and Appendix F for Typical Traffic Control Plans.
Delays, Closures, Diversions, and Detours	**<u>Will delays, closures, diversions, and/or detours be in place?</u>** LSLP will not use traffic diversions or detours for Spread 3 and 4A for the project unless specifically permitted to do so. See Appendix D for Segment Unique ID numbers and Appendix F for Typical Traffic Control Plans Highway interchanges will remain open to the public. The TMEP TI is responsible for communication between Contractors to ensure that delays are kept to a maximum of 20 minutes per MOTI district and that the total delay does not exceed 60 minutes through a single highway corridor.
Hours of Work	**<u>The hours during which the work will occur.</u>** Typical departure time in the morning is no later than 7:00 AM and returning to the yards between 5:30 PM and 7:00 PM **<u>The time period during which the work will affect traffic.</u>** Typical days of work will be 7:00 AM to 7:00 PM for most personnel. **<u>Statutory Holidays/Boxing Day/Special Events</u>** Work that affects traffic will need to be coordinated with Trans Mountain for notification to Appropriate Government Authorities and will not be conducted unless the Contractor(s) have obtained proper approvals from Trans Mountain and regulatory authorities.
Construction Equipment	**<u>How will construction equipment be protected during working hours?</u>** Construction equipment will be within the TMEP RoW away from the public. **<u>During off-hours?</u>** Inactive construction equipment and material will be safely stored outside of the clear zone with keys removed and security personnel patrolling.

Special Provisions

Traffic Control Supervisor	**<u>Name of Traffic Control Supervisor and company.</u>** TBD
Traffic Control Persons	**<u>Name of TCPs and company.</u>** TBD LSLP will train its own TCPs to WorkSafeBC standards for high risk locations.
Off-Hours Traffic Control	**<u>Types of traffic control devices.</u>** During Off-Hours, traffic control devices will be covered or removed.
Means of Communication	**<u>How will TCPs communicate?</u>** TCPs will communicate via LSLP supplied radios.
Signage	**<u>Are signs installed for short-duration or long-duration work?</u>** Traffic devices will be setup in advance of the planned work. The signage will be post-mounted for long duration work scopes and portable sign supports used for short duration work such as vehicle repairs on the shoulder of the road. The signage will meet the minimum requirement for signage as per *section 4.2 of the of the B.C Traffic Management Manual for Work on Roadways* and approved eDAS EDAS AMPs. **<u>Are the signs spaced in accordance with posted speed?</u>** The signs will be spaced as per posted speed limit to provide travelling public adequate notice.
Portable Dynamic Message Signs (PDMS)	**<u>Will PDMS be required?</u>** PDMS will be installed at each end of the spreads and major communities (i.e. Valemount and Blue River). They will be utilizing at major intersections, centers and corridors to communicate with the travelling public of any unscheduled traffic delays. **<u>Who will be responsible for updating the sign message(s)?</u>** LSPL Traffic Manager/ Superintendent will be responsible for updating the sign messages and to ensure local emergency agencies have been made aware of the unscheduled delays

Intersections affected by work zone or traffic control devices	**<u>Are intersections affected by the work zone or traffic control devices?</u>** Intersections may be affected by the work zone or traffic control devices. **<u>If so, how will the intersections be controlled?</u>** Traffic devices will be setup in advance of the planned work. The signage will be post-mounted for long duration work scopes and portable sign supports used for short duration work such as vehicle repairs on the shoulder of the road. The signage will meet the minimum requirement for signage as per *section 4.2 of the of the B.C Traffic Management Manual for Work on Roadways* and approved EDAS AMPs.
Flexible Drums	**<u>Will flexible drums be used to delineate lane drops?</u>** The temporary lane delineation may be in the form of flexible drums, traffic cones to provide markings where existing pavement conflict with temporary lane alignments. The application of temporary traffic control devices, signing, and pavement markings will be in accordance with BC MoTI TMM. See Appendix D for Segment Unique ID numbers. Layout of Flexible Drums and other traffic control devices will be as per individual TCPs. **<u>Will they be used to identify construction accesses to the work activity area?</u>** Where existing pavement markings are modified to accommodate traffic, flexible drums, delineators will be used to identify construction accesses and work zones.
Traffic Stoppages	**<u>Are there any anticipated traffic stoppages?</u>** LSLP does not anticipate the need to have long duration traffic stoppages. I**<u>f so, for how long?</u>** There will short term delays to facilitate safe crossing of equipment. LSLP will utilized TCP trained as per WorkSafeBC to implement the plan. Crossings will be done in 15 minutes or less. If pipe trucks are required to track into opposing lanes in order to access and egress the site, traffic in both directions will be stopped and controlled with traffic control persons. **<u>Will there be single lane alternating traffic?</u>** If a lane is required to be temporarily closed, LSLP will utilized single lane alternating configuration as per the TCP. See Appendix

	E for Segment Unique ID numbers and Appendix G for Typical Traffic Control Plans. Lane closure requests will be applied in advance of the work.
Layout of Devices	See Appendix D for Segment Unique ID numbers. Layout of traffic control devices will be as per individual TCPs. All devises will be installed and removed as per section 6.7 of the MoTI TMM. During extended closures or winter-layup, the Site is to be left in a safe condition with any material or equipment stored outside of the clear zone as per the TMEP TACMP.
Emergency Vehicles	**Will emergency vehicles have clear, unobstructed access to the site?** Emergency Vehicles will be given right of way throughout the work area once it is safe for them to proceed. **What procedures will be in place to ensure that emergency vehicles are able to access the site without delay**? The Spread 3 and 4A crossings on highways will be completed using trenchless techniques to ensure emergency vehicles have access through the work areas. During an incident where traffic may be affected, the Supervisor will provide traffic control around the incident as quickly as possible. This may include the removal of the construction lane closure to facilitate traffic flow around the incident. The Traffic Control Manager will be notified by the Supervisor. TCPr will be trained to ensure Emergency vehicles will be given priority throughout the work zone in those situations.

3. Incident Management Plan

The Incident Management Plan defines processes for responding to unplanned events or traffic incidents in the work zone so that incident response operations within the work site are managed effectively.

LSLP has developed an Emergency Response Plan that includes the identification and organized response for any potential emergency situations that the Trans Mountain Expansion Project, Spreads 3 & 4A from Valemount to Vavenby in the province of British Columbia, could encounter regarding any of its activities, facilities, equipment, work sites or associated personnel and support systems. This plan includes directions for all emergency response activities; from identification to reporting/communication and from response to investigations/follow up. This plan will be reviewed through the project orientation with all project personnel and made available on all project vehicle. Emergency response and procedures shall be consistent with the LSLP SSERP and BC OHS section 4.13 – 4.18. The LSLP's Emergency Response Procedures for the Project will be in all Project vehicles and shall be followed. Emergency contact names and numbers are noted in Section 6 of this Appendix and Section 15.4 of this TMP.

Traffic Control Manager	**<u>Name and qualifications.</u>** TBD
Emergency Response Agencies and Contact Information	**<u>Name and contact information (may be listed in Section 6: Contact List).</u>** Contact information listed in Section 6.
Types of traffic incident that could occur within work zone	**<u>Motor vehicle incident, motor vehicle incident with injuries, vehicle stalls, emergency vehicle transit of work zone, dangerous goods incident, wide load passing, etc.</u>** Motor Vehicle Incident, Motor Vehicle Incident with injuries, Vehicle stalls, Emergency Vehicle transit of work zone, Dangerous Goods incident, Wide load such as pipe, heavy equipment hauling, Horizontal Direct Drilling FRAC, are possible events that may arise and affect traffic within the project footprint.
Procedures for responding to traffic incident that occurs within work zone	**<u>Who will evaluate the incident?</u>** Traffic Control Supervisors will be on duty where work zones directly affect the travelling public and when traffic control persons are required. As per the project Emergency Response Plan, the Traffic Control Supervisor is responsible for the scope of work affecting the traffic and will evaluate the event/ incident and initiate the response plan by contacting the Traffic Control Manager and the required Emergency agencies as per project Emergency Response Plan. The Traffic Control Manager will contact the TMEP Traffic Inspector as per Section 13.2 of the TACMP.

	<u>Who will call 911?</u> The Traffic Control Supervisor responsible of the scope of work affecting the traffic make the initial call to emergency responder to ensure no delay in the response plan. Further communication with external agencies/ parties will be done by the TMEP Traffic Inspector as per Section 13.2 of the TACMP. **<u>Will traffic be stopped, or will there be single lane alternating traffic?</u>** If necessary, LSLP will utilized single lane alternating configuration as per *figure 7.8 of Section 7 of the B.C Traffic Management Manual for Work on Roadways.* **<u>Who will assist the emergency responders through the site, and how?</u>** Where LSLP will have an active work zone, the Traffic Control Supervisor or designate will be the incident commander who will coordinate the movement of emergency responders through the site with the use of Traffic Control Persons equipped with radios by clearing other vehicles as necessary.
Procedures to restore traffic flow around incident site as quickly as possible	**<u>Will traffic control devices be used?</u>** LSLP will utilized approved traffic devices to assist with the implementation of this plan. **<u>If so, how?</u>** LSLP will utilize Portable Dynamic Message Signs located at major intersections, centers, and corridors to communicate with the travelling public of any unscheduled traffic delays. If the incident can not be resolved quickly, SLAT will be implemented as per *figure 7.8 of Section 7 of the B.C Traffic Management Manual for Work on Roadways.* If a major incident occurs and SLAT cannot be implemented, the TMEP Traffic Inspector will work with BC MoTI to determine appropriate detour routes.
Procedure to inform and update Ministry regarding incident in work zone	**<u>What is the procedure for advising the Ministry that an incident occurred, what response measures are being taken, what clearance measures are required, and what the estimated clearance time will be?</u>** For all traffic incidents within the work zone, the site supervisor will immediately notify the Traffic Control Manager who will then notify the TMEP Traffic Inspector.

	The TMEP Traffic Inspector will be responsible to notify the Ministry of the incident, the response measures taken to date, and the estimated recovery time needed.
Procedure to inform travelling public of estimated duration of delay and alternative routes (if applicable)	**Will DMS or PDMS be used to display information?** In the event that an incident may affect highway traffic operations, LSLP will utilize PDMS to provide motorists with advance warning of the work activities.
Incident Reporting	**Who will provide details to the Ministry?** The Ministry and External Parties will be notified by the TMEP Traffic Inspector of the incident and details.
Investigation Process	**Who will lead the incident investigation?** LSLP Safety Manager with the support from the Traffic Control Supervisor and Project superintendent, will be responsible to ensure that all incidents are investigated. **What investigation process will be used to assess the incident and those involved?** LSLP has a robust Incident Management Program that will be utilized to investigate all incidents.
Review and Continuous Improvement Process	**How incidents will be reviewed and followed up to reduce the severity and frequency of future incidents?** All incidents will be investigated using LSLP Incident Management program, learnings will be shared with all project personnel via Safety Meetings/ Toolbox Talks and tracked corrective actions will be implemented to reduce reoccurrence.

4. Public Information Plan

Process for routinely notifying Ministry of changes to scheduled work plans	**Who will be responsible for the changes?** LSLP will communicate with the TMEP Traffic Inspector and TMEP's Stakeholder Engagement Team who will then communicate with external agencies such as the Ministry of Transport and Infrastructure of any changes to the work schedule or any activities that may impact the public. The TMEP Traffic Inspector will be the primary contact for MoTI.
Process for notifying travelling public of scheduled traffic delays and project duration	**Identify the forms of communication to be used [DriveBC, radio, project signs, overhead Dynamic Message Signs (DMS), Portable Dynamic Message Signs (PDMS), public meetings, etc.].** LSLP Traffic Control Manager will attend Municipal Meetings to keep them inform of project schedule, and delays.
Process for notifying travelling public of unscheduled traffic delays	**Identify the forms of communication to be used [DriveBC, radio, Twitter, overhead Dynamic Message Signs (DMS), Portable Dynamic Message Signs (PDMS), etc.]**. The TMEP Traffic Inspector will be responsible for notifying MoTI and MoTI construction contractors of any unscheduled delays so that DMS and the DriveBC website can be used to notify the public. Additionally, LSLP will utilize Portable Dynamic Message Signs to communicate with the travelling public of any unscheduled traffic delays. The TMEP Stakeholder Engagement Team will be responsible to ensure local emergency agencies have been made aware of the unscheduled delays.
Major user groups for alternating lane closures or road closures	**Identify the major user groups (BC Trucking Association, BC Transit, emergency response agencies, school districts, etc.)**. On the Spread 3 and 4A the major user groups are: • Public (local, tourist) • The Town of Blue River • Village of Valemount • The Town of Vavenby • Emergency Response Services (RCMP, Fire Department, BC Ambulance authorities) • BC Trucking Companies • CVSE • Local Utilities (BC Hydro, Fortis BC, Telus, Shaw) • Lakes District Maintenance Ltd. (MoTI Northern Region Maintenance Contractor) • Argo Road Maintenance (MoTI Southern Region Maintenance Contractor)

	• MoTI Construction Contractors (TBD) • School District #57 (Elementary and High School in Valemount) • School District #73 (Elementary School in Blue River)

5. Implementation Plan

The Implementation Plan identifies responsibilities and procedures for ensuring that traffic management sub-plans are developed and implemented in a coordinated manner.

It identifies the qualifications, responsibilities, and duties of supervisory and management personnel responsible for implementing the Traffic Management Plan and includes the designation of a Traffic Control Manager and a Traffic Control Supervisor.

See also Section 3.2: Traffic Management Plan Sub-Plans and Section 3.4: Traffic Management Plan Requirements by Category in the **Traffic Management Manual for Work on Roadways.**

Traffic Control Supervisor and Responsibilities	**Name, qualifications, responsibilities, and duties**. TBD Where LSLP active work-zones are on or near major roads, Traffic Control Supervisors will be responsible for ensuring that traffic control requirements are in place and effective. If required, LSLP sub contractors will have their own Traffic Control Supervisors who will operate under the direction of the LSLP Traffic Control Manager.
Person who will manage emergency traffic control operations	**Name and title.** Where LSLP active work-zones are on or near major roads, Traffic Control Supervisors will be responsible for ensuring that traffic control requirements are in place and effective. At all other locations, the crew Supervisor with the support of the Traffic Manager will be responsible to ensure traffic control requirements are in place and effective at every location as their crew progresses along the project route. • This includes signage, Traffic Control Persons, other traffic management/protection systems, etc. • Traffic control personnel trained to the WorkSafeBC standard for high risk traffic areas, conforming to MOTI's guidance on traffic control and training, and meeting the requirements of Part 18 of the BC Occupational Health and Safety Regulation 18, shall be used in accordance with this TMP or in accordance with a Traffic Control Plan developed under this TMP. For each Traffic Control Plan, on-site personnel shall be designated and be responsible for erection, monitoring and removal of temporary traffic control devices while work is being carried.

Person who will maintain daily traffic control logs	**Name and title.** Danielle Royle – Traffic Control Manager
Person who will manage Incident Management Plan	**Name and title.** Eddy Kibambe - LSLP Safety Manager The Crew supervisor will report immediately to the safety team member responsible of any traffic/construction incidents involving damage, injuries, environmental incidents, security related incidents, or on complaints from residents or the travelling public. • The Safety and Security Manager will ensure that an Incident Report form is accurately completed. • The report will be submitted through appropriate channels, depending on the Incident type, etc. as soon as practical following the incident.
Person who will manage Public Information Plan	**Name and title.** Danielle Royle – Traffic Control Manager
Person who will monitor inactive work site	**Name, title, and responsibilities.** Active and inactive work sites will be patrolled on a daily basis. This will be via a sub-contracted Security company. Any traffic related issues will be reported to the Traffic Control Manager for resolution.

6. Contact Lists

Emergency Response Agencies/Assistance Contact List

Type of Emergency	Contact/ Organization	Numbers
Vehicular Incident	Local RCMP Detachment	Valemount - 250-566-4466 Blue River/Clearwater - 250-674-2237 **For Emergency 9 - 1 - 1**
Healthcare/ Injury	Ambulance Service	9 - 1 - 1
Environmental	Emergency Management BC	1-800-663-3456
Forest Fire	BC Wildfire Service	1-800-663-5555 or *5555 on a cell phone
Fire Department		9 - 1 - 1
Hit Phone Line	Local Telephone Provider (TELUS, Citywest, EnTel, etc.)	6 - 1 - 1
Hit Gas Line	Local Natural Gas Provider (PNG, Fortis	911 or BC One Call Emergency Line – 1-800-663 9111
Hit Electrical Line	BC Hydro	911 or 1-888-769-3766
Poisoning	Poison Control Center	1-800-567-8911
Locates	BC One Call	1-800-474-6886
Workplace safety	WorkSafe BC 1	1-888-621-SAFE (7233)
Rail Disruption	CN Rail Police (24 hour)	1-800-465-9239
	CN Rail Operations (24 hour)	1-800-661 3963
Hazardous Goods Spill	Canutec	(613) 996-6666 or *666 (on your cell)
Health/Hygiene Emergency	Emergency Management, BC Ministry of Health	250-952-1687

TMEP Emergency Contacts

Position	Name	Email	Contact Number
TMEP Project Manager	Mike Zorniak	Mike_Zorniak@transmountain.com	403-554-9035
TMEP Construction Manager	Doug Stanyer	Doug_Stanyer@Transmountain.com	780-910-1301
TMEP Project Safety Lead	Greg MacIsaac	Greg_MacIsaac@Transmountain.com	780-966-5581
TMEP Sr. Traffic Manager	Patrick McTiernan	Patrick_McTiernan@Transmountain.com	250-613-9633
TMEP Traffic Supervisor	Paul McGhie	Paul_McGhie@Transmountain.com	250-464-5565

LSLP Emergency Contacts

Position	Name	Email	Phone Number
Traffic Control Manager	Danielle Royle	Danielle.Royle@Ledcor.com	587-784-7139
Superintendent	Lindsay Miller	Lindsay.Miller@Ledcor.com	780-385-1257
Safety Manager	Eddy Kibambe	Eddy.Kibambe@Ledcor.com	780-995-5635
Sr. Project Manager	Matt Granger	Matt.Granger@Ledcor.com	780-232-8069
Construction Manager	Giuseppe Roda	G.Roda@Sicim.eu	780-860-7767

MoTI Emergency Contacts

MoTI Northern Region (KP 489.1 – KP 669.3)			
Position	**Name**	**Phone**	**Cell**
District Manager	Shaun Holahan	250-565-6090	250-613-5425
Operations Manager	Val Hunsaker	250-565-4411	250-613-8284
Maintenance Contractor (LDM)	Rod Saul	250-566-4474	250-566-1505
MoTI Southern Interior Region (KP 669.4 KP 690)			
Position	**Name**	**Phone**	**Cell**
District Manager	Trent Folk	250-371-3805	
Operations Manager	Graeme Schimpf	250-371-3809	
Maintenance Contractor (Argo Road Maintenance)	General Office	250-374-6690	

Other Major User Groups Contact List

Contact/ Organization	*Numbers*
CVSE (Fort George District)	250-565-7281
MoTI Road Maintenance Contractor (Lakes District Maintenance Ltd.)	1-888-255-8055
MoTI Construction Contractors	(TBD)
School District No. 057 (Prince George) Sid Jawanda	250 561-6802
Village of Valemount	250-566-4435
MoTI Construction Contractors	TBD
BC Hydro	1-800-224-9376
Telus	1-888-811-2323
Shaw	1-877-742-9778
Fortis	1-866-436-7847

Appendix C Sample Category Assessment Tables

Table 3.1: Initial Project Category Assessment - AP-4-A-17-A

Traffic Consideration	Value	✓	Point Value	Score
Posted or Statutory Speed Speed limit of the roadway.	≤ 50 km/hr.		1 point	4 points
	60 - 70 km/hr.		3 points	
	≥ 80 km/hr.	✓	4 points	
Traffic Volume Traffic volume (in both directions) in peak hours.	< 1,000 vehicles/hr.		1 point	4 points
	1,000 to 3,000 vehicles/hr.		3 points	
	> 3,000 vehicles/hr.	✓	4 points	
Lanes Number of lanes in both directions.	2 lanes.		1 point	3 points
	3 lanes.	✓	3 points	
	4 lanes or more.		4 points	
Encroachment Location of work.	Off roadway.		0 point	4 points
	Shoulder work/partial lane closure.		3 points	
	Full lane closure, ramp closure, or intersection closure.	✓	4 points	
Detours	No detour.	✓	0 point	0 points
	Detour traffic on temporary roadway next to work zone.		3 points	
	Route takes traffic off regular route away from work zone; requires detour signing.		4 points	
Duration of Work	Short-duration work (no more than one day-time shift).	✓	1 point	1 point
	Long-duration work (less than 2 weeks).		2 points	
	Long-duration work (more than two weeks).		4 points	
Allowable Delays Delay time plus time to travel through work zone in minutes.	< 20 minutes.	✓	1 point	1 point
	≥ 20 minutes.		3 points	
	No allowable delay.		4 points	

Traffic Consideration	Value	✓	Point Value	Score
Time of Day Time of day that work will occur.	Day-time only work (DT).	✓	1 point	1 point
	Active day-time work, with traffic control devices in place at night (DTN).		3 points	
	Active night-time work (NT).		4 points	
Vertical Alignment	Flat terrain.		0 point	2 points
	Rolling terrain.		1 point	
	Mountainous terrain.	✓	2 point	
Horizontal Alignment	Work zone and approaches on tangent.	✓	0 point	0 point
	Curve in work zone; no reduced speed advisory for curve.		1 point	
	Curve in work zone with reduced speed advisory.		2 point	
Signalization	No signal in work zone.	✓	0 point	0 points
	Signal in work zone with left- or right-turn arrows.		1 point	
	Signal in work zone with left- and right-turn arrows.		4 points	
Runaway Lanes	No runaway lanes in work zone.	✓	0 point	0 points
	Runaway lanes within or near work zone; they will not be blocked at any time during course of work.		1 point	
	Runaway lanes within or near work zone; they may be blocked by work or queues during course of work.		4 points	
Pedestrians and Cyclists	No pedestrians or cyclists in work zone.	✓	0 point	0 points
	Pedestrians and cyclists could be in/near work zone.		2 point	
	Designated cycle route or multi-use pathway in work zone.		3 points	

Traffic Consideration	Value	✓	Point Value	Score
Roundabout	No roundabout in work zone.	✓	0 point	0 point
	Single lane roundabout in work zone.		2 point	
	Multilane roundabout in work zone.		4 points	
HOV or Bus Lane	No HOV or bus lane in work zone.	✓	0 point	0 point
	HOV or bus lane in work zone.		4 points	
Counter-Flow Lane	No counter-flow lane within work zone.	✓	0 point	0 point
	Counter-flow lane within work zone (CF).		4 points	
			Total Score	
			Category 1	< 16
			Category 2	16 to 25
			Category 3	> 25
			Initial Project Category	

3.3.2 Project Risk Analysis

A project risk analysis is the process of reviewing site-specific characteristics and considering the likelihood and consequence of each item listed. It is able to highlight potential hazards that are not captured in the Initial Project Category Assessment.

Each project has a unique combination of site-specific characteristics, and the risk analysis considers potential hazards associated with the specific project and/or location.

Table 3.2: Project Risk Analysis on the following pages is used to determine whether each potential hazard creates a low, medium, or high risk for the project and location.

The total point value calculated at the end of Table 3.2 indicates that the project is assessed as a low-risk, medium-risk, or high-risk project.

Combining the results of the initial project category assessment and the risk analysis will determine the final project category (see *Section 3.3.3: Final Project Category Determination*).

Table 3.2: Project Risk Analysis - AP-4-A-17-A

Item	Risk	Definition	✓	Point Value	Score
Falling object	Low	Potential of falling object through course of work (i.e., overhead works, slung loads, or equipment boom/bucket work).		1 point	2 points
	Medium	Working within a known avalanche or rock fall area; no recent evidence of activity.	✓	2 points	
	High	Recent evidence of rock or material entering work site or overhead work that may impact travelling public or worker safety (i.e., overhead structures). Vehicle queues may back into a rock fall or avalanche area.		3 points	
Nature of work activity	Low	Work activity is not expected to create a significant hazard.	✓	1 point	1 point
	Medium	Work activity will create excessive dirt, dust, or gravel on the road surface, and will thereby create a potential hazard.		2 points	
	High	Work activity such as blasting, scaling, or excavation < 2 metres from active travelling lanes will create a potential hazard.		3 points	
Removal of safety devices	Low	No removal of safety devices.	✓	1 point	1 point
	Medium	Removal of safety devices such as pavement markings, signage, traffic signal, or reflectors.		2 points	
	High	Removal of containment devices, such as barrier, guard rail, crash attenuators, fencing, etc.		3 points	
Equipment movement through work zone	Low	Minimal conflict with traffic (e.g., work commencing off travelled roadway).		1 point	2 points
	Medium	Conflict with normal traffic flow; no queuing or traffic stoppages.	✓	2 points	
	High	Conflicts with normal traffic; may create queuing and require traffic stoppages. Difficult for equipment to enter and exit site.		3 points	

Item	Risk	Definition	✓	Point Value	Score
Roadway surface condition during construction	Low	Roadway surface is maintained.	✓	1 point	1 point
	Medium	Roadway surface, such as milling and grinding (consistent surface), creates a hazard for road users.		2 points	
	High	Roadway surface is inconsistent, with multiple changes or work tasks (manholes, culvert installation, etc.).		3 points	
Storage of equipment and material	Low	Stored outside clear zone.	✓	1 point	1 point
	Medium	Stored within clear zone but outside travelled roadway.		2 points	
	High	Stored on shoulder but encroaching on travelled roadway.		3 points	
Load restrictions as a result of construction	Low	No load restrictions.	✓	1 point	1 point
	Medium	Narrow lanes restrict wide loads		2 points	
	High	Overweight/overheight vehicles restricted (may result in structural damage).		3 points	
Lane widths	Low	Maintain existing lane widths.	✓	1 point	1 point
	Medium	n/a	-	n/a	
	High	Lane width not maintained throughout work zone, or Single-lane alternating traffic.		3 points	
Work zone or queues block access (active or inactive site)	Low	None.	✓	1 point	1 point
	Medium	Side street or business access.		2 points	
	High	Major public facility and/or major secondary roadway.		3 points	
Transit access	Low	No transit or school bus stops.	✓	1 point	1 point
	Medium	Community shuttle or school bus stops.		2 points	
	High	Express transit or major bus route.		3 points	
Impacts of special events	Low	No known event.	✓	1 point	1 point
	Medium	Moderate public event with attendance under 5,000.		2 points	
	High	Major public event with attendance over 5,000 or moderate public event (under 5,000) with no alternative access or route.		3 points	

Item	Risk	Definition	✓	Point Value	Score
Overlapping work	Low	No overlapping work.		1 point	3 points
	Medium	Another work site within 3 km; traffic control for the projects could impact one another.		2 points	
	High	Work sites adjacent or overlapping.	✓	3 points	
Emergency facility access	Low	No emergency facility near work site.	✓	1 point	1 point
	Medium	24-hour manned emergency facility.		2 points	
	High	Volunteer-staffed emergency facility; consider responder access to facility and emergency response.		3 points	
				Total Score	
				Low Risk	< 23
				Medium Risk	23 to 28
				High Risk	> 28
				Project Risk	

Note: If significant project-specific hazards are not included in the risk analysis above, the Evaluator may consider increasing the final risk rating. This modification and the justification for it should be documented.

All high-risk, project-specific hazards should be addressed and mitigated in the Traffic Management Plan.

3.3.3 Final Project Category Determination

The matrix in *Table 3.3: Final Project Category Determination* should be used to make the final project category determination.

It combines the initial project category assessment with the results of the risk analysis to identify a final project category based on roadway and traffic characteristics and risks.

It may be appropriate to increase the final category level for high-risk projects to reflect the complexity or hazards associated with the work.

Table 3.3: Final Project Category Determination

		Initial Project Category Assessment		
		1	2	3
Project Risk	Low	Category 1	Category 2	Category 3
	Medium	Category 1	Category 2	Category 3
	High	Category 2	Category 3	Category 3

The final project category determination should be used to identify required and recommended sub-plans and special conditions addressed in the Traffic Management Plan. This process is a guide and may not capture all components of the project which should be considered when determining the Project Category.

On the Trans Mountain Expansion Project, all access points will be considered as Category 3.

Appendix D TMEP TACMP Risk Assessment

3.0 PROJECT RISK ASSESSMENT

A Risk Assessment for the entire Project corridor, including roads in proximity of construction work zone(s), was conducted using the template(s) identified in Table 3-1 as guided by the BC MoTI TMM. The results of this assessment consider the potential hazards associated with the Project. Table 3-1 summarizes the details of this assessment, including the identification of potential issues or hazards, assignment of a risk factor to each issue, and determination of feasible actions to mitigate the particular risk issue. For each specific work zone and construction activity, the Contractor will be responsible to conduct a detailed Project Category Determination based on jurisdictional roadway authority requirements. The final Category Determination will dictate the level of details for Contractor TMPs and TCPs for each work zone.

For areas initially determined as Categories 1 and 2 Roads/Projects, a more detailed risk assessment may be required by the Contractor(s) in development of their overall TMP or location specific TCPs where typical TCPs cannot otherwise be used.

TABLE 3-1

RISK ASSESSMENT

Issue	Description	Risk Factor	Mitigation
Falling objects	Object of any kind (rock, earth, tools, or construction materials) that could fall on the roadway, pedestrian walkway, or ROW accessed by the public.	Low risk, given that the Project entirely involves subsurface construction.	Where overhead work may be required, provide lateral offset or install hoarding. Detour pedestrian and cycle paths away from overhead work, wherever feasible.
Nature of work activity	Does the work activity create a hazard? Blasting, rock scaling, and excavation are obvious examples. However, excessive dust, dirt, or gravel on the roadway, or paint overspray can also cause hazards. Any work activity that distracts a driver or creates unanticipated driving conditions should be considered as a potential hazard.	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, potential dirt, dust, or gravel on the road surface, trench safety and trench engineered loading, etc.).	Where construction is required immediately adjacent to the highway, incorporate visual screening, as appropriate. Where open-trench construction is implemented along municipal roadways, incorporate physical separation between traffic and the work area, along with appropriate warning signage. Where tracking of mud and dirt is a potential concern, provide wheel-washing facilities, regularly sweep the roadway, or both.
Safety device removal	If the work activity requires that safety devices be removed, does this create a hazard that must be mitigated? Examples of safety devices include guardrail, crash attenuators, lighting, pavement markings, signage, traffic signals, or reflectors.	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, requiring lane closures, removal of existing signing and pavement markings, or both).	Where open-trench construction is implemented along municipal roadways, incorporate reduced speed zones (as appropriate) along with warning signage and lane delineation. Coordinate any required changes to existing traffic signal operations with the municipal traffic authority. Wherever any safety devices require temporary relocation (including barriers and crash attenuation), ensure that these appropriately re-provided in the interim.
Equipment movement through work zone	Is equipment movement likely to conflict with normal traffic in the work zone? An example would be construction vehicles causing vehicle queues as they arrive at and leave the work area.	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques (that is, no direct effects to travel lanes). Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, may involve lane closures and construction vehicle access during peak traffic periods).	Where open-trench construction is implemented along municipal roadways some lane closure may be required in communication with local roadway authorities). Establish protocols for moving construction equipment across roadways (that is, involving traffic control personnel (TCPr) with jurisdictional authorities. The public traffic will be protected from the construction equipment during non-work hours.

TABLE 3-1 Cont'd

Issue	Description	Risk Factor	Mitigation
Roadway surface condition during construction	Will the roadway surface create a hazard? For example, pavement milling may create difficulties for motorcycles and cyclists.	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, may involve traffic temporarily running on rough surfaces prior to final asphalt lift re-instatement).	Place requirements on the allowable duration of running traffic on milled surfaces. Install adequate signage to provide advanced warning to motorcycles and cyclists.
Equipment and materials storage	Will storage of equipment or materials at the work area create a hazard? A hazard could be a physical obstacle created by an object stored too close to the travelled roadway. Another type of hazard could be created by poor control of material such that vandalism is a possibility.	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques (that is, construction occurs outside of roadway lanes and shoulders). Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, equipment and materials may be located adjacent to travel lanes).	Where open-trench construction is implemented along municipal roadways, requiring the storage of equipment and materials adjacent to travel lanes, incorporate reduced speed zones (as appropriate), along with warning signage and lane delineation. Where clear zone requirements apply (that is, higher speed areas) but cannot be met, locate equipment and material storage behind barriers or with clearance from roadways.
Load restrictions as a result of construction	Should restrictions on the types of vehicles using the roadway be imposed during construction?	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques (that is, construction occurs outside of roadway lanes and shoulders). Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, some localized narrowing of the road carriageway will be required, possibly restricting the passage of over-wide load vehicles).	Where open-trench construction is implemented along municipal roadways, requiring localized narrowing of the road carriageway, discussion with the municipal Road Authority may be required to establish and define alternate truck routes. Establish a communication protocol with the local trucking agencies for any affected truck routes.
Noise levels created by work activities	Will local residents or businesses be negatively impacted by noise created by work activities? Will municipal bylaws be a consideration?	Generally low risk, given that the majority of construction will be located along remote areas of the Project corridor. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, particularly in areas nearby residences).	Where open-trench construction is implemented along municipal roadways, local municipal noise bylaws must be considered. Limit night work in residential areas to low-noise activities only.
Pedestrian and cyclist movements through traffic	Will special measures be needed to convey pedestrians or cyclists through the work zone?	Generally low risk, where all highway and major roadway crossings will be constructed using trenchless techniques (that is, construction occurs outside of roadway lanes and shoulders). Medium or high risk, where open-trench construction will be implemented along municipal roadways (that is, particularly along municipally designated bike routes).	Where open-trench construction is implemented along municipal roadways, liaise closely with the municipal Road Authority to determine the existing bike network and potential alternate routes. Where existing bike and pedestrian paths are maintained or locally detoured, provide adequate signage and that travel surfaces are clear of debris. Due consideration needs to be given to accessibility for the mobility impaired, and the need for cyclist dismounting.
Night-time work	What night-time safety considerations must be addressed to maintain a safe work zone for the travelling public and workers? Consider the use of additional traffic control devices optimized for night-time work, work area lighting, and traffic control supervision.	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways.	Keep signage clean, and use high-reflective sheeting and reflective pavement markings. TCPr will wear high-visibility clothing. Use flashing arrow boards as required. Implement temporary lighting to mitigate dimly lit areas. Delineate lanes with retro-reflective markers, and hazards using low-intensity flashing warning lights.
Lane widths	Are lane widths in the open lanes reduced to less than 3.6 m, or are objects located closer to the edge of the roadway than acceptable for the highway classification?	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, some localized narrowing of lane widths may be required, including potential areas with single lanes or alternating traffic).	Where open-trench construction is implemented along municipal roadways, requiring localized narrowing of lane widths, single-lane or alternating traffic, or some combination of these, incorporate reduced speed zones (as appropriate) along with warning signage and barrier separation between travel lanes and open-trenches. In addition, look at opportunities to re-instate full lane widths during non-construction periods (for example, by temporary backfilling and steel-plating trenches).

TABLE 3-1 Cont'd

Issue	Description	Risk Factor	Mitigation
Work zone blocks road access	Is the work zone likely to block road or business accesses?	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, requiring temporary blockage of some private business and residential driveways).	Where open-trench construction is implemented along municipal roadways, requiring temporary blockage of some private driveways, provide TCPr to direct safe passage of private property traffic (where alternative access cannot be provided). Alternatively, some lane closures and certain construction activities may need to be restricted during the peak traffic periods (confirmation with the municipalities required and in continued communication with business owners).
Bus access	Will the work zone impede bus access through the work zone? Will the work zone affect bus stops, including school bus stops	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques (that is, construction occurs outside of roadway lanes and shoulders). Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, may impact some bus routes and require the occasional local bus stop relocation).	Where open-trench construction is implemented along municipal roadways, coordinate closely with the local transit authority and school districts regarding potential effects to bus stops and routing. Alternatively, some lane closures and certain construction activities may need to be restricted during the peak traffic periods.
Impact of special events	Is the route on which the Project is located likely to be affected by special events? If so, what special events are likely to cause problems for the Project?	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, where large venues exist for the purposes of hosting events, such as the casino situated along United Boulevard in Coquitlam, BC).	Where open-trench construction is implemented along and within municipal roadways, liaise closely with the municipal Road Authority and large private venues regarding special event schedules through the roadway use application submission process. Include any local special event schedules as part of the Public Information and Communications Plan and process The Contractor's TIA, TMP, and TCPs will address special occasion's needs if needed.
Overlapping work	Are there other construction works in the immediate or nearby area where the respective traffic controls could impact one another?	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, multiple nearby construction sites requiring traffic control with overlapping zones of influence – either undertaken by the same or different Contractors).	Where open-trench construction is implemented along municipal roadways, include contractual requirements that the constructor must coordinate all multiple work zone traffic controls (that is, in the instance of the same project works). Liaise closely with municipal Road Authority on other potential overlapping work zone traffic controls (that is, in the instance of different project works).
Emergency facility access	Are there any nearby emergency facilities that rely on the subject roadway for access?	Generally low risk, given that all highway and major roadway crossings will be constructed using trenchless techniques. Medium risk, where open-trench construction will be implemented along some municipal roadways (that is, potential impedance to designated response routes of nearby emergency facilities).	Where open-trench construction is implemented along municipal roadways, liaise with municipal Road Authority potential locations of nearby emergency facilities and their designated response routes. Include protocols as part of the Incident Response Plan to deal with such instances, and provide sufficient TCPr on-site. Contractor to include protocols for allowing the passage of emergency vehicles through a work zone in their traffic management requirements.

Appendix E Spread 3 & 4A Access Points

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-A-2-B-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-B-2	Her Majesty The Queen In Right Of The Province Of British Columbia	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-B-2.1	CROWN	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-B-2.2	CROWN	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-B-2.3	BC Oil & Gas Commission	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-C-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-C-2	The Crown In Right Of British Columbia	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-D-1	The Crown In Right Of British Columbia	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-D-2	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-E-1	Her Majesty The Queen In Right Of The Province Of British Columbia	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-E-2	The Crown In Right Of British Columbia	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-E-3	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-2-E-4	Trans Mountain Pipeline ULC	New Temporary Access	3		Construction Access
3-A-4-A-1	The Crown In Right Of British Columbia	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-A-2.1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-A-2.2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-A-2.3	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-A-4	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4.1-A-1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-B-1.1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-B-1.2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-B-2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-B-3	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-C-1	The Crown In Right Of British Columbia	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-C-2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-D-1	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-D-2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-E-1.1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-E-1.2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-E-2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-E-3	Trans Mountain Pipeline ULC	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-E-4	Trans Mountain Pipeline ULC	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-F-1.1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-F-1.2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-F-2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-F-3	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-1	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-2	Canadian Northern Pacific Railway Company	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-3	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-4	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-5.1	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-5.2	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-G-5.3	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-A-4-H-1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-A-4-I-1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-2.1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-2.2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-3.1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-3.2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-A-4	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-B-5.5		New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-B-5.6		New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-B-5.7		New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-B-5.8		New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-B-5.9		New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-5-B-5.10		New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-6-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-6-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-7-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-7-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-8-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-8-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-9-B-1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-9-B-2	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-9-B-3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-10-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-11-A-2.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-11-A-2.2	Arthur Willis Blackman	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-11-B-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-11-B-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-11-B-2.1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-11-B-2.2	ARTHUR WILLIS BLACKMAN, IRENE CHARLOTTE BLACKMAN, KATHY LY	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-A-1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-A-2.1	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-A-2.2	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-A-2.3	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-A-2.4	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-A-2.5	CARRIER LUMBER LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-1.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-2	The Crown In Right Of British Columbia	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-3.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-3.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-B-12-B-3.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-3.4	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-4.1	Shirley Ann Taylor	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-12-B-4.2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.5	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.6	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-1.7	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-3.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-3.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-3.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-13-A-3.4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-14-A-2	Village of Valemount	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-14-B-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-14-B-2	Village of Valemount	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-15-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-16-B-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-16-B-2	Village of Valemount	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-16-B-3	Village of Valemount	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-17-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-17-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-19-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-19-A-2.1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-19-A-2.2	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-19-A-2.3	Roger Brian Hicks	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-19-A-3.1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-19-A-3.2	Jill Collene Moore	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-20-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-20-A-2.1	FLORIAN GASSER, ASHLEY ANNA MAY FLAVELLE	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-20-A-2.2	KEWEST EQUIPMENT CORP.	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-20-A-2.3	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22.1-A-1	RONALD ALLAN BAER, MAUREEN MAY BROWNLEE	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-22.1-A-2	RONALD ALLAN BAER, MAUREEN MAY BROWNLEE	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-22.2-A-1	City of Kamloops	Existing Secondary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-22-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-2.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-2.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-2.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access

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3-B-22-A-4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-5	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-5.1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-5.2	RAY JOHN MARKHAM, ALISON CLAIRE MARKHAM	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-5.3	GERHARD JOSEF OBERAUER, MARIA LERCH	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-22-A-6	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-23.1-A-1	Valemount Community Forest Company Ltd.	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-A-2	Valemount Community Forest Company Ltd.	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-A-5	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-B-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-B-2	Valemount Community Forest Company Ltd.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-B-3	Valemount Community Forest Company Ltd.	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-B-4	Valemount Community Forest Company Ltd.	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-23.1-B-5	VALEMONT COMMUNITY FOREST COMPANY LTD.	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-24-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-A-2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-A-3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-B-1.1	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-B-1.2	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-B-1.3	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-B-2	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-24-B-3	GOAT CREEK LOGGING LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-25-B-1.1	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-25-B-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-25-B-2	Trans Mountain Pipeline ULC	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-A-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-A-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-A-3	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-A-4	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-B-1	WESTRIDGE FSR	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-B-2	WESTRIDGE FSR	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-B-2.1	WESTRIDGE FSR	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-26-B-2.2	WESTRIDGE FSR	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-27-A-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-27-B-1	WESTRIDGE FSR	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-28-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-28-A-2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29.1-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29.1-A-1.2	NESTER KUNKA, JANET MAY JACQUELINE KUNKA	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29.1-A-1.3	CANOE RIVER CAMPGROUND LTD.	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29.1-A-1.4	DERRECK PAUL DEIBERT, SALLY NORAH LOCKWOOD, MARCEL ROCQ	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29.1-A-1.5	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29.1-A-1.6	NESTER KUNKA, JANET MAY JACQUELINE KUNKA	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access

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3-B-29.2-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-29.2-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-29.2-A-2	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	New Temporary Access	3	Fraser Fort George Reg Dis	Camp and Stockpile Roads
3-B-29-A-1	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29-A-2.1	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29-A-2.2	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29-A-3	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29-A-4	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-29-A-5	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-30-A-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-31-A-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-32-A-1.1	VALEMOUNT COMMUNITY FOREST COMPANY LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-32-A-1.2	Intrawest ULC, Inc.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-32-A-1.3	Canoe River Campground Ltd.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-33-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-B-33-A-2	DERRECK PAUL DIEBERT, SALLY NORAH LOCKWOOD-UNDIVIDED HAL	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-34-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-34-A-1.2	Canoe River Campground Ltd.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-34-A-2	CANOE RIVER CAMPGROUND LTD.	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-A-1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-B-1	Elizabeth Everard	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-B-2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-B-3	Elizabeth Everard	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-C-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-C-2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-35-C-3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-36-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3		Construction Access
3-C-36-A-1.1	CROWN	Deactivated / Overgrown Access	3		Construction Access
3-C-36-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3		Construction Access
3-C-36-A-1.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3		Construction Access
3-C-36-A-1.4	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3		Construction Access
3-C-37-A-1.1	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-37-A-1.2	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-37-A-1.3	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-37-B-1.4	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-38-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-39-A-1	CROWN	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-39-A-1.1	CROWN	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-40-A-1.1	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-40-A-1.2	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-40-B-1	The Crown In Right Of British Columbia	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-40-B-2	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-40-B-3	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-C-40-B-4	Trans Mountain Pipeline ULC	New Temporary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-41-A-1.1	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-41-A-1.2	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-42-A-1.1	CROWN	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-42-A-1.2	CROWN	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-43-A-1.1	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-43-A-1.2	CARRIER LUMBER LTD.	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-44-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-44-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-44-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-1	Canadian Northern Pacific Railway Company	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-1.1	Canadian Northern Pacific Railway Company	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-1.2	Terrance William Power As To An Undivided 2/3 Interest with Lisa	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-2.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-2.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-2.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-2.4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-45-B-2.5	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-46-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-46-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-46-A-2	Trans Mountain Pipeline ULC	New Temporary Access	3		Construction Access
3-C-47-A-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-48-A-1.1	Valerie Alison Urquhart	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-48-A-1.2	Canadian Northern Pacific Railway Company	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-48-A-2.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-48-A-2.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-48-A-2.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Fraser Fort George Reg Dis	Construction Access
3-C-49-A-1	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-50-A-1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-50-B-1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-50-B-2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-51-A-1.1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-51-A-1.2	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-51-A-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-51-B-1	Canadian National Railway Company	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-51-B-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-51-C-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-A-1.1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-A-1.2	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-1.1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-1.2	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-1.3	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-1.4	Wayne Lee Sturdivan	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-C-52-B-1.5	Canadian National Railway Company	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-1.6	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-2	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-3	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-4	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-5	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-B-6	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-C-1.1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-C-1.2	Canadian National Railway Company	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-C-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-D-1	Canadian National Railway Company	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-D-2.1	Canadian National Railway Company	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-D-2.2	Canadian National Railway Company	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-D-2.3	Her Majesty The Queen In Right Of The Province Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-E-1.1	Her Majesty The Queen In Right Of The Province Of British Columbia	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-E-1.2	Her Majesty The Queen In Right Of The Province Of British Columbia	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-E-3	Her Majesty The Queen In Right Of The Province Of British Columbia	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-52-E-4	Trans Mountain Pipeline ULC	New Temporary Access	3		Construction Access
3-C-53-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-53-A-1.2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-54-557.2-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-55-A-1	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-55-A-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-56-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-56-A-1.2	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-56-A-2	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-57-A-1.1	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-57-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-58-A-4	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-58-A-5	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-58-A-6	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-58.1-A-1.1	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-58.1-A-1.2	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-1.1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-1.2	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-1.3	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-1.4	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-1.5	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-1.6	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-A-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-2	Her Majesty The Queen In Right Of The Province Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-3	TIMBER SALES MANAGER KAMLOOPS	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-C-59-C-4	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-5	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-6	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-7	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-C-8	Her Majesty The Queen In Right Of The Province Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-59-D-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-A-1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-B-1.1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-B-1.2	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-B-1.3	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-B-1.4	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-B-1.5	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-C-1	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-D-1	The Crown In Right Of British Columbia	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-E-1	TIMBER SALES MANAGER KAMLOOPS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-F-1	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-F-2	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-G-1.1	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-G-1.2	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-G-1.3	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-G-1.4	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-G-1.5	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-60-G-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-61-A-1	Canadian Northern Pacific Railway Company	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-61-A-2	Canadian Northern Pacific Railway Company	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-62-A-1.1	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-62-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-62-A-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-63-A-1.1	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-63-A-1.2	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-63-A-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-64-A-1	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-65-A-1.1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-65-A-1.2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-65-A-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-66-A-1.1	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-66-A-1.2	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-67-A-1.1	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-67-A-1.2	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-A-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-A-1.3	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-C-68-A-1.4	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-A-1.5	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-A-2	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-B-1.1	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-B-1.2	GILBERT SMITH FOREST PRODUCTS LTD.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-B-2	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-68-B-3	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-69-A-1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-69-A-2	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-69-A-3	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-69-A-4	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-69-A-5	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-A-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-A-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-B-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-C-2	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-D-1	The Crown In Right Of British Columbia	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-D-3	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-D-4	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-D-5	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-70-D-6	CROWN	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-71-A-1	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-71-A-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3		Construction Access
3-C-71-A-3	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3		Construction Access
3-C-72-A-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-72-A-2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-72-B-1	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-72-C-1	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-73-A-1	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-73-A-2	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-73-A-3	GILBERT SMITH FOREST PRODUCTS LTD.	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-74-A-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-74-A-2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-74-A-3	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-74-B-1	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-74-C-1	The Crown In Right Of British Columbia	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-75-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-76-A-1	The Crown In Right Of British Columbia	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-76-B-1	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-76-B-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-76-B-3	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-76-B-4	CROWN	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-76-C-1	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
3-C-77-A-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-77-B-1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-77-C-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-77-C-2	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-77-C-3	The Crown In Right Of British Columbia	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-78-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-78-A-2	Trans Mountain Pipeline ULC	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-79-A-1.1	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-79-A-1.2	Trans Mountain Pipeline ULC	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-80-A-1.1	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-80-A-1.2	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-80-A-1.3	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-80.1-A-1.1	Trans Mountain Pipeline ULC	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-80.1-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-B-1.1	Cariboo Monashee Heli-Ski Village Ltd.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-B-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-B-2	Cariboo Monashee Heli-Ski Village Ltd.	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-C-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-C-2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-C-3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81-D-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81.1-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	3	Thompson Nicola Reg Dis	Construction Access
3-C-81.1-A-2	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	3	Thompson Nicola Reg Dis	Construction Access
4-A-10-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-11-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-12-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-12-A-2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-12-A-3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-13-A-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-14-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-14-A-2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-15-A-3.1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-15-A-3.2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-16-A-1.1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-16-A-1.2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-17-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-18-B-2.1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-18-B-2.2	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-19-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-19-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
4-A-1-A-1.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-A-1.4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-A-1.5	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-A-1.6	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-A-1.7	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-1-B-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Camp and Stockpile Roads
4-A-20-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-22-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-22-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-25-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-27-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.5	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.6	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-1.7	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-5	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-5.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-B-5.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-C-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-C-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-D-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-E-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-2.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-2.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-2.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-2.4	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-2.5	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-3.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-F-3.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-G-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-28-G-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-29-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-2-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-2-B-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-30-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-30-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-30-A-1.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-32-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
4-A-34-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-35-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-37-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-38-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-39-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-3-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-3-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-40-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-41-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-41-B-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-41-B-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-41-C-1.3	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-42-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-43-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-43-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-44-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-45.1-A-1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-45-A-1	DISTRICT MANAGER HEADWATERS	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-46-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-47-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-49-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-4-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-50-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-50-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-51-A-2.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-51-E-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-51-E-2.2	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-52-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-52-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-54-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-55-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-56-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-56-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-57-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-58-A-1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-59-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-59-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-5-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-5-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-5-A-1.3	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-5-A-1.4	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-5-A-1.5	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-60-A-1	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access

Segment Unique ID (UPI)	Operator (UPI)	Road Status (UPI)	Spread	Admin Area (UPI)	TypeCL (UPI)
4-A-60-A-2.1	MINISTRY OF TRANSPORATION (MOTI)	New Temporary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-61-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-61-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-62-A-1.2	MINISTRY OF TRANSPORATION (MOTI)	Existing Secondary Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-63-A-1.1	MINISTRY OF TRANSPORATION (MOTI)	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-9-A-1	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-9-A-3	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-9-A-4	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access
4-A-9-A-5	DISTRICT MANAGER HEADWATERS	Deactivated / Overgrown Access	4	Thompson Nicola Reg Dis	Construction Access

Agency Application ID	Summary	Permit Type Name	Kilometer Post-In	JIRA Issue Status	Work Location (Spread)
2017-01051	AP 3-A-4 Fort George	MOTI - Access Point	504	Approved (TMEP)	3
2017-06049	AP-3-B-82-1	MOTI - Access Point	505	Technical Review	3
2017-06050	AP-3-B-82-2	MOTI - Access Point	505	Technical Review	3
2019-05443	AP 3-B-5	MOTI - Access Point	505	Technical Review	3
2017-01054	AP 3-B-6 Fort George	MOTI - Access Point	506	Approved (TMEP)	3
2017-01056	AP 3-B-7 Fort George	MOTI - Access Point	507	Approved (TMEP)	3
2017-01057	AP 3-B-8 Fort George	MOTI - Access Point	508	Approved (TMEP)	3
2017-01058	AP 3-B-9 Fort George	MOTI - Access Point	509	Approved (TMEP)	3
2017-01059	AP 3-B-10 Fort George	MOTI - Access Point	509	Approved (TMEP)	3
2017-01060	AP 3-B-Hwy 5-1 Fort George	MOTI - Access Point	510	Approved (TMEP)	3
2017-01061	AP 3-B-11 Fort George	MOTI - Access Point	511	Approved (TMEP)	3
2017-01062	AP 3-B-Hwy 5-2 Fort George	MOTI - Access Point	511	Approved (TMEP)	3
2017-01255	AP 3-B-12-B-1 Fort George	MOTI - Access Point	512	Approved (TMEP)	3
2019-05409	AP 3-B-12-A-1	MOTI - Access Point	512	Technical Review	3
2019-05420	AP 3-B-12-A-2	MOTI - Access Point	512	Technical Review	3
2019-05423	AP 3-B-12-A-3	MOTI - Access Point	512	Technical Review	3
2019-05424	AP 3-B-13-A-1	MOTI - Access Point	513	Pending Cancellation	3
2019-05425	AP 3-B-13-A-2	MOTI - Access Point	514	Technical Review	3
2019-05427	AP 3-B-14-B	MOTI - Access Point	514	Technical Review	3
2017-01258	AP 3-B-15-A Fort George	MOTI - Access Point	515	Approved	3
2017-01259	AP 3-B-16-B Fort George	MOTI - Access Point	515	Approved	3
2017-01063	AP 3-B-17-A Fort George	MOTI - Access Point	517	Approved (TMEP)	3
2017-01383	AP 3-B-Hwy 5-3 Fort George	MOTI - Access Point	517	Approved	3
2018-05573	AP 3-B-Hwy 5-4 Fort George	MOTI - Access Point	517	First Nations Consultation	3
2019-05428	AP 3-B-17-A-1	MOTI - Access Point	517	Technical Review	3
2019-05429	AP 3-B-17-A-2	MOTI - Access Point	517	Technical Review	3
2017-01835	AP 3-B-20-A-1 Fort George	MOTI - Access Point	519	Approved (TMEP)	3
2017-01838	AP 3-B-23 Fort George	MOTI - Access Point	519	Approved (TMEP)	3
2017-01850	AP 3-B-23-A Fort George	MOTI - Access Point	519	Approved (TMEP)	3
2017-01852	AP 3-B-22-A-1 Fort George	MOTI - Access Point	519	Approved (TMEP)	3
2017-01225	AP 3-B-25-B Fort George	MOTI - Access Point	522	Approved	3
2017-01286	AP 3-B-24-A-1 Fort George	MOTI - Access Point	522	Approved (TMEP)	3
2017-01287	AP 3-B-24-A-2 Fort George	MOTI - Access Point	522	Approved (TMEP)	3
2017-05631	-B-23.1-D Fort George (Valemount Stockpile - VAL	MOTI - Access Point	523	Approved	3
2019-05432	AP 3-B-23.1-B	MOTI - Access Point	523	Assembly In-Draft	3
2019-05433	AP 3-B-23.1-C	MOTI - Access Point	524	Technical Review	3
2019-05435	AP 3-B-27-A	MOTI - Access Point	524	Technical Review	3
2019-05444	AP 3-B-82	MOTI - Access Point	524	Technical Review	3
2019-05445	AP 3-B-84	MOTI - Access Point	524	Approved	3
2017-01064	AP 3-B-33-A Fort George	MOTI - Access Point	525	Approved (TMEP)	3
2019-05439	AP 3-B-29.1-A	MOTI - Access Point	525	Assembly In-Draft	3
2019-05442	AP 3-B-29.2-A-1	MOTI - Access Point	525	Technical Review	3
2017-01065	AP 3-C-34-A Fort George	MOTI - Access Point	526	Approved (TMEP)	3
2017-01857	AP 3-C-35-C-1 Fort George	MOTI - Access Point	527	Approved (TMEP)	3
2017-01859	AP 3-C-35-C-2 Fort George	MOTI - Access Point	527	Approved (TMEP)	3
2019-05453	AP 3-C-35-C	MOTI - Access Point	527	Pending Cancellation	3
2019-07044	AP-3-C-36-A	MOTI - Access Point	529	Assembly In-Draft	3
2017-01068	AP 3-C-38-A Fort George	MOTI - Access Point	532	Approved (TMEP)	3
2017-01122	AP 3-C-39-A Fort George	MOTI - Access Point	534	Approved (TMEP)	3
2017-01125	AP 3-C-40-B Fort George	MOTI - Access Point	535	Approved (TMEP)	3
2017-01127	AP 3-C-41-A Fort George	MOTI - Access Point	537	Approved (TMEP)	3
2017-01128	AP 3-C-42-A Fort George	MOTI - Access Point	538	Approved (TMEP)	3
2017-01129	AP 3-C-43-A Fort George	MOTI - Access Point	540	Approved (TMEP)	3
2017-01130	AP 3-C-44-A Fort George	MOTI - Access Point	540	Approved (TMEP)	3
2017-01131	AP 3-C-45-B Fort George	MOTI - Access Point	541	Approved (TMEP)	3
2017-01136	AP 3-C-46-A Fort George	MOTI - Access Point	541	Approved (TMEP)	3
2017-06038	AP 3-C-46-B Fort George	MOTI - Access Point	541	Approved	3
2017-01138	AP 3-C-48-A Fort George	MOTI - Access Point	543	Approved (TMEP)	3
2019-05456	AP 3-C-49.1-A	MOTI - Access Point	548	Technical Review	3
2019-05457	AP 3-C-49.1-B	MOTI - Access Point	548	Assembly In-Draft	3
2017-01288	AP 3-C-50-B Fort George	MOTI - Access Point	549	Approved (TMEP)	3
2019-05458	AP 3-C-52-B	MOTI - Access Point	554	First Nations Consultation	3
2017-01229	AP 3-C-53-A Fort George	MOTI - Access Point	557	Approved (TMEP)	3
2017-01231	AP 3-C-55-A Fort George	MOTI - Access Point	558	Approved (TMEP)	3
2017-01323	AP 3-C-56-A Fort George	MOTI - Access Point	559	Approved	3
2017-01232	AP 3-C-57-A Fort George	MOTI - Access Point	560	Approved (TMEP)	3
2017-01325	AP 3-C-Hwy 5-4 Fort George	MOTI - Access Point	560	Approved (TMEP)	3
2017-01324	AP 3-C-58-A Fort George	MOTI - Access Point	562	Approved (TMEP)	3
2017-01326	AP 3-C-Hwy 5-5 Fort George	MOTI - Access Point	578	Approved (TMEP)	3

Agency Application ID	Summary	Permit Type Name	Kilometer Post-In	JIRA Issue Status	Work Location (Spread)
2017-01327	AP 3-C-Hwy 5-6 Fort George	MOTI - Access Point	578	Approved (TMEP)	3
2017-01864	AP 3-C-64-A Fort George	MOTI - Access Point	578	Approved (TMEP)	3
2019-05460	AP 3-C-62-A	MOTI - Access Point	578	Pending Cancellation	3
2017-01237	AP 3-C-65-A Fort George	MOTI - Access Point	580	Approved (TMEP)	3
2017-01262	AP 3-C-66-A Fort George	MOTI - Access Point	582	Approved (TMEP)	3
2017-01263	AP 3-C-67-A-1 Fort George	MOTI - Access Point	584	Approved (TMEP)	3
2017-01264	AP 3-C-68-B Fort George	MOTI - Access Point	589	Approved (TMEP)	3
2017-01266	AP 3-C-69-A Fort George	MOTI - Access Point	589	Approved (TMEP)	3
2017-01270	AP 3-C-Hwy 5-7 Fort George	MOTI - Access Point	592	Approved	3
2017-01272	AP 3-C-71-A Fort George	MOTI - Access Point	595	Approved (TMEP)	3
2017-01861	AP 3-C-73-A Fort George	MOTI - Access Point	597	Approved	3
2017-01274	AP 3-C-75-A Fort George	MOTI - Access Point	601	Approved (TMEP)	3
2019-05461	AP 3-C-76-B	MOTI - Access Point	601	Technical Review	3
2017-01321	AP 3-C-Hwy 5-9 Fort George	MOTI - Access Point	604	Approved (TMEP)	3
2017-01281	AP 3-C-Hwy 5-10 Fort George	MOTI - Access Point	605	Approved (TMEP)	3
2017-01282	AP 3-C-79-A Fort George	MOTI - Access Point	607	Approved (TMEP)	3
2017-01865	AP 3-C-80.1-A Fort George	MOTI - Access Point	610	Approved (TMEP)	3
2017-02722	AP 3-C-81-C-1 Fort George	MOTI - Access Point	610	Approved (TMEP)	3
2017-02723	AP 3-C-81-C-2 Fort George	MOTI - Access Point	610	Approved (TMEP)	3
2017-05634	AP 3-C-80.2-A (Blue River Camp - BLU007)	MOTI - Access Point	610	Technical Review	3
2019-05462	AP 3-C-80.2-B	MOTI - Access Point	610	Assembly In-Draft	3
2017-01876	AP 3-C-81-D-1 Fort George	MOTI - Access Point	611	Approved (TMEP)	3
2017-01879	AP 3-C-81-D-2 Fort George	MOTI - Access Point	611	Approved (TMEP)	3
2019-05463	AP 3-C-80.2-C	MOTI - Access Point	611	Assembly In-Draft	3
2019-06391	AP 3-B-22.1-A	MOTI - Access Point		Approved	3
TBD	AP 3-B-22.1-A-1	MOTI - Access Point		Assembly Not Started	3
2017-01717	AP 4-A-2-A-1 Fort George	MOTI - Access Point	611	Approved (TMEP)	4A
2017-01718	AP 4-A-2-A-2 Fort George	MOTI - Access Point	611	Approved (TMEP)	4A
2017-01722	AP 4-A-3-A Fort George	MOTI - Access Point	611	Approved (TMEP)	4A
2017-01713	AP 4-A-1-A-1 Fort George	MOTI - Access Point	612	Approved	4A
2017-01714	AP 4-A-1-A-2 Fort George	MOTI - Access Point	612	Approved	4A
2017-01720	AP 4-A-4-A-1 Fort George	MOTI - Access Point	612	Approved (TMEP)	4A
2017-01721	AP 4-A-4-A-2 Fort George	MOTI - Access Point	612	Approved (TMEP)	4A
2017-01724	AP 4-A-5-A-1 Fort George	MOTI - Access Point	612	Approved	4A
2017-01725	AP 4-A-5-A-2 Fort George	MOTI - Access Point	612	Approved	4A
2017-05638	P 4-A-3.1-A Fort George (Blue River Office - BLU00	MOTI - Access Point	612	Assembly In-Draft	4A
2019-05465	AP 4-A-4-A-3	MOTI - Access Point	612	Technical Review	4A
2017-01147	AP 4-A-7-A Fort George	MOTI - Access Point	614	Approved (TMEP)	4A
2017-01148	AP 4-A-8-A Fort George	MOTI - Access Point	616	Approved (TMEP)	4A
2017-01639	AP 4-A-Hwy 5-11 Fort George	MOTI - Access Point	622	Approved	4A
2017-01640	AP 4-A-Hwy 5-12 Fort George	MOTI - Access Point	622	Approved (TMEP)	4A
2017-01149	AP 4-A-10-A Fort George	MOTI - Access Point	623	Approved (TMEP)	4A
2017-01150	AP 4-A-11-A Fort George	MOTI - Access Point	624	Approved	4A
2017-01641	AP 4-A-Hwy 5-13 Fort George	MOTI - Access Point	626	Approved (TMEP)	4A
2017-01385	AP 4-A-12-A Fort George	MOTI - Access Point	627	Approved (TMEP)	4A
2017-01646	AP 4-A-Hwy 5-14 Fort George	MOTI - Access Point	627	Approved (TMEP)	4A
2017-01647	AP 4-A-Hwy 5-15 Fort George	MOTI - Access Point	627	Technical Review	4A
2017-01386	AP 4-A-13-A Fort George	MOTI - Access Point	628	Approved	4A
2017-01387	AP 4-A-Hwy 5-16 Fort George	MOTI - Access Point	628	Approved	4A
2017-01151	AP 4-A-14-A Fort George	MOTI - Access Point	632	Approved (TMEP)	4A
2017-06052	AP-4-A-151-A Fort George	MOTI - Access Point	633	Approved	4A
2017-06053	AP-4-A-151-B Fort George	MOTI - Access Point	633	Approved	4A
2017-01376	AP 4-A-17-A Fort George	MOTI - Access Point	634	Approved	4A
2017-01377	AP 4-A-19-A Fort George	MOTI - Access Point	636	Approved (TMEP)	4A
2017-01463	AP 4-A-Hwy 5-18 Fort George	MOTI - Access Point	638	Technical Review	4A
2017-01656	AP 4-A-Hwy 5-17 Fort George	MOTI - Access Point	638	Approved (TMEP)	4A
2017-01378	AP 4-A-20-A Fort George	MOTI - Access Point	639	Approved (TMEP)	4A
2017-01153	AP 4-A-22-A Fort George	MOTI - Access Point	641	Approved (TMEP)	4A
2017-01157	AP 4-A-23-A Fort George	MOTI - Access Point	642	Approved (TMEP)	4A
2017-01464	AP 4-A-Hwy 5-19 Fort George	MOTI - Access Point	643	Technical Review	4A
2017-01158	AP 4-A-25-A Fort George	MOTI - Access Point	644	Approved (TMEP)	4A
2017-01465	AP 4-A-Hwy 5-20 Fort George	MOTI - Access Point	645	Approved (TMEP)	4A
2017-01379	AP 4-A-26-A Fort George	MOTI - Access Point	646	Approved	4A
2017-01466	AP 4-A-Hwy 5-21 Fort George	MOTI - Access Point	646	Approved (TMEP)	4A
2017-01467	AP 4-A-Hwy 5-22 Fort George	MOTI - Access Point	646	Approved (TMEP)	4A
2017-01486	AP 4-A-Hwy 5-23 Fort George	MOTI - Access Point	646	Approved (TMEP)	4A
2017-01726	AP 4-A-28-B-1 Fort George	MOTI - Access Point	648	Approved	4A
2017-01727	AP 4-A-28-B-2 Fort George	MOTI - Access Point	648	Approved	4A
2017-02514	AP 4-A-27-A Fort George	MOTI - Access Point	650	Approved	4A

Agency Application ID	Summary	Permit Type Name	Kilometer Post-In	JIRA Issue Status	Work Location (Spread)
2017-01728	AP 4-A-28-C-1 Fort George	MOTI - Access Point	651	Approved (TMEP)	4A
2017-01729	AP 4-A-28-C-2 Fort George	MOTI - Access Point	651	Approved (TMEP)	4A
2017-01731	AP 4-A-28-E-1 Fort George	MOTI - Access Point	651	Approved (TMEP)	4A
2017-01732	AP 4-A 28-E-2 Fort George	MOTI - Access Point	651	Approved (TMEP)	4A
2019-05467	AP 4-A 28-B-5	MOTI - Access Point	651	Assembly In-Draft	4A
2019-05468	AP 4-A-28-D	MOTI - Access Point	651	Pending Cancellation	4A
2019-05469	AP 4-A-28-F-3	MOTI - Access Point	651	Pending Cancellation	4A
2019-05470	AP 4-A-28-F-4	MOTI - Access Point	651	Pending Cancellation	4A
2017-01159	AP 4-A-29-A Fort George	MOTI - Access Point	652	Approved	4A
2017-06054	AP-4-A-152-A Fort George	MOTI - Access Point	652	Approved	4A
2017-06056	AP-4-A-152-B Fort George	MOTI - Access Point	652	Approved	4A
2019-05471	AP 4-A-28-G	MOTI - Access Point	652	Pending Cancellation	4A
2017-01163	AP 4-A-30-A Fort George	MOTI - Access Point	654	Approved (TMEP)	4A
2017-01388	AP 4-A-31-A Fort George	MOTI - Access Point	654	Approved	4A
2017-01164	AP 4-A-32-A Fort George	MOTI - Access Point	655	Approved (TMEP)	4A
2017-01488	AP 4-A-Hwy 5-24 Fort George	MOTI - Access Point	656	Approved (TMEP)	4A
2017-01490	AP 4-A-33-A Fort George	MOTI - Access Point	656	Approved (TMEP)	4A
2017-01165	AP 4-A-34-A Fort George	MOTI - Access Point	658	Approved	4A
2017-01239	AP 4-A-35-A Fort George	MOTI - Access Point	660	Approved	4A
2017-01241	AP 4-A-37-A Fort George	MOTI - Access Point	662	First Nations Consultation	4A
2017-01242	AP 4-A-38-A Fort George	MOTI - Access Point	663	Approved	4A
2017-01341	AP 4-A-39-A Fort George	MOTI - Access Point	663	Approved	4A
2017-01493	AP 4-A-Hwy 5-25 Fort George	MOTI - Access Point	665	Approved	4A
2017-01248	AP 4-A-40-A Fort George	MOTI - Access Point	666	Approved	4A
2017-01249	AP 4-A-41-B Fort George	MOTI - Access Point	667	First Nations Consultation	4A
2017-01250	AP 4-A-42-A Thompson-Nicola	MOTI - Access Point	670	Approved (TMEP)	4A
2017-02294	AP 4-A-43-A-1 Thompson-Nicola	MOTI - Access Point	671	Approved	4A
2017-02295	AP 4-A-43-A-2 Thompson-Nicola	MOTI - Access Point	671	Approved	4A
2017-06058	AP-4-A-153-A Thompson-Nicola	MOTI - Access Point	671	Assembly In-Draft	4A
2017-06060	AP-4-A-153-B Thompson-Nicola	MOTI - Access Point	671	Assembly In-Draft	4A
2019-05472	AP 4-A-44-A	MOTI - Access Point	673	Technical Review	4A
2017-01342	AP 4-A-45.1-A Thompson-Nicola	MOTI - Access Point	674	Approved	4A
2017-01495	AP 4-A-Hwy 5-26 Thompson-Nicola	MOTI - Access Point	675	Approved (TMEP)	4A
2017-01602	AP 4-A-46-A Thompson-Nicola	MOTI - Access Point	676	Approved (TMEP)	4A
2017-01604	AP 4-A-47-A Thompson-Nicola	MOTI - Access Point	677	Approved	4A
2017-01497	AP 4-A-Hwy 5-27 Thompson-Nicola	MOTI - Access Point	678	Approved (TMEP)	4A
2017-01605	AP 4-A-48-A Thompson-Nicola	MOTI - Access Point	678	Approved (TMEP)	4A
2017-01606	AP 4-A-49-A Thompson-Nicola	MOTI - Access Point	679	Approved (TMEP)	4A
2017-01608	AP 4-A-50-A Thompson-Nicola	MOTI - Access Point	679	Approved	4A
2017-01498	AP 4-A-Hwy 5-28 Thompson-Nicola	MOTI - Access Point	682	Approved	4A
2017-01626	AP 4-A-51-E Thompson-Nicola	MOTI - Access Point	682	Approved (TMEP)	4A
2017-01627	AP 4-A-52-A Thompson-Nicola	MOTI - Access Point	682	Approved (TMEP)	4A
2017-01628	AP 4-A-54-A Thompson-Nicola	MOTI - Access Point	683	Approved	4A
2017-01629	AP 4-A-55-A Thompson-Nicola	MOTI - Access Point	683	Approved	4A
2017-01630	AP 4-A-57-A Thompson-Nicola	MOTI - Access Point	684	Approved	4A
2017-06063	AP-4-A-154-A Thompson-Nicola	MOTI - Access Point	684	Approved	4A
2017-06064	AP-4-A-154-B Thompson-Nicola	MOTI - Access Point	684	Approved	4A
2019-05498	AP 4-A-56-A	MOTI - Access Point	684	Technical Review	4A
2017-01631	AP 4-A-58-A Thompson-Nicola	MOTI - Access Point	685	Approved (TMEP)	4A
2017-06065	AP-4-A-155-A Thompson-Nicola	MOTI - Access Point	685	Approved	4A
2017-01613	AP 4-A-50-A-4 Thompson-Nicola	MOTI - Access Point	687	Approved (TMEP)	4A
2017-01623	AP 4-A-60-A-3 Thompson-Nicola	MOTI - Access Point	687	Approved (TMEP)	4A
2017-01633	AP 4-A-60-A-1 Thompson-Nicola	MOTI - Access Point	687	Approved	4A
2017-01634	AP 4-A-60-A-2 Thompson-Nicola	MOTI - Access Point	687	Approved (TMEP)	4A
2017-01632	AP 4-A-59-A Thompson-Nicola	MOTI - Access Point	688	Approved	4A
2019-05503	AP 4-A-59-B	MOTI - Access Point	688	Technical Review	4A
2019-05504	AP 4-A-60-A	MOTI - Access Point	688	Technical Review	4A
2017-01635	AP 4-A-61-A Thompson-Nicola	MOTI - Access Point	690	Approved (TMEP)	4A
2017-01636	AP 4-A-62-A Thompson-Nicola	MOTI - Access Point	690	Approved (TMEP)	4A
2017-01637	AP 4-A-63-A Thompson-Nicola	MOTI - Access Point	690	Approved (TMEP)	4A
2017-01638	AP 4-A-64-A Thompson-Nicola	MOTI - Access Point	690	Approved (TMEP)	4A
2017-06109	AP 4-A-64-B Thompson-Nicola	MOTI - Access Point	690	Approved	4A
TBD	AP 4-A-44-B	MOTI - Access Point		Assembly Not Started	4A
TBD	AP 4-A-44-C	MOTI - Access Point		Assembly Not Started	4A

Appendix F Sample Forms

Incident Management Report

Project: LSLP – TMEP Spread 3 & 4A

Date: _____

Time Incident Occurred: _____
Time Incident Cleared: _____
Incident Reported by: _____

Location:

_____

_____

Description of Incident:

_____

_____

_____

_____

_____

Number of vehicles	_____	Injuries	YES / NO
Types of vehicles	_____	Fatalities	YES / NO
RCMP Attended	YES / NO	File Number:	_____
Ambulance Attended	YES / NO		
Fire Trucks Attended	YES / NO		

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Construction Contractor Representative
Signature: _____
Print Name: _____
Date: _____

Road Authority Representative Signature: _____
Print Name: _____
Date: _____

MoTI Incident

Highway Incident Communications		Additional Items
Primary Public Information /Drive BC	1. Location (Highway/Road)	
	2. Impact to Traffic (Closure, SLAT, None)	
	3. Incident Description	
	4. DriveBC Comments	
	5. Expected Time of Reopening	
	6. Level of Confidence	
Secondary / Sensitive information	*7. Next Update*	
	8. Detailed Incident Description	
	9. Injuries/Fatalities	
	10. Ministry Personnel Involved	
	11. Incident Responders	
	12. Site History	
	13. Weather and Road Conditions	
	14. Maintenance Contractor	
	15. Traffic Management	

Daily Activity Report – Traffic Plan Implementation

Project: LSLP – TMEP Spread 3 & 4A

Date: _____

Activity	Time	Comment

Comments:

_____

_____

_____

_____

_____

_____

_____

Superintendent's Signature: _____

Print Name: _____

Non-Work Day Inspection Report

Project: LSLP – TMEP Spread 3 & 4A

Date: _____

Road and Safety Concerns	Time	Corrective Action Taken

Comments:

_____

_____

_____

_____

_____

Inspector's Signature: _____

Print Name: _____

Record of Traffic Control Equipment

Project: LSLP – TMEP Spread 3 & 4A

Date: _____

Traffic Control Equipment	Location	Date Installed	Date Removed

Notice of Construction

Project: LSLP – TMEP Spread 3 & 4A

Date: _____

Company: _____
Address: _____
City: _____
Province: _____
Postal Code: _____
Fax #: _____

Attention: _____

Re: "Construction Activities"

Traffic delays on Highway ___at ____ in _____, BC can be expected due to -
_____.

Commencement Date: _____
Completion Date: _____

Emergency Vehicles will be given priority and have clear access at all times.

If you have any questions, concerns or require further information, please contact:

Name:	Company:	P: F:

Media Notification

Project: LSLP – TMEP Spread 3 & 4A

Date: _____

Company: _____
Address: _____
City: _____
Province: _____
Postal Code: _____
Fax #: _____

Attention: _____

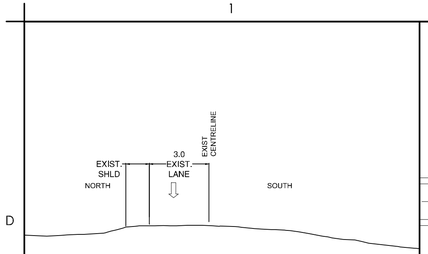
Re: "Scheduled Traffic Delays Notification"

Please run the following advertisement:

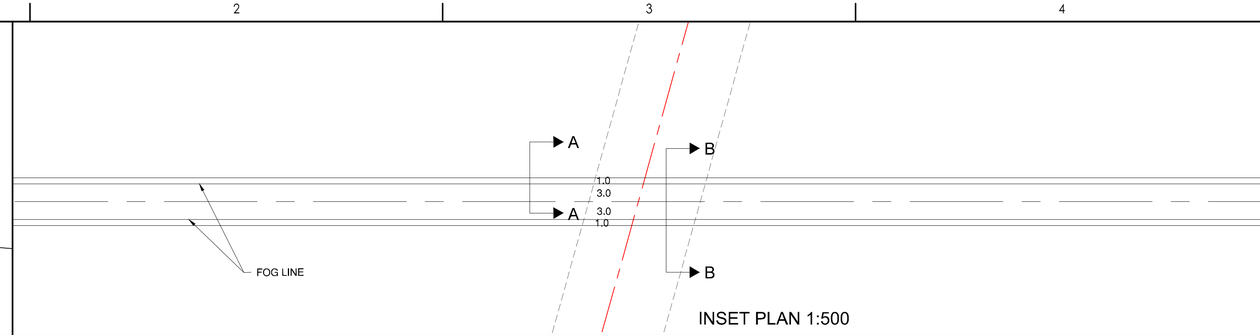
"Traffic delays on Highway ___ at _____ in _____, BC can be expected due Trans Mountain Pipeline construction. Construction activities to consist of:

Construction activities to commence on: _____
and be completed on: _____

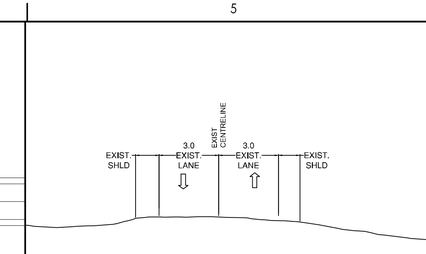
Appendix G - Traffic Control Plan Drawing Examples



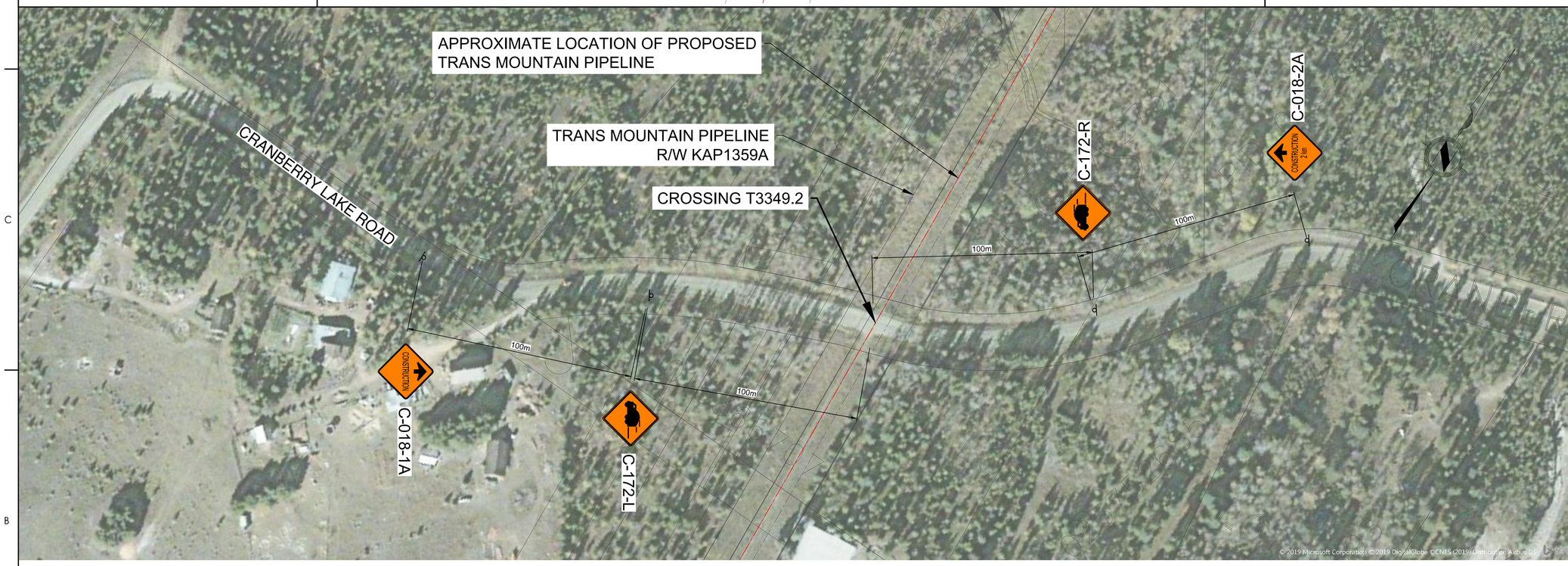
SECTION A-A

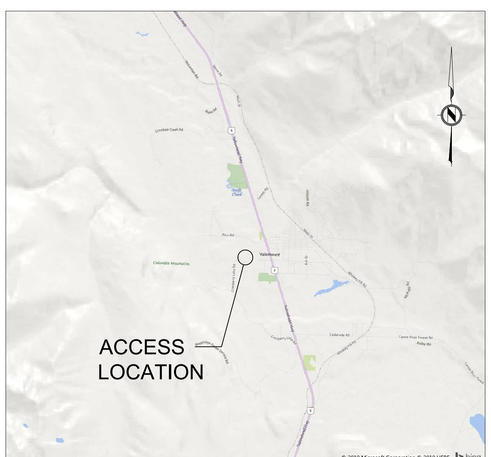


INSET PLAN 1:500



SECTION B-B





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LOCATION MAP

N.T.S.

TEMPORARY BARRIER DESIGN GENERAL NOTES:

1. TEMPORARY BARRIERS ARE INSTALLED TO PROTECT THE WORK ZONE AND TRAVELING PUBLIC. TEMPORARY BARRIERS SHOULD BE INSTALLED WHEN THE WORK ZONE INCLUDING BELL HOLES, TEMPORARY WORKING SPACES, OR CONSTRUCTION EQUIPMENT ARE WITHIN THE CLEAR ZONE AS DEFINED BY THE BC SUPPLEMENT TO TRANSPORT ASSOCIATION OF CANADA GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS (2007).
2. THE FOLLOWING FACTORS MUST BE CONSIDERED FOR TEMPORARY BARRIER INSTALLATION: THE POSTED SPEED OF THE FACILITY, THE AADT, WHETHER THE WORK ZONE IS THE POSTED SPEED FOR THE DURATION OF THE WORK ZONE.
3. THE CONTRACTOR MAY SELECT ALTERNATIVES TO BARRIER INSTALLATIONS DUE TO THE RISKS TO DRIVERS AND TO THE WORKERS INVOLVED IN INSTALLING AND REMOVING MUST BE APPROVED BY THE BC MOTI PRIOR TO IMPLEMENTATION.
4. PIPELINE AND ACCESS LOCATIONS TO BE CONFIRMED ON SITE BY THE CONTRACTOR. TRAFFIC CONTROL MEASURES SHALL BE LAID OUT FROM THE EDGE OF THE ACCESS OR THE END OF BARRIERS. THE CONTRACTOR TO LOCATE THE ACCESS TO AVOID CONFLICT OF TEMPORARY BARRIER PLACEMENT.
5. FOR CONSTRUCTION TIMING AND DURATION REFER TO THE PERMIT OF THIS LOCATION. THE KEY WORK ACTIVITIES WILL INCLUDE, BUT NOT LIMITED TO, EQUIPMENT MOBILIZATION, MATERIAL STAGING, PIPELINE AND PUMP STATION CONSTRUCTION, AND EQUIPMENT DEMOBILIZATION. REFER TO TACMP FOR GENERAL RESTRICTIONS, SPECIAL EVENTS, AND OTHER CONDITIONS ASSOCIATED WITH EACH SITE.
6. THE CONTRACTOR IS TO IMPLEMENT TEMPORARY TRAFFIC CONTROL MEASURE DURING THE INSTALLATION AND REMOVAL OF THE TEMPORARY BARRIERS. ALL SIGNS SHALL MEET BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE (BC MOTI) SPECIFICATIONS FOR STANDARD HIGHWAY SIGN MATERIALS, FABRICATION, SUPPLY, INSTALLATION, AND MAINTENANCE. EXISTING SIGNS SHALL BE COVERED WHERE THEY CONTRADICT WITH TEMPORARY SIGNING REQUIREMENTS IN THE TRAFFIC CONTROL MEASURES. CONTRACTOR IS TO NOTIFY THE TRAFFIC ENGINEER IF TRAFFIC CONTROL MEASURES OVERLAP WITH ADJACENT ACCESS MANAGEMENT PLAN.
7. CONTRACTOR TO MAINTAIN DRAINAGE OF THE FACILITY THROUGHOUT CONSTRUCTION.
8. THE POSTED SPEED OF THE ROAD IS USED AS THE DESIGN SPEED FOR THE TRAFFIC CONTROL MEASURES AND BARRIER FLARES. IF THE ROAD IS NOT POSTED, THE LEGAL SPEED WAS OBTAINED FROM THE BC MOTI.
9. CONTRACTOR TO RESTORE THE ROAD TO ORIGINAL CONDITION AFTER PIPELINE CONSTRUCTION.
10. CONTRACTOR TO RE-SHAPE FRONT SLOPE TO BE FLATTER THAN EXISTING AND LEAVE BARRIER SUPPORTMATERIAL REQUIRED ON SITE AT END OF CONSTRUCTION.
11. CONSTRUCTION ITEMS RELATED TO TEMPORARY BARRIER PLACEMENT SHALL BE IN ACCORDANCE WITH 2018 DESIGN BUILD STANDARD SPECIFICATIONS BY BC MOTI. KEY ITEMS RELATED TO TEMPORARY BARRIER INSTALLATION INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:

- SECTION 165 - PROTECTION OF THE ENVIRONMENT
- SECTION 200 - CLEARING AND GRUBBING
- SECTION 201- ROADWAY AND DRAINAGE EXCAVATION
- SECTION 202 - GRANULAR SURFACING, BASE AND SUB-BASES
- SECTION 941- PRECAST REINFORCED CONCRETE BARRIERS

12. TRAFFIC CONTROL LAYOUT PLANS SHALL BE LAID OUT FROM THE INTRODUCTION OF THE TEMPORARY BARRIERS.
13. THE BELL HOLE EDGE TO BE A MINIMUM OF 1.0M FROM THE BACK OF THE BARRIER.
14. WHITE REFLECTORS SHALL BE INSTALLED ALONG BARRIERS, ONE PER BARRIER.
15. TRAFFIC CONTROL LAYOUT PLAN ON OPPOSITE SIDE OF ROADWAY WILL BE SIMILAR TO WHAT IS PRESENTED ABOVE.
16. MINIMUM SLOPE OF 2:1 OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
17. THE LENGTH OF PARALLEL CRB FLANKING THE PIPELINE CROSSING SHALL BE ASSESSED BASED ON FIELD CONDITIONS AND MODIFIED TO LENGTH AS REQUIRED IN CONSIDERATION OF DEPTH OF EXCAVATION ALONG THE ROAD AND SITE GEOTECHNICAL CONDITIONS.
18. DISTANCE FROM FOG LINE TO FACE OF CRB TO BE MIN. 1.3M OR 1.5M FOR BIKES OR PEDESTRIANS.

LEGEND

	PROPOSED PIPELINE CENTER LINE
	FLEXIBLE DRUM
	TUBULAR MARKER
	CONE
	SIGN
	TRAFFIC CONTROL PERSON
	BARRICADE
	FLASHING ARROW BOARD
	FLASHING ARROW BOARD (FAB IN CAUTION MODE)
DYNAMIC MESSAGING SIGN	DYNAMIC MESSAGING SIGN (DMS)

SITE ID: T3349.2			
CATEGORY 1 (CRANBERRY LAKE ROAD)		POSTED SPEED, KM/HR	80
LATEST AADT, VEH/DAY (2016)	<1,000	LATEST SADT, VEH/DAY (2016)	<1,000
ANTICIPATED AADT, VEH/DAY (2020)	<1,200	ANTICIPATED SADT, VEH/DAY (2020)	<1,200
AVG. HOURLY DAYTIME VOLUME, VEH/HR	<50	AVG. HOURLY NIGHTTIME VOLUME, VEH/HR	<30
NOTE: TRAFFIC DATA IS UNAVAILABLE FOR THIS LOCATION. ASSUME LOW-MODERATE VOLUME ROAD.			

Stantec

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www.stantec.com

Consultant

Notes

Revision	By	Appd	YYYY.MM.DD
REV. 0 - ACCESS MANAGEMENT PLAN	BW	WB	2019-02-27

Issued	By	Appd	YYYY.MM.DD

File Name: 2017-03090-T3349.2	BW	TEH	WB	2019-02-26
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

ISSUED FOR PERMIT APPLICATION

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — W.K. BYCZEK # 42726 — 2019-02-26

Client/Project Logo

TRANS MOUNTAIN

Client/Project

TRANS MOUNTAIN EXPANSION PROJECT

Title

TRAFFIC CONTROL LAYOUT PLAN

Project No.	Scale
117202583	1:1000

Revision	Sheet	SITE ID
0	of	T3349.2

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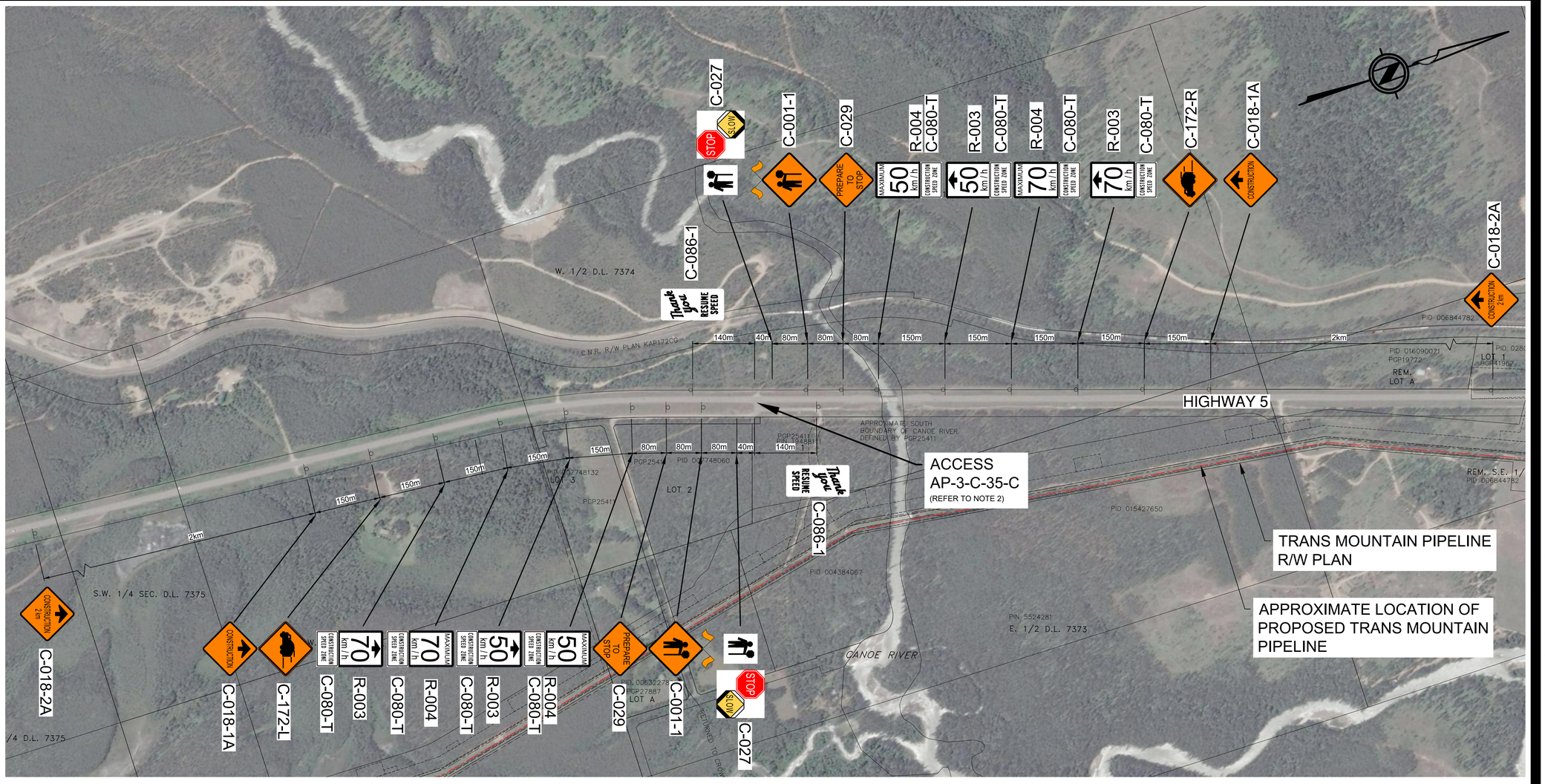
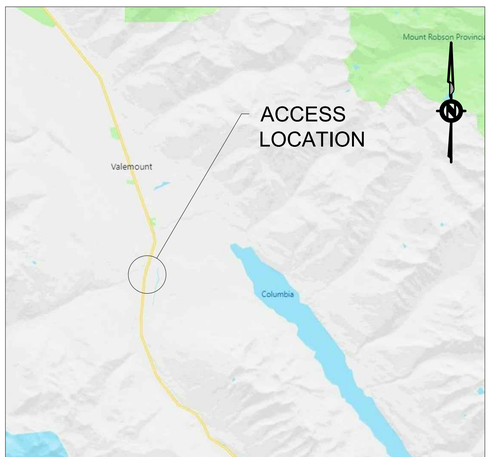
2019-02-26 7:33:27 PM

ORIGINAL SHEET - ANSI D





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LOCATION MAP

N.T.S.

GENERAL NOTES:

1. PIPELINE AND ACCESS LOCATIONS TO BE CONFIRMED ON SITE BY THE CONTRACTOR. TRAFFIC CONTROL MEASURES SHALL BE LAID OUT FROM THE EDGE OF THE ACCESS.
2. DETAILS FOR DRIVEWAY ACCESS LAYOUT CAN BE FOUND IN DRAWING AR-001: TYPICAL ACCESS ROAD ENTRANCE.
3. ALL SIGNS SHALL MEET BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE (BC MoTI) SPECIFICATIONS FOR STANDARD HIGHWAY SIGN MATERIALS, FABRICATION, SUPPLY, INSTALLATION AND MAINTENANCE. EXISTING SIGNS SHALL BE COVERED WHERE THEY CONTRADICT WITH TEMPORARY SIGNING REQUIREMENTS IN THE TRAFFIC CONTROL MEASURES. CONTRACTOR IS TO NOTIFY THE TRAFFIC ENGINEER IF TRAFFIC CONTROL MEASURES OVERLAP WITH ADJACENT ACCESS MANAGEMENT PLAN.
4. A SUMMARY OF THE CONSULTATIONS WITH APPROPRIATE GOVERNMENT AUTHORITIES, POTENTIALLY AFFECTED ABORIGINAL GROUPS AND AFFECTED LANDOWNERS/TENANTS IS PROVIDED IN THE TRAFFIC AND ACCESS CONTROL MANAGEMENT PLAN (TACMP). THE TACMP ALSO PROVIDES A DESCRIPTION AND JUSTIFICATION OF METHODOLOGIES FOR INCORPORATING INPUT AND RECOMMENDATION FROM THE CONSULTATION AND REVIEW PROCESS INTO THE TACMP AND ACCESS MANAGEMENT PLAN (AMP) FOR EACH SITE.
5. FOR CONSTRUCTION TIMING AND DURATION REFER TO THE PERMIT OF THIS LOCATION. THE KEY WORK ACTIVITIES WILL INCLUDE, BUT NOT LIMITED TO, EQUIPMENT MOBILIZATION, MATERIAL STAGING, PIPELINE AND PUMP STATION CONSTRUCTION, AND EQUIPMENT DEMOBILIZATION. REFER TO TACMP FOR GENERAL RESTRICTIONS, SPECIAL EVENTS, AND OTHER CONDITIONS ASSOCIATED WITH EACH SITE.
6. THE CONSTRUCTION TRAFFIC WILL COMPOSE OF TRUCKS HAULING EQUIPMENT AND MATERIALS AS WELL AS CREW TRANSPORT TO ACCESS TO/FROM THE WORKS. THE ESTIMATED VOLUME (REFER TO PERMIT) MAY RESULT IN MINOR REDUCTION OF SPEED UP TO 10 km/hr, AND/OR TEMPORARY STOPPING WITH AVERAGE DELAY LESS THAN 5 MINUTES, AND NO LONGER THAN 15 MINUTES.
7. THE POSTED SPEED OF THE ROAD IS USED AS THE DESIGN SPEED FOR THE TRAFFIC CONTROL MEASURES. IF THE ROAD IS NOT POSTED, THE LEGAL SPEED WAS OBTAINED BY THE BC MoTI. THE TABLE BELOW PROVIDES CURRENT AND ANTICIPATED TRAFFIC CONDITIONS DURING THE CONSTRUCTION PERIOD.
8. IN TIMES OF MINIMAL ACTIVITY AT ANY PERMANENT ACCESS, ADVANCE WARNING TRUCK TURNING (W-317) SIGNS AND OTHER SUPPLEMENTAL SIGNS AS REQUIRED BY THE MINISTRY REPRESENTATIVE ARE TO BE ERECTED EITHER SIDE OF THE ACCESS IN ACCORDANCE WITH THE LATEST VERSION OF THE MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE MANUAL OF STANDARD TRAFFIC SIGNS AND PAVEMENT MARKINGS, AND IN COMPLIANCE WITH ACCESS MANAGEMENT PLANS SPECIFIC TO EACH LOCATION, AS ACCEPTED BY THE MINISTRY.
9. IN TIMES OF MINIMAL ACTIVITY AT ANY TEMPORARY ACCESS, ADVANCE CONSTRUCTION TRUCK TURNING (C-172) SIGNS AND OTHER SUPPLEMENTAL SIGNS AS REQUIRED BY THE DESIGNATED DISTRICT OFFICIAL ARE TO BE ERECTED EITHER SIDE OF THE ACCESS IN ACCORDANCE WITH THE LATEST VERSION OF THE MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE MANUAL OF STANDARD TRAFFIC SIGNS AND PAVEMENT MARKINGS, AND IN COMPLIANCE WITH ACCESS MANAGEMENT PLANS SPECIFIC TO EACH LOCATION, AS ACCEPTED BY THE MINISTRY.

LEGEND

	PROPOSED PIPELINE CENTER LINE
	FLEXIBLE DRUM
	TUBULAR MARKER
	CONE
	SIGN
	TRAFFIC CONTROL PERSON
	BARRICADE
	FLASHING ARROW BOARD
	FLASHING ARROW BOARD (FAB IN CAUTION MODE)
DYNAMIC MESSAGING SIGN	DYNAMIC MESSAGING SIGN (DMS)

SITE ID: AP-3-C-35-C			
CATEGORY 3		POSTED SPEED, KM/HR	100
LATEST AADT, VEH/DAY (2017)	3,826	LATEST SADT, VEH/DAY (2017)	3,925
ANTICIPATED AADT, VEH/DAY (2020)	3,965	ANTICIPATED SADT, VEH/DAY (2020)	4,068
AVG. HOURLY DAYTIME VOLUME, VEH/HR	357	AVG. HOURLY NIGHTTIME VOLUME, VEH/HR	198
NOTE: TRAFFIC DATA IS SOURCED FROM UTV 225 AND TMS 23-010NS.			

Stantec

Stantec Consulting Ltd.
500-4730 Kingsway
Burnaby BC V5H 0C6
Tel: (604) 436-3014
www.stantec.com

Consultant

Notes

Revision	By	Appd	YYYY.MM.DD
REV. 0 - ACCESS MANAGEMENT PLAN	GH	AK	2019-11-08
Issued	By	Appd	YYYY.MM.DD
File Name: AP-3-C-35-C	GH	GH	AK	2019-11-08
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

ISSUED FOR PERMIT APPLICATION

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. A. E. KAFAFI # 48363

Ahmed Kafafi
Nov. 8, 2019

Client/Project Logo

TRANS MOUNTAIN

Client/Project

TRANS MOUNTAIN EXPANSION PROJECT

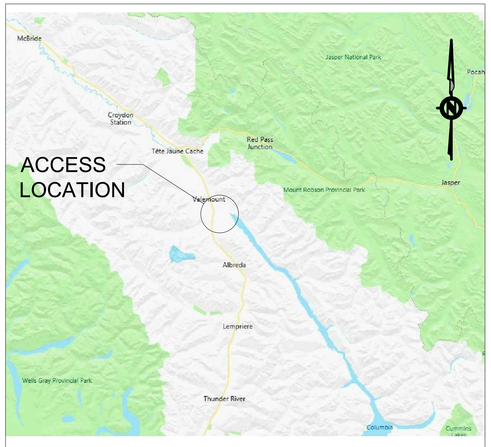
Title

ACCESS MANAGEMENT PLAN

Project No.	Scale
117202583	1:5000

Revision	Sheet	Drawing No.
0	of	AMP_AP-3-C-35-C

ORIGINAL SHEET - ANSI D



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LOCATION MAP

N.T.S.

GENERAL NOTES:

1. PIPELINE AND ACCESS LOCATIONS TO BE CONFIRMED ON SITE BY THE CONTRACTOR. TRAFFIC CONTROL MEASURES SHALL BE LAID OUT FROM THE EDGE OF THE ACCESS.
2. DETAILS FOR DRIVEWAY ACCESS LAYOUT CAN BE FOUND IN DRAWING AR-005: TYPICAL ACCESS ROAD ENTRANCE.
3. ALL SIGNS SHALL MEET BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE (BC MoTI) SPECIFICATIONS FOR STANDARD HIGHWAY SIGN MATERIALS, FABRICATION, SUPPLY, INSTALLATION AND MAINTENANCE. EXISTING SIGNS SHALL BE COVERED WHERE THEY CONTRADICT WITH TEMPORARY SIGNING REQUIREMENTS IN THE TRAFFIC CONTROL MEASURES. CONTRACTOR IS TO NOTIFY THE TRAFFIC ENGINEER IF TRAFFIC CONTROL MEASURES OVERLAP WITH ADJACENT ACCESS MANAGEMENT PLAN.
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LEGEND

	PROPOSED PIPELINE CENTER LINE
	FLEXIBLE DRUM
	TUBULAR MARKER
	CONE
	SIGN
	TRAFFIC CONTROL PERSON
	BARRICADE
	FLASHING ARROW BOARD
	FLASHING ARROW BOARD (FAB IN CAUTION MODE)
DYNAMIC MESSAGING SIGN	DYNAMIC MESSAGING SIGN (DMS)

SITE ID: AP-3-B-84			
CATEGORY 1		POSTED SPEED, KM/HR	60
LATEST AADT, VEH/DAY (2019)	<1000	LATEST SADT, VEH/DAY (2019)	<1000
ANTICIPATED AADT, VEH/DAY (2020)	<1000	ANTICIPATED SADT, VEH/DAY (2020)	<1000
AVG. HOURLY DAYTIME VOLUME, VEH/HR	<100	AVG. HOURLY NIGHTTIME VOLUME, VEH/HR	<50
NOTE: TRAFFIC DATA IS UNAVAILABLE FOR THIS LOCATION. DAILY VOLUMES ARE ASSUMED BASED ON VOLUME ROAD STANDARDS AND LOCAL KNOWLEDGE.			

Stantec

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Consultant

Notes

Revision	By	Appd	YYYY.MM.DD
ACCESS MANAGEMENT PLAN	KS	WB	2020-02-07
Issued	By	Appd	YYYY.MM.DD
File Name: 2019-05445_AP-3-B-84	KS	WB	AK	2020-02-07
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

ISSUED FOR PERMIT APPLICATION

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — W. K. BYCZKOWSKI — # 43728 — Feb 27, 2020

Client/Project Logo

TRANS MOUNTAIN

Client/Project

TRANS MOUNTAIN EXPANSION PROJECT

Title

ACCESS MANAGEMENT PLAN

Project No.	Scale
117202583	1:3000

Revision	Sheet	Drawing No.
0	of	AMP_AP-3-B-84

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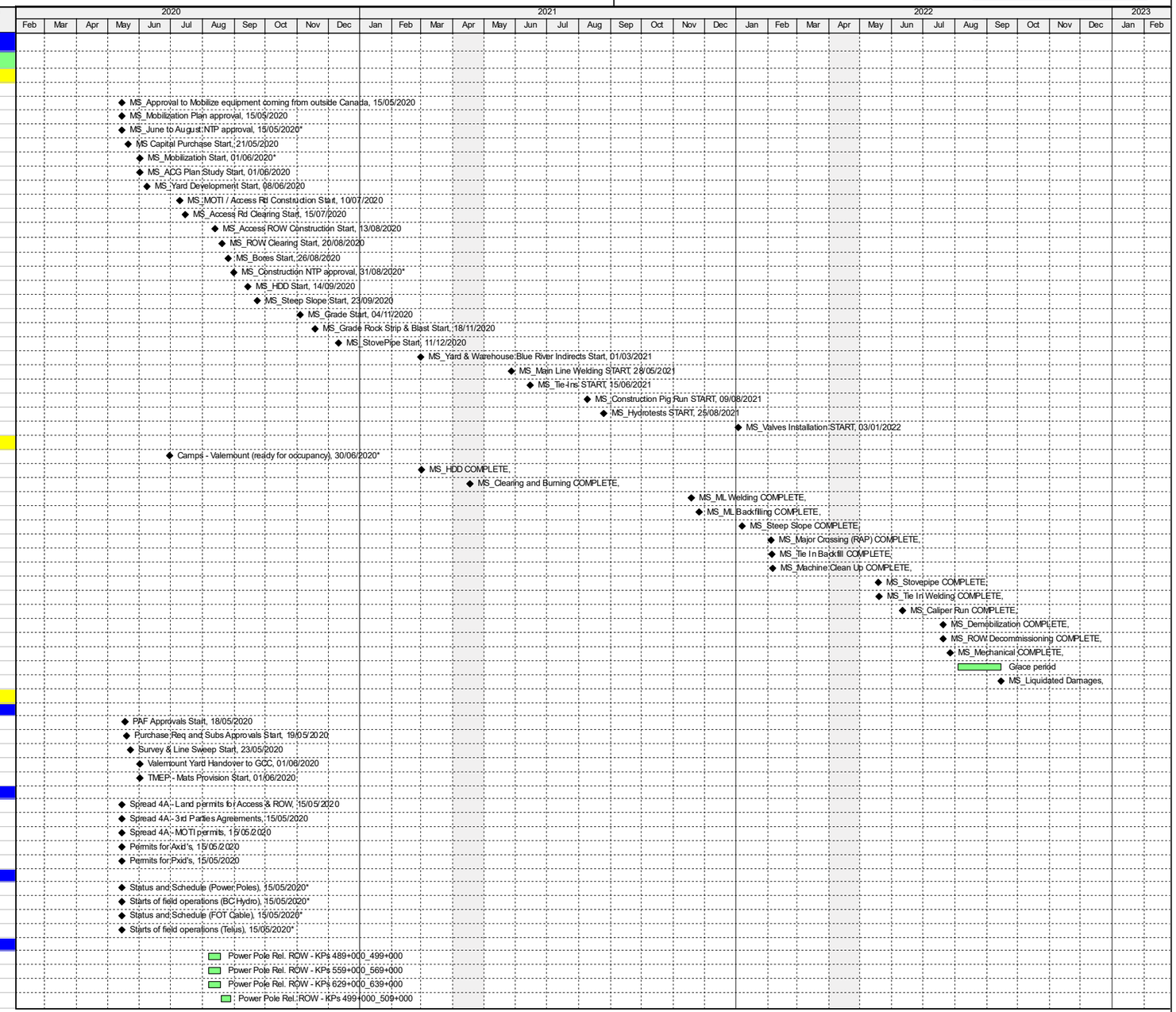
2020.02.07 10:29:35 AM

ORIGINAL SHEET - ANSI D

Appendix H LSLP Construction Schedule

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
TMEP Spread 3/4a (2018/2019)_current		987.00	28/01/2019 A	31/10/2022	
000.Milestones		873.00	01/05/2019	14/09/2022	
Start Milestone		696.00	01/05/2019	03/01/2022	
MILE-START	MS_Preconstruction activities Start	0.00	01/05/2019*		
MILE-S00B30	MS_Approval to Mobilize equipment coming from outside Canada	0.00	15/05/2020		
MILE-S590	MS_Mobilization Plan approval	0.00	15/05/2020		
MILE-S620	MS_June to August NTP approval	0.00	15/05/2020*		
MILE-S560	MS Capital Purchase Start	0.00	21/05/2020		
MILE-S00A	MS_Mobilization Start	0.00	01/06/2020*		I
MILE-S220	MS_ACG Plan Study Start	0.00	01/06/2020		
MILE-S225	MS_Yard Development Start	0.00	08/06/2020		
MILE-S610	MS_MOTI / Access Rd Construction Start	0.00	10/07/2020		
MILE-S600	MS_Access Rd Clearing Start	0.00	15/07/2020		
MILE-S035	MS_Access ROW Construction Start	0.00	13/08/2020		
MILE-S050	MS_ROW Clearing Start	0.00	20/08/2020		
MILE-S085	MS_Bores Start	0.00	26/08/2020		
MILE-S520	MS_Construction NTP approval	0.00	31/08/2020*		
MILE-S120	MS_HDD Start	0.00	14/09/2020		
MILE-S090	MS_Steep Slope Start	0.00	23/09/2020		
MILE-S060	MS_Grade Start	0.00	04/11/2020		
MILE-S070	MS_Grade Rock Strip & Blast Start	0.00	18/11/2020		
MILE-S080	MS_StovePipe Start	0.00	11/12/2020		
MILE-S095	MS_Yard & Warehouse Blue River Indirects Start	0.00	01/03/2021		
MILE-S100	MS_Main Line Welding START	0.00	28/05/2021		
MILE-S110	MS_Tie-Ins START	0.00	15/06/2021		
MILE-S130	MS_Construction Pig Run START	0.00	09/08/2021		
MILE-S140	MS_Hydrotests START	0.00	25/08/2021		
MILE-S150	MS_Valves Installation START	0.00	03/01/2022		
Completion Milestone		554.00	30/06/2020	14/09/2022	
MILE-C000	Camps - Valemount (ready for occupancy)	0.00	30/06/2020*		
MILE-F060	MS_HDD COMPLETE	0.00		01/03/2021	
MILE-F010	MS_Clearing and Burning COMPLETE	0.00		17/04/2021	
MILE-F030	MS_ML Welding COMPLETE	0.00		18/11/2021	
MILE-F040	MS_ML Backfilling COMPLETE	0.00		25/11/2021	
MILE-F070	MS_Steep Slope COMPLETE	0.00		06/01/2022	
MILE-F080	MS_Major Crossing (RAP) COMPLETE	0.00		03/02/2022	
MILE-F095	MS_Tie In Backfill COMPLETE	0.00		04/02/2022	
MILE-F100	MS_Machine Clean Up COMPLETE	0.00		05/02/2022	
MILE-F050	MS_Stovepipe COMPLETE	0.00		18/05/2022	
MILE-F090	MS_Tie In Welding COMPLETE	0.00		19/05/2022	
MILE-F110	MS_Caliper Run COMPLETE	0.00		11/06/2022	
MILE-F020	MS_Demobilization COMPLETE	0.00		20/07/2022	
MILE-F130	MS_ROW Decommissioning COMPLETE	0.00		20/07/2022	
MILE-F120	MS_Mechanical COMPLETE	0.00		27/07/2022	
MILE-F150	Grace period	30.00	04/08/2022	14/09/2022	
MILE-F160	MS_Liquidated Damages	0.00		14/09/2022	
TMEP REQUIREMENTS/PERMITS		141.83	24/03/2020	23/10/2020	
Requirements		9.00	18/05/2020	01/06/2020	
TMEP-A1020	PAF Approvals Start	0.00	18/05/2020		
TMEP-A1030	Purchase Req and Subs Approvals Start	0.00	19/05/2020		
TMEP-A1010	Survey & Line Sweep Start	0.00	23/05/2020		
TMEP-A0090	Valemount Yard Handover to GCC	0.00	01/06/2020		
TMEP-A1000	TMEP - Mats Provision Start	0.00	01/06/2020		
Permits		0.00	15/05/2020	15/05/2020	
TMEP-061	Spread 4A - Land permits for Access & ROW	0.00	15/05/2020		
TMEP-070	Spread 4A - 3rd Parties Agreements	0.00	15/05/2020		
TMEP-080	Spread 4A - MOTI permits	0.00	15/05/2020		
TMEP-A0100	Permits for Axid's	0.00	15/05/2020		
TMEP-A0110	Permits for Pxid's	0.00	15/05/2020		
Power Poles (rise/move)		0.00	15/05/2020	15/05/2020	
TMEP-1130	Status and Schedule (Power Poles)	0.00	15/05/2020*		
TMEP-1140	Starts of field operations (BC Hydro)	0.00	15/05/2020*		
TMEP-1150	Status and Schedule (FOT Cable)	0.00	15/05/2020*		
TMEP-1160	Starts of field operations (Telus)	0.00	15/05/2020*		
Power Poles ROW		56.00	07/08/2020	23/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 489+000_499+000	8.00	07/08/2020*	18/08/2020	I
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 559+000_569+000	8.00	07/08/2020	18/08/2020	I
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 629+000_639+000	8.00	07/08/2020	18/08/2020	I
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 499+000_509+000	8.00	19/08/2020	28/08/2020	I

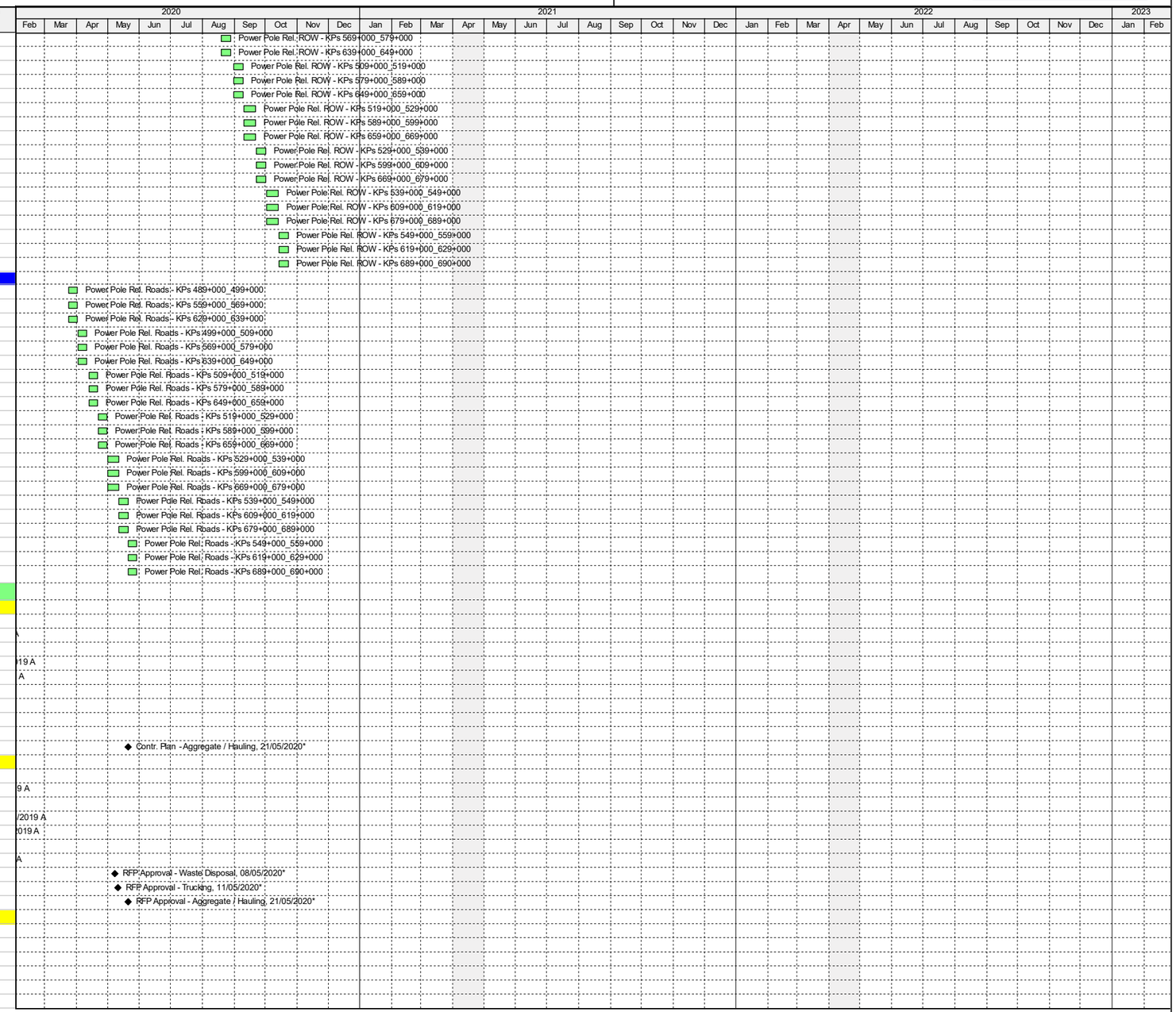


Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 569+000_579+000	8.00	19/08/2020	28/08/2020	I
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 639+000_649+000	8.00	19/08/2020	28/08/2020	I
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 509+000_519+000	8.00	31/08/2020	09/09/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 579+000_589+000	8.00	31/08/2020	09/09/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 649+000_659+000	8.00	31/08/2020	09/09/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 519+000_529+000	8.00	10/09/2020	21/09/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 589+000_599+000	8.00	10/09/2020	21/09/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 659+000_669+000	8.00	10/09/2020	21/09/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 529+000_539+000	8.00	22/09/2020	01/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 599+000_609+000	8.00	22/09/2020	01/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 669+000_679+000	8.00	22/09/2020	01/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 539+000_549+000	8.00	02/10/2020	13/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 609+000_619+000	8.00	02/10/2020	13/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 679+000_689+000	8.00	02/10/2020	13/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 549+000_559+000	8.00	14/10/2020	23/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 619+000_629+000	8.00	14/10/2020	23/10/2020	
TMEP-PP-RO'	Power Pole Rel. ROW - KPs 689+000_690+000	8.00	14/10/2020	23/10/2020	
Power Poles Roads		49.00	24/03/2020	29/05/2020	
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 489+000_499+000	7.00	24/03/2020*	01/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 559+000_569+000	7.00	24/03/2020	01/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 629+000_639+000	7.00	24/03/2020	01/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 499+000_509+000	7.00	02/04/2020	10/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 569+000_579+000	7.00	02/04/2020	10/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 639+000_649+000	7.00	02/04/2020	10/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 509+000_519+000	7.00	13/04/2020	21/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 579+000_589+000	7.00	13/04/2020	21/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 649+000_659+000	7.00	13/04/2020	21/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 519+000_529+000	7.00	22/04/2020	30/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 589+000_599+000	7.00	22/04/2020	30/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 659+000_669+000	7.00	22/04/2020	30/04/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 529+000_539+000	7.00	01/05/2020	11/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 599+000_609+000	7.00	01/05/2020	11/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 669+000_679+000	7.00	01/05/2020	11/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 539+000_549+000	7.00	12/05/2020	20/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 609+000_619+000	7.00	12/05/2020	20/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 679+000_689+000	7.00	12/05/2020	20/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 549+000_559+000	7.00	21/05/2020	29/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 619+000_629+000	7.00	21/05/2020	29/05/2020	I
TMEP-PP-RDS	Power Pole Rel. Roads - KPs 689+000_690+000	7.00	21/05/2020	29/05/2020	I
Contracts		378.00	28/01/2019 A	04/06/2020	
Contracting Plan		0.00	12/06/2019 A	21/05/2020	
CPLN-S460	Contr. Plan - 2 Way Radio	0.00	12/06/2019 A		
CPLN-S500	Contr. Plan - Clearing & Log Hauling	0.00	01/08/2019 A		
CPLN-S510	Contr. Plan - Medical Service	0.00	01/08/2019 A		
CPLN-S470	Contr. Plan - Bridge Supply & Installation	0.00	01/08/2019 A		
CPLN-S450	Contr. Plan - Hydrovac / Water Trucks	0.00	03/08/2019 A		
CPLN-S480	Contr. Plan - Fuel	0.00	13/08/2019 A		
CPLN-S530	Contr. Plan - Waste Disposal	0.00	20/08/2019 A		
CPLN-S440	Contr. Plan - Line Locating	0.00	22/08/2019 A		
CPLN-S520	Contr. Plan - Trucking	0.00	27/08/2019 A		
CPLN-S490	Contr. Plan - Aggregate / Hauling	0.00	21/05/2020*		
Approval RFP		5.00	12/06/2019 A	21/05/2020	
RFPA-S350	RFP Approval - 2 Way Radio	0.00	12/06/2019 A		
RFPA-S390	RFP Approval - Clearing & Log Hauling	0.00	03/08/2019 A		
RFPA-S400	RFP Approval - Medical Service	0.00	03/08/2019 A		
RFPA-S360	RFP Approval - Bridge Supply & Installation	0.00	03/08/2019 A		
RFPA-S340	RFP Approval - Hydrovac / Water Trucks	0.00	09/08/2019 A		
RFPA-S370	RFP Approval - Fuel	0.00	14/08/2019 A		
RFPA-S330	RFP Approval - Line Locating	0.00	29/08/2019 A		
RFPA-S420	RFP Approval - Waste Disposal	0.00	08/05/2020*		
RFPA-S410	RFP Approval - Trucking	0.00	11/05/2020*		
RFPA-S380	RFP Approval - Aggregate / Hauling	0.00	21/05/2020*		
Issue RFA		370.00	28/01/2019 A	26/05/2020	
RFAI-S010	RFA Issue - Blasting	0.00	28/01/2019		
RFAI-S180	RFA Issue - Track Bores	0.00	28/01/2019		
RFAI-S190	RFA Issue - Foreign Equipment Mobilization	0.00	28/01/2019		
RFAI-S220	RFA Issue - Concrete Coating	0.00	28/01/2019		
RFAI-S230	RFA Issue - Pipe Haul & String	0.00	28/01/2019		
RFAI-S250	RFA Issue - Mechanized Coating	0.00	28/01/2019		



Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

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TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
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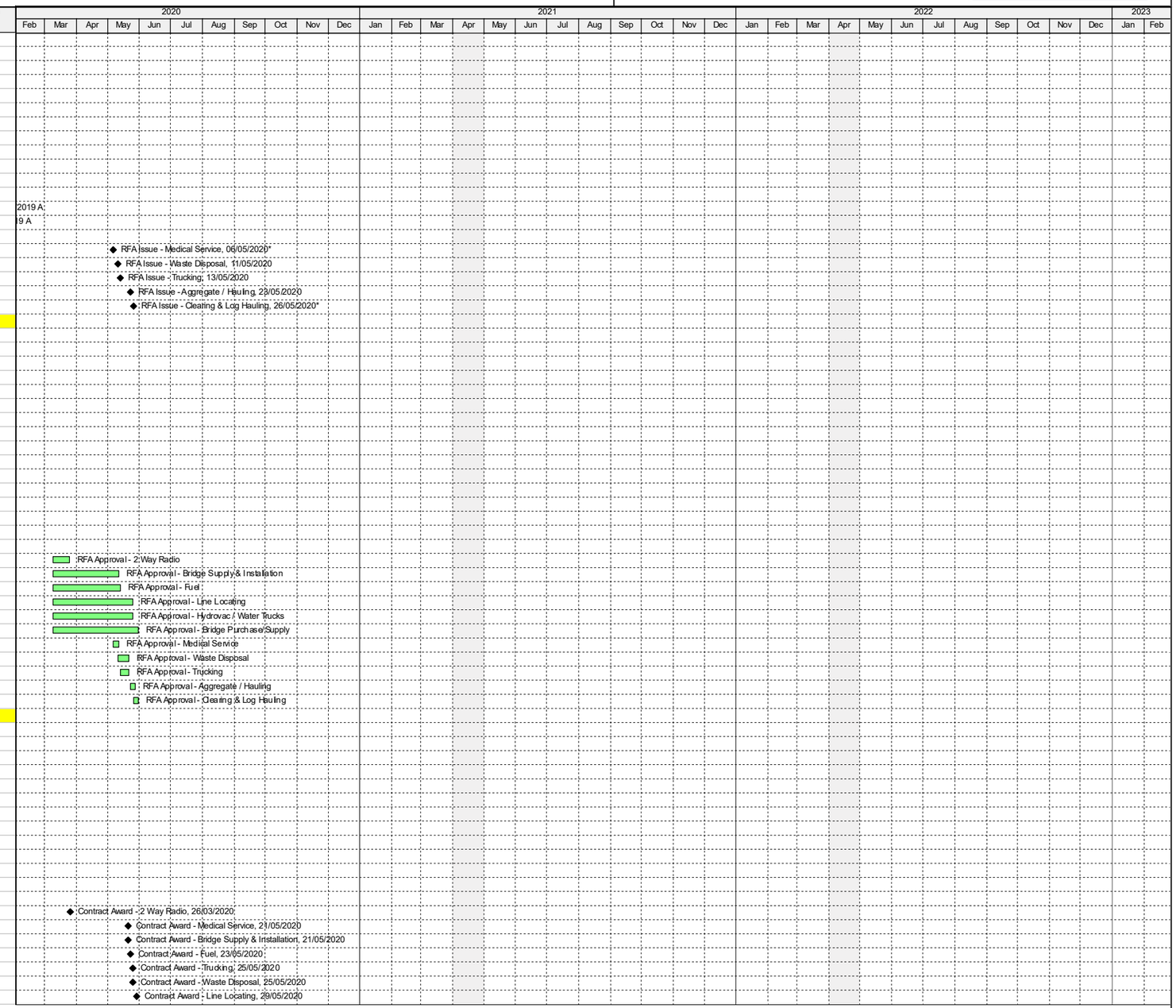
Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
RFAI-S260	RFA Issue - Cranes	0.00	28/01/2019		
RFAI-S270	RFA Issue - Caliper Pigging	0.00	28/01/2019		
RFAI-S280	RFA Issue - Piling	0.00	28/01/2019		
RFAI-S290	RFA Issue - Seeding	0.00	28/01/2019		
RFAI-S300	RFA Issue - Engineering Const. SupportSteep Slope	0.00	28/01/2019		
RFAI-S310	RFA Issue - Cathodic Protection	0.00	28/01/2019		
RFAI-S320	RFA Issue - Bag weights	0.00	28/01/2019		
RFAI-S330	RFA Issue - Mechanized Welding	0.00	28/01/2019		
RFAI-S340	RFA Issue - Office Complex	0.00	28/01/2019		
RFAI-S090	RFA Issue - Line Locating	0.00	08/05/2019 A		
RFAI-S100	RFA Issue - Hydrovac / Water Trucks	0.00	08/05/2019 A		
RFAI-S020	RFA Issue - 2 Way Radio	0.00	12/06/2019 A		
RFAI-S050	RFA Issue - Bridge Supply & Installation	0.00	13/08/2019 A		
RFAI-S060	RFA Issue - Bridge Purchase/Supply	0.00	13/08/2019 A		
RFAI-S080	RFA Issue - Fuel	0.00	15/08/2019 A		
RFAI-S040	RFA Issue - Medical Service	0.00	06/05/2020*		
RFAI-S170	RFA Issue - Waste Disposal	0.00	11/05/2020		
RFAI-S160	RFA Issue - Trucking	0.00	13/05/2020		
RFAI-S070	RFA Issue - Aggregate / Hauling	0.00	23/05/2020		
RFAI-S000	RFA Issue - Clearing & Log Hauling	0.00	26/05/2020*		
Approval RFA		375.00	28/01/2019	30/05/2020	
RFAA-S010	RFA Approval - Blasting	10.00	28/01/2019	07/02/2019	
RFAA-S180	RFA Approval - Track Bores	10.00	28/01/2019	07/02/2019	
RFAA-S190	RFA Approval - Foreign Equipment Mobilization	10.00	28/01/2019	07/02/2019	
RFAA-S210	RFA Approval - Blasting	10.00	28/01/2019	07/02/2019	
RFAA-S220	RFA Approval - Concrete Coating	10.00	28/01/2019	07/02/2019	
RFAA-S230	RFA Approval - Pipe Haul & String	10.00	28/01/2019	07/02/2019	
RFAA-S250	RFA Approval - Mechanized Coating	10.00	28/01/2019	07/02/2019	
RFAA-S260	RFA Approval - Cranes	10.00	28/01/2019	07/02/2019	
RFAA-S270	RFA Approval - Caliper Pigging	10.00	28/01/2019	07/02/2019	
RFAA-S280	RFA Approval - Piling	10.00	28/01/2019	07/02/2019	
RFAA-S290	RFA Approval - Seeding	10.00	28/01/2019	07/02/2019	
RFAA-S300	RFA Approval - Engineering Const. SupportSteep Slope	10.00	28/01/2019	07/02/2019	
RFAA-S310	RFA Approval - Cathodic Protection	10.00	28/01/2019	07/02/2019	
RFAA-S320	RFA Approval - Bag weights	10.00	28/01/2019	07/02/2019	
RFAA-S330	RFA Approval - Mechanized Welding	10.00	28/01/2019	07/02/2019	
RFAA-S340	RFA Approval - Office Complex	10.00	28/01/2019	07/02/2019	
RFAA-S020	RFA Approval - 2 Way Radio	14.00	09/03/2020	24/03/2020	
RFAA-S050	RFA Approval - Bridge Supply & Installation	45.00	09/03/2020	11/05/2020	
RFAA-S080	RFA Approval - Fuel	47.00	09/03/2020	13/05/2020	
RFAA-S090	RFA Approval - Line Locating	51.00	09/03/2020	25/05/2020	
RFAA-S100	RFA Approval - Hydrovac / Water Trucks	51.00	09/03/2020	25/05/2020	
RFAA-S060	RFA Approval - Bridge Purchase/Supply	53.92	09/03/2020	30/05/2020	
RFAA-S040	RFA Approval - Medical Service	5.00	06/05/2020	11/05/2020	
RFAA-S170	RFA Approval - Waste Disposal	4.00	11/05/2020	21/05/2020	
RFAA-S160	RFA Approval - Trucking	2.00	13/05/2020	21/05/2020	
RFAA-S070	RFA Approval - Aggregate / Hauling	4.00	23/05/2020	27/05/2020	
RFAA-S000	RFA Approval - Clearing & Log Hauling	5.00	26/05/2020	30/05/2020	
Contract Awards		298.00	01/05/2019	04/06/2020	
AWRD-S010	Contract Award - Blasting	0.00	01/05/2019		
AWRD-S220	Contract Award - Concrete Coating	0.00	01/05/2019		
AWRD-S230	Contract Award - Pipe Haul & String	0.00	01/05/2019		
AWRD-S250	Contract Award - Mechanized Coating	0.00	01/05/2019		
AWRD-S260	Contract Award - Cranes	0.00	01/05/2019		
AWRD-S270	Contract Award - Caliper Pigging	0.00	01/05/2019		
AWRD-S280	Contract Award - Piling	0.00	01/05/2019		
AWRD-S290	Contract Award - Seeding	0.00	01/05/2019		
AWRD-S300	Contract Award - Engineering Const. SupportSteep Slope	0.00	01/05/2019		
AWRD-S310	Contract Award - Cathodic Protection	0.00	01/05/2019		
AWRD-S320	Contract Award - Bag weights	0.00	01/05/2019		
AWRD-S330	Contract Award - Mechanized Welding	0.00	01/05/2019		
AWRD-S340	Contract Award - Office Complex	0.00	01/05/2019		
AWRD-S020	Contract Award - 2 Way Radio	0.00	26/03/2020		
AWRD-S040	Contract Award - Medical Service	0.00	21/05/2020		
AWRD-S050	Contract Award - Bridge Supply & Installation	0.00	21/05/2020		
AWRD-S080	Contract Award - Fuel	0.00	23/05/2020		
AWRD-S160	Contract Award - Trucking	0.00	25/05/2020		
AWRD-S170	Contract Award - Waste Disposal	0.00	25/05/2020		
AWRD-S090	Contract Award - Line Locating	0.00	29/05/2020		



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TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
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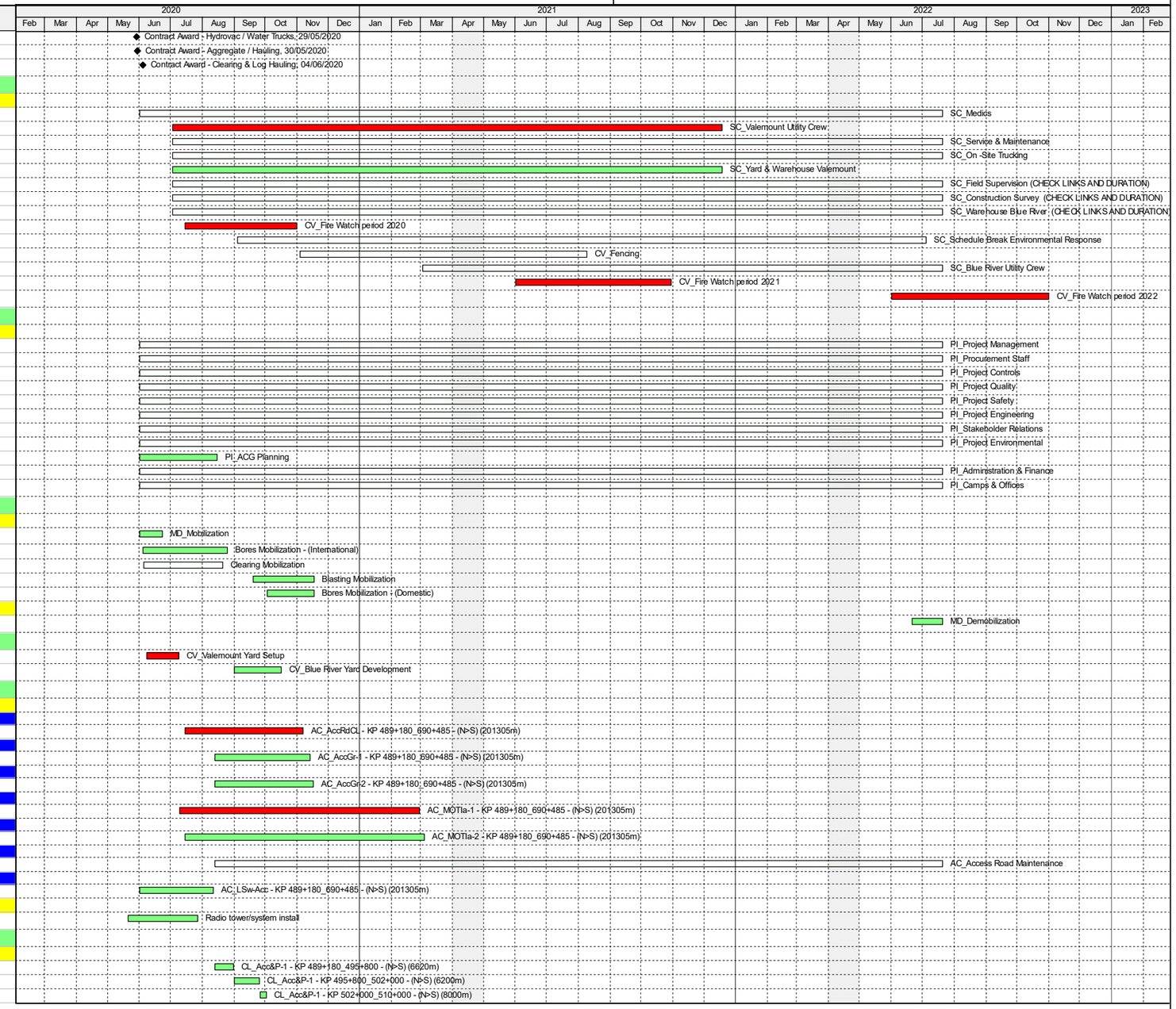
Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
AWRD-S100	Contract Award - Hydrovac / Water Trucks	0.00	29/05/2020		
AWRD-S070	Contract Award - Aggregate / Hauling	0.00	30/05/2020		
AWRD-S000	Contract Award - Clearing & Log Hauling	0.00	04/06/2020		
30.Project Field Support		**612.00**	**01/06/2020**	**31/10/2022**	
Field Support Crews		**612.00**	**01/06/2020**	**31/10/2022**	
3020A	SC_Medics	521.00	01/06/2020	20/07/2022	
3000A	SC_Valemount Utility Crew	366.00	03/07/2020	18/12/2021	
3050A	SC_Service & Maintenance	493.00	03/07/2020	20/07/2022	
3040A	SC_On -Site Trucking	493.00	03/07/2020	20/07/2022	
3060A	SC_Yard & Warehouse Valemount	366.00	03/07/2020	18/12/2021	
3090A	SC_Field Supervision (CHECK LINKS AND DURATION)	493.00	03/07/2020	20/07/2022	
3100A	SC_Construction Survey (CHECK LINKS AND DURATION)	493.00	03/07/2020	20/07/2022	
3110A	SC_Warehouse Blue River (CHECK LINKS AND DURATION)	493.00	03/07/2020	20/07/2022	
1242	CV_Fire Watch period 2020	76.00	15/07/2020	31/10/2020	
3010A	SC_Schedule Break Environmental Response	128.00	04/09/2020	04/07/2022	
1245	CV_Fencing	177.00	04/11/2020	09/08/2021	
3070A	SC_Blue River Utility Crew	321.00	03/03/2021	20/07/2022	
1243	CV_Fire Watch period 2021	106.00	01/06/2021	30/10/2021	
1244	CV_Fire Watch period 2022	110.00	01/06/2022	31/10/2022	
40.Project Indirects		**521.00**	**01/06/2020**	**20/07/2022**	
Indirect Personnel		**521.00**	**01/06/2020**	**20/07/2022**	
4000A	PI_Project Management	521.00	01/06/2020	20/07/2022	
4040A	PI_Procurement Staff	521.00	01/06/2020	20/07/2022	
4020A	PI_Project Controls	521.00	01/06/2020	20/07/2022	
4060A	PI_Project Quality	521.00	01/06/2020	20/07/2022	
4070A	PI_Project Safety	521.00	01/06/2020	20/07/2022	
4010A	PI_Project Engineering	521.00	01/06/2020	20/07/2022	
4080A	PI_Stakeholder Relations	521.00	01/06/2020	20/07/2022	
4050A	PI_Project Environmental	521.00	01/06/2020	20/07/2022	
4012A	PI_ACG Planning	60.00	01/06/2020	15/08/2020	
4030A	PI_Administration & Finance	521.00	01/06/2020	20/07/2022	
4090A	PI_Camps & Offices	521.00	01/06/2020	20/07/2022	
10.Mob / Demob		**521.00**	**01/06/2020**	**20/07/2022**	
Mobilization		**128.00**	**01/06/2020**	**17/11/2020**	
1000A	MD_Mobilization	20.00	01/06/2020	23/06/2020	
1000A-IB	Bores Mobilization - (International)	65.00	04/06/2020	25/08/2020	
1000A-CL	Clearing Mobilization	60.00	05/06/2020	20/08/2020	
1000A-BL	Blasting Mobilization	45.00	19/09/2020	17/11/2020	
1000A-DB	Bores Mobilization - (Domestic)	33.00	03/10/2020	17/11/2020	
Demobilization		**20.00**	**21/06/2022**	**20/07/2022**	
1010	MD_Demobilization	20.00	21/06/2022	20/07/2022	
11.Yard Development		**95.00**	**08/06/2020**	**16/10/2020**	
1100A	CV_Valemount Yard Setup	28.00	08/06/2020	09/07/2020	I
1110A	CV_Blue River Yard Development	28.00	01/09/2020*	16/10/2020	
12.Access		**530.00**	**21/05/2020**	**20/07/2022**	
Access		**521.00**	**01/06/2020**	**20/07/2022**	
Access Road Clearing		**81.00**	**15/07/2020**	**06/11/2020**	
1200A	AC_AccRdCL - KP 489+180_690+485 - (N>S) (201305m)	81.00	15/07/2020	06/11/2020	
Access Road Grade Crew #1 Moderate		**68.00**	**13/08/2020**	**13/11/2020**	
1210A	AC_AccGr-1 - KP 489+180_690+485 - (N>S) (201305m)	68.00	13/08/2020	13/11/2020	
Access Road Grade Crew #2 Heavy		**70.00**	**13/08/2020**	**16/11/2020**	
1212A	AC_AccGr-2 - KP 489+180_690+485 - (N>S) (201305m)	70.00	13/08/2020	16/11/2020	
MOTI Approaches Crew #1		**164.00**	**10/07/2020**	**27/02/2021**	
1220A	AC_MOTIa-1 - KP 489+180_690+485 - (N>S) (201305m)	164.00	10/07/2020	27/02/2021	
MOTI Approaches Crew #2		**164.00**	**15/07/2020**	**04/03/2021**	
1222A	AC_MOTIa-2 - KP 489+180_690+485 - (N>S) (201305m)	164.00	15/07/2020	04/03/2021	
Access Road Maintenance		**464.00**	**13/08/2020**	**20/07/2022**	
1230A	AC_Access Road Maintenance	464.00	13/08/2020	20/07/2022	
Line Sweep Access		**56.00**	**01/06/2020**	**11/08/2020**	
1240A	AC_LSw-Acc - KP 489+180_690+485 - (N>S) (201305m)	56.00	01/06/2020	11/08/2020	
Radio		**58.00**	**21/05/2020**	**27/07/2020**	
1299A	Radio tower/system install	58.00	21/05/2020	27/07/2020	
13.Clearing		**428.00**	**01/06/2020**	**02/02/2022**	
Access & Pioneer #1		**168.00**	**13/08/2020**	**31/03/2021**	
1300A-011	CL_Acc&P-1 - KP 489+180_495+800 - (N>S) (6620m)	16.00	13/08/2020*	31/08/2020	I
1300A-0111	CL_Acc&P-1 - KP 495+800_502+000 - (N>S) (6200m)	16.00	01/09/2020	25/09/2020	
1300A-012	CL_Acc&P-1 - KP 502+000_510+000 - (N>S) (8000m)	6.00	26/09/2020	02/10/2020	



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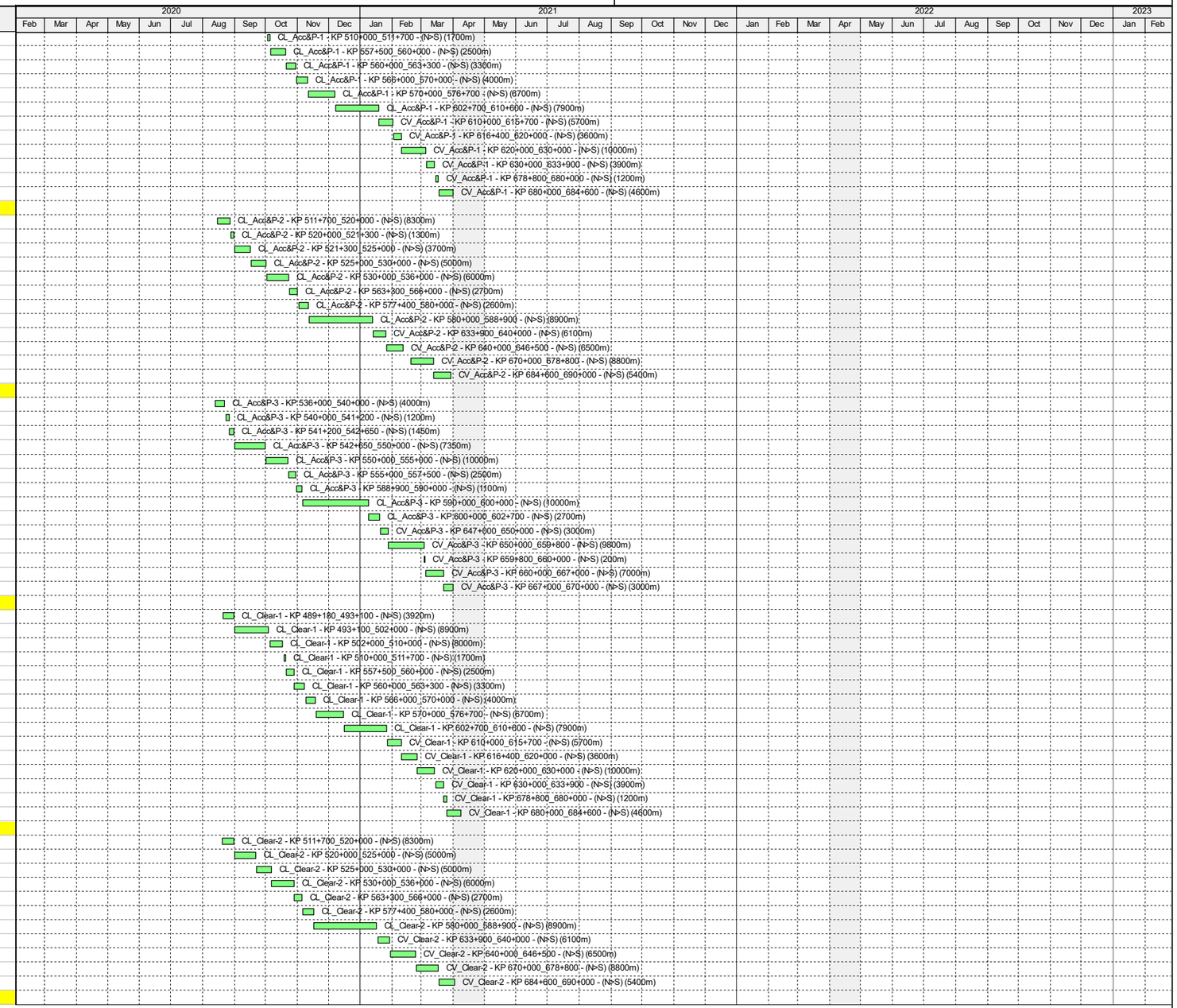
Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1300A-013	CL_Acc&P-1 - KP 510+000_511+700 - (N>S) (1700m)	2.00	03/10/2020	05/10/2020	
1300A-014	CL_Acc&P-1 - KP 557+500_560+000 - (N>S) (2500m)	7.00	06/10/2020	20/10/2020	
1300A-015	CL_Acc&P-1 - KP 560+000_563+300 - (N>S) (3300m)	9.00	21/10/2020	30/10/2020	
1300A-032	CL_Acc&P-1 - KP 566+000_570+000 - (N>S) (4000m)	9.00	31/10/2020	10/11/2020	
1300A-042	CL_Acc&P-1 - KP 570+000_576+700 - (N>S) (6700m)	23.00	11/11/2020	07/12/2020	
1300A-079	CL_Acc&P-1 - KP 602+700_610+600 - (N>S) (7900m)	24.00	08/12/2020	18/01/2021	
1300-89	CV_Acc&P-1 - KP 610+000_615+700 - (N>S) (5700m)	12.00	19/01/2021	01/02/2021	
1300-52	CV_Acc&P-1 - KP 616+400_620+000 - (N>S) (3600m)	7.00	02/02/2021	09/02/2021	
1300-62	CV_Acc&P-1 - KP 620+000_630+000 - (N>S) (10000m)	15.00	10/02/2021	05/03/2021	
1300-72	CV_Acc&P-1 - KP 630+000_633+900 - (N>S) (3900m)	7.00	06/03/2021	13/03/2021	
1300-82	CV_Acc&P-1 - KP 678+800_680+000 - (N>S) (1200m)	3.00	15/03/2021	17/03/2021	
1300-92	CV_Acc&P-1 - KP 680+000_684+600 - (N>S) (4600m)	12.00	18/03/2021	31/03/2021	
Access & Pioneer #2		164.00	15/08/2020	29/03/2021	
1302A-021	CL_Acc&P-2 - KP 511+700_520+000 - (N>S) (8300m)	11.00	15/08/2020	27/08/2020	I
1302A-022	CL_Acc&P-2 - KP 520+000_521+300 - (N>S) (1300m)	3.00	28/08/2020	31/08/2020	I
1302A-0221	CL_Acc&P-2 - KP 521+300_525+000 - (N>S) (3700m)	8.00	01/09/2020	16/09/2020	
1302A-023	CL_Acc&P-2 - KP 525+000_530+000 - (N>S) (5000m)	13.00	17/09/2020	01/10/2020	
1302A-024	CL_Acc&P-2 - KP 530+000_536+000 - (N>S) (6000m)	13.00	02/10/2020	23/10/2020	
1302A-025	CL_Acc&P-2 - KP 563+300_566+000 - (N>S) (2700m)	7.00	24/10/2020	31/10/2020	
1302A-030	CL_Acc&P-2 - KP 577+400_580+000 - (N>S) (2600m)	9.00	02/11/2020	11/11/2020	
1302A-040	CL_Acc&P-2 - KP 580+000_588+900 - (N>S) (8900m)	41.00	12/11/2020	12/01/2021	
1302-50	CV_Acc&P-2 - KP 633+900_640+000 - (N>S) (6100m)	11.00	13/01/2021	25/01/2021	
1302-60	CV_Acc&P-2 - KP 640+000_646+500 - (N>S) (6500m)	15.00	26/01/2021	11/02/2021	
1302-129	CV_Acc&P-2 - KP 670+000_678+800 - (N>S) (8800m)	19.00	19/02/2021	12/03/2021	
1302-70	CV_Acc&P-2 - KP 684+600_690+000 - (N>S) (5400m)	14.00	13/03/2021	29/03/2021	
Access & Pioneer #3		168.00	13/08/2020	31/03/2021	
1304A-031	CL_Acc&P-3 - KP 536+000_540+000 - (N>S) (4000m)	9.00	13/08/2020	22/08/2020	I
1304A-032	CL_Acc&P-3 - KP 540+000_541+200 - (N>S) (1200m)	3.00	24/08/2020	26/08/2020	I
1304A-033	CL_Acc&P-3 - KP 541+200_542+650 - (N>S) (1450m)	4.00	27/08/2020	31/08/2020	I
1304A-0331	CL_Acc&P-3 - KP 542+650_550+000 - (N>S) (7350m)	20.00	01/09/2020	30/09/2020	
1304A-034	CL_Acc&P-3 - KP 550+000_555+000 - (N>S) (10000m)	13.00	01/10/2020	22/10/2020	
1304A-035	CL_Acc&P-3 - KP 555+000_557+500 - (N>S) (2500m)	7.00	23/10/2020	30/10/2020	
1304A-055	CL_Acc&P-3 - KP 588+900_590+000 - (N>S) (1100m)	5.00	31/10/2020	05/11/2020	
1304A-065	CL_Acc&P-3 - KP 590+000_600+000 - (N>S) (10000m)	43.00	06/11/2020	08/01/2021	
1304A-075	CL_Acc&P-3 - KP 600+000_602+700 - (N>S) (2700m)	9.00	09/01/2021	19/01/2021	
1304-85	CV_Acc&P-3 - KP 647+000_650+000 - (N>S) (3000m)	7.00	20/01/2021	27/01/2021	
1304-95	CV_Acc&P-3 - KP 650+000_659+800 - (N>S) (9800m)	24.00	28/01/2021	03/03/2021	
1304-99	CV_Acc&P-3 - KP 659+800_660+000 - (N>S) (200m)	1.00	04/03/2021	04/03/2021	
1304-109	CV_Acc&P-3 - KP 660+000_667+000 - (N>S) (7000m)	15.00	05/03/2021	22/03/2021	
1304-119	CV_Acc&P-3 - KP 667+000_670+000 - (N>S) (3000m)	8.00	23/03/2021	31/03/2021	
Clearing #1		168.00	21/08/2020	08/04/2021	
1310A-011	CL_Clear-1 - KP 489+180_493+100 - (N>S) (3920m)	9.00	21/08/2020	31/08/2020	I
1310A-0111	CL_Clear-1 - KP 493+100_502+000 - (N>S) (8900m)	23.00	01/09/2020	03/10/2020	
1310A-012	CL_Clear-1 - KP 502+000_510+000 - (N>S) (8000m)	6.00	05/10/2020	17/10/2020	
1310A-013	CL_Clear-1 - KP 510+000_511+700 - (N>S) (1700m)	2.00	19/10/2020	20/10/2020	
1310A-014	CL_Clear-1 - KP 557+500_560+000 - (N>S) (2500m)	7.00	21/10/2020	28/10/2020	
1310A-015	CL_Clear-1 - KP 560+000_563+300 - (N>S) (3300m)	9.00	29/10/2020	07/11/2020	
1310A-016	CL_Clear-1 - KP 566+000_570+000 - (N>S) (4000m)	9.00	09/11/2020	18/11/2020	
1310A-017	CL_Clear-1 - KP 570+000_576+700 - (N>S) (6700m)	23.00	19/11/2020	15/12/2020	
1310A-059	CL_Clear-1 - KP 602+700_610+600 - (N>S) (7900m)	24.00	16/12/2020	26/01/2021	
1310-063	CV_Clear-1 - KP 610+000_615+700 - (N>S) (5700m)	12.00	27/01/2021	09/02/2021	
1310-018	CV_Clear-1 - KP 616+400_620+000 - (N>S) (3600m)	7.00	10/02/2021	24/02/2021	
1310-019	CV_Clear-1 - KP 620+000_630+000 - (N>S) (10000m)	15.00	25/02/2021	13/03/2021	
1310-020	CV_Clear-1 - KP 630+000_633+900 - (N>S) (3900m)	7.00	15/03/2021	22/03/2021	
1310-021	CV_Clear-1 - KP 678+800_680+000 - (N>S) (1200m)	3.00	23/03/2021	25/03/2021	
1310-022	CV_Clear-1 - KP 680+000_684+600 - (N>S) (4600m)	12.00	26/03/2021	08/04/2021	
Clearing #2		164.00	20/08/2020	02/04/2021	
1312A-021	CL_Clear-2 - KP 511+700_520+000 - (N>S) (8300m)	10.00	20/08/2020	31/08/2020	I
1312A-022	CL_Clear-2 - KP 520+000_525+000 - (N>S) (5000m)	12.00	01/09/2020	21/09/2020	
1312A-023	CL_Clear-2 - KP 525+000_530+000 - (N>S) (5000m)	13.00	22/09/2020	06/10/2020	
1312A-024	CL_Clear-2 - KP 530+000_536+000 - (N>S) (6000m)	13.00	07/10/2020	28/10/2020	
1312A-025	CL_Clear-2 - KP 563+300_566+000 - (N>S) (2700m)	7.00	29/10/2020	05/11/2020	
1312A-026	CL_Clear-2 - KP 577+400_580+000 - (N>S) (2600m)	9.00	06/11/2020	16/11/2020	
1312A-027	CL_Clear-2 - KP 580+000_588+900 - (N>S) (8900m)	41.00	17/11/2020	16/01/2021	
1312-028	CV_Clear-2 - KP 633+900_640+000 - (N>S) (6100m)	11.00	18/01/2021	29/01/2021	
1312-029	CV_Clear-2 - KP 640+000_646+500 - (N>S) (6500m)	15.00	30/01/2021	23/02/2021	
1312-079	CV_Clear-2 - KP 670+000_678+800 - (N>S) (8800m)	19.00	24/02/2021	17/03/2021	
1312-030	CV_Clear-2 - KP 684+600_690+000 - (N>S) (5400m)	14.00	18/03/2021	02/04/2021	
Clearing #3		168.00	21/08/2020	08/04/2021	

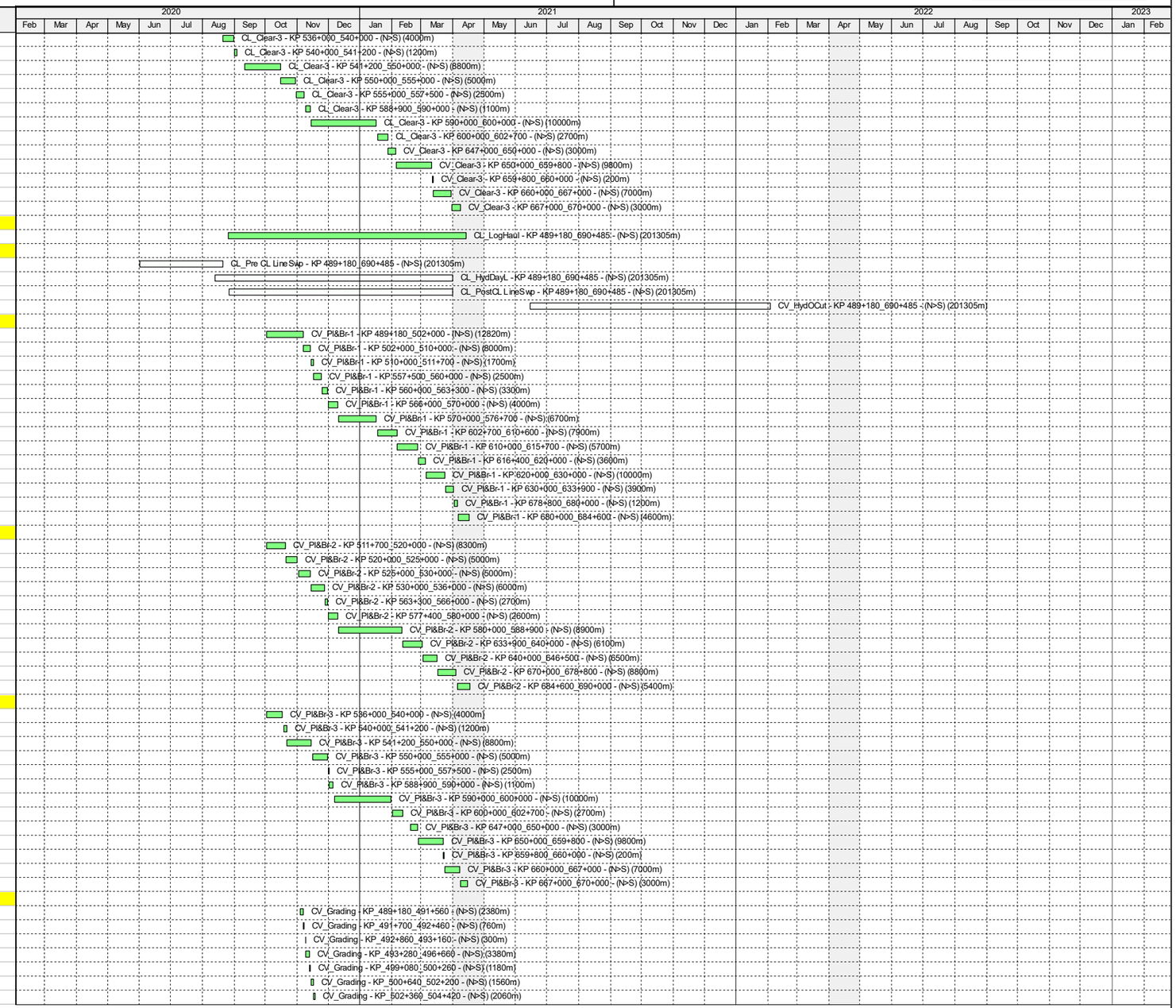


Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1314A-031	CL_Clear-3 - KP 536+000_540+000 - (N>S) (4000m)	9.00	21/08/2020	31/08/2020	I
1314A-032	CL_Clear-3 - KP 540+000_541+200 - (N>S) (1200m)	3.00	01/09/2020	03/09/2020	
1314A-033	CL_Clear-3 - KP 541+200_550+000 - (N>S) (8800m)	24.00	11/09/2020	15/10/2020	
1314A-034	CL_Clear-3 - KP 550+000_555+000 - (N>S) (5000m)	13.00	16/10/2020	30/10/2020	
1314A-035	CL_Clear-3 - KP 555+000_557+500 - (N>S) (2500m)	7.00	31/10/2020	07/11/2020	
1314A-039	CL_Clear-3 - KP 588+900_590+000 - (N>S) (1100m)	5.00	09/11/2020	13/11/2020	
1314A-043	CL_Clear-3 - KP 590+000_600+000 - (N>S) (10000m)	43.00	14/11/2020	16/01/2021	
1314A-047	CL_Clear-3 - KP 600+000_602+700 - (N>S) (2700m)	9.00	18/01/2021	27/01/2021	
1314-051	CV_Clear-3 - KP 647+000_650+000 - (N>S) (3000m)	7.00	28/01/2021	04/02/2021	
1314-055	CV_Clear-3 - KP 650+000_659+800 - (N>S) (9800m)	24.00	05/02/2021	11/03/2021	
1312-067	CV_Clear-3 - KP 659+800_660+000 - (N>S) (200m)	1.00	12/03/2021	12/03/2021	
1314-071	CV_Clear-3 - KP 660+000_667+000 - (N>S) (7000m)	15.00	13/03/2021	30/03/2021	
1314-075	CV_Clear-3 - KP 667+000_670+000 - (N>S) (3000m)	8.00	31/03/2021	08/04/2021	
Log Haul		168.00	26/08/2020	13/04/2021	
1320A	CL_LogHaul - KP 489+180_690+485 - (N>S) (201305m)	168.00	26/08/2020	13/04/2021	
Line Locate & Hydrovac		421.00	01/06/2020	02/02/2022	
1330A	CL_Pre CL LineSwp - KP 489+180_690+485 - (N>S) (201305m)	64.00	01/06/2020	20/08/2020	
1340A	CL_HydDayL - KP 489+180_690+485 - (N>S) (201305m)	168.00	13/08/2020	31/03/2021	
1330A10	CL_PostCL LineSwp - KP 489+180_690+485 - (N>S) (201305m)	156.00	27/08/2020	31/03/2021	
1234	CV_HydOCut - KP 489+180_690+485 - (N>S) (201305m)	164.00	15/06/2021	02/02/2022	
Piling & Burning #1		145.00	02/10/2020	16/04/2021	
1316A-011	CV_PI&Br-1 - KP 489+180_502+000 - (N>S) (12820m)	25.00	02/10/2020	06/11/2020	
1316A-012	CV_PI&Br-1 - KP 502+000_510+000 - (N>S) (8000m)	6.00	07/11/2020	13/11/2020	
1316A-013	CV_PI&Br-1 - KP 510+000_511+700 - (N>S) (1700m)	2.00	14/11/2020	16/11/2020	
1316A-014	CV_PI&Br-1 - KP 557+500_560+000 - (N>S) (2500m)	7.00	17/11/2020	24/11/2020	
1316A-015	CV_PI&Br-1 - KP 560+000_563+300 - (N>S) (3300m)	5.00	25/11/2020	30/11/2020	
1316A-022	CV_PI&Br-1 - KP 566+000_570+000 - (N>S) (4000m)	9.00	01/12/2020	10/12/2020	
1316A-032	CV_PI&Br-1 - KP 570+000_576+700 - (N>S) (6700m)	20.00	11/12/2020	16/01/2021	
1316A-079	CV_PI&Br-1 - KP 602+700_610+600 - (N>S) (7900m)	17.00	18/01/2021	05/02/2021	
1216-89	CV_PI&Br-1 - KP 610+000_615+700 - (N>S) (5700m)	11.00	06/02/2021	25/02/2021	
1216-42	CV_PI&Br-1 - KP 616+400_620+000 - (N>S) (3600m)	7.00	26/02/2021	05/03/2021	
1216-52	CV_PI&Br-1 - KP 620+000_630+000 - (N>S) (10000m)	16.00	06/03/2021	24/03/2021	
1216-62	CV_PI&Br-1 - KP 630+000_633+900 - (N>S) (3900m)	7.00	25/03/2021	01/04/2021	
1216-72	CV_PI&Br-1 - KP 678+800_680+000 - (N>S) (1200m)	3.00	02/04/2021	05/04/2021	
1216-82	CV_PI&Br-1 - KP 680+000_684+600 - (N>S) (4600m)	10.00	06/04/2021	16/04/2021	
Piling & Burning #2		146.00	02/10/2020	17/04/2021	
1318A-021	CV_PI&Br-2 - KP 511+700_520+000 - (N>S) (8300m)	10.00	02/10/2020	20/10/2020	
1318A-022	CV_PI&Br-2 - KP 520+000_525+000 - (N>S) (5000m)	10.00	21/10/2020	31/10/2020	
1318A-023	CV_PI&Br-2 - KP 525+000_530+000 - (N>S) (5000m)	11.00	02/11/2020	13/11/2020	
1318A-024	CV_PI&Br-2 - KP 530+000_536+000 - (N>S) (6000m)	12.00	14/11/2020	27/11/2020	
1318A-025	CV_PI&Br-2 - KP 563+300_566+000 - (N>S) (2700m)	2.00	28/11/2020	30/11/2020	
1318A-030	CV_PI&Br-2 - KP 577+400_580+000 - (N>S) (2600m)	9.00	01/12/2020	10/12/2020	
1318A-040	CV_PI&Br-2 - KP 580+000_588+900 - (N>S) (8900m)	41.00	11/12/2020	10/02/2021	
1218-50	CV_PI&Br-2 - KP 633+900_640+000 - (N>S) (6100m)	11.00	11/02/2021	02/03/2021	
1218-60	CV_PI&Br-2 - KP 640+000_646+500 - (N>S) (6500m)	12.00	03/03/2021	16/03/2021	
1218-129	CV_PI&Br-2 - KP 670+000_678+800 - (N>S) (8800m)	16.00	17/03/2021	03/04/2021	
1218-70	CV_PI&Br-2 - KP 684+600_690+000 - (N>S) (5400m)	12.00	05/04/2021	17/04/2021	
Piling & Burning #3		144.00	02/10/2020	15/04/2021	
1320A-031	CV_PI&Br-3 - KP 536+000_540+000 - (N>S) (4000m)	8.00	02/10/2020	17/10/2020	
1320A-032	CV_PI&Br-3 - KP 540+000_541+200 - (N>S) (1200m)	3.00	19/10/2020	21/10/2020	
1320A-033	CV_PI&Br-3 - KP 541+200_550+000 - (N>S) (8800m)	21.00	22/10/2020	14/11/2020	
1320A-034	CV_PI&Br-3 - KP 550+000_555+000 - (N>S) (5000m)	13.00	16/11/2020	30/11/2020	
1320A-035	CV_PI&Br-3 - KP 555+000_557+500 - (N>S) (2500m)	1.00	01/12/2020	01/12/2020	
1320A-055	CV_PI&Br-3 - KP 588+900_590+000 - (N>S) (1100m)	4.00	02/12/2020	05/12/2020	
1320A-065	CV_PI&Br-3 - KP 590+000_600+000 - (N>S) (10000m)	36.00	07/12/2020	30/01/2021	
1320A-075	CV_PI&Br-3 - KP 600+000_602+700 - (N>S) (2700m)	10.00	01/02/2021	11/02/2021	
1220-85	CV_PI&Br-3 - KP 647+000_650+000 - (N>S) (3000m)	6.00	19/02/2021	25/02/2021	
1220-95	CV_PI&Br-3 - KP 650+000_659+800 - (N>S) (9800m)	21.00	26/02/2021	22/03/2021	
1218-99	CV_PI&Br-3 - KP 659+800_660+000 - (N>S) (200m)	1.00	23/03/2021	23/03/2021	
1220-109	CV_PI&Br-3 - KP 660+000_667+000 - (N>S) (7000m)	13.00	24/03/2021	07/04/2021	
1220-119	CV_PI&Br-3 - KP 667+000_670+000 - (N>S) (3000m)	7.00	08/04/2021	15/04/2021	
Grade		177.00	04/11/2020	09/08/2021	
1265-005	CV_Grading - KP_489+180_491+560 - (N>S) (2380m)	3.00	04/11/2020	06/11/2020	
1265-010	CV_Grading - KP_491+700_492+460 - (N>S) (760m)	1.00	07/11/2020	07/11/2020	
1265-015	CV_Grading - KP_492+860_493+160 - (N>S) (300m)	0.00	09/11/2020	09/11/2020	
1265-020	CV_Grading - KP_493+280_496+660 - (N>S) (3380m)	4.00	09/11/2020	12/11/2020	
1265-025	CV_Grading - KP_499+080_500+260 - (N>S) (1180m)	1.00	13/11/2020	13/11/2020	
1265-030	CV_Grading - KP_500+640_502+200 - (N>S) (1560m)	2.00	14/11/2020	16/11/2020	
1265-035	CV_Grading - KP_502+360_504+420 - (N>S) (2060m)	2.00	17/11/2020	18/11/2020	

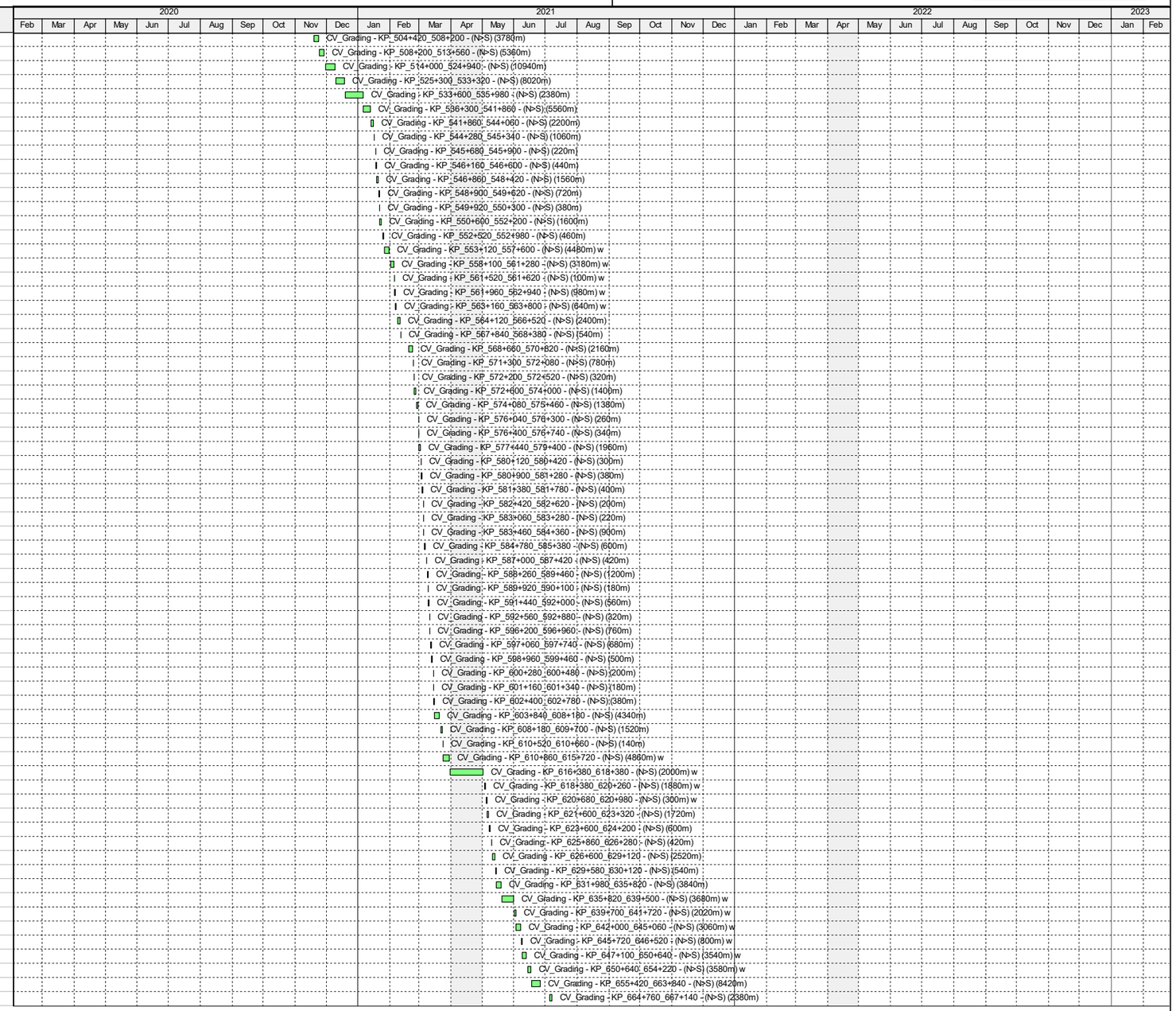


Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1265-040	CV_Grading - KP_504+420_508+200 - (N>S) (3780m)	4.00	19/11/2020	23/11/2020	
1265-045	CV_Grading - KP_508+200_513+560 - (N>S) (5360m)	5.00	24/11/2020	28/11/2020	
1265-050	CV_Grading - KP_514+000_524+940 - (N>S) (10940m)	9.00	30/11/2020	09/12/2020	
1265-055	CV_Grading - KP_525+300_533+320 - (N>S) (8020m)	8.00	10/12/2020	18/12/2020	
1265-060	CV_Grading - KP_533+600_535+980 - (N>S) (2380m)	3.00	19/12/2020	05/01/2021	
1265-065	CV_Grading - KP_536+300_541+860 - (N>S) (5560m)	6.00	06/01/2021	12/01/2021	
1265-070	CV_Grading - KP_541+860_544+060 - (N>S) (2200m)	3.00	13/01/2021	15/01/2021	
1265-075	CV_Grading - KP_544+280_545+340 - (N>S) (1060m)	1.00	16/01/2021	16/01/2021	
1265-080	CV_Grading - KP_545+680_545+900 - (N>S) (220m)	0.00	18/01/2021	18/01/2021	
1265-085	CV_Grading - KP_546+160_546+600 - (N>S) (440m)	1.00	18/01/2021	18/01/2021	
1265-090	CV_Grading - KP_546+860_548+420 - (N>S) (1560m)	2.00	19/01/2021	20/01/2021	
1265-095	CV_Grading - KP_548+900_549+620 - (N>S) (720m)	1.00	21/01/2021	21/01/2021	
1265-100	CV_Grading - KP_549+920_550+300 - (N>S) (380m)	0.00	22/01/2021	22/01/2021	
1265-105	CV_Grading - KP_550+600_552+200 - (N>S) (1600m)	2.00	22/01/2021	23/01/2021	
1265-110	CV_Grading - KP_552+520_552+980 - (N>S) (460m)	1.00	25/01/2021	25/01/2021	
1265-115	CV_Grading - KP_553+120_557+600 - (N>S) (4480m) w	5.00	26/01/2021	30/01/2021	
1265-120	CV_Grading - KP_558+100_561+280 - (N>S) (3180m) w	4.00	01/02/2021	04/02/2021	
1265-125	CV_Grading - KP_561+520_561+620 - (N>S) (100m) w	0.00	05/02/2021	05/02/2021	
1265-130	CV_Grading - KP_561+960_562+940 - (N>S) (980m) w	1.00	05/02/2021	05/02/2021	
1265-135	CV_Grading - KP_563+160_563+800 - (N>S) (640m) w	1.00	06/02/2021	06/02/2021	
1265-140	CV_Grading - KP_564+120_566+520 - (N>S) (2400m)	3.00	08/02/2021	10/02/2021	
1265-145	CV_Grading - KP_567+840_568+380 - (N>S) (540m)	1.00	11/02/2021	11/02/2021	
1265-150	CV_Grading - KP_568+660_570+820 - (N>S) (2160m)	3.00	19/02/2021	22/02/2021	
1265-155	CV_Grading - KP_571+300_572+080 - (N>S) (780m)	1.00	23/02/2021	23/02/2021	
1265-160	CV_Grading - KP_572+200_572+520 - (N>S) (320m)	0.00	24/02/2021	24/02/2021	
1265-165	CV_Grading - KP_572+600_574+000 - (N>S) (1400m)	2.00	24/02/2021	25/02/2021	
1265-170	CV_Grading - KP_574+080_575+460 - (N>S) (1380m)	2.00	26/02/2021	27/02/2021	
1265-175	CV_Grading - KP_576+040_576+300 - (N>S) (260m)	0.00	01/03/2021	01/03/2021	
1265-180	CV_Grading - KP_576+400_576+740 - (N>S) (340m)	0.00	01/03/2021	01/03/2021	
1265-185	CV_Grading - KP_577+440_579+400 - (N>S) (1960m)	2.00	01/03/2021	02/03/2021	
1265-190	CV_Grading - KP_580+120_580+420 - (N>S) (300m)	0.00	03/03/2021	03/03/2021	
1265-195	CV_Grading - KP_580+900_581+280 - (N>S) (380m)	1.00	03/03/2021	03/03/2021	
1265-200	CV_Grading - KP_581+380_581+780 - (N>S) (400m)	1.00	04/03/2021	04/03/2021	
1265-205	CV_Grading - KP_582+420_582+620 - (N>S) (200m)	0.00	05/03/2021	05/03/2021	
1265-210	CV_Grading - KP_583+060_583+280 - (N>S) (220m)	0.00	05/03/2021	05/03/2021	
1265-215	CV_Grading - KP_583+460_584+360 - (N>S) (900m)	1.00	05/03/2021	05/03/2021	
1265-220	CV_Grading - KP_584+780_585+380 - (N>S) (600m)	1.00	06/03/2021	06/03/2021	
1265-225	CV_Grading - KP_587+000_587+420 - (N>S) (420m)	1.00	08/03/2021	08/03/2021	
1265-230	CV_Grading - KP_588+260_589+460 - (N>S) (1200m)	1.00	09/03/2021	09/03/2021	
1265-235	CV_Grading - KP_589+920_590+100 - (N>S) (180m)	0.00	10/03/2021	10/03/2021	
1265-240	CV_Grading - KP_591+440_592+000 - (N>S) (560m)	1.00	10/03/2021	10/03/2021	
1265-245	CV_Grading - KP_592+560_592+880 - (N>S) (320m)	0.00	11/03/2021	11/03/2021	
1265-250	CV_Grading - KP_596+200_596+960 - (N>S) (760m)	1.00	11/03/2021	11/03/2021	
1265-255	CV_Grading - KP_597+060_597+740 - (N>S) (680m)	1.00	12/03/2021	12/03/2021	
1265-260	CV_Grading - KP_598+960_599+460 - (N>S) (500m)	1.00	13/03/2021	13/03/2021	
1265-265	CV_Grading - KP_600+280_600+480 - (N>S) (200m)	0.00	15/03/2021	15/03/2021	
1265-270	CV_Grading - KP_601+160_601+340 - (N>S) (180m)	0.00	15/03/2021	15/03/2021	
1265-275	CV_Grading - KP_602+400_602+780 - (N>S) (380m)	1.00	15/03/2021	15/03/2021	
1265-280	CV_Grading - KP_603+840_608+180 - (N>S) (4340m)	5.00	16/03/2021	20/03/2021	
1265-285	CV_Grading - KP_608+180_609+700 - (N>S) (1520m)	2.00	22/03/2021	23/03/2021	
1265-290	CV_Grading - KP_610+520_610+660 - (N>S) (140m)	0.00	24/03/2021	24/03/2021	
1265-295	CV_Grading - KP_610+860_615+720 - (N>S) (4860m) w	6.00	24/03/2021	30/03/2021	
1265-300	CV_Grading - KP_616+380_618+380 - (N>S) (2000m) w	2.00	31/03/2021	01/05/2021	
1265-305	CV_Grading - KP_618+380_620+260 - (N>S) (1880m) w	2.00	03/05/2021	04/05/2021	
1265-310	CV_Grading - KP_620+680_620+980 - (N>S) (300m) w	1.00	05/05/2021	05/05/2021	
1265-315	CV_Grading - KP_621+600_623+320 - (N>S) (1720m)	2.00	06/05/2021	07/05/2021	
1265-320	CV_Grading - KP_623+600_624+200 - (N>S) (600m)	1.00	08/05/2021	08/05/2021	
1265-325	CV_Grading - KP_625+860_626+280 - (N>S) (420m)	1.00	10/05/2021	10/05/2021	
1265-330	CV_Grading - KP_626+600_629+120 - (N>S) (2520m)	3.00	11/05/2021	13/05/2021	
1265-335	CV_Grading - KP_629+580_630+120 - (N>S) (540m)	1.00	14/05/2021	14/05/2021	
1265-340	CV_Grading - KP_631+980_635+820 - (N>S) (3840m)	4.00	15/05/2021	19/05/2021	
1265-345	CV_Grading - KP_635+820_639+500 - (N>S) (3680m) w	4.00	20/05/2021	31/05/2021	
1265-350	CV_Grading - KP_639+700_641+720 - (N>S) (2020m) w	2.00	01/06/2021	02/06/2021	
1265-355	CV_Grading - KP_642+000_645+060 - (N>S) (3060m) w	4.00	03/06/2021	07/06/2021	
1265-360	CV_Grading - KP_645+720_646+520 - (N>S) (800m) w	1.00	08/06/2021	08/06/2021	
1265-365	CV_Grading - KP_647+100_650+640 - (N>S) (3540m) w	4.00	09/06/2021	12/06/2021	
1265-370	CV_Grading - KP_650+640_654+220 - (N>S) (3580m) w	4.00	14/06/2021	17/06/2021	
1265-375	CV_Grading - KP_655+420_663+840 - (N>S) (8420m)	8.00	18/06/2021	26/06/2021	
1265-380	CV_Grading - KP_664+760_667+140 - (N>S) (2380m)	3.00	05/07/2021	07/07/2021	

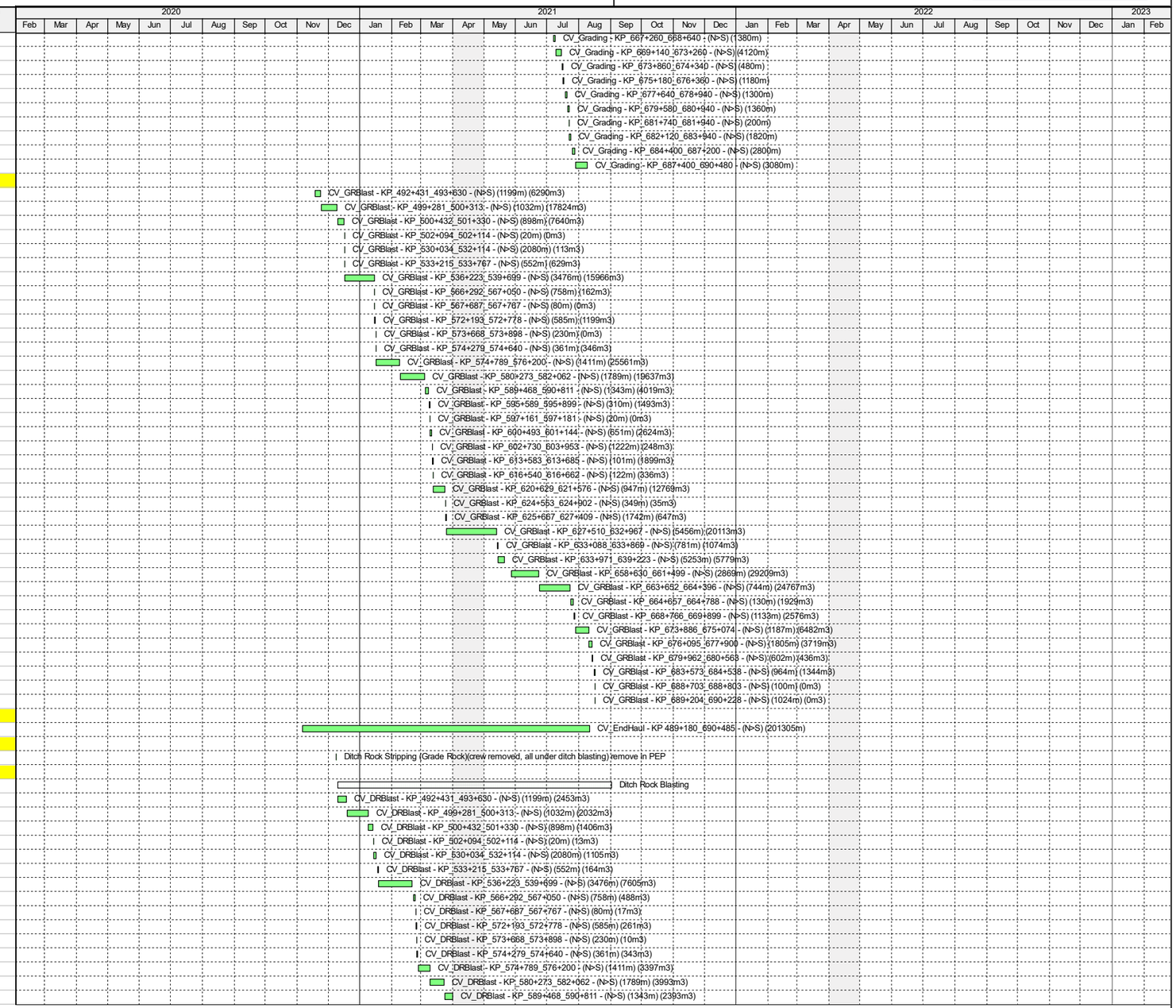


Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1265-385	CV_Grading - KP_667+260_668+640 - (N>S) (1380m)	2.00	08/07/2021	09/07/2021	
1265-390	CV_Grading - KP_669+140_673+260 - (N>S) (4120m)	5.00	10/07/2021	15/07/2021	
1265-395	CV_Grading - KP_673+860_674+340 - (N>S) (480m)	1.00	16/07/2021	16/07/2021	
1265-400	CV_Grading - KP_675+180_676+360 - (N>S) (1180m)	1.00	17/07/2021	17/07/2021	
1265-405	CV_Grading - KP_677+640_678+940 - (N>S) (1300m)	2.00	19/07/2021	20/07/2021	
1265-410	CV_Grading - KP_679+580_680+940 - (N>S) (1360m)	2.00	21/07/2021	22/07/2021	
1265-415	CV_Grading - KP_681+740_681+940 - (N>S) (200m)	0.00	23/07/2021	23/07/2021	
1265-420	CV_Grading - KP_682+120_683+940 - (N>S) (1820m)	2.00	23/07/2021	24/07/2021	
1265-425	CV_Grading - KP_684+400_687+200 - (N>S) (2800m)	3.00	26/07/2021	28/07/2021	
1265-430	CV_Grading - KP_687+400_690+480 - (N>S) (3080m)	4.00	29/07/2021	09/08/2021	
Grade Rock & Blast		**171.00**	**18/11/2020**	**17/08/2021**	
1260-010	CV_GRBlast - KP_492+431_493+630 - (N>S) (1199m) (6290m3)	5.00	18/11/2020	23/11/2020	
1260-015	CV_GRBlast - KP_499+281_500+313 - (N>S) (1032m) (17824m3)	14.00	24/11/2020	09/12/2020	
1260-020	CV_GRBlast - KP_500+432_501+330 - (N>S) (898m) (7640m3)	6.00	10/12/2020	16/12/2020	
1260-025	CV_GRBlast - KP_502+094_502+114 - (N>S) (20m) (0m3)	0.00	17/12/2020	17/12/2020	
1260-030	CV_GRBlast - KP_530+034_532+114 - (N>S) (2080m) (113m3)	0.00	17/12/2020	17/12/2020	
1260-035	CV_GRBlast - KP_533+215_533+767 - (N>S) (552m) (629m3)	0.00	17/12/2020	17/12/2020	
1260-040	CV_GRBlast - KP_536+223_539+699 - (N>S) (3476m) (15966m3)	13.00	17/12/2020	14/01/2021	
1260-045	CV_GRBlast - KP_566+292_567+050 - (N>S) (758m) (162m3)	0.00	15/01/2021	15/01/2021	
1260-050	CV_GRBlast - KP_567+687_567+767 - (N>S) (80m) (0m3)	0.00	15/01/2021	15/01/2021	
1260-055	CV_GRBlast - KP_572+193_572+778 - (N>S) (585m) (1199m3)	1.00	15/01/2021	15/01/2021	
1260-060	CV_GRBlast - KP_573+668_573+898 - (N>S) (230m) (0m3)	0.00	16/01/2021	16/01/2021	
1260-065	CV_GRBlast - KP_574+279_574+640 - (N>S) (361m) (346m3)	0.00	16/01/2021	16/01/2021	
1260-070	CV_GRBlast - KP_574+789_576+200 - (N>S) (1411m) (25561m3)	20.00	16/01/2021	08/02/2021	
1260-075	CV_GRBlast - KP_580+273_582+062 - (N>S) (1789m) (19637m3)	15.00	09/02/2021	04/03/2021	
1260-080	CV_GRBlast - KP_589+468_590+811 - (N>S) (1343m) (4019m3)	3.00	05/03/2021	08/03/2021	
1260-085	CV_GRBlast - KP_595+589_595+899 - (N>S) (310m) (1493m3)	1.00	09/03/2021	09/03/2021	
1260-090	CV_GRBlast - KP_597+161_597+181 - (N>S) (20m) (0m3)	0.00	10/03/2021	10/03/2021	
1260-095	CV_GRBlast - KP_600+493_601+144 - (N>S) (651m) (2624m3)	2.00	10/03/2021	11/03/2021	
1260-100	CV_GRBlast - KP_602+730_603+953 - (N>S) (1222m) (248m3)	0.00	12/03/2021	12/03/2021	
1260-105	CV_GRBlast - KP_613+583_613+685 - (N>S) (101m) (1899m3)	1.00	12/03/2021	12/03/2021	
1260-110	CV_GRBlast - KP_616+540_616+662 - (N>S) (122m) (336m3)	0.00	13/03/2021	13/03/2021	
1260-115	CV_GRBlast - KP_620+629_621+576 - (N>S) (947m) (12769m3)	10.00	13/03/2021	24/03/2021	
1260-120	CV_GRBlast - KP_624+553_624+902 - (N>S) (349m) (35m3)	0.00	25/03/2021	25/03/2021	
1260-125	CV_GRBlast - KP_625+667_627+409 - (N>S) (1742m) (647m3)	1.00	25/03/2021	25/03/2021	
1260-130	CV_GRBlast - KP_627+510_632+967 - (N>S) (5456m) (20113m3)	16.00	26/03/2021	13/05/2021	
1260-135	CV_GRBlast - KP_633+088_633+869 - (N>S) (781m) (1074m3)	1.00	14/05/2021	14/05/2021	
1260-140	CV_GRBlast - KP_633+971_639+223 - (N>S) (5253m) (5779m3)	5.00	15/05/2021	20/05/2021	
1260-145	CV_GRBlast - KP_658+630_661+499 - (N>S) (2869m) (29209m3)	23.00	28/05/2021	23/06/2021	
1260-150	CV_GRBlast - KP_663+652_664+396 - (N>S) (744m) (24767m3)	20.00	24/06/2021	23/07/2021	
1260-155	CV_GRBlast - KP_664+657_664+788 - (N>S) (130m) (1929m3)	2.00	24/07/2021	26/07/2021	
1260-160	CV_GRBlast - KP_668+766_669+899 - (N>S) (1133m) (2576m3)	2.00	27/07/2021	28/07/2021	
1260-165	CV_GRBlast - KP_673+886_675+074 - (N>S) (1187m) (6482m3)	5.00	29/07/2021	10/08/2021	
1260-170	CV_GRBlast - KP_676+095_677+900 - (N>S) (1805m) (3719m3)	3.00	11/08/2021	13/08/2021	
1260-175	CV_GRBlast - KP_679+962_680+563 - (N>S) (602m) (436m3)	1.00	14/08/2021	14/08/2021	
1260-180	CV_GRBlast - KP_683+573_684+538 - (N>S) (964m) (1344m3)	1.00	16/08/2021	16/08/2021	
1260-185	CV_GRBlast - KP_688+703_688+803 - (N>S) (100m) (0m3)	0.00	17/08/2021	17/08/2021	
1260-186	CV_GRBlast - KP_689+204_690+228 - (N>S) (1024m) (0m3)	0.00	17/08/2021	17/08/2021	
End Haul		**177.00**	**06/11/2020**	**11/08/2021**	
1267B	CV_EndHaul - KP 489+180_690+485 - (N>S) (201305m)	177.00	06/11/2020	11/08/2021	
Ditch Rock Stripping		**0.00**	**09/12/2020**	**09/12/2020**	
1270	Ditch Rock Stripping (Grade Rock)(crew removed, all under ditch blasting) remove in PEP	0.00	09/12/2020	09/12/2020	
Ditch Rock Blasting		**166.00**	**10/12/2020**	**01/09/2021**	
1275	Ditch Rock Blasting	166.00	10/12/2020	01/09/2021	
1275-005	CV_DRBlast - KP_492+431_493+630 - (N>S) (1199m) (2453m3)	8.00	10/12/2020	18/12/2020	
1275-010	CV_DRBlast - KP_499+281_500+313 - (N>S) (1032m) (2032m3)	6.00	19/12/2020	08/01/2021	
1275-015	CV_DRBlast - KP_500+432_501+330 - (N>S) (898m) (1406m3)	4.00	09/01/2021	13/01/2021	
1275-020	CV_DRBlast - KP_502+094_502+114 - (N>S) (20m) (13m3)	0.00	14/01/2021	14/01/2021	
1275-025	CV_DRBlast - KP_530+034_532+114 - (N>S) (2080m) (1105m3)	3.00	14/01/2021	16/01/2021	
1275-030	CV_DRBlast - KP_533+215_533+767 - (N>S) (552m) (164m3)	1.00	18/01/2021	18/01/2021	
1275-035	CV_DRBlast - KP_536+223_539+699 - (N>S) (3476m) (7605m3)	23.00	19/01/2021	20/02/2021	
1275-040	CV_DRBlast - KP_566+292_567+050 - (N>S) (758m) (488m3)	2.00	22/02/2021	23/02/2021	
1275-045	CV_DRBlast - KP_567+687_567+767 - (N>S) (80m) (17m3)	0.00	24/02/2021	24/02/2021	
1275-050	CV_DRBlast - KP_572+193_572+778 - (N>S) (585m) (261m3)	1.00	24/02/2021	24/02/2021	
1275-055	CV_DRBlast - KP_573+668_573+898 - (N>S) (230m) (10m3)	0.00	25/02/2021	25/02/2021	
1275-060	CV_DRBlast - KP_574+279_574+640 - (N>S) (361m) (343m3)	1.00	25/02/2021	25/02/2021	
1275-065	CV_DRBlast - KP_574+789_576+200 - (N>S) (1411m) (3397m3)	10.00	26/02/2021	09/03/2021	
1275-070	CV_DRBlast - KP_580+273_582+062 - (N>S) (1789m) (3993m3)	12.00	10/03/2021	23/03/2021	
1275-075	CV_DRBlast - KP_589+468_590+811 - (N>S) (1343m) (2393m3)	7.00	24/03/2021	31/03/2021	

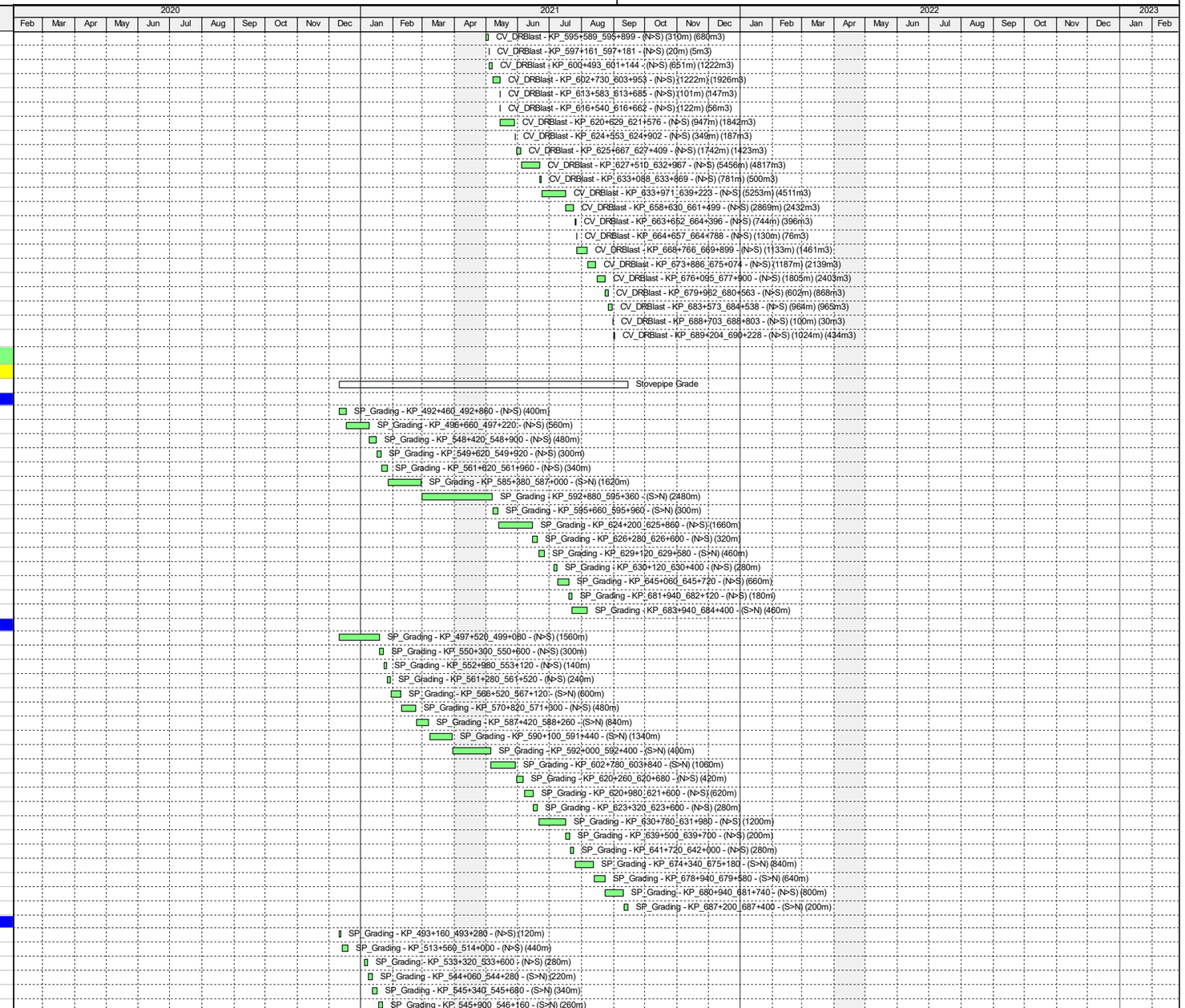


Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1275-080	CV_DRBlast - KP_595+589_595+899 - (N>S) (310m) (680m3)	2.00	01/05/2021	03/05/2021	
1275-085	CV_DRBlast - KP_597+161_597+181 - (N>S) (20m) (5m3)	0.00	04/05/2021	04/05/2021	
1275-090	CV_DRBlast - KP_600+493_601+144 - (N>S) (651m) (1222m3)	4.00	04/05/2021	07/05/2021	
1275-095	CV_DRBlast - KP_602+730_603+953 - (N>S) (1222m) (1926m3)	6.00	08/05/2021	14/05/2021	
1275-100	CV_DRBlast - KP_613+583_613+685 - (N>S) (101m) (147m3)	0.00	15/05/2021	15/05/2021	
1275-105	CV_DRBlast - KP_616+540_616+662 - (N>S) (122m) (56m3)	0.00	15/05/2021	15/05/2021	
1275-110	CV_DRBlast - KP_620+629_621+576 - (N>S) (947m) (1842m3)	6.00	15/05/2021	28/05/2021	
1275-115	CV_DRBlast - KP_624+553_624+902 - (N>S) (349m) (187m3)	1.00	29/05/2021	29/05/2021	
1275-120	CV_DRBlast - KP_625+667_627+409 - (N>S) (1742m) (1423m3)	4.00	31/05/2021	03/06/2021	
1275-125	CV_DRBlast - KP_627+510_632+967 - (N>S) (5456m) (4817m3)	15.00	04/06/2021	21/06/2021	
1275-130	CV_DRBlast - KP_633+088_633+869 - (N>S) (781m) (500m3)	2.00	22/06/2021	23/06/2021	
1275-135	CV_DRBlast - KP_633+971_639+223 - (N>S) (5253m) (4511m3)	14.00	24/06/2021	16/07/2021	
1275-140	CV_DRBlast - KP_658+630_661+499 - (N>S) (2869m) (2432m3)	7.00	17/07/2021	24/07/2021	
1275-145	CV_DRBlast - KP_663+652_664+396 - (N>S) (744m) (396m3)	1.00	26/07/2021	26/07/2021	
1275-150	CV_DRBlast - KP_664+657_664+788 - (N>S) (130m) (76m3)	0.00	27/07/2021	27/07/2021	
1275-155	CV_DRBlast - KP_668+766_669+899 - (N>S) (1133m) (1461m3)	4.00	27/07/2021	06/08/2021	
1275-160	CV_DRBlast - KP_673+886_675+074 - (N>S) (1187m) (2139m3)	7.00	07/08/2021	14/08/2021	
1275-165	CV_DRBlast - KP_676+095_677+900 - (N>S) (1805m) (2403m3)	7.00	16/08/2021	23/08/2021	
1275-170	CV_DRBlast - KP_679+962_680+563 - (N>S) (602m) (868m3)	3.00	24/08/2021	26/08/2021	
1275-175	CV_DRBlast - KP_683+573_684+538 - (N>S) (964m) (965m3)	3.00	27/08/2021	30/08/2021	
1275-180	CV_DRBlast - KP_688+703_688+803 - (N>S) (100m) (30m3)	1.00	31/08/2021	31/08/2021	
1275-185	CV_DRBlast - KP_689+204_690+228 - (N>S) (1024m) (434m3)	1.00	01/09/2021	01/09/2021	
130.Stovepipe		331.00	11/12/2020	18/05/2022	
Stovepipe Grade		170.00	11/12/2020	14/09/2021	
1300	Stovepipe Grade	170.00	11/12/2020	14/09/2021	
SP Grade Crew #1		143.00	11/12/2020	06/08/2021	
1300-0010	SP_Grading - KP_492+460_492+860 - (N>S) (400m)	6.00	11/12/2020	17/12/2020	
1300-0030	SP_Grading - KP_496+660_497+220 - (N>S) (560m)	7.00	18/12/2020	08/01/2021	
1300-0110	SP_Grading - KP_548+420_548+900 - (N>S) (480m)	6.00	09/01/2021	15/01/2021	
1300-0120	SP_Grading - KP_549+620_549+920 - (N>S) (300m)	4.00	16/01/2021	20/01/2021	
1300-0160	SP_Grading - KP_561+620_561+960 - (N>S) (340m)	5.00	21/01/2021	26/01/2021	
1300-0250	SP_Grading - KP_585+380_587+000 - (S>N) (1620m)	22.00	27/01/2021	27/02/2021	
1300-0290	SP_Grading - KP_592+880_595+360 - (S>N) (2480m)	33.00	01/03/2021	07/05/2021	
1300-0300	SP_Grading - KP_595+660_595+960 - (S>N) (300m)	4.00	08/05/2021	12/05/2021	
1300-0400	SP_Grading - KP_624+200_625+860 - (N>S) (1660m)	22.00	13/05/2021	14/06/2021	
1300-0410	SP_Grading - KP_626+280_626+600 - (N>S) (320m)	5.00	15/06/2021	19/06/2021	
1300-0420	SP_Grading - KP_629+120_629+580 - (S>N) (460m)	6.00	21/06/2021	26/06/2021	
1300-0430	SP_Grading - KP_630+120_630+400 - (N>S) (280m)	4.00	05/07/2021	08/07/2021	
1300-0470	SP_Grading - KP_645+060_645+720 - (N>S) (660m)	9.00	09/07/2021	19/07/2021	
1300-0560	SP_Grading - KP_681+940_682+120 - (N>S) (180m)	3.00	20/07/2021	22/07/2021	
1300-0570	SP_Grading - KP_683+940_684+400 - (S>N) (460m)	7.00	23/07/2021	06/08/2021	
SP Grade Crew #2		170.00	11/12/2020	14/09/2021	
1300-0040	SP_Grading - KP_497+520_499+080 - (N>S) (1560m)	21.00	11/12/2020	18/01/2021	
1300-0130	SP_Grading - KP_550+300_550+600 - (N>S) (300m)	4.00	19/01/2021	22/01/2021	
1300-0140	SP_Grading - KP_552+980_553+120 - (N>S) (140m)	2.00	23/01/2021	25/01/2021	
1300-0150	SP_Grading - KP_561+280_561+520 - (N>S) (240m)	4.00	26/01/2021	29/01/2021	
1300-0180	SP_Grading - KP_566+520_567+120 - (S>N) (600m)	8.00	30/01/2021	08/02/2021	
1300-0190	SP_Grading - KP_570+820_571+300 - (N>S) (480m)	6.00	09/02/2021	22/02/2021	
1300-0260	SP_Grading - KP_587+420_588+260 - (S>N) (840m)	11.00	23/02/2021	06/03/2021	
1300-0270	SP_Grading - KP_590+100_591+440 - (S>N) (1340m)	19.00	08/03/2021	29/03/2021	
1300-0280	SP_Grading - KP_592+000_592+400 - (S>N) (400m)	6.00	30/03/2021	05/05/2021	
1300-0360	SP_Grading - KP_602+780_603+840 - (S>N) (1060m)	15.00	06/05/2021	29/05/2021	
1300-0370	SP_Grading - KP_620+260_620+680 - (N>S) (420m)	6.00	31/05/2021	05/06/2021	
1300-0380	SP_Grading - KP_620+980_621+600 - (N>S) (620m)	8.00	07/06/2021	15/06/2021	
1300-0390	SP_Grading - KP_623+320_623+600 - (N>S) (280m)	4.00	16/06/2021	19/06/2021	
1300-0440	SP_Grading - KP_630+780_631+980 - (N>S) (1200m)	17.00	21/06/2021	16/07/2021	
1300-0450	SP_Grading - KP_639+500_639+700 - (N>S) (200m)	3.00	17/07/2021	20/07/2021	
1300-0460	SP_Grading - KP_641+720_642+000 - (N>S) (280m)	4.00	21/07/2021	24/07/2021	
1300-0520	SP_Grading - KP_674+340_675+180 - (S>N) (840m)	10.00	26/07/2021	12/08/2021	
1300-0540	SP_Grading - KP_678+940_679+580 - (S>N) (640m)	9.00	13/08/2021	23/08/2021	
1300-0550	SP_Grading - KP_680+940_681+740 - (N>S) (800m)	10.00	24/08/2021	10/09/2021	
1300-0580	SP_Grading - KP_687+200_687+400 - (S>N) (200m)	3.00	11/09/2021	14/09/2021	
SP Grade Crew #3		170.00	11/12/2020	14/09/2021	
1300-0020	SP_Grading - KP_493+160_493+280 - (N>S) (120m)	2.00	11/12/2020	12/12/2020	
1300-0050	SP_Grading - KP_513+560_514+000 - (N>S) (440m)	6.00	14/12/2020	19/12/2020	
1300-0060	SP_Grading - KP_533+320_533+600 - (N>S) (280m)	4.00	04/01/2021	07/01/2021	
1300-0070	SP_Grading - KP_544+060_544+280 - (S>N) (220m)	3.00	08/01/2021	11/01/2021	
1300-0080	SP_Grading - KP_545+340_545+680 - (S>N) (340m)	5.00	12/01/2021	16/01/2021	
1300-0090	SP_Grading - KP_545+900_546+160 - (S>N) (260m)	4.00	18/01/2021	21/01/2021	



Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1300-0100	SP_Grading - KP_546+600_546+860 - (S>N) (260m)	4.00	22/01/2021	26/01/2021	
1300-0170	SP_Grading - KP_562+940_563+160 - (N>S) (220m)	3.00	27/01/2021	29/01/2021	
1300-0200	SP_Grading - KP_575+460_576+040 - (N>S) (580m)	8.00	30/01/2021	08/02/2021	
1300-0210	SP_Grading - KP_581+780_582+420 - (S>N) (640m)	8.00	09/02/2021	24/02/2021	
1300-0220	SP_Grading - KP_582+620_583+060 - (S>N) (440m)	6.00	25/02/2021	03/03/2021	
1300-0230	SP_Grading - KP_583+280_583+460 - (S>N) (180m)	3.00	04/03/2021	06/03/2021	
1300-0240	SP_Grading - KP_584+360_584+780 - (S>N) (420m)	6.00	08/03/2021	13/03/2021	
1300-0310	SP_Grading - KP_597+740_598+960 - (S>N) (1220m)	17.00	15/03/2021	03/05/2021	
1300-0320	SP_Grading - KP_599+460_600+280 - (S>N) (820m)	11.00	04/05/2021	15/05/2021	
1300-0330	SP_Grading - KP_600+480_601+160 - (S>N) (680m)	9.00	17/05/2021	02/06/2021	
1300-0340	SP_Grading - KP_601+340_601+600 - (S>N) (260m)	4.00	03/06/2021	07/06/2021	
1300-0350	SP_Grading - KP_601+860_602+400 - (S>N) (540m)	7.00	08/06/2021	15/06/2021	
1300-0480	SP_Grading - KP_654+220_655+420 - (S>N) (1200m)	17.00	16/06/2021	12/07/2021	
1300-0490	SP_Grading - KP_663+840_664+760 - (S>N) (920m)	11.00	13/07/2021	24/07/2021	
1300-0500	SP_Grading - KP_668+640_669+140 - (S>N) (500m)	6.00	26/07/2021	07/08/2021	
1300-0510	SP_Grading - KP_673+260_673+860 - (S>N) (600m)	8.00	09/08/2021	17/08/2021	
1300-0530	SP_Grading - KP_676+360_677+640 - (N>S) (1280m)	18.00	18/08/2021	14/09/2021	
Stovepipe String & Bend		**250.00**	**12/12/2020**	**07/01/2022**	
1305	SP_Str&Bnd	250.00	12/12/2020	07/01/2022	
Stovepipe		**251.00**	**12/12/2020**	**08/01/2022**	
Stovepipe #1		**250.00**	**12/12/2020**	**07/01/2022**	
1311-0010	SP_Inst-Cr - KP_492+460_492+860 - (N>S) (400m)	9.00	12/12/2020	05/01/2021	
1311-0030	SP_Inst-Cr - KP_496+660_497+220 - (N>S) (560m)	14.00	06/01/2021	21/01/2021	
1311-0110	SP_Inst-Cr - KP_548+420_548+900 - (N>S) (480m)	12.00	22/01/2021	04/02/2021	
1311-0250	SP_Inst-Cr - KP_585+380_587+000 - (S>N) (1620m)	39.00	05/02/2021	29/03/2021	
1311-0290	SP_Inst-Cr - KP_592+880_595+360 - (S>N) (2480m)	60.00	30/03/2021	21/07/2021	
1311-0300	SP_Inst-Cr - KP_595+660_595+960 - (S>N) (300m)	7.00	22/07/2021	29/07/2021	
1311-0370	SP_Inst-Cr - KP_620+260_620+680 - (N>S) (420m)	10.00	06/08/2021	17/08/2021	
1311-0400	SP_Inst-Cr - KP_624+200_625+860 - (N>S) (1660m)	40.00	18/08/2021	16/10/2021	
1311-0410	SP_Inst-Cr - KP_626+280_626+600 - (N>S) (320m)	7.00	18/10/2021	25/10/2021	
1311-0420	SP_Inst-Cr - KP_629+120_629+580 - (S>N) (460m)	11.00	26/10/2021	06/11/2021	
1311-0430	SP_Inst-Cr - KP_630+120_630+400 - (N>S) (280m)	7.00	08/11/2021	15/11/2021	
1311-0470	SP_Inst-Cr - KP_645+060_645+720 - (N>S) (660m)	16.00	16/11/2021	03/12/2021	
1311-0560	SP_Inst-Cr - KP_681+940_682+120 - (N>S) (180m)	6.00	04/12/2021	10/12/2021	
1311-0570	SP_Inst-Cr - KP_683+940_684+400 - (S>N) (460m)	12.00	11/12/2021	07/01/2022	
Stovepipe #2		**251.00**	**12/12/2020**	**08/01/2022**	
1313-0040	SP_Inst-Cr - KP_497+520_499+080 - (N>S) (1560m)	38.00	12/12/2020	08/02/2021	
1313-0130	SP_Inst-Cr - KP_550+300_550+600 - (N>S) (300m)	7.00	09/02/2021	23/02/2021	
1313-0140	SP_Inst-Cr - KP_552+980_553+120 - (N>S) (140m)	4.00	24/02/2021	27/02/2021	
1313-0150	SP_Inst-Cr - KP_561+280_561+520 - (N>S) (240m)	6.00	01/03/2021	06/03/2021	
1313-0180	SP_Inst-Cr - KP_566+520_567+120 - (S>N) (600m)	15.00	08/03/2021	24/03/2021	
1313-0270	SP_Inst-Cr - KP_590+100_591+440 - (S>N) (1340m)	32.00	25/03/2021	07/06/2021	
1313-0360	SP_Inst-Cr - KP_602+780_603+840 - (S>N) (1060m)	26.00	08/06/2021	14/07/2021	
1313-0380	SP_Inst-Cr - KP_620+980_621+600 - (N>S) (620m)	15.00	15/07/2021	07/08/2021	
1313-0390	SP_Inst-Cr - KP_623+320_623+600 - (N>S) (280m)	6.00	09/08/2021	14/08/2021	
1313-0440	SP_Inst-Cr - KP_630+780_631+980 - (N>S) (1200m)	29.00	16/08/2021	24/09/2021	
1313-0450	SP_Inst-Cr - KP_639+500_639+700 - (N>S) (200m)	5.00	25/09/2021	30/09/2021	
1313-0460	SP_Inst-Cr - KP_641+720_642+000 - (N>S) (280m)	7.00	01/10/2021	15/10/2021	
1313-0520	SP_Inst-Cr - KP_674+340_675+180 - (S>N) (840m)	20.00	16/10/2021	08/11/2021	
1313-0540	SP_Inst-Cr - KP_678+940_679+580 - (S>N) (640m)	16.00	09/11/2021	26/11/2021	
1313-0550	SP_Inst-Cr - KP_680+940_681+740 - (N>S) (800m)	19.00	27/11/2021	18/12/2021	
1313-0580	SP_Inst-Cr - KP_687+200_687+400 - (S>N) (200m)	6.00	03/01/2022	08/01/2022	
Stovepipe #3		**240.00**	**12/12/2020**	**13/12/2021**	
1315-0020	SP_Inst-Cr - KP_493+160_493+280 - (N>S) (120m)	3.00	12/12/2020	15/12/2020	
1315-0050	SP_Inst-Cr - KP_513+560_514+000 - (N>S) (440m)	10.00	16/12/2020	09/01/2021	
1315-0060	SP_Inst-Cr - KP_533+320_533+600 - (N>S) (280m)	6.00	11/01/2021	16/01/2021	
1315-0070	SP_Inst-Cr - KP_544+060_544+280 - (S>N) (220m)	6.00	18/01/2021	23/01/2021	
1315-0080	SP_Inst-Cr - KP_545+340_545+680 - (S>N) (340m)	8.00	25/01/2021	02/02/2021	
1315-0090	SP_Inst-Cr - KP_545+900_546+160 - (S>N) (260m)	6.00	03/02/2021	09/02/2021	
1315-0100	SP_Inst-Cr - KP_546+600_546+860 - (S>N) (260m)	6.00	10/02/2021	23/02/2021	
1315-0170	SP_Inst-Cr - KP_562+940_563+160 - (N>S) (220m)	6.00	24/02/2021	02/03/2021	
1315-0200	SP_Inst-Cr - KP_575+460_576+040 - (N>S) (580m)	14.00	03/03/2021	18/03/2021	
1315-0220	SP_Inst-Cr - KP_582+620_583+060 - (S>N) (440m)	10.00	19/03/2021	30/03/2021	
1315-0320	SP_Inst-Cr - KP_599+460_600+280 - (S>N) (820m)	19.00	31/03/2021	28/05/2021	
1315-0330	SP_Inst-Cr - KP_600+480_601+160 - (S>N) (680m)	17.00	29/05/2021	17/06/2021	
1315-0340	SP_Inst-Cr - KP_601+340_601+600 - (S>N) (260m)	7.00	18/06/2021	25/06/2021	
1315-0350	SP_Inst-Cr - KP_601+860_602+400 - (S>N) (540m)	13.00	26/06/2021	17/07/2021	
1315-0480	SP_Inst-Cr - KP_654+220_655+420 - (S>N) (1200m)	29.00	19/07/2021	27/08/2021	
1315-0490	SP_Inst-Cr - KP_663+840_664+760 - (S>N) (920m)	22.00	28/08/2021	29/09/2021	
1315-0500	SP_Inst-Cr - KP_668+640_669+140 - (S>N) (500m)	12.00	30/09/2021	20/10/2021	

Actual Work
Critical Remaining Work
Milestone
Remaining Work
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DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

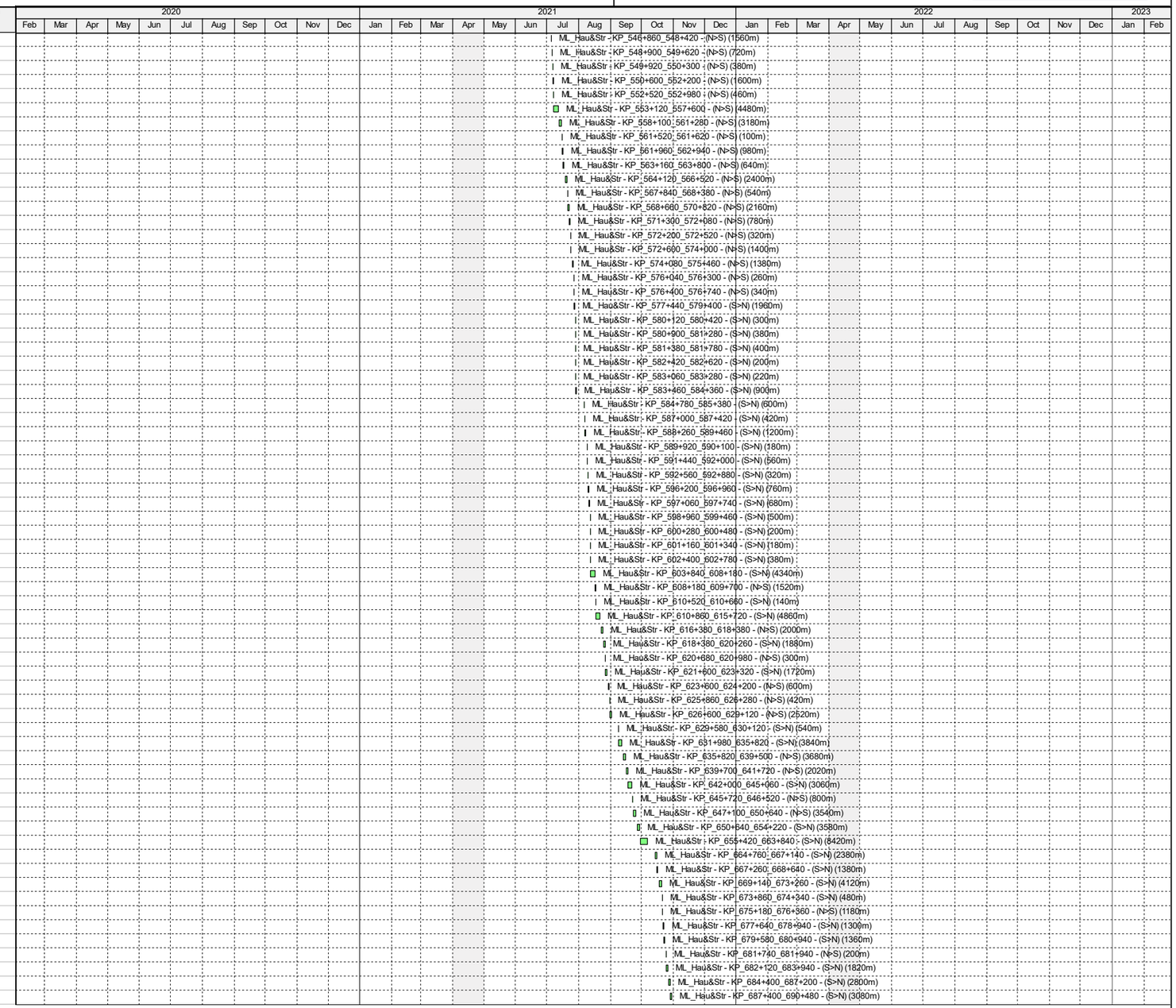
Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1315-0510	SP_Inst-Cr - KP_673+260_673+860 - (S>N) (600m)	15.00	21/10/2021	06/11/2021	
1315-0530	SP_Inst-Cr - KP_676+360_677+640 - (N>S) (1280m)	31.00	08/11/2021	13/12/2021	
Stovepipe #4 from Steep Slope		66.00	18/01/2021	11/05/2021	
1317-0120	SP_Inst-Cr - KP_549+620_549+920 - (N>S) (300m)	7.00	18/01/2021	25/01/2021	
1317-0160	SP_Inst-Cr - KP_561+620_561+960 - (N>S) (340m)	8.00	26/01/2021	03/02/2021	
1317-0190	SP_Inst-Cr - KP_570+820_571+300 - (N>S) (480m)	12.00	10/02/2021	02/03/2021	
1317-0230	SP_Inst-Cr - KP_583+280_583+460 - (S>N) (180m)	5.00	03/03/2021	08/03/2021	
1317-0260	SP_Inst-Cr - KP_587+420_588+260 - (S>N) (840m)	20.00	09/03/2021	31/03/2021	
1317-0280	SP_Inst-Cr - KP_592+000_592+400 - (S>N) (400m)	9.00	01/05/2021	11/05/2021	
Stovepipe #5 from Steep Slope		56.00	10/02/2021	29/05/2021	
1319-0210	SP_Inst-Cr - KP_581+780_582+420 - (S>N) (640m)	16.00	10/02/2021	06/03/2021	
1319-0240	SP_Inst-Cr - KP_584+360_584+780 - (S>N) (420m)	10.00	08/03/2021	18/03/2021	
1319-0310	SP_Inst-Cr - KP_597+740_598+960 - (S>N) (1220m)	30.00	19/03/2021	29/05/2021	
Stovepipe Clean-Up		161.00	15/09/2021	18/05/2022	
1350	SP_CleanUp	161.00	15/09/2021	18/05/2022	
140.Steep Slope		384.00	15/07/2020	03/02/2022	
Steep Slope Crew #1		286.00	23/09/2020	23/11/2021	
1460-000	SS_Inst-Cr - KP_497+220_497+520 - (N>S) (300m)	19.00	23/09/2020	21/10/2020	
1460-005	SS_Inst-Cr - KP_502+200_502+360 - (N>S) (160m)	9.00	22/10/2020	31/10/2020	
1460-010	SS_Inst-Cr - KP_535+980_536+300 - (N>S) (320m)	19.00	02/11/2020	23/11/2020	
1460-015	SS_Inst-Cr - KP_557+600_558+100 - (N>S) (500m)	30.00	24/11/2020	11/01/2021	
1460-020	SS_Inst-Cr - KP_567+120_567+840 - (S>N) (720m)	43.00	13/05/2021	15/07/2021	
1460-025	SS_Inst-Cr - KP_572+080_572+200 - (N>S) (120m)	7.00	16/07/2021	23/07/2021	
1460-030	SS_Inst-Cr - KP_579+400_580+120 - (S>N) (720m)	42.00	24/07/2021	24/09/2021	
1460-035	SS_Inst-Cr - KP_581+280_581+380 - (S>N) (100m)	6.00	25/09/2021	01/10/2021	
1460-040	SS_Inst-Cr - KP_592+400_592+560 - (S>N) (160m)	9.00	02/10/2021	19/10/2021	
1460-045	SS_Inst-Cr - KP_595+960_596+200 - (S>N) (240m)	14.00	20/10/2021	04/11/2021	
1460-050	SS_Inst-Cr - KP_601+600_601+860 - (S>N) (260m)	16.00	05/11/2021	23/11/2021	
Steep Slope Crew #2		304.00	02/10/2020	06/01/2022	
1465-000	SS_Inst-Cr - KP_500+260_500+640 - (S>N) (380m)	22.00	02/10/2020	03/11/2020	
1465-005	SS_Inst-Cr - KP_524+940_525+300 - (N>S) (360m)	21.00	04/11/2020	27/11/2020	
1465-010	SS_Inst-Cr - KP_552+200_552+520 - (N>S) (320m)	19.00	28/11/2020	19/12/2020	
1465-015	SS_Inst-Cr - KP_563+800_564+120 - (N>S) (320m)	19.00	02/06/2021	23/06/2021	
1465-020	SS_Inst-Cr - KP_568+380_568+660 - (N>S) (280m)	17.00	24/06/2021	20/07/2021	
1465-025	SS_Inst-Cr - KP_572+520_572+600 - (N>S) (80m)	5.00	21/07/2021	26/07/2021	
1465-030	SS_Inst-Cr - KP_574+000_574+080 - (N>S) (80m)	5.00	27/07/2021	07/08/2021	
1465-035	SS_Inst-Cr - KP_576+300_576+400 - (N>S) (100m)	6.00	09/08/2021	14/08/2021	
1465-040	SS_Inst-Cr - KP_580+420_580+900 - (S>N) (480m)	28.00	16/08/2021	23/09/2021	
1465-045	SS_Inst-Cr - KP_589+460_589+920 - (S>N) (460m)	26.00	24/09/2021	30/10/2021	
1465-050	SS_Inst-Cr - KP_595+360_595+660 - (S>N) (300m)	18.00	01/11/2021	20/11/2021	
1465-055	SS_Inst-Cr - KP_596+960_597+060 - (S>N) (100m)	6.00	22/11/2021	27/11/2021	
1465-056	SS_Inst-Cr - KP_630+400_630+780 - (N>S) (380m)	22.00	29/11/2021	06/01/2022	
Ditch Breakers		384.00	15/07/2020	03/02/2022	
1470	SS_Ditch Breakers Installation	384.00	15/07/2020	03/02/2022	
150.Mainline		423.00	01/06/2020	04/02/2022	
PB Haul & String		219.00	08/06/2020	31/03/2021	
1499	PB Haul & String	219.00	08/06/2020	31/03/2021	
PB End Prep & Transition		415.00	08/06/2020	02/02/2022	
1520	PB_Transition	415.00	08/06/2020	02/02/2022	
ML Haul & String		127.00	01/05/2021	30/10/2021	
1500	ML Haul & String	127.00	01/05/2021	30/10/2021	
1500-000	ML_Hau&Str - KP_489+180_491+560 - (N>S) (2400m)	3.00	01/05/2021*	04/05/2021	
1500-005	ML_Hau&Str - KP_491+700_492+460 - (N>S) (760m)	1.00	05/05/2021	05/05/2021	
1500-010	ML_Hau&Str - KP_492+860_493+160 - (N>S) (300m)	0.00	06/05/2021	06/05/2021	
1500-015	ML_Hau&Str - KP_493+280_496+660 - (N>S) (3380m)	4.00	06/05/2021	10/05/2021	
1500-020	ML_Hau&Str - KP_499+080_500+260 - (N>S) (1180m)	1.00	11/05/2021	11/05/2021	
1500-025	ML_Hau&Str - KP_500+640_502+200 - (S>N) (1560m)	1.00	12/05/2021	12/05/2021	
1500-030	ML_Hau&Str - KP_502+360_504+420 - (N>S) (2060m)	2.00	13/05/2021	14/05/2021	
1500-035	ML_Hau&Str - KP_504+420_508+200 - (S>N) (3780m)	3.00	15/05/2021	18/05/2021	
1500-040	ML_Hau&Str - KP_508+200_513+560 - (N>S) (5360m)	5.00	19/05/2021	31/05/2021	
1500-045	ML_Hau&Str - KP_514+000_524+940 - (N>S) (10940m)	7.00	01/06/2021	08/06/2021	
1500-050	ML_Hau&Str - KP_525+300_533+320 - (N>S) (8020m)	6.00	09/06/2021	15/06/2021	
1500-055	ML_Hau&Str - KP_533+600_535+980 - (N>S) (2380m)	2.00	16/06/2021	17/06/2021	
1500-060	ML_Hau&Str - KP_536+300_541+860 - (N>S) (5560m)	5.00	18/06/2021	23/06/2021	
1500-065	ML_Hau&Str - KP_541+860_544+060 - (S>N) (2200m)	2.00	24/06/2021	25/06/2021	
1500-070	ML_Hau&Str - KP_544+280_545+340 - (S>N) (1060m)	1.00	26/06/2021	26/06/2021	
1500-075	ML_Hau&Str - KP_545+680_545+900 - (S>N) (220m)	0.00	05/07/2021	05/07/2021	
1500-080	ML_Hau&Str - KP_546+160_546+600 - (S>N) (440m)	0.00	05/07/2021	05/07/2021	

Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1500-085	ML_Hau&Str - KP_546+860_548+420 - (N>S) (1560m)	1.00	05/07/2021	05/07/2021	
1500-090	ML_Hau&Str - KP_548+900_549+620 - (N>S) (720m)	1.00	06/07/2021	06/07/2021	
1500-095	ML_Hau&Str - KP_549+920_550+300 - (N>S) (380m)	0.00	07/07/2021	07/07/2021	
1500-100	ML_Hau&Str - KP_550+600_552+200 - (N>S) (1600m)	1.00	07/07/2021	07/07/2021	
1500-105	ML_Hau&Str - KP_552+520_552+980 - (N>S) (460m)	0.00	08/07/2021	08/07/2021	
1500-110	ML_Hau&Str - KP_553+120_557+600 - (N>S) (4480m)	4.00	08/07/2021	12/07/2021	
1500-115	ML_Hau&Str - KP_558+100_561+280 - (N>S) (3180m)	3.00	13/07/2021	15/07/2021	
1500-120	ML_Hau&Str - KP_561+520_561+620 - (N>S) (100m)	0.00	16/07/2021	16/07/2021	
1500-125	ML_Hau&Str - KP_561+960_562+940 - (N>S) (980m)	1.00	16/07/2021	16/07/2021	
1500-130	ML_Hau&Str - KP_563+160_563+800 - (N>S) (640m)	1.00	17/07/2021	17/07/2021	
1500-135	ML_Hau&Str - KP_564+120_566+520 - (N>S) (2400m)	2.00	19/07/2021	20/07/2021	
1500-140	ML_Hau&Str - KP_567+840_568+380 - (N>S) (540m)	0.00	21/07/2021	21/07/2021	
1500-145	ML_Hau&Str - KP_568+660_570+820 - (N>S) (2160m)	2.00	21/07/2021	22/07/2021	
1500-150	ML_Hau&Str - KP_571+300_572+080 - (N>S) (780m)	1.00	23/07/2021	23/07/2021	
1500-155	ML_Hau&Str - KP_572+200_572+520 - (N>S) (320m)	0.00	24/07/2021	24/07/2021	
1500-160	ML_Hau&Str - KP_572+600_574+000 - (N>S) (1400m)	1.00	24/07/2021	24/07/2021	
1500-165	ML_Hau&Str - KP_574+080_575+460 - (N>S) (1380m)	1.00	26/07/2021	26/07/2021	
1500-170	ML_Hau&Str - KP_576+040_576+300 - (N>S) (260m)	0.00	27/07/2021	27/07/2021	
1500-175	ML_Hau&Str - KP_576+400_576+740 - (N>S) (340m)	0.00	27/07/2021	27/07/2021	
1500-180	ML_Hau&Str - KP_577+440_579+400 - (S>N) (1960m)	2.00	27/07/2021	28/07/2021	
1500-185	ML_Hau&Str - KP_580+120_580+420 - (S>N) (300m)	0.00	29/07/2021	29/07/2021	
1500-190	ML_Hau&Str - KP_580+900_581+280 - (S>N) (380m)	0.00	29/07/2021	29/07/2021	
1500-195	ML_Hau&Str - KP_581+380_581+780 - (S>N) (400m)	0.00	29/07/2021	29/07/2021	
1500-200	ML_Hau&Str - KP_582+420_582+620 - (S>N) (200m)	0.00	29/07/2021	29/07/2021	
1500-205	ML_Hau&Str - KP_583+060_583+280 - (S>N) (220m)	0.00	29/07/2021	29/07/2021	
1500-210	ML_Hau&Str - KP_583+460_584+360 - (S>N) (900m)	1.00	29/07/2021	29/07/2021	
1500-215	ML_Hau&Str - KP_584+780_585+380 - (S>N) (600m)	1.00	06/08/2021	06/08/2021	
1500-220	ML_Hau&Str - KP_587+000_587+420 - (S>N) (420m)	0.00	07/08/2021	07/08/2021	
1500-225	ML_Hau&Str - KP_588+260_589+460 - (S>N) (1200m)	1.00	07/08/2021	07/08/2021	
1500-230	ML_Hau&Str - KP_589+920_590+100 - (S>N) (180m)	0.00	09/08/2021	09/08/2021	
1500-235	ML_Hau&Str - KP_591+440_592+000 - (S>N) (560m)	1.00	09/08/2021	09/08/2021	
1500-240	ML_Hau&Str - KP_592+560_592+880 - (S>N) (320m)	0.00	10/08/2021	10/08/2021	
1500-245	ML_Hau&Str - KP_596+200_596+960 - (S>N) (760m)	1.00	10/08/2021	10/08/2021	
1500-250	ML_Hau&Str - KP_597+060_597+740 - (S>N) (680m)	1.00	11/08/2021	11/08/2021	
1500-255	ML_Hau&Str - KP_598+960_599+460 - (S>N) (500m)	0.00	12/08/2021	12/08/2021	
1500-260	ML_Hau&Str - KP_600+280_600+480 - (S>N) (200m)	0.00	12/08/2021	12/08/2021	
1500-265	ML_Hau&Str - KP_601+160_601+340 - (S>N) (180m)	0.00	12/08/2021	12/08/2021	
1500-270	ML_Hau&Str - KP_602+400_602+780 - (S>N) (380m)	0.00	12/08/2021	12/08/2021	
1500-275	ML_Hau&Str - KP_603+840_608+180 - (S>N) (4340m)	4.00	12/08/2021	16/08/2021	
1500-280	ML_Hau&Str - KP_608+180_609+700 - (N>S) (1520m)	1.00	17/08/2021	17/08/2021	
1500-285	ML_Hau&Str - KP_610+520_610+660 - (S>N) (140m)	0.00	18/08/2021	18/08/2021	
1500-290	ML_Hau&Str - KP_610+860_615+720 - (S>N) (4860m)	4.00	18/08/2021	21/08/2021	
1500-295	ML_Hau&Str - KP_616+380_618+380 - (N>S) (2000m)	2.00	23/08/2021	24/08/2021	
1500-300	ML_Hau&Str - KP_618+380_620+260 - (S>N) (1880m)	2.00	25/08/2021	26/08/2021	
1500-305	ML_Hau&Str - KP_620+680_620+980 - (N>S) (300m)	0.00	27/08/2021	27/08/2021	
1500-310	ML_Hau&Str - KP_621+600_623+320 - (S>N) (1720m)	2.00	27/08/2021	28/08/2021	
1500-315	ML_Hau&Str - KP_623+600_624+200 - (N>S) (600m)	1.00	30/08/2021	30/08/2021	
1500-320	ML_Hau&Str - KP_625+860_626+280 - (N>S) (420m)	0.00	31/08/2021	31/08/2021	
1500-325	ML_Hau&Str - KP_626+600_629+120 - (N>S) (2520m)	2.00	31/08/2021	01/09/2021	
1500-330	ML_Hau&Str - KP_629+580_630+120 - (S>N) (540m)	0.00	09/09/2021	09/09/2021	
1500-335	ML_Hau&Str - KP_631+980_635+820 - (S>N) (3840m)	3.00	09/09/2021	11/09/2021	
1500-340	ML_Hau&Str - KP_635+820_639+500 - (N>S) (3680m)	3.00	13/09/2021	15/09/2021	
1500-345	ML_Hau&Str - KP_639+700_641+720 - (N>S) (2020m)	2.00	16/09/2021	17/09/2021	
1500-350	ML_Hau&Str - KP_642+000_645+060 - (S>N) (3060m)	3.00	18/09/2021	21/09/2021	
1500-355	ML_Hau&Str - KP_645+720_646+520 - (N>S) (800m)	1.00	22/09/2021	22/09/2021	
1500-360	ML_Hau&Str - KP_647+100_650+640 - (N>S) (3540m)	3.00	23/09/2021	25/09/2021	
1500-365	ML_Hau&Str - KP_650+640_654+220 - (S>N) (3580m)	3.00	27/09/2021	29/09/2021	
1500-370	ML_Hau&Str - KP_655+420_663+840 - (S>N) (8420m)	6.00	30/09/2021	06/10/2021	
1500-375	ML_Hau&Str - KP_664+760_667+140 - (S>N) (2380m)	2.00	14/10/2021	15/10/2021	
1500-380	ML_Hau&Str - KP_667+260_668+640 - (S>N) (1380m)	1.00	16/10/2021	16/10/2021	
1500-385	ML_Hau&Str - KP_669+140_673+260 - (S>N) (4120m)	3.00	18/10/2021	20/10/2021	
1500-390	ML_Hau&Str - KP_673+860_674+340 - (S>N) (480m)	0.00	21/10/2021	21/10/2021	
1500-395	ML_Hau&Str - KP_675+180_676+360 - (N>S) (1180m)	1.00	21/10/2021	21/10/2021	
1500-400	ML_Hau&Str - KP_677+640_678+940 - (S>N) (1300m)	1.00	22/10/2021	22/10/2021	
1500-405	ML_Hau&Str - KP_679+580_680+940 - (S>N) (1360m)	1.00	23/10/2021	23/10/2021	
1500-410	ML_Hau&Str - KP_681+740_681+940 - (N>S) (200m)	0.00	25/10/2021	25/10/2021	
1500-415	ML_Hau&Str - KP_682+120_683+940 - (S>N) (1820m)	2.00	25/10/2021	26/10/2021	
1500-420	ML_Hau&Str - KP_684+400_687+200 - (S>N) (2800m)	2.00	27/10/2021	28/10/2021	
1500-425	ML_Hau&Str - KP_687+400_690+480 - (S>N) (3080m)	2.00	29/10/2021	30/10/2021	

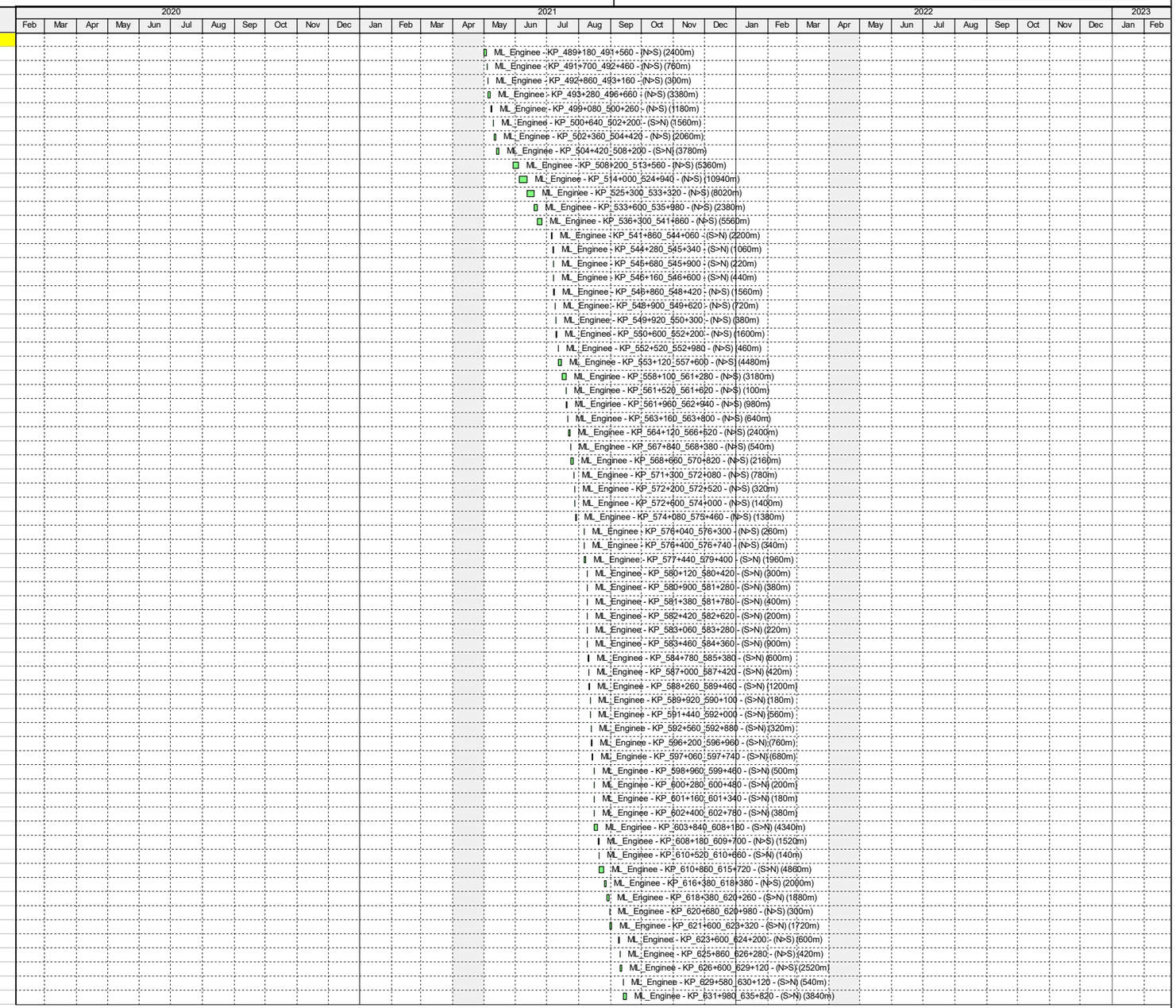


Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
ML Engineering		132.00	01/05/2021	05/11/2021	
1505-000	ML_Enginee - KP_489+180_491+560 - (N>S) (2400m)	2.00	01/05/2021	03/05/2021	
1505-005	ML_Enginee - KP_491+700_492+460 - (N>S) (760m)	1.00	04/05/2021	04/05/2021	
1505-010	ML_Enginee - KP_492+860_493+160 - (N>S) (300m)	0.00	05/05/2021	05/05/2021	
1505-015	ML_Enginee - KP_493+280_496+660 - (N>S) (3380m)	3.00	05/05/2021	07/05/2021	
1505-020	ML_Enginee - KP_499+080_500+260 - (N>S) (1180m)	1.00	08/05/2021	08/05/2021	
1505-025	ML_Enginee - KP_500+640_502+200 - (S>N) (1560m)	1.00	10/05/2021	10/05/2021	
1505-030	ML_Enginee - KP_502+360_504+420 - (N>S) (2060m)	2.00	11/05/2021	12/05/2021	
1505-035	ML_Enginee - KP_504+420_508+200 - (S>N) (3780m)	3.00	13/05/2021	15/05/2021	
1505-040	ML_Enginee - KP_508+200_513+560 - (N>S) (5360m)	5.00	29/05/2021	03/06/2021	
1505-045	ML_Enginee - KP_514+000_524+940 - (N>S) (10940m)	7.00	04/06/2021	11/06/2021	
1505-050	ML_Enginee - KP_525+300_533+320 - (N>S) (8020m)	6.00	12/06/2021	18/06/2021	
1505-055	ML_Enginee - KP_533+600_535+980 - (N>S) (2380m)	2.00	19/06/2021	21/06/2021	
1505-060	ML_Enginee - KP_536+300_541+860 - (N>S) (5560m)	5.00	22/06/2021	26/06/2021	
1505-065	ML_Enginee - KP_541+860_544+060 - (S>N) (2200m)	2.00	05/07/2021	06/07/2021	
1505-070	ML_Enginee - KP_544+280_545+340 - (S>N) (1060m)	1.00	07/07/2021	07/07/2021	
1505-075	ML_Enginee - KP_545+680_545+900 - (S>N) (220m)	0.00	08/07/2021	08/07/2021	
1505-080	ML_Enginee - KP_546+160_546+600 - (S>N) (440m)	0.00	08/07/2021	08/07/2021	
1505-085	ML_Enginee - KP_546+860_548+420 - (N>S) (1560m)	1.00	08/07/2021	08/07/2021	
1505-090	ML_Enginee - KP_548+900_549+620 - (N>S) (720m)	1.00	09/07/2021	09/07/2021	
1505-095	ML_Enginee - KP_549+920_550+300 - (N>S) (380m)	0.00	10/07/2021	10/07/2021	
1505-100	ML_Enginee - KP_550+600_552+200 - (N>S) (1600m)	1.00	10/07/2021	10/07/2021	
1505-105	ML_Enginee - KP_552+520_552+980 - (N>S) (460m)	0.00	12/07/2021	12/07/2021	
1505-110	ML_Enginee - KP_553+120_557+600 - (N>S) (4480m)	4.00	12/07/2021	15/07/2021	
1505-115	ML_Enginee - KP_558+100_561+280 - (N>S) (3180m)	3.00	16/07/2021	19/07/2021	
1505-120	ML_Enginee - KP_561+520_561+620 - (N>S) (100m)	0.00	20/07/2021	20/07/2021	
1505-125	ML_Enginee - KP_561+960_562+940 - (N>S) (980m)	1.00	20/07/2021	20/07/2021	
1505-130	ML_Enginee - KP_563+160_563+800 - (N>S) (640m)	1.00	21/07/2021	21/07/2021	
1505-135	ML_Enginee - KP_564+120_566+520 - (N>S) (2400m)	2.00	22/07/2021	23/07/2021	
1505-140	ML_Enginee - KP_567+840_568+380 - (N>S) (540m)	0.00	24/07/2021	24/07/2021	
1505-145	ML_Enginee - KP_568+660_570+820 - (N>S) (2160m)	2.00	24/07/2021	26/07/2021	
1505-150	ML_Enginee - KP_571+300_572+080 - (N>S) (780m)	1.00	27/07/2021	27/07/2021	
1505-155	ML_Enginee - KP_572+200_572+520 - (N>S) (320m)	0.00	28/07/2021	28/07/2021	
1505-160	ML_Enginee - KP_572+600_574+000 - (N>S) (1400m)	1.00	28/07/2021	28/07/2021	
1505-165	ML_Enginee - KP_574+080_575+460 - (N>S) (1380m)	1.00	29/07/2021	29/07/2021	
1505-170	ML_Enginee - KP_576+040_576+300 - (N>S) (260m)	0.00	06/08/2021	06/08/2021	
1505-175	ML_Enginee - KP_576+400_576+740 - (N>S) (340m)	0.00	06/08/2021	06/08/2021	
1505-180	ML_Enginee - KP_577+440_579+400 - (S>N) (1960m)	2.00	06/08/2021	07/08/2021	
1505-185	ML_Enginee - KP_580+120_580+420 - (S>N) (300m)	0.00	09/08/2021	09/08/2021	
1505-190	ML_Enginee - KP_580+900_581+280 - (S>N) (380m)	0.00	09/08/2021	09/08/2021	
1505-195	ML_Enginee - KP_581+380_581+780 - (S>N) (400m)	0.00	09/08/2021	09/08/2021	
1505-200	ML_Enginee - KP_582+420_582+620 - (S>N) (200m)	0.00	09/08/2021	09/08/2021	
1505-205	ML_Enginee - KP_583+060_583+280 - (S>N) (220m)	0.00	09/08/2021	09/08/2021	
1505-210	ML_Enginee - KP_583+460_584+360 - (S>N) (900m)	1.00	09/08/2021	09/08/2021	
1505-215	ML_Enginee - KP_584+780_585+380 - (S>N) (600m)	1.00	10/08/2021	10/08/2021	
1505-220	ML_Enginee - KP_587+000_587+420 - (S>N) (420m)	0.00	11/08/2021	11/08/2021	
1505-225	ML_Enginee - KP_588+260_589+460 - (S>N) (1200m)	1.00	11/08/2021	11/08/2021	
1505-230	ML_Enginee - KP_589+920_590+100 - (S>N) (180m)	0.00	12/08/2021	12/08/2021	
1505-235	ML_Enginee - KP_591+440_592+000 - (S>N) (560m)	1.00	12/08/2021	12/08/2021	
1505-240	ML_Enginee - KP_592+560_592+880 - (S>N) (320m)	0.00	13/08/2021	13/08/2021	
1505-245	ML_Enginee - KP_596+200_596+960 - (S>N) (760m)	1.00	13/08/2021	13/08/2021	
1505-250	ML_Enginee - KP_597+060_597+740 - (S>N) (680m)	1.00	14/08/2021	14/08/2021	
1505-255	ML_Enginee - KP_598+960_599+460 - (S>N) (500m)	0.00	16/08/2021	16/08/2021	
1505-260	ML_Enginee - KP_600+280_600+480 - (S>N) (200m)	0.00	16/08/2021	16/08/2021	
1505-265	ML_Enginee - KP_601+160_601+340 - (S>N) (180m)	0.00	16/08/2021	16/08/2021	
1505-270	ML_Enginee - KP_602+400_602+780 - (S>N) (380m)	0.00	16/08/2021	16/08/2021	
1505-275	ML_Enginee - KP_603+840_608+180 - (S>N) (4340m)	4.00	16/08/2021	19/08/2021	
1505-280	ML_Enginee - KP_608+180_609+700 - (N>S) (1520m)	1.00	20/08/2021	20/08/2021	
1505-285	ML_Enginee - KP_610+520_610+660 - (S>N) (140m)	0.00	21/08/2021	21/08/2021	
1505-290	ML_Enginee - KP_610+860_615+720 - (S>N) (4860m)	4.00	21/08/2021	25/08/2021	
1505-295	ML_Enginee - KP_616+380_618+380 - (N>S) (2000m)	2.00	26/08/2021	27/08/2021	
1505-300	ML_Enginee - KP_618+380_620+260 - (S>N) (1880m)	2.00	28/08/2021	30/08/2021	
1505-305	ML_Enginee - KP_620+680_620+980 - (N>S) (300m)	0.00	31/08/2021	31/08/2021	
1505-310	ML_Enginee - KP_621+600_623+320 - (S>N) (1720m)	2.00	31/08/2021	01/09/2021	
1505-315	ML_Enginee - KP_623+600_624+200 - (N>S) (600m)	1.00	09/09/2021	09/09/2021	
1505-320	ML_Enginee - KP_625+860_626+280 - (N>S) (420m)	0.00	10/09/2021	10/09/2021	
1505-325	ML_Enginee - KP_626+600_629+120 - (N>S) (2520m)	2.00	10/09/2021	11/09/2021	
1505-330	ML_Enginee - KP_629+580_630+120 - (S>N) (540m)	0.00	13/09/2021	13/09/2021	
1505-335	ML_Enginee - KP_631+980_635+820 - (S>N) (3840m)	4.00	13/09/2021	16/09/2021	



Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
◆ Milestone

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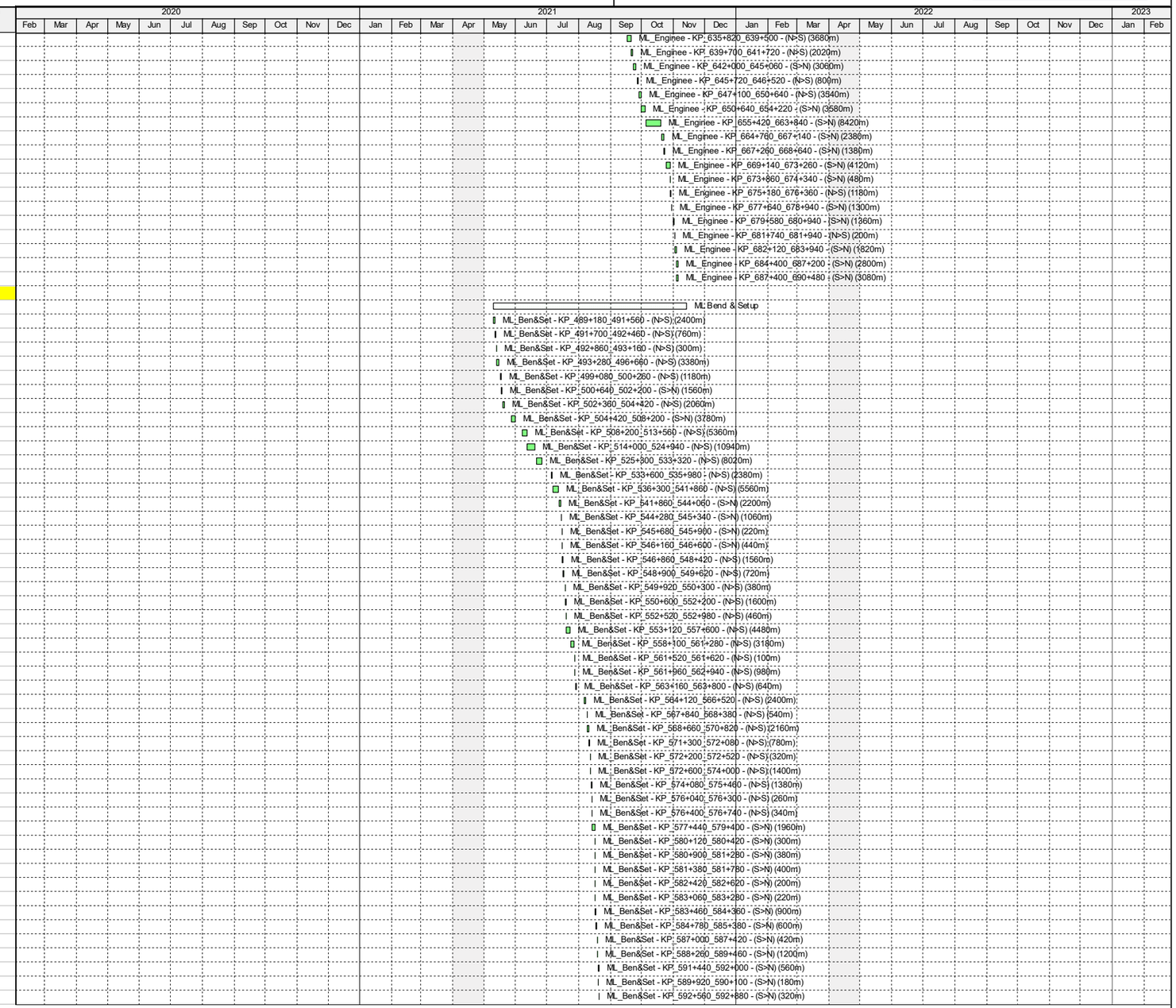
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1505-340	ML_Enginee - KP_635+820_639+500 - (N>S) (3680m)	3.00	17/09/2021	20/09/2021	
1505-345	ML_Enginee - KP_639+700_641+720 - (N>S) (2020m)	2.00	21/09/2021	22/09/2021	
1505-350	ML_Enginee - KP_642+000_645+060 - (S>N) (3060m)	3.00	23/09/2021	25/09/2021	
1505-355	ML_Enginee - KP_645+720_646+520 - (N>S) (800m)	1.00	27/09/2021	27/09/2021	
1505-360	ML_Enginee - KP_647+100_650+640 - (N>S) (3540m)	3.00	28/09/2021	30/09/2021	
1505-365	ML_Enginee - KP_650+640_654+220 - (S>N) (3580m)	3.00	01/10/2021	04/10/2021	
1505-370	ML_Enginee - KP_655+420_663+840 - (S>N) (8420m)	7.00	05/10/2021	19/10/2021	
1505-375	ML_Enginee - KP_664+760_667+140 - (S>N) (2380m)	3.00	20/10/2021	22/10/2021	
1505-380	ML_Enginee - KP_667+260_668+640 - (S>N) (1380m)	1.00	23/10/2021	23/10/2021	
1505-385	ML_Enginee - KP_669+140_673+260 - (S>N) (4120m)	4.00	25/10/2021	28/10/2021	
1505-390	ML_Enginee - KP_673+860_674+340 - (S>N) (480m)	0.00	29/10/2021	29/10/2021	
1505-395	ML_Enginee - KP_675+180_676+360 - (N>S) (1180m)	1.00	29/10/2021	29/10/2021	
1505-400	ML_Enginee - KP_677+640_678+940 - (S>N) (1300m)	1.00	30/10/2021	30/10/2021	
1505-405	ML_Enginee - KP_679+580_680+940 - (S>N) (1360m)	1.00	01/11/2021	01/11/2021	
1505-410	ML_Enginee - KP_681+740_681+940 - (N>S) (200m)	0.00	02/11/2021	02/11/2021	
1505-415	ML_Enginee - KP_682+120_683+940 - (S>N) (1820m)	2.00	02/11/2021	03/11/2021	
1505-420	ML_Enginee - KP_684+400_687+200 - (S>N) (2800m)	2.00	04/11/2021	05/11/2021	
1505-425	ML_Enginee - KP_687+400_690+480 - (S>N) (3080m)	2.00	04/11/2021	05/11/2021	
ML Bend & Setup		132.00	10/05/2021	13/11/2021	
1510	ML Bend & Setup	132.00	10/05/2021	13/11/2021	
1510-000	ML_Ben&Set - KP_489+180_491+560 - (N>S) (2400m)	2.00	10/05/2021	11/05/2021	
1510-005	ML_Ben&Set - KP_491+700_492+460 - (N>S) (760m)	1.00	12/05/2021	12/05/2021	
1510-010	ML_Ben&Set - KP_492+860_493+160 - (N>S) (300m)	0.00	13/05/2021	13/05/2021	
1510-015	ML_Ben&Set - KP_493+280_496+660 - (N>S) (3380m)	3.00	13/05/2021	15/05/2021	
1510-020	ML_Ben&Set - KP_499+080_500+260 - (N>S) (1180m)	1.00	17/05/2021	17/05/2021	
1510-025	ML_Ben&Set - KP_500+640_502+200 - (S>N) (1560m)	1.00	18/05/2021	18/05/2021	
1510-030	ML_Ben&Set - KP_502+360_504+420 - (N>S) (2060m)	2.00	19/05/2021	20/05/2021	
1510-035	ML_Ben&Set - KP_504+420_508+200 - (S>N) (3780m)	3.00	28/05/2021	31/05/2021	
1510-040	ML_Ben&Set - KP_508+200_513+560 - (N>S) (5360m)	5.00	07/06/2021	11/06/2021	
1510-045	ML_Ben&Set - KP_514+000_524+940 - (N>S) (10940m)	7.00	12/06/2021	19/06/2021	
1510-050	ML_Ben&Set - KP_525+300_533+320 - (N>S) (8020m)	6.00	21/06/2021	26/06/2021	
1510-055	ML_Ben&Set - KP_533+600_535+980 - (N>S) (2380m)	2.00	05/07/2021	06/07/2021	
1510-060	ML_Ben&Set - KP_536+300_541+860 - (N>S) (5560m)	5.00	07/07/2021	12/07/2021	
1510-065	ML_Ben&Set - KP_541+860_544+060 - (S>N) (2200m)	2.00	13/07/2021	14/07/2021	
1510-070	ML_Ben&Set - KP_544+280_545+340 - (S>N) (1060m)	1.00	15/07/2021	15/07/2021	
1510-075	ML_Ben&Set - KP_545+680_545+900 - (S>N) (220m)	0.00	16/07/2021	16/07/2021	
1510-080	ML_Ben&Set - KP_546+160_546+600 - (S>N) (440m)	0.00	16/07/2021	16/07/2021	
1510-085	ML_Ben&Set - KP_546+860_548+420 - (N>S) (1560m)	1.00	16/07/2021	16/07/2021	
1510-090	ML_Ben&Set - KP_548+900_549+620 - (N>S) (720m)	1.00	17/07/2021	17/07/2021	
1510-095	ML_Ben&Set - KP_549+920_550+300 - (N>S) (380m)	0.00	19/07/2021	19/07/2021	
1510-100	ML_Ben&Set - KP_550+600_552+200 - (N>S) (1600m)	1.00	19/07/2021	19/07/2021	
1510-105	ML_Ben&Set - KP_552+520_552+980 - (N>S) (460m)	0.00	20/07/2021	20/07/2021	
1510-110	ML_Ben&Set - KP_553+120_557+600 - (N>S) (4480m)	4.00	20/07/2021	23/07/2021	
1510-115	ML_Ben&Set - KP_558+100_561+280 - (N>S) (3180m)	3.00	24/07/2021	27/07/2021	
1510-120	ML_Ben&Set - KP_561+520_561+620 - (N>S) (100m)	0.00	28/07/2021	28/07/2021	
1510-125	ML_Ben&Set - KP_561+960_562+940 - (N>S) (980m)	1.00	28/07/2021	28/07/2021	
1510-130	ML_Ben&Set - KP_563+160_563+800 - (N>S) (640m)	1.00	29/07/2021	29/07/2021	
1510-135	ML_Ben&Set - KP_564+120_566+520 - (N>S) (2400m)	2.00	06/08/2021	07/08/2021	
1510-140	ML_Ben&Set - KP_567+840_568+380 - (N>S) (540m)	0.00	09/08/2021	09/08/2021	
1510-145	ML_Ben&Set - KP_568+660_570+820 - (N>S) (2160m)	2.00	09/08/2021	10/08/2021	
1510-150	ML_Ben&Set - KP_571+300_572+080 - (N>S) (780m)	1.00	11/08/2021	11/08/2021	
1510-155	ML_Ben&Set - KP_572+200_572+520 - (N>S) (320m)	0.00	12/08/2021	12/08/2021	
1510-160	ML_Ben&Set - KP_572+600_574+000 - (N>S) (1400m)	1.00	12/08/2021	12/08/2021	
1510-165	ML_Ben&Set - KP_574+080_575+460 - (N>S) (1380m)	1.00	13/08/2021	13/08/2021	
1510-170	ML_Ben&Set - KP_576+040_576+300 - (N>S) (260m)	0.00	14/08/2021	14/08/2021	
1510-175	ML_Ben&Set - KP_576+400_576+740 - (N>S) (340m)	0.00	14/08/2021	14/08/2021	
1510-180	ML_Ben&Set - KP_577+440_579+400 - (S>N) (1960m)	2.00	14/08/2021	16/08/2021	
1510-185	ML_Ben&Set - KP_580+120_580+420 - (S>N) (300m)	0.00	17/08/2021	17/08/2021	
1510-190	ML_Ben&Set - KP_580+900_581+280 - (S>N) (380m)	0.00	17/08/2021	17/08/2021	
1510-195	ML_Ben&Set - KP_581+380_581+780 - (S>N) (400m)	0.00	17/08/2021	17/08/2021	
1510-200	ML_Ben&Set - KP_582+420_582+620 - (S>N) (200m)	0.00	17/08/2021	17/08/2021	
1510-205	ML_Ben&Set - KP_583+060_583+280 - (S>N) (220m)	0.00	17/08/2021	17/08/2021	
1510-210	ML_Ben&Set - KP_583+460_584+360 - (S>N) (900m)	1.00	17/08/2021	17/08/2021	
1510-215	ML_Ben&Set - KP_584+780_585+380 - (S>N) (600m)	1.00	18/08/2021	18/08/2021	
1510-220	ML_Ben&Set - KP_587+000_587+420 - (S>N) (420m)	0.00	19/08/2021	19/08/2021	
1510-225	ML_Ben&Set - KP_588+260_589+460 - (S>N) (1200m)	1.00	19/08/2021	19/08/2021	
1510-235	ML_Ben&Set - KP_591+440_592+000 - (S>N) (560m)	1.00	20/08/2021	20/08/2021	
1510-230	ML_Ben&Set - KP_589+920_590+100 - (S>N) (180m)	0.00	20/08/2021	20/08/2021	
1510-240	ML_Ben&Set - KP_592+560_592+880 - (S>N) (320m)	0.00	21/08/2021	21/08/2021	



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Remaining Level of Effort

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TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

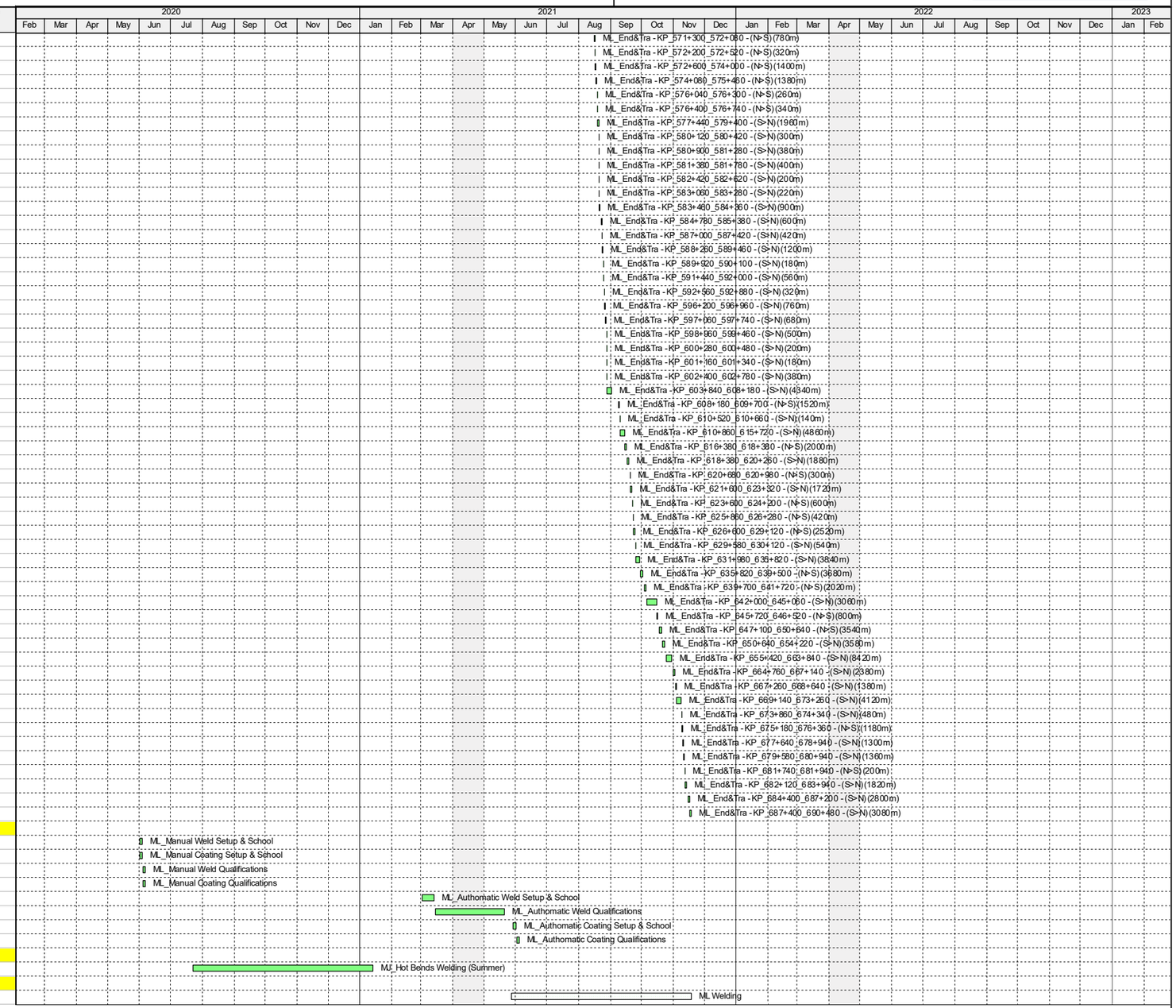
Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1510-245	ML_Ben&Set - KP_596+200_596+960 - (S>N) (760m)	1.00	21/08/2021	21/08/2021	
1510-250	ML_Ben&Set - KP_597+060_597+740 - (S>N) (680m)	1.00	23/08/2021	23/08/2021	
1510-255	ML_Ben&Set - KP_598+960_599+460 - (S>N) (500m)	0.00	24/08/2021	24/08/2021	
1510-260	ML_Ben&Set - KP_600+280_600+480 - (S>N) (200m)	0.00	24/08/2021	24/08/2021	
1510-265	ML_Ben&Set - KP_601+160_601+340 - (S>N) (180m)	0.00	24/08/2021	24/08/2021	
1510-270	ML_Ben&Set - KP_602+400_602+780 - (S>N) (380m)	0.00	24/08/2021	24/08/2021	
1510-275	ML_Ben&Set - KP_603+840_608+180 - (S>N) (4340m)	4.00	24/08/2021	27/08/2021	
1510-280	ML_Ben&Set - KP_608+180_609+700 - (N>S) (1520m)	1.00	28/08/2021	28/08/2021	
1510-285	ML_Ben&Set - KP_610+520_610+660 - (S>N) (140m)	0.00	30/08/2021	30/08/2021	
1510-290	ML_Ben&Set - KP_610+860_615+720 - (S>N) (4860m)	4.00	30/08/2021	09/09/2021	
1510-295	ML_Ben&Set - KP_616+380_618+380 - (N>S) (2000m)	2.00	10/09/2021	11/09/2021	
1510-300	ML_Ben&Set - KP_618+380_620+260 - (S>N) (1880m)	2.00	13/09/2021	14/09/2021	
1510-305	ML_Ben&Set - KP_620+680_620+980 - (N>S) (300m)	0.00	15/09/2021	15/09/2021	
1510-310	ML_Ben&Set - KP_621+600_623+320 - (S>N) (1720m)	2.00	15/09/2021	16/09/2021	
1510-315	ML_Ben&Set - KP_623+600_624+200 - (N>S) (600m)	1.00	17/09/2021	17/09/2021	
1510-320	ML_Ben&Set - KP_625+860_626+280 - (N>S) (420m)	0.00	18/09/2021	18/09/2021	
1510-325	ML_Ben&Set - KP_626+600_629+120 - (N>S) (2520m)	2.00	18/09/2021	20/09/2021	
1510-330	ML_Ben&Set - KP_629+580_630+120 - (S>N) (540m)	0.00	21/09/2021	21/09/2021	
1510-335	ML_Ben&Set - KP_631+980_635+820 - (S>N) (3840m)	4.00	21/09/2021	24/09/2021	
1510-340	ML_Ben&Set - KP_635+820_639+500 - (N>S) (3680m)	3.00	25/09/2021	28/09/2021	
1510-345	ML_Ben&Set - KP_639+700_641+720 - (N>S) (2020m)	2.00	29/09/2021	30/09/2021	
1510-350	ML_Ben&Set - KP_642+000_645+060 - (S>N) (3060m)	3.00	01/10/2021	04/10/2021	
1510-355	ML_Ben&Set - KP_645+720_646+520 - (N>S) (800m)	1.00	05/10/2021	05/10/2021	
1510-360	ML_Ben&Set - KP_647+100_650+640 - (N>S) (3540m)	3.00	06/10/2021	15/10/2021	
1510-365	ML_Ben&Set - KP_650+640_654+220 - (S>N) (3580m)	3.00	16/10/2021	19/10/2021	
1510-370	ML_Ben&Set - KP_655+420_663+840 - (S>N) (8420m)	6.00	20/10/2021	26/10/2021	
1510-375	ML_Ben&Set - KP_664+760_667+140 - (S>N) (2380m)	2.00	27/10/2021	28/10/2021	
1510-380	ML_Ben&Set - KP_667+260_668+640 - (S>N) (1380m)	1.00	29/10/2021	29/10/2021	
1510-385	ML_Ben&Set - KP_669+140_673+260 - (S>N) (4120m)	4.00	30/10/2021	03/11/2021	
1510-390	ML_Ben&Set - KP_673+860_674+340 - (S>N) (480m)	0.00	04/11/2021	04/11/2021	
1510-395	ML_Ben&Set - KP_675+180_676+360 - (N>S) (1180m)	1.00	04/11/2021	04/11/2021	
1510-400	ML_Ben&Set - KP_677+640_678+940 - (S>N) (1300m)	1.00	05/11/2021	05/11/2021	
1510-405	ML_Ben&Set - KP_679+580_680+940 - (S>N) (1360m)	1.00	06/11/2021	06/11/2021	
1510-410	ML_Ben&Set - KP_681+740_681+940 - (N>S) (200m)	0.00	08/11/2021	08/11/2021	
1510-415	ML_Ben&Set - KP_682+120_683+940 - (S>N) (1820m)	2.00	08/11/2021	09/11/2021	
1510-420	ML_Ben&Set - KP_684+400_687+200 - (S>N) (2800m)	2.00	10/11/2021	11/11/2021	
1510-425	ML_Ben&Set - KP_687+400_690+480 - (S>N) (3080m)	2.00	12/11/2021	13/11/2021	
ML End Prep & Transition		**132.00**	**14/05/2021**	**18/11/2021**	
1525	ML End Prep & Transition	132.00	14/05/2021	18/11/2021	
1525-000	ML_End&Tra - KP_489+180_491+560 - (N>S) (2400m)	2.00	14/05/2021*	15/05/2021	
1525-005	ML_End&Tra - KP_491+700_492+460 - (N>S) (760m)	1.00	17/05/2021	17/05/2021	
1525-010	ML_End&Tra - KP_492+860_493+160 - (N>S) (300m)	0.00	18/05/2021	18/05/2021	
1525-015	ML_End&Tra - KP_493+280_496+660 - (N>S) (3380m)	3.00	18/05/2021	20/05/2021	
1525-020	ML_End&Tra - KP_499+080_500+260 - (N>S) (1180m)	1.00	28/05/2021	28/05/2021	
1525-025	ML_End&Tra - KP_500+640_502+200 - (S>N) (1560m)	1.00	29/05/2021	29/05/2021	
1525-030	ML_End&Tra - KP_502+360_504+420 - (N>S) (2060m)	2.00	31/05/2021	01/06/2021	
1525-035	ML_End&Tra - KP_504+420_508+200 - (S>N) (3780m)	3.00	02/06/2021	04/06/2021	
1525-040	ML_End&Tra - KP_508+200_513+560 - (N>S) (5360m)	5.00	11/06/2021	16/06/2021	
1525-045	ML_End&Tra - KP_514+000_524+940 - (N>S) (10940m)	7.00	17/06/2021	24/06/2021	
1525-050	ML_End&Tra - KP_525+300_533+320 - (N>S) (8020m)	6.00	25/06/2021	08/07/2021	
1525-055	ML_End&Tra - KP_533+600_535+980 - (N>S) (2380m)	2.00	09/07/2021	10/07/2021	
1525-060	ML_End&Tra - KP_536+300_541+860 - (N>S) (5560m)	5.00	12/07/2021	16/07/2021	
1525-065	ML_End&Tra - KP_541+860_544+060 - (S>N) (2200m)	2.00	17/07/2021	19/07/2021	
1525-070	ML_End&Tra - KP_544+280_545+340 - (S>N) (1060m)	1.00	20/07/2021	20/07/2021	
1525-075	ML_End&Tra - KP_545+680_545+900 - (S>N) (220m)	0.00	21/07/2021	21/07/2021	
1525-080	ML_End&Tra - KP_546+160_546+600 - (S>N) (440m)	0.00	21/07/2021	21/07/2021	
1525-085	ML_End&Tra - KP_546+860_548+420 - (N>S) (1560m)	1.00	21/07/2021	21/07/2021	
1525-090	ML_End&Tra - KP_548+900_549+620 - (N>S) (720m)	1.00	22/07/2021	22/07/2021	
1525-095	ML_End&Tra - KP_549+920_550+300 - (N>S) (380m)	0.00	23/07/2021	23/07/2021	
1525-100	ML_End&Tra - KP_550+600_552+200 - (N>S) (1600m)	1.00	23/07/2021	23/07/2021	
1525-105	ML_End&Tra - KP_552+520_552+980 - (N>S) (460m)	0.00	24/07/2021	24/07/2021	
1525-110	ML_End&Tra - KP_553+120_557+600 - (N>S) (4480m)	4.00	24/07/2021	28/07/2021	
1525-115	ML_End&Tra - KP_558+100_561+280 - (N>S) (3180m)	3.00	29/07/2021	07/08/2021	
1525-120	ML_End&Tra - KP_561+520_561+620 - (N>S) (100m)	0.00	09/08/2021	09/08/2021	
1525-125	ML_End&Tra - KP_561+960_562+940 - (N>S) (980m)	1.00	09/08/2021	09/08/2021	
1525-130	ML_End&Tra - KP_563+160_563+800 - (N>S) (640m)	1.00	10/08/2021	10/08/2021	
1525-135	ML_End&Tra - KP_564+120_566+520 - (N>S) (2400m)	2.00	11/08/2021	12/08/2021	
1525-140	ML_End&Tra - KP_567+840_568+380 - (N>S) (540m)	0.00	13/08/2021	13/08/2021	
1525-145	ML_End&Tra - KP_568+660_570+820 - (N>S) (2160m)	2.00	13/08/2021	14/08/2021	

Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
◆ Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1525-150	ML_End&Tra - KP_571+300_572+080 - (N>S) (780m)	1.00	16/08/2021	16/08/2021	
1525-155	ML_End&Tra - KP_572+200_572+520 - (N>S) (320m)	0.00	17/08/2021	17/08/2021	
1525-160	ML_End&Tra - KP_572+600_574+000 - (N>S) (1400m)	1.00	17/08/2021	17/08/2021	
1525-165	ML_End&Tra - KP_574+080_575+460 - (N>S) (1380m)	1.00	18/08/2021	18/08/2021	
1525-170	ML_End&Tra - KP_576+040_576+300 - (N>S) (260m)	0.00	19/08/2021	19/08/2021	
1525-175	ML_End&Tra - KP_576+400_576+740 - (N>S) (340m)	0.00	19/08/2021	19/08/2021	
1525-180	ML_End&Tra - KP_577+440_579+400 - (S>N) (1960m)	2.00	19/08/2021	20/08/2021	
1525-185	ML_End&Tra - KP_580+120_580+420 - (S>N) (300m)	0.00	21/08/2021	21/08/2021	
1525-190	ML_End&Tra - KP_580+900_581+280 - (S>N) (380m)	0.00	21/08/2021	21/08/2021	
1525-195	ML_End&Tra - KP_581+380_581+780 - (S>N) (400m)	0.00	21/08/2021	21/08/2021	
1525-200	ML_End&Tra - KP_582+420_582+620 - (S>N) (200m)	0.00	21/08/2021	21/08/2021	
1525-205	ML_End&Tra - KP_583+060_583+280 - (S>N) (220m)	0.00	21/08/2021	21/08/2021	
1525-210	ML_End&Tra - KP_583+460_584+360 - (S>N) (900m)	1.00	21/08/2021	21/08/2021	
1525-215	ML_End&Tra - KP_584+780_585+380 - (S>N) (600m)	1.00	23/08/2021	23/08/2021	
1525-220	ML_End&Tra - KP_587+000_587+420 - (S>N) (420m)	0.00	24/08/2021	24/08/2021	
1525-225	ML_End&Tra - KP_588+260_589+460 - (S>N) (1200m)	1.00	24/08/2021	24/08/2021	
1525-230	ML_End&Tra - KP_589+920_590+100 - (S>N) (180m)	0.00	25/08/2021	25/08/2021	
1525-235	ML_End&Tra - KP_591+440_592+000 - (S>N) (560m)	1.00	25/08/2021	25/08/2021	
1525-240	ML_End&Tra - KP_592+560_592+880 - (S>N) (320m)	0.00	26/08/2021	26/08/2021	
1525-245	ML_End&Tra - KP_596+200_596+960 - (S>N) (760m)	1.00	26/08/2021	26/08/2021	
1525-250	ML_End&Tra - KP_597+060_597+740 - (S>N) (680m)	1.00	27/08/2021	27/08/2021	
1525-255	ML_End&Tra - KP_598+960_599+460 - (S>N) (500m)	0.00	28/08/2021	28/08/2021	
1525-260	ML_End&Tra - KP_600+280_600+480 - (S>N) (200m)	0.00	28/08/2021	28/08/2021	
1525-265	ML_End&Tra - KP_601+160_601+340 - (S>N) (180m)	0.00	28/08/2021	28/08/2021	
1525-270	ML_End&Tra - KP_602+400_602+780 - (S>N) (380m)	0.00	28/08/2021	28/08/2021	
1525-275	ML_End&Tra - KP_603+840_608+180 - (S>N) (4340m)	4.00	28/08/2021	01/09/2021	
1525-280	ML_End&Tra - KP_608+180_609+700 - (N>S) (1520m)	1.00	09/09/2021	09/09/2021	
1525-285	ML_End&Tra - KP_610+520_610+660 - (S>N) (140m)	0.00	10/09/2021	10/09/2021	
1525-290	ML_End&Tra - KP_610+860_615+720 - (S>N) (4860m)	4.00	10/09/2021	14/09/2021	
1525-295	ML_End&Tra - KP_616+380_618+380 - (N>S) (2000m)	2.00	15/09/2021	16/09/2021	
1525-300	ML_End&Tra - KP_618+380_620+260 - (S>N) (1880m)	2.00	17/09/2021	18/09/2021	
1525-305	ML_End&Tra - KP_620+680_620+980 - (N>S) (300m)	0.00	20/09/2021	20/09/2021	
1525-310	ML_End&Tra - KP_621+600_623+320 - (S>N) (1720m)	2.00	20/09/2021	21/09/2021	
1525-315	ML_End&Tra - KP_623+600_624+200 - (N>S) (600m)	1.00	22/09/2021	22/09/2021	
1525-320	ML_End&Tra - KP_625+860_626+280 - (N>S) (420m)	0.00	23/09/2021	23/09/2021	
1525-325	ML_End&Tra - KP_626+600_629+120 - (N>S) (2520m)	2.00	23/09/2021	24/09/2021	
1525-330	ML_End&Tra - KP_629+580_630+120 - (S>N) (540m)	0.00	25/09/2021	25/09/2021	
1525-335	ML_End&Tra - KP_631+980_635+820 - (S>N) (3840m)	4.00	25/09/2021	29/09/2021	
1525-340	ML_End&Tra - KP_635+820_639+500 - (N>S) (3680m)	3.00	30/09/2021	02/10/2021	
1525-345	ML_End&Tra - KP_639+700_641+720 - (N>S) (2020m)	2.00	04/10/2021	05/10/2021	
1525-350	ML_End&Tra - KP_642+000_645+060 - (S>N) (3060m)	3.00	06/10/2021	15/10/2021	
1525-355	ML_End&Tra - KP_645+720_646+520 - (N>S) (800m)	1.00	16/10/2021	16/10/2021	
1525-360	ML_End&Tra - KP_647+100_650+640 - (N>S) (3540m)	3.00	18/10/2021	20/10/2021	
1525-365	ML_End&Tra - KP_650+640_654+220 - (S>N) (3580m)	3.00	21/10/2021	23/10/2021	
1525-370	ML_End&Tra - KP_655+420_663+840 - (S>N) (8420m)	6.00	25/10/2021	30/10/2021	
1525-375	ML_End&Tra - KP_664+760_667+140 - (S>N) (2380m)	2.00	01/11/2021	02/11/2021	
1525-380	ML_End&Tra - KP_667+260_668+640 - (S>N) (1380m)	1.00	03/11/2021	03/11/2021	
1525-385	ML_End&Tra - KP_669+140_673+260 - (S>N) (4120m)	4.00	04/11/2021	08/11/2021	
1525-390	ML_End&Tra - KP_673+860_674+340 - (S>N) (480m)	0.00	09/11/2021	09/11/2021	
1525-395	ML_End&Tra - KP_675+180_676+360 - (N>S) (1180m)	1.00	09/11/2021	09/11/2021	
1525-400	ML_End&Tra - KP_677+640_678+940 - (S>N) (1300m)	1.00	10/11/2021	10/11/2021	
1525-405	ML_End&Tra - KP_679+580_680+940 - (S>N) (1360m)	1.00	11/11/2021	11/11/2021	
1525-410	ML_End&Tra - KP_681+740_681+940 - (N>S) (200m)	0.00	12/11/2021	12/11/2021	
1525-415	ML_End&Tra - KP_682+120_683+940 - (S>N) (1820m)	2.00	12/11/2021	13/11/2021	
1525-420	ML_End&Tra - KP_684+400_687+200 - (S>N) (2800m)	2.00	15/11/2021	16/11/2021	
1525-425	ML_End&Tra - KP_687+400_690+480 - (S>N) (3080m)	2.00	17/11/2021	18/11/2021	
Qualifications		249.00	01/06/2020	04/06/2021	
1515-020	ML_Manual Weld Setup & School	3.00	01/06/2020	03/06/2020	
1515-001	ML_Manual Coating Setup & School	3.00	01/06/2020	03/06/2020	
1516-020	ML_Manual Weld Qualifications	3.00	04/06/2020	06/06/2020	
1516-001	ML_Manual Coating Qualifications	3.00	04/06/2020	06/06/2020	
1515-010	ML_Authomatic Weld Setup & School	11.00	02/03/2021	13/03/2021	
1516-010	ML_Authomatic Weld Qualifications	32.00	15/03/2021	20/05/2021	
1515-002	ML_Authomatic Coating Setup & School	3.00	29/05/2021	01/06/2021	
1516-002	ML_Authomatic Coating Qualifications	3.00	02/06/2021	04/06/2021	
Hot Bends Welding		119.00	23/07/2020	13/01/2021	
1615	MJ_Hot Bends Welding (Summer)	119.00	23/07/2020	13/01/2021	
ML Welding		126.00	28/05/2021	18/11/2021	
1535	ML Welding	126.00	28/05/2021	18/11/2021	



Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

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TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1535-000	ML_Welding - KP_489+180_491+560 - (N>S) (2400m)	2.00	28/05/2021*	29/05/2021	
1535-005	ML_Welding - KP_491+700_492+460 - (N>S) (760m)	1.00	31/05/2021	31/05/2021	
1535-010	ML_Welding - KP_492+860_493+160 - (N>S) (300m)	0.00	01/06/2021	01/06/2021	
1535-015	ML_Welding - KP_493+280_496+660 - (N>S) (3380m)	3.00	01/06/2021	03/06/2021	
1535-020	ML_Welding - KP_499+080_500+260 - (N>S) (1180m)	1.00	04/06/2021	04/06/2021	
1535-025	ML_Welding - KP_500+640_502+200 - (S>N) (1560m)	1.00	05/06/2021	05/06/2021	
1535-030	ML_Welding - KP_502+360_504+420 - (N>S) (2060m)	2.00	07/06/2021	08/06/2021	
1535-035	ML_Welding - KP_504+420_508+200 - (S>N) (3780m)	3.00	09/06/2021	11/06/2021	
1535-040	ML_Welding - KP_508+200_513+560 - (N>S) (5360m)	4.00	12/06/2021	16/06/2021	
1535-045	ML_Welding - KP_514+000_524+940 - (N>S) (10940m)	6.00	17/06/2021	23/06/2021	
1535-050	ML_Welding - KP_525+300_533+320 - (N>S) (8020m)	5.00	24/06/2021	06/07/2021	
1535-055	ML_Welding - KP_533+600_535+980 - (N>S) (2380m)	2.00	07/07/2021	08/07/2021	
1535-060	ML_Welding - KP_536+300_541+860 - (N>S) (5560m)	4.00	09/07/2021	13/07/2021	
1535-065	ML_Welding - KP_541+860_544+060 - (S>N) (2200m)	2.00	14/07/2021	15/07/2021	
1535-070	ML_Welding - KP_544+280_545+340 - (S>N) (1060m)	1.00	16/07/2021	16/07/2021	
1535-075	ML_Welding - KP_545+680_545+900 - (S>N) (220m)	0.00	17/07/2021	17/07/2021	
1535-080	ML_Welding - KP_546+160_546+600 - (S>N) (440m)	0.00	17/07/2021	17/07/2021	
1535-085	ML_Welding - KP_546+860_548+420 - (N>S) (1560m)	1.00	17/07/2021	17/07/2021	
1535-090	ML_Welding - KP_548+900_549+620 - (N>S) (720m)	1.00	29/07/2021	29/07/2021	
1535-095	ML_Welding - KP_549+920_550+300 - (N>S) (380m)	0.00	06/08/2021	06/08/2021	
1535-100	ML_Welding - KP_550+600_552+200 - (N>S) (1600m)	1.00	06/08/2021	06/08/2021	
1535-105	ML_Welding - KP_552+520_552+980 - (N>S) (460m)	0.00	07/08/2021	07/08/2021	
1535-110	ML_Welding - KP_553+120_557+600 - (N>S) (4480m)	3.00	07/08/2021	10/08/2021	
1535-115	ML_Welding - KP_558+100_561+280 - (N>S) (3180m)	3.00	11/08/2021	13/08/2021	
1535-120	ML_Welding - KP_561+520_561+620 - (N>S) (100m)	0.00	14/08/2021	14/08/2021	
1535-125	ML_Welding - KP_561+960_562+940 - (N>S) (980m)	1.00	14/08/2021	14/08/2021	
1535-130	ML_Welding - KP_563+160_563+800 - (N>S) (640m)	1.00	16/08/2021	16/08/2021	
1535-135	ML_Welding - KP_564+120_566+520 - (N>S) (2400m)	2.00	17/08/2021	18/08/2021	
1535-140	ML_Welding - KP_567+840_568+380 - (N>S) (540m)	0.00	19/08/2021	19/08/2021	
1535-145	ML_Welding - KP_568+660_570+820 - (N>S) (2160m)	2.00	19/08/2021	20/08/2021	
1535-150	ML_Welding - KP_571+300_572+080 - (N>S) (780m)	1.00	21/08/2021	21/08/2021	
1535-155	ML_Welding - KP_572+200_572+520 - (N>S) (320m)	0.00	23/08/2021	23/08/2021	
1535-160	ML_Welding - KP_572+600_574+000 - (N>S) (1400m)	1.00	23/08/2021	23/08/2021	
1535-165	ML_Welding - KP_574+080_575+460 - (N>S) (1380m)	1.00	24/08/2021	24/08/2021	
1535-170	ML_Welding - KP_576+040_576+300 - (N>S) (260m)	0.00	25/08/2021	25/08/2021	
1535-175	ML_Welding - KP_576+400_576+740 - (N>S) (340m)	0.00	25/08/2021	25/08/2021	
1535-180	ML_Welding - KP_577+440_579+400 - (S>N) (1960m)	2.00	25/08/2021	26/08/2021	
1535-185	ML_Welding - KP_580+120_580+420 - (S>N) (300m)	0.00	27/08/2021	27/08/2021	
1535-190	ML_Welding - KP_580+900_581+280 - (S>N) (380m)	0.00	27/08/2021	27/08/2021	
1535-195	ML_Welding - KP_581+380_581+780 - (S>N) (400m)	0.00	27/08/2021	27/08/2021	
1535-200	ML_Welding - KP_582+420_582+620 - (S>N) (200m)	0.00	27/08/2021	27/08/2021	
1535-205	ML_Welding - KP_583+060_583+280 - (S>N) (220m)	0.00	27/08/2021	27/08/2021	
1535-210	ML_Welding - KP_583+460_584+360 - (S>N) (900m)	1.00	27/08/2021	27/08/2021	
1535-215	ML_Welding - KP_584+780_585+380 - (S>N) (600m)	1.00	28/08/2021	28/08/2021	
1535-220	ML_Welding - KP_587+000_587+420 - (S>N) (420m)	0.00	30/08/2021	30/08/2021	
1535-225	ML_Welding - KP_588+260_589+460 - (S>N) (1200m)	1.00	30/08/2021	30/08/2021	
1535-230	ML_Welding - KP_589+920_590+100 - (S>N) (180m)	0.00	31/08/2021	31/08/2021	
1535-235	ML_Welding - KP_591+440_592+000 - (S>N) (560m)	0.00	31/08/2021	31/08/2021	
1535-240	ML_Welding - KP_592+560_592+880 - (S>N) (320m)	0.00	31/08/2021	31/08/2021	
1535-245	ML_Welding - KP_596+200_596+960 - (S>N) (760m)	1.00	31/08/2021	31/08/2021	
1535-250	ML_Welding - KP_597+060_597+740 - (S>N) (680m)	1.00	01/09/2021	01/09/2021	
1535-255	ML_Welding - KP_598+960_599+460 - (S>N) (500m)	0.00	09/09/2021	09/09/2021	
1535-260	ML_Welding - KP_600+280_600+480 - (S>N) (200m)	0.00	09/09/2021	09/09/2021	
1535-265	ML_Welding - KP_601+160_601+340 - (S>N) (180m)	0.00	09/09/2021	09/09/2021	
1535-270	ML_Welding - KP_602+400_602+780 - (S>N) (380m)	0.00	09/09/2021	09/09/2021	
1535-275	ML_Welding - KP_603+840_608+180 - (S>N) (4340m)	3.00	09/09/2021	11/09/2021	
1535-280	ML_Welding - KP_608+180_609+700 - (N>S) (1520m)	1.00	13/09/2021	13/09/2021	
1535-285	ML_Welding - KP_610+520_610+660 - (S>N) (140m)	0.00	14/09/2021	14/09/2021	
1535-290	ML_Welding - KP_610+860_615+720 - (S>N) (4860m)	3.00	14/09/2021	16/09/2021	
1535-295	ML_Welding - KP_616+380_618+380 - (N>S) (2000m)	2.00	17/09/2021	18/09/2021	
1535-300	ML_Welding - KP_618+380_620+260 - (S>N) (1880m)	2.00	20/09/2021	21/09/2021	
1535-305	ML_Welding - KP_620+680_620+980 - (N>S) (300m)	0.00	22/09/2021	22/09/2021	
1535-310	ML_Welding - KP_621+600_623+320 - (S>N) (1720m)	1.00	22/09/2021	22/09/2021	
1535-315	ML_Welding - KP_623+600_624+200 - (N>S) (600m)	1.00	23/09/2021	23/09/2021	
1535-320	ML_Welding - KP_625+860_626+280 - (N>S) (420m)	0.00	24/09/2021	24/09/2021	
1535-325	ML_Welding - KP_626+600_629+120 - (N>S) (2520m)	2.00	24/09/2021	25/09/2021	
1535-330	ML_Welding - KP_629+580_630+120 - (S>N) (540m)	0.00	27/09/2021	27/09/2021	
1535-335	ML_Welding - KP_631+980_635+820 - (S>N) (3840m)	3.00	27/09/2021	29/09/2021	
1535-340	ML_Welding - KP_635+820_639+500 - (N>S) (3680m)	3.00	30/09/2021	02/10/2021	

Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

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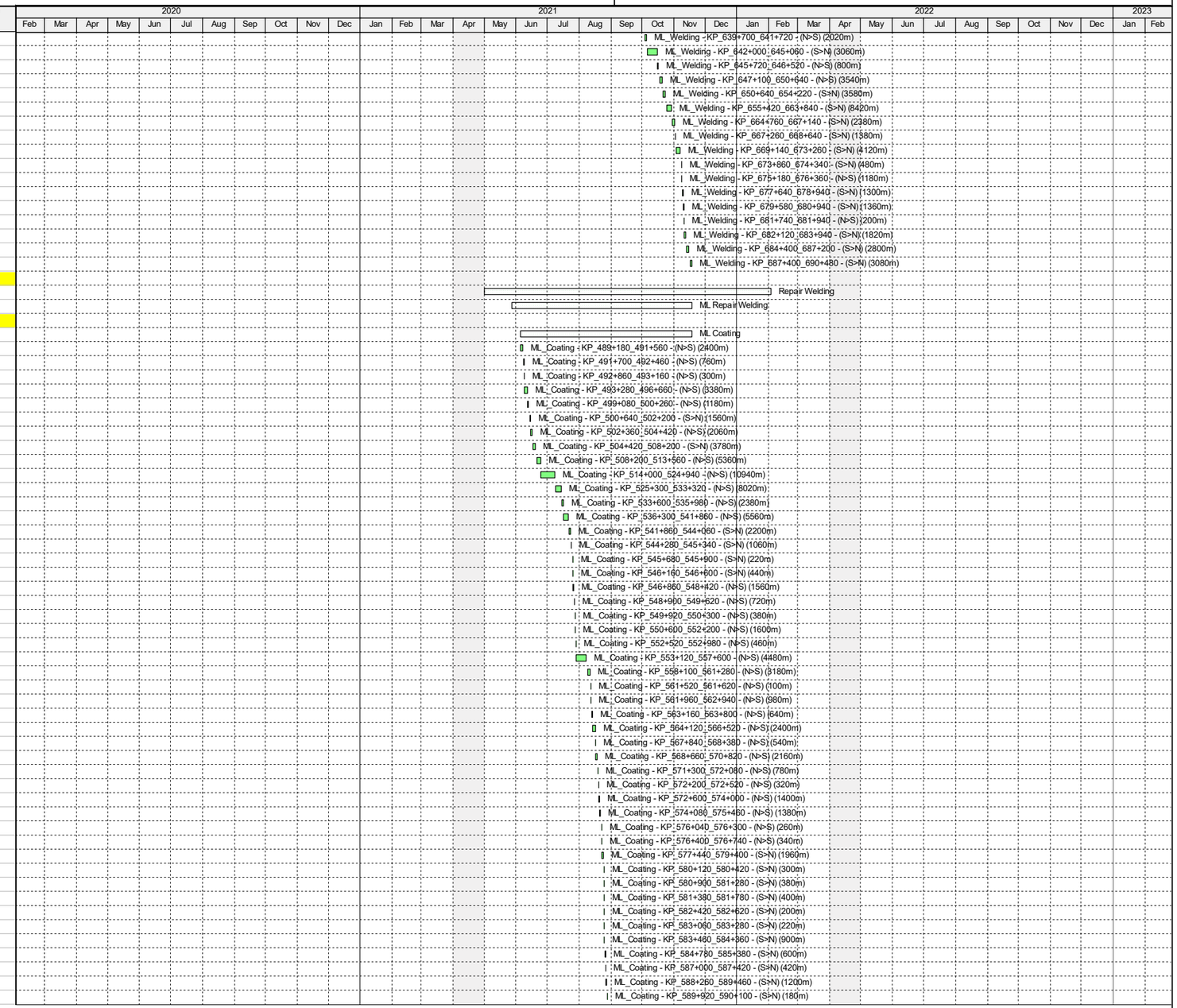
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1535-345	ML_Welding - KP_639+700_641+720 - (N>S) (2020m)	2.00	04/10/2021	05/10/2021	
1535-350	ML_Welding - KP_642+000_645+060 - (S>N) (3060m)	3.00	06/10/2021	15/10/2021	
1535-355	ML_Welding - KP_645+720_646+520 - (N>S) (800m)	1.00	16/10/2021	16/10/2021	
1535-360	ML_Welding - KP_647+100_650+640 - (N>S) (3540m)	3.00	18/10/2021	20/10/2021	
1535-365	ML_Welding - KP_650+640_654+220 - (S>N) (3580m)	3.00	21/10/2021	23/10/2021	
1535-370	ML_Welding - KP_655+420_663+840 - (S>N) (8420m)	5.00	25/10/2021	29/10/2021	
1535-375	ML_Welding - KP_664+760_667+140 - (S>N) (2380m)	2.00	30/10/2021	01/11/2021	
1535-380	ML_Welding - KP_667+260_668+640 - (S>N) (1380m)	1.00	02/11/2021	02/11/2021	
1535-385	ML_Welding - KP_669+140_673+260 - (S>N) (4120m)	4.00	03/11/2021	06/11/2021	
1535-390	ML_Welding - KP_673+860_674+340 - (S>N) (480m)	0.00	08/11/2021	08/11/2021	
1535-395	ML_Welding - KP_675+180_676+360 - (N>S) (1180m)	1.00	08/11/2021	08/11/2021	
1535-400	ML_Welding - KP_677+640_678+940 - (S>N) (1300m)	1.00	09/11/2021	09/11/2021	
1535-405	ML_Welding - KP_679+580_680+940 - (S>N) (1360m)	1.00	10/11/2021	10/11/2021	
1535-410	ML_Welding - KP_681+740_681+940 - (N>S) (200m)	0.00	11/11/2021	11/11/2021	
1535-415	ML_Welding - KP_682+120_683+940 - (S>N) (1820m)	2.00	11/11/2021	12/11/2021	
1535-420	ML_Welding - KP_684+400_687+200 - (S>N) (2800m)	2.00	13/11/2021	15/11/2021	
1535-425	ML_Welding - KP_687+400_690+480 - (S>N) (3080m)	2.00	17/11/2021	18/11/2021	
Repair Welding		196.00	01/05/2021	02/02/2022	
1537	Repair Welding	196.00	01/05/2021	02/02/2022	
1536	ML Repair Welding	126.00	28/05/2021	18/11/2021	
ML Coating		119.00	05/06/2021	18/11/2021	
1545	ML Coating	119.00	05/06/2021	18/11/2021	
1545-000	ML_Coating - KP_489+180_491+560 - (N>S) (2400m)	2.00	05/06/2021	07/06/2021	
1545-005	ML_Coating - KP_491+700_492+460 - (N>S) (760m)	1.00	08/06/2021	08/06/2021	
1545-010	ML_Coating - KP_492+860_493+160 - (N>S) (300m)	0.00	09/06/2021	09/06/2021	
1545-015	ML_Coating - KP_493+280_496+660 - (N>S) (3380m)	3.00	09/06/2021	11/06/2021	
1545-020	ML_Coating - KP_499+080_500+260 - (N>S) (1180m)	1.00	12/06/2021	12/06/2021	
1545-025	ML_Coating - KP_500+640_502+200 - (S>N) (1560m)	1.00	14/06/2021	14/06/2021	
1545-030	ML_Coating - KP_502+360_504+420 - (N>S) (2060m)	2.00	15/06/2021	16/06/2021	
1545-035	ML_Coating - KP_504+420_508+200 - (S>N) (3780m)	3.00	17/06/2021	19/06/2021	
1545-040	ML_Coating - KP_508+200_513+560 - (N>S) (5360m)	4.00	21/06/2021	24/06/2021	
1545-045	ML_Coating - KP_514+000_524+940 - (N>S) (10940m)	6.00	25/06/2021	08/07/2021	
1545-050	ML_Coating - KP_525+300_533+320 - (N>S) (8020m)	5.00	09/07/2021	14/07/2021	
1545-055	ML_Coating - KP_533+600_535+980 - (N>S) (2380m)	2.00	15/07/2021	16/07/2021	
1545-060	ML_Coating - KP_536+300_541+860 - (N>S) (5560m)	4.00	17/07/2021	21/07/2021	
1545-065	ML_Coating - KP_541+860_544+060 - (S>N) (2200m)	2.00	22/07/2021	23/07/2021	
1545-070	ML_Coating - KP_544+280_545+340 - (S>N) (1060m)	1.00	24/07/2021	24/07/2021	
1545-075	ML_Coating - KP_545+680_545+900 - (S>N) (220m)	0.00	26/07/2021	26/07/2021	
1545-080	ML_Coating - KP_546+160_546+600 - (S>N) (440m)	0.00	26/07/2021	26/07/2021	
1545-085	ML_Coating - KP_546+860_548+420 - (N>S) (1560m)	1.00	26/07/2021	26/07/2021	
1545-090	ML_Coating - KP_548+900_549+620 - (N>S) (720m)	1.00	27/07/2021	27/07/2021	
1545-095	ML_Coating - KP_549+920_550+300 - (N>S) (380m)	0.00	28/07/2021	28/07/2021	
1545-100	ML_Coating - KP_550+600_552+200 - (N>S) (1600m)	1.00	28/07/2021	28/07/2021	
1545-105	ML_Coating - KP_552+520_552+980 - (N>S) (460m)	0.00	29/07/2021	29/07/2021	
1545-110	ML_Coating - KP_553+120_557+600 - (N>S) (4480m)	3.00	29/07/2021	07/08/2021	
1545-115	ML_Coating - KP_558+100_561+280 - (N>S) (3180m)	3.00	09/08/2021	11/08/2021	
1545-120	ML_Coating - KP_561+520_561+620 - (N>S) (100m)	0.00	12/08/2021	12/08/2021	
1545-125	ML_Coating - KP_561+960_562+940 - (N>S) (980m)	1.00	12/08/2021	12/08/2021	
1545-130	ML_Coating - KP_563+160_563+800 - (N>S) (640m)	1.00	13/08/2021	13/08/2021	
1545-135	ML_Coating - KP_564+120_566+520 - (N>S) (2400m)	2.00	14/08/2021	16/08/2021	
1545-140	ML_Coating - KP_567+840_568+380 - (N>S) (540m)	0.00	17/08/2021	17/08/2021	
1545-145	ML_Coating - KP_568+660_570+820 - (N>S) (2160m)	2.00	17/08/2021	18/08/2021	
1545-150	ML_Coating - KP_571+300_572+080 - (N>S) (780m)	1.00	19/08/2021	19/08/2021	
1545-155	ML_Coating - KP_572+200_572+520 - (N>S) (320m)	0.00	20/08/2021	20/08/2021	
1545-160	ML_Coating - KP_572+600_574+000 - (N>S) (1400m)	1.00	20/08/2021	20/08/2021	
1545-165	ML_Coating - KP_574+080_575+460 - (N>S) (1380m)	1.00	21/08/2021	21/08/2021	
1545-170	ML_Coating - KP_576+040_576+300 - (N>S) (260m)	0.00	23/08/2021	23/08/2021	
1545-175	ML_Coating - KP_576+400_576+740 - (N>S) (340m)	0.00	23/08/2021	23/08/2021	
1545-180	ML_Coating - KP_577+440_579+400 - (S>N) (1960m)	2.00	23/08/2021	24/08/2021	
1545-185	ML_Coating - KP_580+120_580+420 - (S>N) (300m)	0.00	25/08/2021	25/08/2021	
1545-190	ML_Coating - KP_580+900_581+280 - (S>N) (380m)	0.00	25/08/2021	25/08/2021	
1545-195	ML_Coating - KP_581+380_581+780 - (S>N) (400m)	0.00	25/08/2021	25/08/2021	
1545-200	ML_Coating - KP_582+420_582+620 - (S>N) (200m)	0.00	25/08/2021	25/08/2021	
1545-205	ML_Coating - KP_583+060_583+280 - (S>N) (220m)	0.00	25/08/2021	25/08/2021	
1545-210	ML_Coating - KP_583+460_584+360 - (S>N) (900m)	1.00	25/08/2021	25/08/2021	
1545-215	ML_Coating - KP_584+780_585+380 - (S>N) (600m)	1.00	26/08/2021	26/08/2021	
1545-220	ML_Coating - KP_587+000_587+420 - (S>N) (420m)	0.00	27/08/2021	27/08/2021	
1545-225	ML_Coating - KP_588+260_589+460 - (S>N) (1200m)	1.00	27/08/2021	27/08/2021	
1545-230	ML_Coating - KP_589+920_590+100 - (S>N) (180m)	0.00	28/08/2021	28/08/2021	

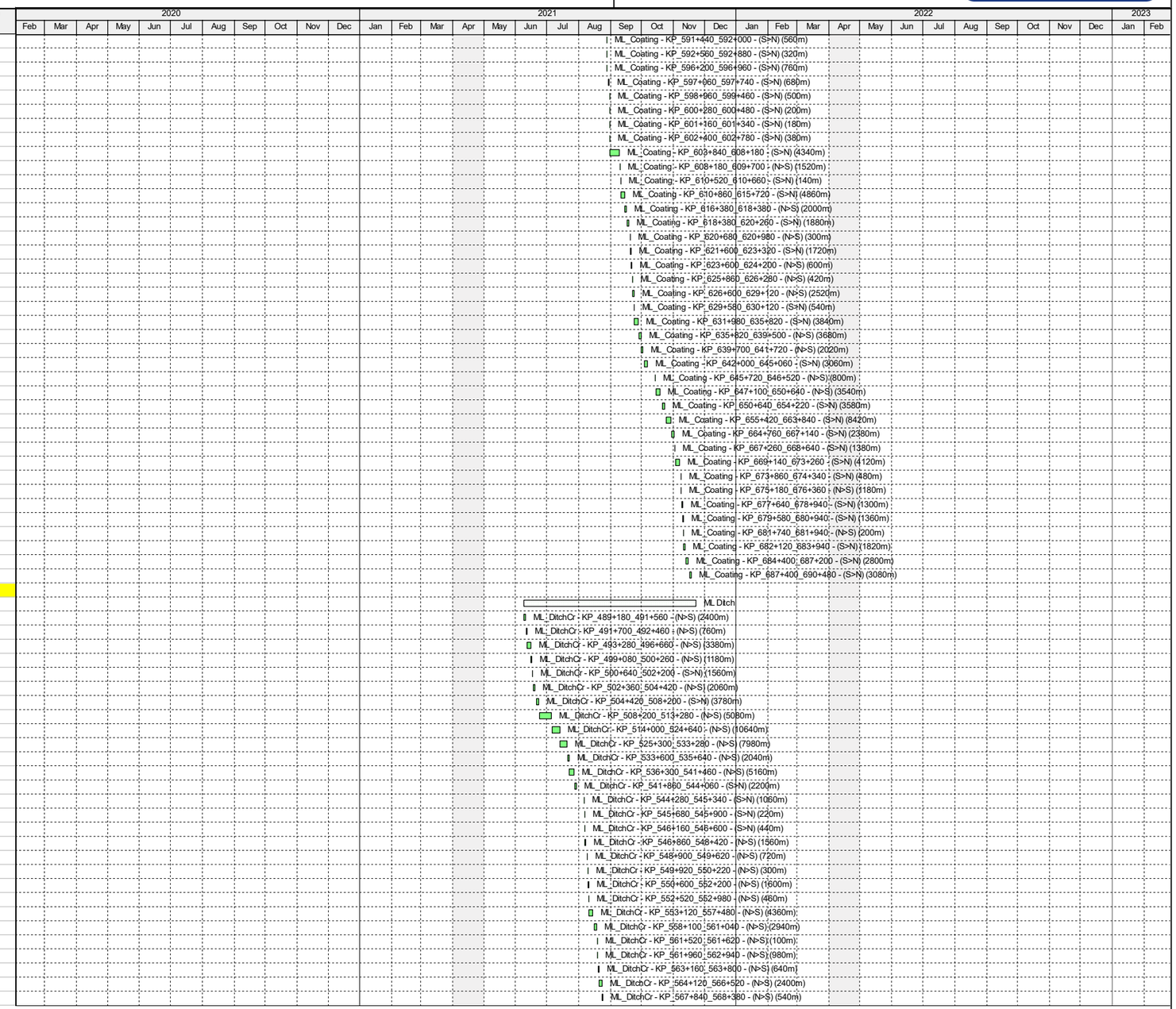


Actual Work
Remaining Work
Critical Remaining Work
Milestone
Remaining Level of Effort

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1545-235	ML_Coating - KP_591+440_592+000 - (S>N) (560m)	0.00	28/08/2021	28/08/2021	
1545-240	ML_Coating - KP_592+560_592+880 - (S>N) (320m)	0.00	28/08/2021	28/08/2021	
1545-245	ML_Coating - KP_596+200_596+960 - (S>N) (760m)	1.00	28/08/2021	28/08/2021	
1545-250	ML_Coating - KP_597+060_597+740 - (S>N) (680m)	1.00	30/08/2021	30/08/2021	
1545-255	ML_Coating - KP_598+960_599+460 - (S>N) (500m)	0.00	31/08/2021	31/08/2021	
1545-260	ML_Coating - KP_600+280_600+480 - (S>N) (200m)	0.00	31/08/2021	31/08/2021	
1545-265	ML_Coating - KP_601+160_601+340 - (S>N) (180m)	0.00	31/08/2021	31/08/2021	
1545-270	ML_Coating - KP_602+400_602+780 - (S>N) (380m)	0.00	31/08/2021	31/08/2021	
1545-275	ML_Coating - KP_603+840_608+180 - (S>N) (4340m)	3.00	31/08/2021	09/09/2021	
1545-280	ML_Coating - KP_608+180_609+700 - (N>S) (1520m)	1.00	10/09/2021	10/09/2021	
1545-285	ML_Coating - KP_610+520_610+660 - (S>N) (140m)	0.00	11/09/2021	11/09/2021	
1545-290	ML_Coating - KP_610+860_615+720 - (S>N) (4860m)	3.00	11/09/2021	14/09/2021	
1545-295	ML_Coating - KP_616+380_618+380 - (N>S) (2000m)	2.00	15/09/2021	16/09/2021	
1545-300	ML_Coating - KP_618+380_620+260 - (S>N) (1880m)	2.00	17/09/2021	18/09/2021	
1545-305	ML_Coating - KP_620+680_620+980 - (N>S) (300m)	0.00	20/09/2021	20/09/2021	
1545-310	ML_Coating - KP_621+600_623+320 - (S>N) (1720m)	1.00	20/09/2021	20/09/2021	
1545-315	ML_Coating - KP_623+600_624+200 - (N>S) (600m)	1.00	21/09/2021	21/09/2021	
1545-320	ML_Coating - KP_625+860_626+280 - (N>S) (420m)	0.00	22/09/2021	22/09/2021	
1545-325	ML_Coating - KP_626+600_629+120 - (N>S) (2520m)	2.00	22/09/2021	23/09/2021	
1545-330	ML_Coating - KP_629+580_630+120 - (S>N) (540m)	0.00	24/09/2021	24/09/2021	
1545-335	ML_Coating - KP_631+980_635+820 - (S>N) (3840m)	3.00	24/09/2021	27/09/2021	
1545-340	ML_Coating - KP_635+820_639+500 - (N>S) (3680m)	3.00	28/09/2021	30/09/2021	
1545-345	ML_Coating - KP_639+700_641+720 - (N>S) (2020m)	2.00	01/10/2021	02/10/2021	
1545-350	ML_Coating - KP_642+000_645+060 - (S>N) (3060m)	3.00	04/10/2021	06/10/2021	
1545-355	ML_Coating - KP_645+720_646+520 - (N>S) (800m)	1.00	14/10/2021	14/10/2021	
1545-360	ML_Coating - KP_647+100_650+640 - (N>S) (3540m)	3.00	15/10/2021	18/10/2021	
1545-365	ML_Coating - KP_650+640_654+220 - (S>N) (3580m)	3.00	21/10/2021	23/10/2021	
1545-370	ML_Coating - KP_655+420_663+840 - (S>N) (8420m)	5.00	25/10/2021	29/10/2021	
1545-375	ML_Coating - KP_664+760_667+140 - (S>N) (2380m)	2.00	30/10/2021	01/11/2021	
1545-380	ML_Coating - KP_667+260_668+640 - (S>N) (1380m)	1.00	02/11/2021	02/11/2021	
1545-385	ML_Coating - KP_669+140_673+260 - (S>N) (4120m)	4.00	03/11/2021	06/11/2021	
1545-390	ML_Coating - KP_673+860_674+340 - (S>N) (480m)	0.00	08/11/2021	08/11/2021	
1545-395	ML_Coating - KP_675+180_676+360 - (N>S) (1180m)	1.00	08/11/2021	08/11/2021	
1545-400	ML_Coating - KP_677+640_678+940 - (S>N) (1300m)	1.00	09/11/2021	09/11/2021	
1545-405	ML_Coating - KP_679+580_680+940 - (S>N) (1360m)	1.00	10/11/2021	10/11/2021	
1545-410	ML_Coating - KP_681+740_681+940 - (N>S) (200m)	0.00	11/11/2021	11/11/2021	
1545-415	ML_Coating - KP_682+120_683+940 - (S>N) (1820m)	2.00	11/11/2021	12/11/2021	
1545-420	ML_Coating - KP_684+400_687+200 - (S>N) (2800m)	2.00	13/11/2021	15/11/2021	
1545-425	ML_Coating - KP_687+400_690+480 - (S>N) (3080m)	2.00	17/11/2021	18/11/2021	
ML Ditch		**119.00**	**09/06/2021**	**22/11/2021**	
1550	ML Ditch	119.00	09/06/2021	22/11/2021	
1550-000	ML_DitchCr - KP_489+180_491+560 - (N>S) (2400m)	2.00	09/06/2021	10/06/2021	
1550-005	ML_DitchCr - KP_491+700_492+460 - (N>S) (760m)	1.00	11/06/2021	11/06/2021	
1550-010	ML_DitchCr - KP_493+280_496+660 - (N>S) (3380m)	3.00	12/06/2021	15/06/2021	
1550-015	ML_DitchCr - KP_499+080_500+260 - (N>S) (1180m)	1.00	16/06/2021	16/06/2021	
1550-020	ML_DitchCr - KP_500+640_502+200 - (S>N) (1560m)	1.00	17/06/2021	17/06/2021	
1550-025	ML_DitchCr - KP_502+360_504+420 - (N>S) (2060m)	2.00	18/06/2021	19/06/2021	
1550-030	ML_DitchCr - KP_504+420_508+200 - (S>N) (3780m)	3.00	21/06/2021	23/06/2021	
1550-035	ML_DitchCr - KP_508+200_513+280 - (N>S) (5080m)	4.00	24/06/2021	05/07/2021	
1550-040	ML_DitchCr - KP_514+000_524+640 - (N>S) (10640m)	7.00	06/07/2021	13/07/2021	
1550-045	ML_DitchCr - KP_525+300_533+280 - (N>S) (7980m)	6.00	14/07/2021	20/07/2021	
1550-050	ML_DitchCr - KP_533+600_535+640 - (N>S) (2040m)	2.00	21/07/2021	22/07/2021	
1550-055	ML_DitchCr - KP_536+300_541+460 - (N>S) (5160m)	4.00	23/07/2021	27/07/2021	
1550-060	ML_DitchCr - KP_541+860_544+060 - (S>N) (2200m)	2.00	28/07/2021	29/07/2021	
1550-065	ML_DitchCr - KP_544+280_545+340 - (S>N) (1060m)	1.00	06/08/2021	06/08/2021	
1550-070	ML_DitchCr - KP_545+680_545+900 - (S>N) (220m)	0.00	07/08/2021	07/08/2021	
1550-075	ML_DitchCr - KP_546+160_546+600 - (S>N) (440m)	0.00	07/08/2021	07/08/2021	
1550-080	ML_DitchCr - KP_546+860_548+420 - (N>S) (1560m)	1.00	07/08/2021	07/08/2021	
1550-085	ML_DitchCr - KP_548+900_549+620 - (N>S) (720m)	1.00	09/08/2021	09/08/2021	
1550-090	ML_DitchCr - KP_549+920_550+220 - (N>S) (300m)	0.00	10/08/2021	10/08/2021	
1550-095	ML_DitchCr - KP_550+600_552+200 - (N>S) (1600m)	1.00	10/08/2021	10/08/2021	
1550-100	ML_DitchCr - KP_552+520_552+980 - (N>S) (460m)	0.00	11/08/2021	11/08/2021	
1550-105	ML_DitchCr - KP_553+120_557+480 - (N>S) (4360m)	4.00	11/08/2021	14/08/2021	
1550-110	ML_DitchCr - KP_558+100_561+040 - (N>S) (2940m)	3.00	16/08/2021	18/08/2021	
1550-115	ML_DitchCr - KP_561+520_561+620 - (N>S) (100m)	0.00	19/08/2021	19/08/2021	
1550-120	ML_DitchCr - KP_561+960_562+940 - (N>S) (980m)	1.00	19/08/2021	19/08/2021	
1550-125	ML_DitchCr - KP_563+160_563+800 - (N>S) (640m)	1.00	20/08/2021	20/08/2021	
1550-130	ML_DitchCr - KP_564+120_566+520 - (N>S) (2400m)	2.00	21/08/2021	23/08/2021	
1550-135	ML_DitchCr - KP_567+840_568+380 - (N>S) (540m)	1.00	24/08/2021	24/08/2021	



Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

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TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1550-140	ML_DitchCr - KP_568+660_570+820 - (N>S) (2160m)	2.00	25/08/2021	26/08/2021	
1550-145	ML_DitchCr - KP_571+300_572+020 - (N>S) (720m)	1.00	27/08/2021	27/08/2021	
1550-150	ML_DitchCr - KP_572+200_572+520 - (N>S) (320m)	0.00	28/08/2021	28/08/2021	
1550-155	ML_DitchCr - KP_572+600_574+000 - (N>S) (1400m)	1.00	28/08/2021	28/08/2021	
1550-160	ML_DitchCr - KP_574+080_575+460 - (N>S) (1380m)	1.00	30/08/2021	30/08/2021	
1550-165	ML_DitchCr - KP_576+040_576+300 - (N>S) (260m)	0.00	31/08/2021	31/08/2021	
1550-170	ML_DitchCr - KP_576+400_576+740 - (N>S) (340m)	0.00	31/08/2021	31/08/2021	
1550-175	ML_DitchCr - KP_577+440_579+040 - (S>N) (1600m)	1.00	31/08/2021	31/08/2021	
1550-180	ML_DitchCr - KP_580+120_580+420 - (S>N) (300m)	0.00	01/09/2021	01/09/2021	
1550-185	ML_DitchCr - KP_580+900_581+280 - (S>N) (380m)	0.00	01/09/2021	01/09/2021	
1550-190	ML_DitchCr - KP_582+420_582+620 - (S>N) (200m)	0.00	01/09/2021	01/09/2021	
1550-195	ML_DitchCr - KP_583+060_583+160 - (S>N) (100m)	0.00	01/09/2021	01/09/2021	
1550-200	ML_DitchCr - KP_583+460_584+360 - (S>N) (900m)	1.00	01/09/2021	01/09/2021	
1550-205	ML_DitchCr - KP_584+780_585+380 - (S>N) (600m)	1.00	09/09/2021	09/09/2021	
1550-210	ML_DitchCr - KP_587+000_587+420 - (S>N) (420m)	0.00	10/09/2021	10/09/2021	
1550-215	ML_DitchCr - KP_588+260_588+700 - (S>N) (440m)	0.00	10/09/2021	10/09/2021	
1550-220	ML_DitchCr - KP_589+920_590+100 - (S>N) (180m)	0.00	10/09/2021	10/09/2021	
1550-225	ML_DitchCr - KP_591+440_592+000 - (S>N) (560m)	1.00	10/09/2021	10/09/2021	
1550-230	ML_DitchCr - KP_592+560_592+880 - (S>N) (320m)	0.00	11/09/2021	11/09/2021	
1550-235	ML_DitchCr - KP_596+200_596+960 - (S>N) (760m)	1.00	11/09/2021	11/09/2021	
1550-240	ML_DitchCr - KP_598+960_599+320 - (S>N) (360m)	0.00	13/09/2021	13/09/2021	
1550-245	ML_DitchCr - KP_601+160_601+340 - (S>N) (180m)	0.00	13/09/2021	13/09/2021	
1550-250	ML_DitchCr - KP_602+400_602+780 - (S>N) (380m)	0.00	13/09/2021	13/09/2021	
1550-255	ML_DitchCr - KP_603+840_608+020 - (S>N) (4180m)	4.00	13/09/2021	16/09/2021	
1550-260	ML_DitchCr - KP_608+180_609+700 - (N>S) (1520m)	1.00	17/09/2021	17/09/2021	
1550-265	ML_DitchCr - KP_610+520_610+660 - (S>N) (140m)	0.00	18/09/2021	18/09/2021	
1550-270	ML_DitchCr - KP_610+860_615+720 - (S>N) (4860m)	4.00	18/09/2021	22/09/2021	
1550-275	ML_DitchCr - KP_616+380_618+380 - (N>S) (2000m)	2.00	23/09/2021	24/09/2021	
1550-280	ML_DitchCr - KP_618+380_620+260 - (S>N) (1880m)	2.00	25/09/2021	27/09/2021	
1550-285	ML_DitchCr - KP_620+680_620+980 - (N>S) (300m)	0.00	28/09/2021	28/09/2021	
1550-290	ML_DitchCr - KP_621+600_623+160 - (S>N) (1560m)	1.00	28/09/2021	28/09/2021	
1550-295	ML_DitchCr - KP_623+600_624+200 - (N>S) (600m)	1.00	29/09/2021	29/09/2021	
1550-300	ML_DitchCr - KP_626+600_628+200 - (N>S) (1600m)	1.00	30/09/2021	30/09/2021	
1550-305	ML_DitchCr - KP_629+580_630+120 - (S>N) (540m)	1.00	01/10/2021	01/10/2021	
1550-310	ML_DitchCr - KP_631+980_635+200 - (S>N) (3220m)	3.00	02/10/2021	05/10/2021	
1550-315	ML_DitchCr - KP_635+820_638+880 - (N>S) (3060m)	3.00	06/10/2021	15/10/2021	
1550-320	ML_DitchCr - KP_639+700_641+360 - (N>S) (1660m)	1.00	16/10/2021	16/10/2021	
1550-325	ML_DitchCr - KP_642+000_644+920 - (S>N) (2920m)	3.00	18/10/2021	20/10/2021	
1550-330	ML_DitchCr - KP_645+720_646+520 - (N>S) (800m)	1.00	21/10/2021	21/10/2021	
1550-335	ML_DitchCr - KP_647+100_650+640 - (N>S) (3540m)	3.00	22/10/2021	25/10/2021	
1550-340	ML_DitchCr - KP_650+640_654+140 - (S>N) (3500m)	3.00	26/10/2021	28/10/2021	
1550-345	ML_DitchCr - KP_655+420_662+800 - (S>N) (7380m)	5.00	29/10/2021	03/11/2021	
1550-350	ML_DitchCr - KP_664+760_667+140 - (S>N) (2380m)	2.00	04/11/2021	05/11/2021	
1550-355	ML_DitchCr - KP_667+260_668+640 - (S>N) (1380m)	1.00	06/11/2021	06/11/2021	
1550-360	ML_DitchCr - KP_669+140_673+260 - (S>N) (4120m)	4.00	08/11/2021	11/11/2021	
1550-365	ML_DitchCr - KP_673+860_674+100 - (S>N) (240m)	0.00	12/11/2021	12/11/2021	
1550-370	ML_DitchCr - KP_675+180_676+360 - (N>S) (1180m)	1.00	12/11/2021	12/11/2021	
1550-375	ML_DitchCr - KP_677+640_678+940 - (S>N) (1300m)	1.00	13/11/2021	13/11/2021	
1550-380	ML_DitchCr - KP_679+580_680+180 - (S>N) (600m)	1.00	15/11/2021	15/11/2021	
1550-385	ML_DitchCr - KP_682+120_683+940 - (S>N) (1820m)	2.00	16/11/2021	17/11/2021	
1550-390	ML_DitchCr - KP_684+400_686+020 - (S>N) (1620m)	1.00	18/11/2021	18/11/2021	
1550-395	ML_DitchCr - KP_687+400_690+480 - (S>N) (3080m)	3.00	19/11/2021	22/11/2021	
Water Management		171.00	09/06/2021	04/02/2022	
1555	Water Management (Night)	171.00	09/06/2021	04/02/2022	
Mainline Lower-In		119.00	11/06/2021	24/11/2021	
1560	ML Lower-In	119.00	11/06/2021	24/11/2021	
1560-000	ML_LowerIn - KP_489+180_491+560 - (N>S) (2400m)	2.00	11/06/2021	12/06/2021	
1560-005	ML_LowerIn - KP_491+700_492+460 - (N>S) (760m)	1.00	14/06/2021	14/06/2021	
1560-010	ML_LowerIn - KP_493+280_496+660 - (N>S) (3380m)	3.00	15/06/2021	17/06/2021	
1560-015	ML_LowerIn - KP_499+080_500+260 - (N>S) (1180m)	1.00	18/06/2021	18/06/2021	
1560-020	ML_LowerIn - KP_500+640_502+200 - (S>N) (1560m)	1.00	19/06/2021	19/06/2021	
1560-025	ML_LowerIn - KP_502+360_504+420 - (N>S) (2060m)	2.00	21/06/2021	22/06/2021	
1560-030	ML_LowerIn - KP_504+420_508+200 - (S>N) (3780m)	3.00	23/06/2021	25/06/2021	
1560-035	ML_LowerIn - KP_508+200_513+280 - (N>S) (5080m)	4.00	26/06/2021	07/07/2021	
1560-040	ML_LowerIn - KP_514+000_524+640 - (N>S) (10640m)	7.00	08/07/2021	15/07/2021	
1560-045	ML_LowerIn - KP_525+300_533+280 - (N>S) (7980m)	6.00	16/07/2021	22/07/2021	
1560-050	ML_LowerIn - KP_533+600_535+640 - (N>S) (2040m)	2.00	23/07/2021	24/07/2021	
1560-055	ML_LowerIn - KP_536+300_541+460 - (N>S) (5160m)	4.00	26/07/2021	29/07/2021	
1560-060	ML_LowerIn - KP_541+860_544+060 - (S>N) (2200m)	2.00	06/08/2021	07/08/2021	

Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

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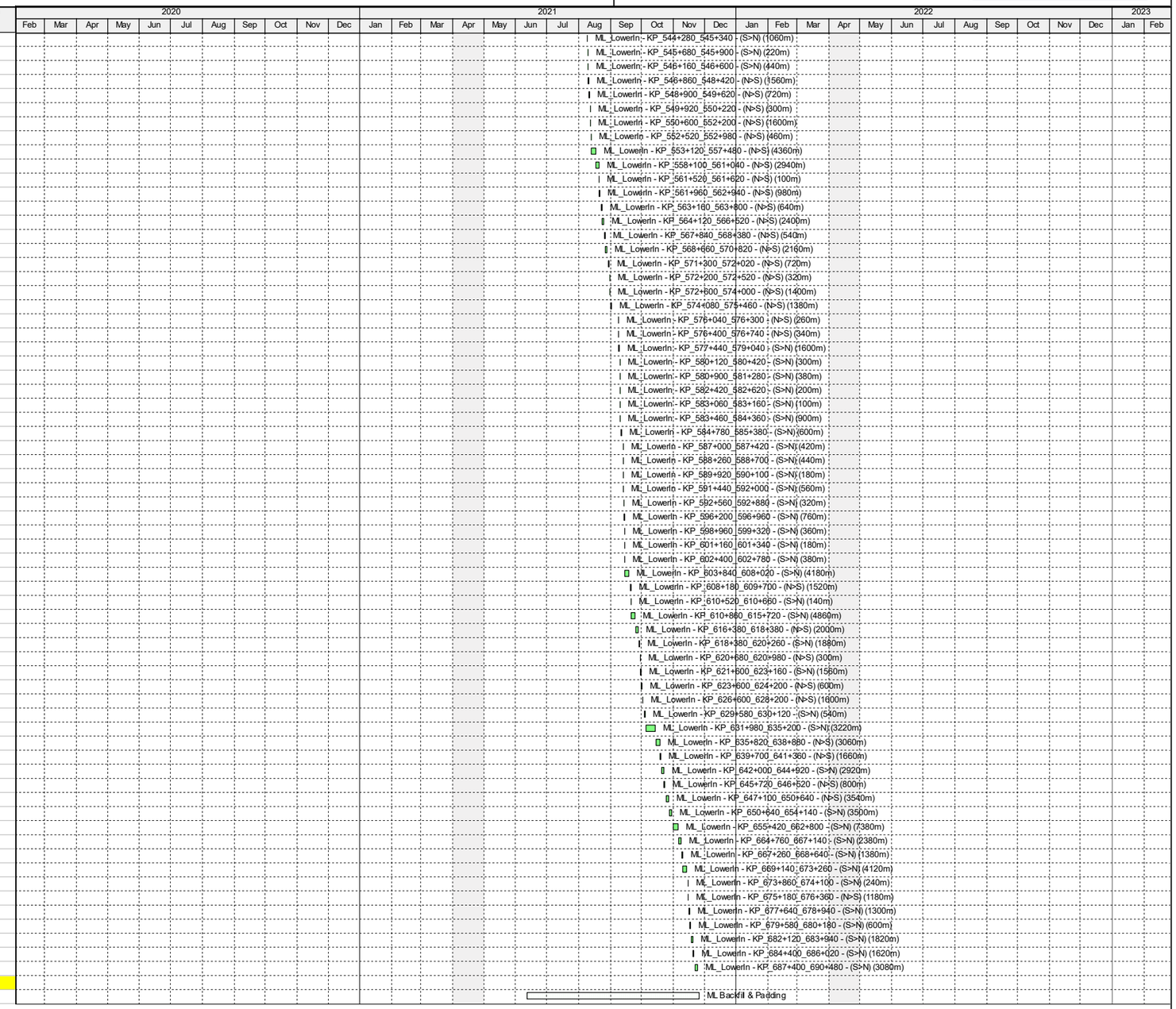
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1560-065	ML_LowerIn - KP_544+280_545+340 - (S>N) (1060m)	1.00	09/08/2021	09/08/2021	
1560-070	ML_LowerIn - KP_545+680_545+900 - (S>N) (220m)	0.00	10/08/2021	10/08/2021	
1560-075	ML_LowerIn - KP_546+160_546+600 - (S>N) (440m)	0.00	10/08/2021	10/08/2021	
1560-080	ML_LowerIn - KP_546+860_548+420 - (N>S) (1560m)	1.00	10/08/2021	10/08/2021	
1560-085	ML_LowerIn - KP_548+900_549+620 - (N>S) (720m)	1.00	11/08/2021	11/08/2021	
1560-090	ML_LowerIn - KP_549+920_550+220 - (N>S) (300m)	0.00	12/08/2021	12/08/2021	
1560-095	ML_LowerIn - KP_550+600_552+200 - (N>S) (1600m)	1.00	12/08/2021	12/08/2021	
1560-100	ML_LowerIn - KP_552+520_552+980 - (N>S) (460m)	0.00	13/08/2021	13/08/2021	
1560-105	ML_LowerIn - KP_553+120_557+480 - (N>S) (4360m)	4.00	13/08/2021	17/08/2021	
1560-110	ML_LowerIn - KP_558+100_561+040 - (N>S) (2940m)	3.00	18/08/2021	20/08/2021	
1560-115	ML_LowerIn - KP_561+520_561+620 - (N>S) (100m)	0.00	21/08/2021	21/08/2021	
1560-120	ML_LowerIn - KP_561+960_562+940 - (N>S) (980m)	1.00	21/08/2021	21/08/2021	
1560-125	ML_LowerIn - KP_563+160_563+800 - (N>S) (640m)	1.00	23/08/2021	23/08/2021	
1560-130	ML_LowerIn - KP_564+120_566+520 - (N>S) (2400m)	2.00	24/08/2021	25/08/2021	
1560-135	ML_LowerIn - KP_567+840_568+380 - (N>S) (540m)	1.00	26/08/2021	26/08/2021	
1560-140	ML_LowerIn - KP_568+660_570+820 - (N>S) (2160m)	2.00	27/08/2021	28/08/2021	
1560-145	ML_LowerIn - KP_571+300_572+020 - (N>S) (720m)	1.00	30/08/2021	30/08/2021	
1560-150	ML_LowerIn - KP_572+200_572+520 - (N>S) (320m)	0.00	31/08/2021	31/08/2021	
1560-155	ML_LowerIn - KP_572+600_574+000 - (N>S) (1400m)	1.00	31/08/2021	31/08/2021	
1560-160	ML_LowerIn - KP_574+080_575+460 - (N>S) (1380m)	1.00	01/09/2021	01/09/2021	
1560-165	ML_LowerIn - KP_576+040_576+300 - (N>S) (260m)	0.00	09/09/2021	09/09/2021	
1560-170	ML_LowerIn - KP_576+400_576+740 - (N>S) (340m)	0.00	09/09/2021	09/09/2021	
1560-175	ML_LowerIn - KP_577+440_579+040 - (S>N) (1600m)	1.00	09/09/2021	09/09/2021	
1560-180	ML_LowerIn - KP_580+120_580+420 - (S>N) (300m)	0.00	10/09/2021	10/09/2021	
1560-185	ML_LowerIn - KP_580+900_581+280 - (S>N) (380m)	0.00	10/09/2021	10/09/2021	
1560-190	ML_LowerIn - KP_582+420_582+620 - (S>N) (200m)	0.00	10/09/2021	10/09/2021	
1560-195	ML_LowerIn - KP_583+060_583+160 - (S>N) (100m)	0.00	10/09/2021	10/09/2021	
1560-200	ML_LowerIn - KP_583+460_584+360 - (S>N) (900m)	1.00	10/09/2021	10/09/2021	
1560-205	ML_LowerIn - KP_584+780_585+380 - (S>N) (600m)	1.00	11/09/2021	11/09/2021	
1560-210	ML_LowerIn - KP_587+000_587+420 - (S>N) (420m)	0.00	13/09/2021	13/09/2021	
1560-215	ML_LowerIn - KP_588+260_588+700 - (S>N) (440m)	0.00	13/09/2021	13/09/2021	
1560-220	ML_LowerIn - KP_589+920_590+100 - (S>N) (180m)	0.00	13/09/2021	13/09/2021	
1560-225	ML_LowerIn - KP_591+440_592+000 - (S>N) (560m)	1.00	13/09/2021	13/09/2021	
1560-230	ML_LowerIn - KP_592+560_592+880 - (S>N) (320m)	0.00	14/09/2021	14/09/2021	
1560-235	ML_LowerIn - KP_596+200_596+960 - (S>N) (760m)	1.00	14/09/2021	14/09/2021	
1560-240	ML_LowerIn - KP_598+960_599+320 - (S>N) (360m)	0.00	15/09/2021	15/09/2021	
1560-245	ML_LowerIn - KP_601+160_601+340 - (S>N) (180m)	0.00	15/09/2021	15/09/2021	
1560-250	ML_LowerIn - KP_602+400_602+780 - (S>N) (380m)	0.00	15/09/2021	15/09/2021	
1560-255	ML_LowerIn - KP_603+840_608+020 - (S>N) (4180m)	4.00	15/09/2021	18/09/2021	
1560-260	ML_LowerIn - KP_608+180_609+700 - (N>S) (1520m)	1.00	20/09/2021	20/09/2021	
1560-265	ML_LowerIn - KP_610+520_610+660 - (S>N) (140m)	0.00	21/09/2021	21/09/2021	
1560-270	ML_LowerIn - KP_610+860_615+720 - (S>N) (4860m)	4.00	21/09/2021	24/09/2021	
1560-275	ML_LowerIn - KP_616+380_618+380 - (N>S) (2000m)	2.00	25/09/2021	27/09/2021	
1560-280	ML_LowerIn - KP_618+380_620+260 - (S>N) (1880m)	2.00	28/09/2021	29/09/2021	
1560-285	ML_LowerIn - KP_620+680_620+980 - (N>S) (300m)	0.00	30/09/2021	30/09/2021	
1560-290	ML_LowerIn - KP_621+600_623+160 - (S>N) (1560m)	1.00	30/09/2021	30/09/2021	
1560-295	ML_LowerIn - KP_623+600_624+200 - (N>S) (600m)	1.00	01/10/2021	01/10/2021	
1560-300	ML_LowerIn - KP_626+600_628+200 - (N>S) (1600m)	1.00	02/10/2021	02/10/2021	
1560-305	ML_LowerIn - KP_629+580_630+120 - (S>N) (540m)	1.00	04/10/2021	04/10/2021	
1560-310	ML_LowerIn - KP_631+980_635+200 - (S>N) (3220m)	3.00	05/10/2021	14/10/2021	
1560-315	ML_LowerIn - KP_635+820_638+880 - (N>S) (3060m)	3.00	15/10/2021	18/10/2021	
1560-320	ML_LowerIn - KP_639+700_641+360 - (N>S) (1660m)	1.00	19/10/2021	19/10/2021	
1560-325	ML_LowerIn - KP_642+000_644+920 - (S>N) (2920m)	3.00	20/10/2021	22/10/2021	
1560-330	ML_LowerIn - KP_645+720_646+520 - (N>S) (800m)	1.00	23/10/2021	23/10/2021	
1560-335	ML_LowerIn - KP_647+100_650+640 - (N>S) (3540m)	3.00	25/10/2021	27/10/2021	
1560-340	ML_LowerIn - KP_650+640_654+140 - (S>N) (3500m)	3.00	28/10/2021	30/10/2021	
1560-345	ML_LowerIn - KP_655+420_662+800 - (S>N) (7380m)	5.00	01/11/2021	05/11/2021	
1560-350	ML_LowerIn - KP_664+760_667+140 - (S>N) (2380m)	2.00	06/11/2021	08/11/2021	
1560-355	ML_LowerIn - KP_667+260_668+640 - (S>N) (1380m)	1.00	09/11/2021	09/11/2021	
1560-360	ML_LowerIn - KP_669+140_673+260 - (S>N) (4120m)	4.00	10/11/2021	13/11/2021	
1560-365	ML_LowerIn - KP_673+860_674+100 - (S>N) (240m)	0.00	15/11/2021	15/11/2021	
1560-370	ML_LowerIn - KP_675+180_676+360 - (N>S) (1180m)	1.00	15/11/2021	15/11/2021	
1560-375	ML_LowerIn - KP_677+640_678+940 - (S>N) (1300m)	1.00	16/11/2021	16/11/2021	
1560-380	ML_LowerIn - KP_679+580_680+180 - (S>N) (600m)	1.00	17/11/2021	17/11/2021	
1560-385	ML_LowerIn - KP_682+120_683+940 - (S>N) (1820m)	2.00	18/11/2021	19/11/2021	
1560-390	ML_LowerIn - KP_684+400_686+020 - (S>N) (1620m)	1.00	20/11/2021	20/11/2021	
1560-395	ML_LowerIn - KP_687+400_690+480 - (S>N) (3080m)	3.00	22/11/2021	24/11/2021	
ML Backfill & Padding		**119.00**	**12/06/2021**	**25/11/2021**	
1570	ML Backfill & Padding	119.00	12/06/2021	25/11/2021	



Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

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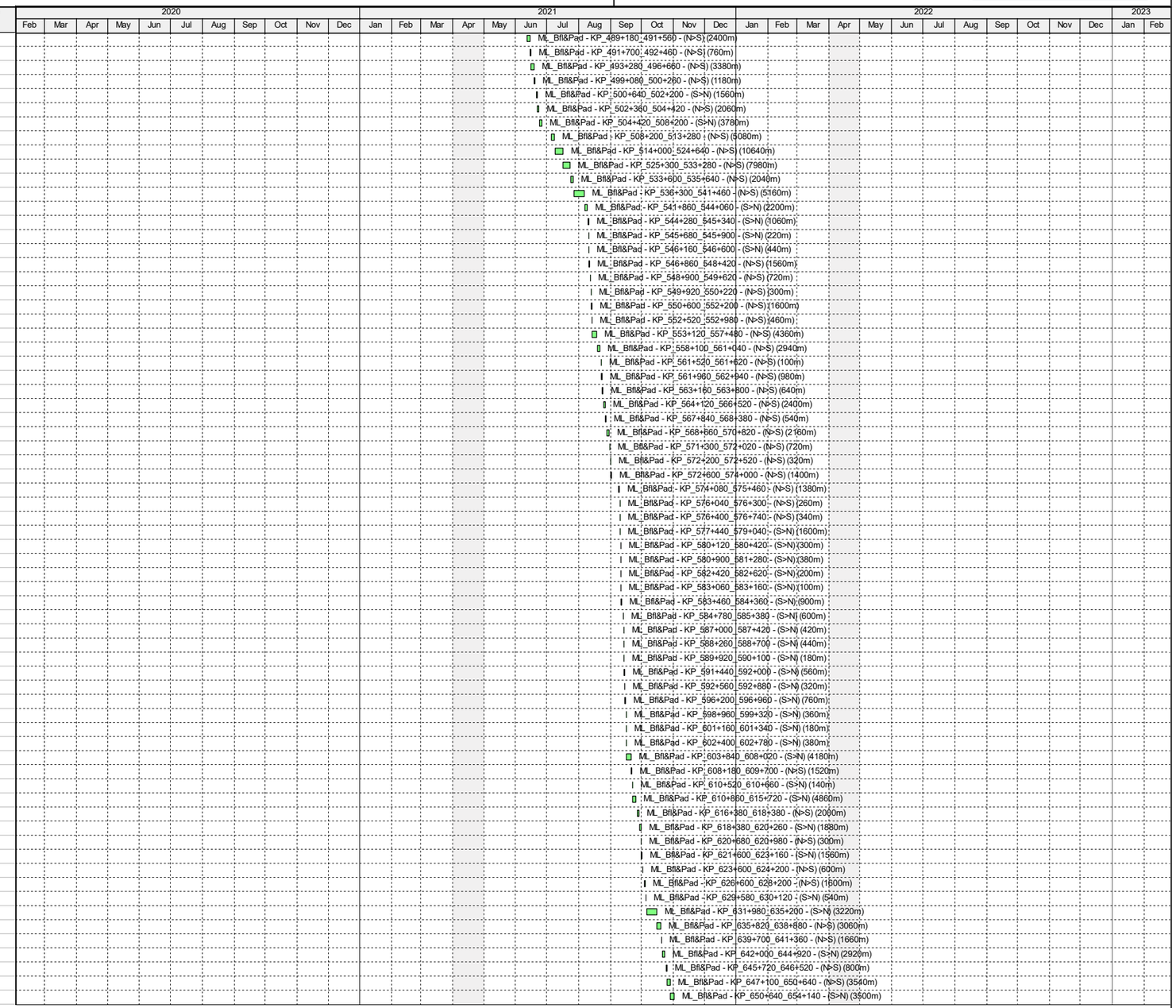
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1570-000	ML_Bfl&Pad - KP_489+180_491+560 - (N>S) (2400m)	2.00	12/06/2021	14/06/2021	
1570-005	ML_Bfl&Pad - KP_491+700_492+460 - (N>S) (760m)	1.00	15/06/2021	15/06/2021	
1570-010	ML_Bfl&Pad - KP_493+280_496+660 - (N>S) (3380m)	3.00	16/06/2021	18/06/2021	
1570-015	ML_Bfl&Pad - KP_499+080_500+260 - (N>S) (1180m)	1.00	19/06/2021	19/06/2021	
1570-020	ML_Bfl&Pad - KP_500+640_502+200 - (S>N) (1560m)	1.00	21/06/2021	21/06/2021	
1570-025	ML_Bfl&Pad - KP_502+360_504+420 - (N>S) (2060m)	2.00	22/06/2021	23/06/2021	
1570-030	ML_Bfl&Pad - KP_504+420_508+200 - (S>N) (3780m)	3.00	24/06/2021	26/06/2021	
1570-035	ML_Bfl&Pad - KP_508+200_513+280 - (N>S) (5080m)	4.00	05/07/2021	08/07/2021	
1570-040	ML_Bfl&Pad - KP_514+000_524+640 - (N>S) (10640m)	7.00	09/07/2021	16/07/2021	
1570-045	ML_Bfl&Pad - KP_525+300_533+280 - (N>S) (7980m)	6.00	17/07/2021	23/07/2021	
1570-050	ML_Bfl&Pad - KP_533+600_535+640 - (N>S) (2040m)	2.00	24/07/2021	26/07/2021	
1570-055	ML_Bfl&Pad - KP_536+300_541+460 - (N>S) (5160m)	4.00	27/07/2021	06/08/2021	
1570-060	ML_Bfl&Pad - KP_541+860_544+060 - (S>N) (2200m)	2.00	07/08/2021	09/08/2021	
1570-065	ML_Bfl&Pad - KP_544+280_545+340 - (S>N) (1060m)	1.00	10/08/2021	10/08/2021	
1570-070	ML_Bfl&Pad - KP_545+680_545+900 - (S>N) (220m)	0.00	11/08/2021	11/08/2021	
1570-075	ML_Bfl&Pad - KP_546+160_546+600 - (S>N) (440m)	0.00	11/08/2021	11/08/2021	
1570-080	ML_Bfl&Pad - KP_546+860_548+420 - (N>S) (1560m)	1.00	11/08/2021	11/08/2021	
1570-085	ML_Bfl&Pad - KP_548+900_549+620 - (N>S) (720m)	1.00	12/08/2021	12/08/2021	
1570-090	ML_Bfl&Pad - KP_549+920_550+220 - (N>S) (300m)	0.00	13/08/2021	13/08/2021	
1570-095	ML_Bfl&Pad - KP_550+600_552+200 - (N>S) (1600m)	1.00	13/08/2021	13/08/2021	
1570-100	ML_Bfl&Pad - KP_552+520_552+980 - (N>S) (460m)	0.00	14/08/2021	14/08/2021	
1570-105	ML_Bfl&Pad - KP_553+120_557+480 - (N>S) (4360m)	4.00	14/08/2021	18/08/2021	
1570-110	ML_Bfl&Pad - KP_558+100_561+040 - (N>S) (2940m)	3.00	19/08/2021	21/08/2021	
1570-115	ML_Bfl&Pad - KP_561+520_561+620 - (N>S) (100m)	0.00	23/08/2021	23/08/2021	
1570-120	ML_Bfl&Pad - KP_561+960_562+940 - (N>S) (980m)	1.00	23/08/2021	23/08/2021	
1570-125	ML_Bfl&Pad - KP_563+160_563+800 - (N>S) (640m)	1.00	24/08/2021	24/08/2021	
1570-130	ML_Bfl&Pad - KP_564+120_566+520 - (N>S) (2400m)	2.00	25/08/2021	26/08/2021	
1570-135	ML_Bfl&Pad - KP_567+840_568+380 - (N>S) (540m)	1.00	27/08/2021	27/08/2021	
1570-140	ML_Bfl&Pad - KP_568+660_570+820 - (N>S) (2160m)	2.00	28/08/2021	30/08/2021	
1570-145	ML_Bfl&Pad - KP_571+300_572+020 - (N>S) (720m)	1.00	31/08/2021	31/08/2021	
1570-150	ML_Bfl&Pad - KP_572+200_572+520 - (N>S) (320m)	0.00	01/09/2021	01/09/2021	
1570-155	ML_Bfl&Pad - KP_572+600_574+000 - (N>S) (1400m)	1.00	01/09/2021	01/09/2021	
1570-160	ML_Bfl&Pad - KP_574+080_575+460 - (N>S) (1380m)	1.00	09/09/2021	09/09/2021	
1570-165	ML_Bfl&Pad - KP_576+040_576+300 - (N>S) (260m)	0.00	10/09/2021	10/09/2021	
1570-170	ML_Bfl&Pad - KP_576+400_576+740 - (N>S) (340m)	0.00	10/09/2021	10/09/2021	
1570-175	ML_Bfl&Pad - KP_577+440_579+040 - (S>N) (1600m)	1.00	10/09/2021	10/09/2021	
1570-180	ML_Bfl&Pad - KP_580+120_580+420 - (S>N) (300m)	0.00	11/09/2021	11/09/2021	
1570-185	ML_Bfl&Pad - KP_580+900_581+280 - (S>N) (380m)	0.00	11/09/2021	11/09/2021	
1570-190	ML_Bfl&Pad - KP_582+420_582+620 - (S>N) (200m)	0.00	11/09/2021	11/09/2021	
1570-195	ML_Bfl&Pad - KP_583+060_583+160 - (S>N) (100m)	0.00	11/09/2021	11/09/2021	
1570-200	ML_Bfl&Pad - KP_583+460_584+360 - (S>N) (900m)	1.00	11/09/2021	11/09/2021	
1570-205	ML_Bfl&Pad - KP_584+780_585+380 - (S>N) (600m)	1.00	13/09/2021	13/09/2021	
1570-210	ML_Bfl&Pad - KP_587+000_587+420 - (S>N) (420m)	0.00	14/09/2021	14/09/2021	
1570-215	ML_Bfl&Pad - KP_588+260_588+700 - (S>N) (440m)	0.00	14/09/2021	14/09/2021	
1570-220	ML_Bfl&Pad - KP_589+920_590+100 - (S>N) (180m)	0.00	14/09/2021	14/09/2021	
1570-225	ML_Bfl&Pad - KP_591+440_592+000 - (S>N) (560m)	1.00	14/09/2021	14/09/2021	
1570-230	ML_Bfl&Pad - KP_592+560_592+880 - (S>N) (320m)	0.00	15/09/2021	15/09/2021	
1570-235	ML_Bfl&Pad - KP_596+200_596+960 - (S>N) (760m)	1.00	15/09/2021	15/09/2021	
1570-240	ML_Bfl&Pad - KP_598+960_599+320 - (S>N) (360m)	0.00	16/09/2021	16/09/2021	
1570-245	ML_Bfl&Pad - KP_601+160_601+340 - (S>N) (180m)	0.00	16/09/2021	16/09/2021	
1570-250	ML_Bfl&Pad - KP_602+400_602+780 - (S>N) (380m)	0.00	16/09/2021	16/09/2021	
1570-255	ML_Bfl&Pad - KP_603+840_608+020 - (S>N) (4180m)	4.00	16/09/2021	20/09/2021	
1570-260	ML_Bfl&Pad - KP_608+180_609+700 - (N>S) (1520m)	1.00	21/09/2021	21/09/2021	
1570-265	ML_Bfl&Pad - KP_610+520_610+660 - (S>N) (140m)	0.00	22/09/2021	22/09/2021	
1570-270	ML_Bfl&Pad - KP_610+860_615+720 - (S>N) (4860m)	4.00	22/09/2021	25/09/2021	
1570-275	ML_Bfl&Pad - KP_616+380_618+380 - (N>S) (2000m)	2.00	27/09/2021	28/09/2021	
1570-280	ML_Bfl&Pad - KP_618+380_620+260 - (S>N) (1880m)	2.00	29/09/2021	30/09/2021	
1570-285	ML_Bfl&Pad - KP_620+680_620+980 - (N>S) (300m)	0.00	01/10/2021	01/10/2021	
1570-290	ML_Bfl&Pad - KP_621+600_623+160 - (S>N) (1560m)	1.00	01/10/2021	01/10/2021	
1570-295	ML_Bfl&Pad - KP_623+600_624+200 - (N>S) (600m)	1.00	02/10/2021	02/10/2021	
1570-300	ML_Bfl&Pad - KP_626+600_628+200 - (N>S) (1600m)	1.00	04/10/2021	04/10/2021	
1570-305	ML_Bfl&Pad - KP_629+580_630+120 - (S>N) (540m)	1.00	05/10/2021	05/10/2021	
1570-310	ML_Bfl&Pad - KP_631+980_635+200 - (S>N) (3220m)	3.00	06/10/2021	15/10/2021	
1570-315	ML_Bfl&Pad - KP_635+820_638+880 - (N>S) (3060m)	3.00	16/10/2021	19/10/2021	
1570-320	ML_Bfl&Pad - KP_639+700_641+360 - (N>S) (1660m)	1.00	20/10/2021	20/10/2021	
1570-325	ML_Bfl&Pad - KP_642+000_644+920 - (S>N) (2920m)	3.00	21/10/2021	23/10/2021	
1570-330	ML_Bfl&Pad - KP_645+720_646+520 - (N>S) (800m)	1.00	25/10/2021	25/10/2021	
1570-335	ML_Bfl&Pad - KP_647+100_650+640 - (N>S) (3540m)	3.00	26/10/2021	28/10/2021	
1570-340	ML_Bfl&Pad - KP_650+640_654+140 - (S>N) (3500m)	3.00	29/10/2021	01/11/2021	



Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
◆ Milestone

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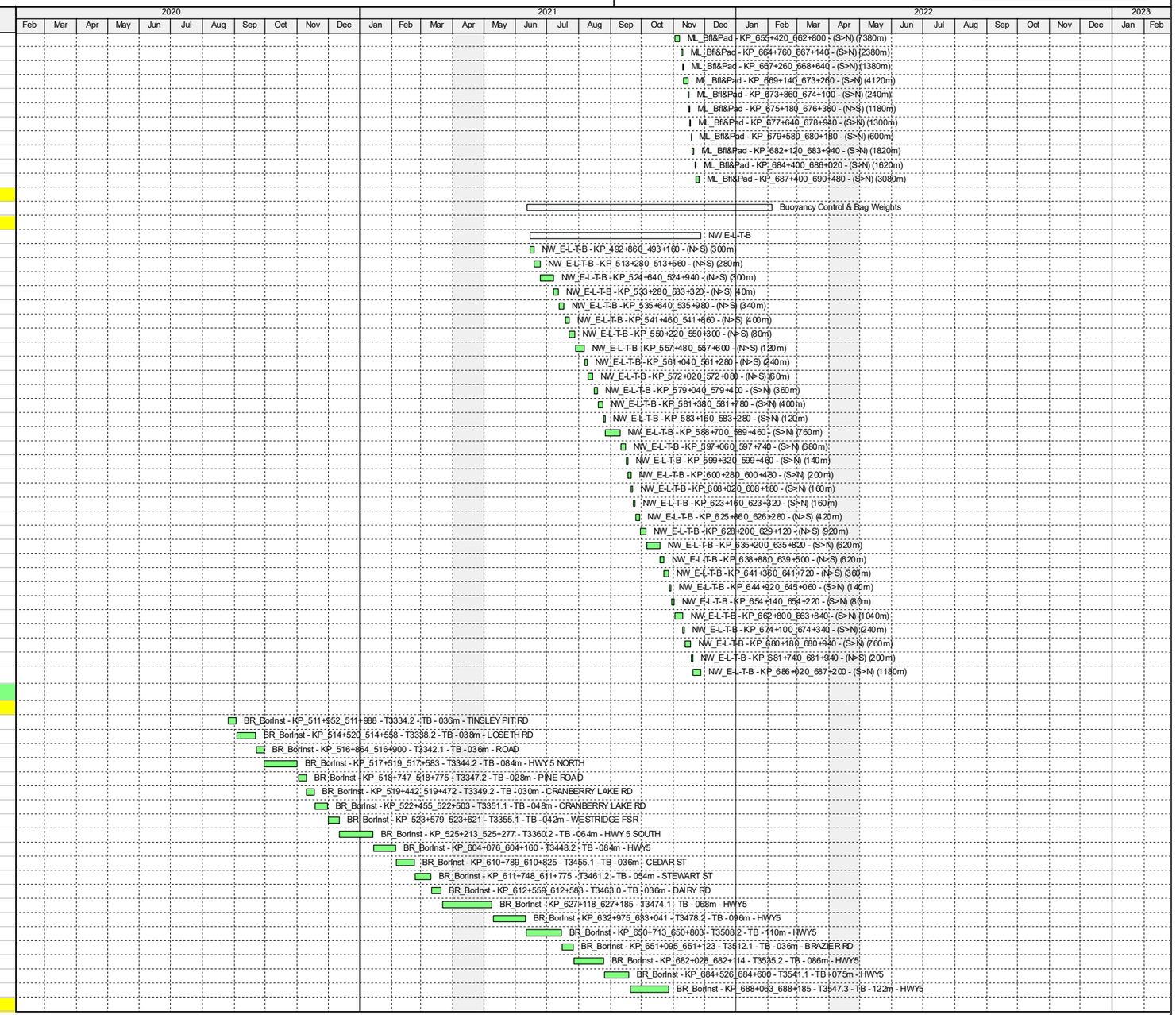
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1570-345	ML_Bfl&Pad - KP_655+420_662+800 - (S>N) (7380m)	5.00	02/11/2021	06/11/2021	
1570-350	ML_Bfl&Pad - KP_664+760_667+140 - (S>N) (2380m)	2.00	08/11/2021	09/11/2021	
1570-355	ML_Bfl&Pad - KP_667+260_668+640 - (S>N) (1380m)	1.00	10/11/2021	10/11/2021	
1570-360	ML_Bfl&Pad - KP_669+140_673+260 - (S>N) (4120m)	4.00	11/11/2021	15/11/2021	
1570-365	ML_Bfl&Pad - KP_673+860_674+100 - (S>N) (240m)	0.00	16/11/2021	16/11/2021	
1570-370	ML_Bfl&Pad - KP_675+180_676+360 - (N>S) (1180m)	1.00	16/11/2021	16/11/2021	
1570-375	ML_Bfl&Pad - KP_677+640_678+940 - (S>N) (1300m)	1.00	17/11/2021	17/11/2021	
1570-380	ML_Bfl&Pad - KP_679+580_680+180 - (S>N) (600m)	1.00	18/11/2021	18/11/2021	
1570-385	ML_Bfl&Pad - KP_682+120_683+940 - (S>N) (1820m)	2.00	19/11/2021	20/11/2021	
1570-390	ML_Bfl&Pad - KP_684+400_686+020 - (S>N) (1620m)	1.00	22/11/2021	22/11/2021	
1570-395	ML_Bfl&Pad - KP_687+400_690+480 - (S>N) (3080m)	3.00	23/11/2021	25/11/2021	
Bouyancy Control		168.00	12/06/2021	04/02/2022	
1575	Buoyancy Control & Bag Weights	168.00	12/06/2021	04/02/2022	
ML Narrow (Exc, L-In, Tie-in & Bfl)		119.00	15/06/2021	27/11/2021	
1580	NW E-L-T-B	119.00	15/06/2021	27/11/2021	
1580-000	NW_E-L-T-B - KP_492+860_493+160 - (N>S) (300m)	4.00	15/06/2021	18/06/2021	
1580-025	NW_E-L-T-B - KP_513+280_513+560 - (N>S) (280m)	5.00	19/06/2021	24/06/2021	
1580-030	NW_E-L-T-B - KP_524+640_524+940 - (N>S) (300m)	5.00	25/06/2021	07/07/2021	
1580-035	NW_E-L-T-B - KP_533+280_533+320 - (N>S) (40m)	4.00	08/07/2021	12/07/2021	
1580-045	NW_E-L-T-B - KP_535+640_535+980 - (N>S) (340m)	5.00	13/07/2021	17/07/2021	
1580-050	NW_E-L-T-B - KP_541+460_541+860 - (N>S) (400m)	4.00	19/07/2021	22/07/2021	
1580-055	NW_E-L-T-B - KP_550+220_550+300 - (N>S) (80m)	5.00	23/07/2021	28/07/2021	
1580-060	NW_E-L-T-B - KP_557+480_557+600 - (N>S) (120m)	2.00	29/07/2021	06/08/2021	
1580-065	NW_E-L-T-B - KP_561+040_561+280 - (N>S) (240m)	2.00	07/08/2021	09/08/2021	
1580-070	NW_E-L-T-B - KP_572+020_572+080 - (N>S) (60m)	5.00	10/08/2021	14/08/2021	
1580-075	NW_E-L-T-B - KP_579+040_579+400 - (S>N) (360m)	4.00	16/08/2021	19/08/2021	
1580-080	NW_E-L-T-B - KP_581+380_581+780 - (S>N) (400m)	4.00	20/08/2021	24/08/2021	
1580-085	NW_E-L-T-B - KP_583+160_583+280 - (S>N) (120m)	2.00	25/08/2021	26/08/2021	
1580-090	NW_E-L-T-B - KP_588+700_589+460 - (S>N) (760m)	7.00	27/08/2021	10/09/2021	
1580-095	NW_E-L-T-B - KP_597+060_597+740 - (S>N) (680m)	4.00	11/09/2021	15/09/2021	
1580-100	NW_E-L-T-B - KP_599+320_599+460 - (S>N) (140m)	2.00	16/09/2021	17/09/2021	
1580-105	NW_E-L-T-B - KP_600+280_600+480 - (S>N) (200m)	2.00	18/09/2021	20/09/2021	
1580-110	NW_E-L-T-B - KP_608+020_608+180 - (S>N) (160m)	2.00	21/09/2021	22/09/2021	
1580-115	NW_E-L-T-B - KP_623+160_623+320 - (S>N) (160m)	2.00	23/09/2021	24/09/2021	
1580-120	NW_E-L-T-B - KP_625+860_626+280 - (N>S) (420m)	4.00	25/09/2021	29/09/2021	
1580-125	NW_E-L-T-B - KP_628+200_629+120 - (N>S) (920m)	5.00	30/09/2021	05/10/2021	
1580-130	NW_E-L-T-B - KP_635+200_635+820 - (S>N) (620m)	5.00	06/10/2021	18/10/2021	
1580-135	NW_E-L-T-B - KP_638+880_639+500 - (N>S) (620m)	4.00	19/10/2021	22/10/2021	
1580-140	NW_E-L-T-B - KP_641+360_641+720 - (N>S) (360m)	4.00	23/10/2021	27/10/2021	
1580-145	NW_E-L-T-B - KP_644+920_645+060 - (S>N) (140m)	2.00	28/10/2021	29/10/2021	
1580-150	NW_E-L-T-B - KP_654+140_654+220 - (S>N) (80m)	2.00	30/10/2021	01/11/2021	
1580-155	NW_E-L-T-B - KP_662+800_663+840 - (S>N) (1040m)	7.00	02/11/2021	09/11/2021	
1580-160	NW_E-L-T-B - KP_674+100_674+340 - (S>N) (240m)	2.00	10/11/2021	11/11/2021	
1580-165	NW_E-L-T-B - KP_680+180_680+940 - (S>N) (760m)	5.00	12/11/2021	17/11/2021	
1580-175	NW_E-L-T-B - KP_681+740_681+940 - (N>S) (200m)	2.00	18/11/2021	19/11/2021	
1580-180	NW_E-L-T-B - KP_686+020_687+200 - (S>N) (1180m)	7.00	20/11/2021	27/11/2021	
Bores		281.00	26/08/2020	27/10/2021	
Road/Rail Bores #1		281.00	26/08/2020	27/10/2021	
1590B-010	BR_Borinst - KP_511+952_511+988 - T3334.2 - TB - 036m - TINSLEY PIT RD	7.00	26/08/2020	02/09/2020	
1590B-0101	BR_Borinst - KP_514+520_514+558 - T3338.2 - TB - 038m - LOSETH RD	10.00	03/09/2020	21/09/2020	
1590B-020	BR_Borinst - KP_516+864_516+900 - T3342.1 - TB - 036m - ROAD	7.00	22/09/2020	29/09/2020	
1590B-0201	BR_Borinst - KP_517+519_517+583 - T3344.2 - TB - 084m - HWY 5 NORTH	22.00	30/09/2020	31/10/2020	
1590B-030	BR_Borinst - KP_518+747_518+775 - T3347.2 - TB - 028m - PINE ROAD	7.00	02/11/2020	09/11/2020	
1590B-0301	BR_Borinst - KP_519+442_519+472 - T3349.2 - TB - 030m - CRANBERRY LAKE RD	7.00	10/11/2020	17/11/2020	
1590B-0401	BR_Borinst - KP_522+455_522+503 - T3351.1 - TB - 048m - CRANBERRY LAKE RD	11.00	18/11/2020	30/11/2020	
1590B-0501	BR_Borinst - KP_523+579_523+621 - T3355.1 - TB - 042m - WESTRIDGE FSR	10.00	01/12/2020	11/12/2020	
1590B-040	BR_Borinst - KP_525+213_525+277 - T3360.2 - TB - 064m - HWY 5 SOUTH	16.00	12/12/2020	13/01/2021	
1590-0801	BR_Borinst - KP_604+076_604+160 - T3448.2 - TB - 084m - HWY5	19.00	14/01/2021	04/02/2021	
1590B-070	BR_Borinst - KP_610+789_610+825 - T3455.1 - TB - 036m - CEDAR ST	9.00	05/02/2021	22/02/2021	
1590-080	BR_Borinst - KP_611+748_611+775 - T3461.2 - TB - 054m - STEWART ST	14.00	23/02/2021	10/03/2021	
1590-090	BR_Borinst - KP_612+559_612+583 - T3463.0 - TB - 036m - DAIRY RD	9.00	11/03/2021	20/03/2021	
1590-100	BR_Borinst - KP_627+118_627+185 - T3474.1 - TB - 068m - HWY5	16.00	22/03/2021	08/05/2021	
1590-110	BR_Borinst - KP_632+975_633+041 - T3478.2 - TB - 096m - HWY5	22.00	10/05/2021	10/06/2021	
1590-120	BR_Borinst - KP_650+713_650+803 - T3508.2 - TB - 110m - HWY5	24.00	11/06/2021	15/07/2021	
1590-130	BR_Borinst - KP_651+095_651+123 - T3512.1 - TB - 036m - BRAZIER RD	9.00	16/07/2021	26/07/2021	
1590-140	BR_Borinst - KP_682+028_682+114 - T3535.2 - TB - 086m - HWY5	20.00	27/07/2021	25/08/2021	
1590-150	BR_Borinst - KP_684+526_684+600 - T3541.1 - TB - 075m - HWY5	15.00	26/08/2021	18/09/2021	
1590-200	BR_Borinst - KP_688+063_688+185 - T3547.3 - TB - 122m - HWY5	27.00	20/09/2021	27/10/2021	
Road/Rail Bores #2		196.00	12/12/2020	22/10/2021	

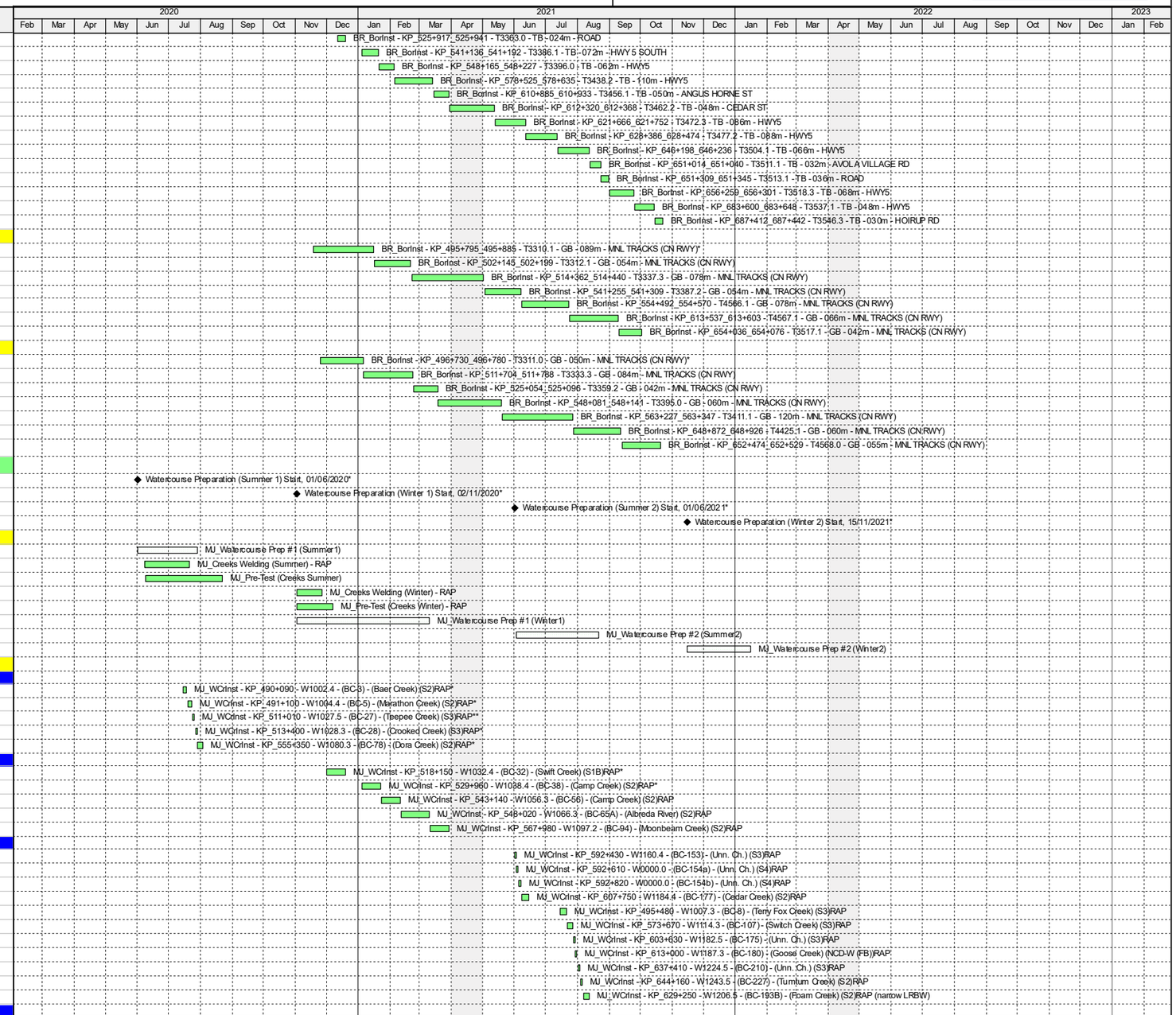


Actual Work
Critical Remaining Work
Milestone
Remaining Work
Remaining Level of Effort

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1592B-060	BR_BorInst - KP_525+917_525+941 - T3363.0 - TB - 024m - ROAD	7.00	12/12/2020	19/12/2020	
1592B-0501	BR_BorInst - KP_541+136_541+192 - T3386.1 - TB - 072m - HWY 5 SOUTH	15.00	04/01/2021	20/01/2021	
1592B-0551	BR_BorInst - KP_548+165_548+227 - T3396.0 - TB - 062m - HWY5	13.00	21/01/2021	04/02/2021	
1592B-0601	BR_BorInst - KP_578+525_578+635 - T3438.2 - TB - 110m - HWY5	26.00	05/02/2021	13/03/2021	
1592-090	BR_BorInst - KP_610+885_610+933 - T3456.1 - TB - 050m - ANGUS HORNE ST	13.00	15/03/2021	29/03/2021	
1592-100	BR_BorInst - KP_612+320_612+368 - T3462.2 - TB - 048m - CEDAR ST	12.00	30/03/2021	12/05/2021	
1592-110	BR_BorInst - KP_621+666_621+752 - T3472.3 - TB - 086m - HWY5	20.00	13/05/2021	11/06/2021	
1592-120	BR_BorInst - KP_628+386_628+474 - T3477.2 - TB - 088m - HWY5	20.00	12/06/2021	12/07/2021	
1592-130	BR_BorInst - KP_646+198_646+236 - T3504.1 - TB - 066m - HWY5	21.00	13/07/2021	12/08/2021	
1592-140	BR_BorInst - KP_651+014_651+040 - T3511.1 - TB - 032m - AVOLA VILLAGE RD	9.00	13/08/2021	23/08/2021	
1592-150	BR_BorInst - KP_651+309_651+345 - T3513.1 - TB - 036m - ROAD	7.00	24/08/2021	31/08/2021	
1592-160	BR_BorInst - KP_656+259_656+301 - T3518.3 - TB - 068m - HWY5	15.00	01/09/2021	24/09/2021	
1592-180	BR_BorInst - KP_683+600_683+648 - T3537.1 - TB - 048m - HWY5	11.00	25/09/2021	14/10/2021	
1592-190	BR_BorInst - KP_687+412_687+442 - T3546.3 - TB - 030m - HOIRUP RD	7.00	15/10/2021	22/10/2021	
Road/Rail Bores #3		206.00	18/11/2020	02/10/2021	
1594B-000	BR_BorInst - KP_495+795_495+885 - T3310.1 - GB - 089m - MNL TRACKS (CN RWY)*	39.00	18/11/2020	15/01/2021	
1594B-010	BR_BorInst - KP_502+145_502+199 - T3312.1 - GB - 054m - MNL TRACKS (CN RWY)	25.00	16/01/2021	20/02/2021	
1594B-025	BR_BorInst - KP_514+362_514+440 - T3337.3 - GB - 078m - MNL TRACKS (CN RWY)	34.00	22/02/2021	01/05/2021	
1594B-085	BR_BorInst - KP_541+255_541+309 - T3387.2 - GB - 054m - MNL TRACKS (CN RWY)	25.00	03/05/2021	07/06/2021	
1594-100	BR_BorInst - KP_554+492_554+570 - T4566.1 - GB - 078m - MNL TRACKS (CN RWY)	34.00	08/06/2021	23/07/2021	
1594-145	BR_BorInst - KP_613+537_613+603 - T4567.1 - GB - 066m - MNL TRACKS (CN RWY)	29.00	24/07/2021	09/09/2021	
1594-205	BR_BorInst - KP_654+036_654+076 - T3517.1 - GB - 042m - MNL TRACKS (CN RWY)	20.00	10/09/2021	02/10/2021	
Road/Rail Bores #4		209.00	25/11/2020	20/10/2021	
1596B-005	BR_BorInst - KP_496+730_496+780 - T3311.0 - GB - 050m - MNL TRACKS (CN RWY)*	24.00	25/11/2020	05/01/2021	
1596B-015	BR_BorInst - KP_511+704_511+788 - T3333.3 - GB - 084m - MNL TRACKS (CN RWY)	35.00	06/01/2021	22/02/2021	
1596B-065	BR_BorInst - KP_525+054_525+096 - T3359.2 - GB - 042m - MNL TRACKS (CN RWY)	21.00	23/02/2021	18/03/2021	
1596B-090	BR_BorInst - KP_548+081_548+141 - T3395.0 - GB - 060m - MNL TRACKS (CN RWY)	27.00	19/03/2021	19/05/2021	
1596-105	BR_BorInst - KP_563+227_563+347 - T3411.1 - GB - 120m - MNL TRACKS (CN RWY)	47.00	20/05/2021	27/07/2021	
1596-175	BR_BorInst - KP_648+872_648+926 - T4425.1 - GB - 060m - MNL TRACKS (CN RWY)	28.00	28/07/2021	11/09/2021	
1596-200	BR_BorInst - KP_652+474_652+529 - T4568.0 - GB - 055m - MNL TRACKS (CN RWY)	27.00	13/09/2021	20/10/2021	
160.Major Creek & River Crossings		429.00	01/06/2020	03/02/2022	
MILE-S170	Watercourse Preparation (Summer 1) Start	0.00	01/06/2020*		
MILE-S160	Watercourse Preparation (Winter 1) Start	0.00	02/11/2020*		
MILE-S570	Watercourse Preparation (Summer 2) Start	0.00	01/06/2021*		
MILE-S580	Watercourse Preparation (Winter 2) Start	0.00	15/11/2021*		
Hot Bends & Pre-Test		413.00	01/06/2020	15/01/2022	
1632	MJ_Watercourse Prep #1 (Summer1)	50.00	01/06/2020	28/07/2020	
1612	MJ_Creeks Welding (Summer) - RAP	38.00	08/06/2020	21/07/2020	
1625	MJ_Pre-Test (Creeks Summer)	58.00	09/06/2020	22/08/2020	
1610	MJ_Creeks Welding (Winter) - RAP	22.00	02/11/2020	26/11/2020	
1620	MJ_Pre-Test (Creeks Winter) - RAP	31.00	02/11/2020	07/12/2020	
1630	MJ_Watercourse Prep #1 (Winter1)	111.00	02/11/2020	10/03/2021	
1636	MJ_Watercourse Prep #2 (Summer2)	69.00	03/06/2021	21/08/2021	
1634	MJ_Watercourse Prep #2 (Winter2)	54.00	15/11/2021	15/01/2022	
Major Watercourse #1		397.00	15/07/2020	03/02/2022	
1645 Summer 1		17.00	15/07/2020	03/08/2020	
1655-010	MJ_WCrInst - KP_490+090 - W1002.4 - (BC-3) - (Baer Creek) (S2)RAP*	4.00	15/07/2020	18/07/2020	
1655-015	MJ_WCrInst - KP_491+100 - W1004.4 - (BC-5) - (Marathon Creek) (S2)RAP*	4.00	20/07/2020	23/07/2020	
1642-06	MJ_WCrInst - KP_511+010 - W1027.5 - (BC-27) - (Teepee Creek) (S3)RAP**	2.00	24/07/2020	25/07/2020	
1655-023	MJ_WCrInst - KP_513+400 - W1028.3 - (BC-28) - (Crooked Creek) (S3)RAP*	2.00	27/07/2020	28/07/2020	
1665-006	MJ_WCrInst - KP_555+350 - W1080.3 - (BC-78) - (Dora Creek) (S2)RAP*	5.00	29/07/2020	03/08/2020	
1640 Winter 1		84.00	01/12/2020	29/03/2021	
1640-000	MJ_WCrInst - KP_518+150 - W1032.4 - (BC-32) - (Swift Creek) (S1B)RAP*	17.00	01/12/2020	19/12/2020	
1640-010	MJ_WCrInst - KP_529+960 - W1038.4 - (BC-38) - (Camp Creek) (S2)RAP*	17.00	04/01/2021	22/01/2021	
1640-030	MJ_WCrInst - KP_543+140 - W1056.3 - (BC-56) - (Camp Creek) (S2)RAP	16.00	23/01/2021	10/02/2021	
1640-035	MJ_WCrInst - KP_548+020 - W1066.3 - (BC-65A) - (Albreda River) (S2)RAP	24.00	11/02/2021	10/03/2021	
1640-060	MJ_WCrInst - KP_567+980 - W1097.2 - (BC-94) - (Moonbeam Creek) (S2)RAP	16.00	11/03/2021	29/03/2021	
1642 Summer 2		51.00	01/06/2021	12/08/2021	
1642-02	MJ_WCrInst - KP_592+430 - W1160.4 - (BC-153) - (Unn. Ch.) (S3)RAP	2.00	01/06/2021	02/06/2021	
1642-170	MJ_WCrInst - KP_592+610 - W0000.0 - (BC-154a) - (Unn. Ch.) (S4)RAP	2.00	03/06/2021	04/06/2021	
1642-180	MJ_WCrInst - KP_592+820 - W0000.0 - (BC-154b) - (Unn. Ch.) (S4)RAP	2.00	05/06/2021	07/06/2021	
1642-05	MJ_WCrInst - KP_607+750 - W1184.4 - (BC-177) - (Cedar Creek) (S2)RAP	6.00	08/06/2021	14/06/2021	
1642-025	MJ_WCrInst - KP_495+480 - W1007.3 - (BC-8) - (Terry Fox Creek) (S3)RAP	6.00	15/07/2021	21/07/2021	
1642-055	MJ_WCrInst - KP_573+670 - W1114.3 - (BC-107) - (Switch Creek) (S3)RAP	5.00	22/07/2021	27/07/2021	
1642-070	MJ_WCrInst - KP_603+630 - W1182.5 - (BC-175) - (Unn. Ch.) (S3)RAP	2.00	28/07/2021	29/07/2021	
1642-085	MJ_WCrInst - KP_613+000 - W1187.3 - (BC-180) - (Goose Creek) (NCD-W (FB))RAP	2.00	30/07/2021	31/07/2021	
1642-095	MJ_WCrInst - KP_637+410 - W1224.5 - (BC-210) - (Unn. Ch.) (S3)RAP	2.00	02/08/2021	03/08/2021	
1642-105	MJ_WCrInst - KP_644+160 - W1243.5 - (BC-227) - (Turnturn Creek) (S2)RAP	2.00	04/08/2021	05/08/2021	
1642-090	MJ_WCrInst - KP_629+250 - W1206.5 - (BC-193B) - (Foam Creek) (S2)RAP (narrow LRBW)	5.00	07/08/2021	12/08/2021	
1647 Winter 2		44.00	01/12/2021	03/02/2022	

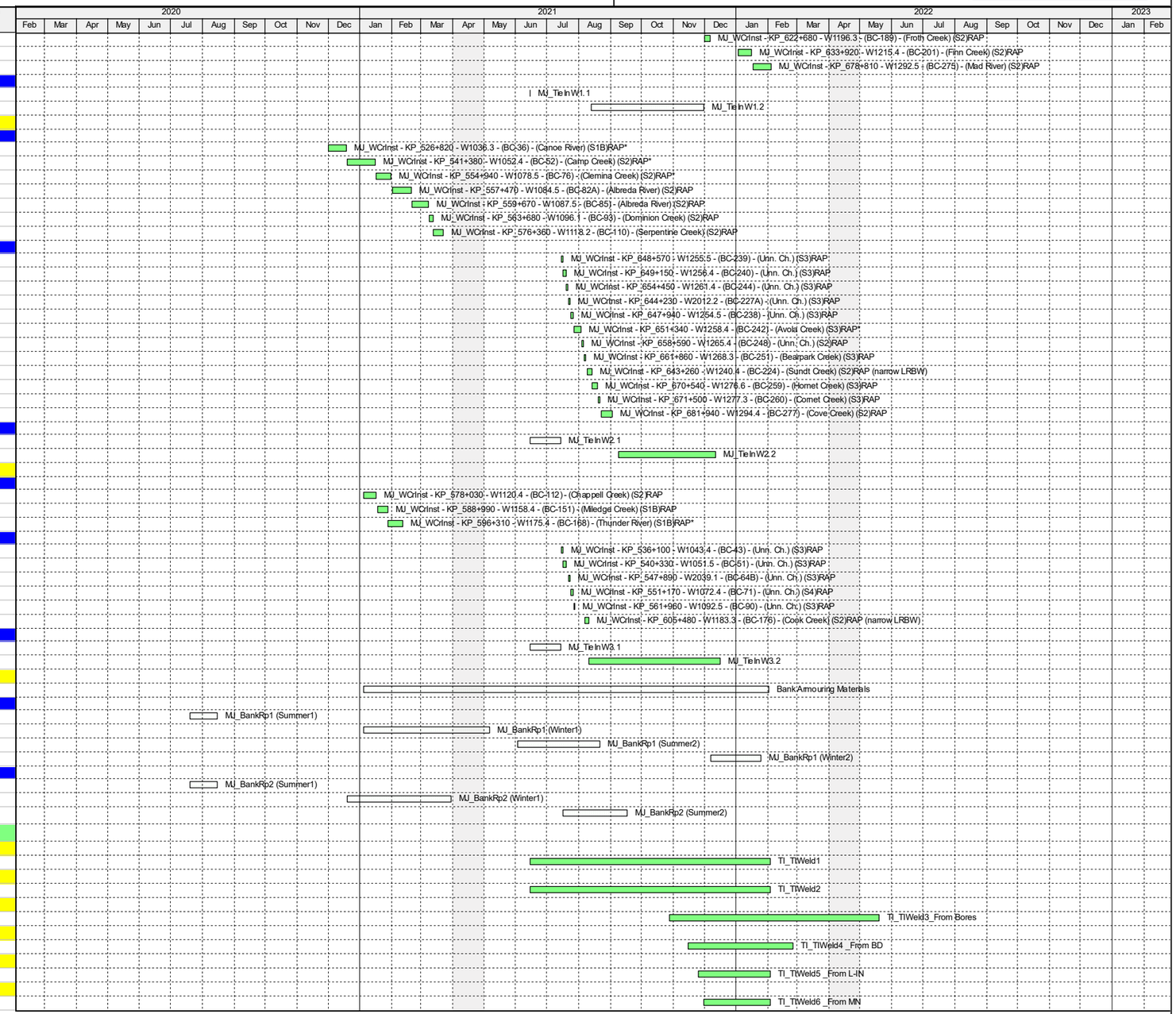


Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1647-076	MJ_WCrInst - KP_622+680 - W1196.3 - (BC-189) - (Froth Creek) (S2)RAP	5.00	01/12/2021	06/12/2021	
1647-086	MJ_WCrInst - KP_633+920 - W1215.4 - (BC-201) - (Finn Creek) (S2)RAP	12.00	03/01/2022	15/01/2022	
1647-101	MJ_WCrInst - KP_678+810 - W1292.5 - (BC-275) - (Mad River) (S2)RAP	16.00	17/01/2022	03/02/2022	
1646 Tie-In Welding (from WC#1 Summer)		121.00	15/06/2021	30/11/2021	
1646-01	MJ_TieInW1.1	0.00	15/06/2021	15/06/2021	
1646-02	MJ_TieInW1.2	82.00	13/08/2021	30/11/2021	
Major Watercourse #2		262.00	01/12/2020	11/12/2021	
1650 Winter 1		78.00	01/12/2020	22/03/2021	
1650-005	MJ_WCrInst - KP_526+820 - W1036.3 - (BC-36) - (Canoe River) (S1B)RAP*	16.00	01/12/2020	18/12/2020	
1650-020	MJ_WCrInst - KP_541+380 - W1052.4 - (BC-52) - (Camp Creek) (S2)RAP*	12.00	19/12/2020	15/01/2021	
1650-030	MJ_WCrInst - KP_554+940 - W1078.5 - (BC-76) - (Clemina Creek) (S2)RAP*	13.00	16/01/2021	30/01/2021	
1650-04	MJ_WCrInst - KP_557+470 - W1084.5 - (BC-82A) - (Albreda River) (S2)RAP	17.00	01/02/2021	19/02/2021	
1650-050	MJ_WCrInst - KP_559+670 - W1087.5 - (BC-85) - (Albreda River) (S2)RAP	14.00	20/02/2021	08/03/2021	
1650-055	MJ_WCrInst - KP_563+680 - W1096.1 - (BC-93) - (Dominion Creek) (S2)RAP	4.00	09/03/2021	12/03/2021	
1650-065	MJ_WCrInst - KP_576+360 - W1118.2 - (BC-110) - (Serpentine Creek) (S2)RAP	8.00	13/03/2021	22/03/2021	
1651 Summer 2		35.00	15/07/2021	02/09/2021	
1651-120	MJ_WCrInst - KP_648+570 - W1255.5 - (BC-239) - (Unn. Ch.) (S3)RAP	2.00	15/07/2021	16/07/2021	
1651-125	MJ_WCrInst - KP_649+150 - W1256.4 - (BC-240) - (Unn. Ch.) (S3)RAP	2.00	17/07/2021	19/07/2021	
1651-135	MJ_WCrInst - KP_654+450 - W1261.4 - (BC-244) - (Unn. Ch.) (S3)RAP	2.00	20/07/2021	21/07/2021	
1651-110	MJ_WCrInst - KP_644+230 - W2012.2 - (BC-227A) - (Unn. Ch.) (S3)RAP	2.00	22/07/2021	23/07/2021	
1651-115	MJ_WCrInst - KP_647+940 - W1254.5 - (BC-238) - (Unn. Ch.) (S3)RAP	2.00	24/07/2021	26/07/2021	
1651-130	MJ_WCrInst - KP_651+340 - W1258.4 - (BC-242) - (Avola Creek) (S3)RAP*	7.00	27/07/2021	03/08/2021	
1651-140	MJ_WCrInst - KP_658+590 - W1265.4 - (BC-248) - (Unn. Ch.) (S2)RAP	2.00	04/08/2021	05/08/2021	
1651-145	MJ_WCrInst - KP_661+860 - W1268.3 - (BC-251) - (Bearpark Creek) (S3)RAP	2.00	06/08/2021	07/08/2021	
1651-100	MJ_WCrInst - KP_643+260 - W1240.4 - (BC-224) - (Sundt Creek) (S2)RAP (narrow LRBW)	5.00	09/08/2021	13/08/2021	
1651-150	MJ_WCrInst - KP_670+540 - W1276.6 - (BC-259) - (Hornet Creek) (S3)RAP	5.00	14/08/2021	19/08/2021	
1651-160	MJ_WCrInst - KP_671+500 - W1277.3 - (BC-260) - (Comet Creek) (S3)RAP	2.00	20/08/2021	21/08/2021	
1651-155	MJ_WCrInst - KP_681+940 - W1294.4 - (BC-277) - (Cove Creek) (S2)RAP	10.00	23/08/2021	02/09/2021	
1656 Tie-In Welding (from WC#2 Summer)		131.00	15/06/2021	11/12/2021	
1656-01	MJ_TieInW2.1	20.00	15/06/2021	14/07/2021	
1656-02	MJ_TieInW2.2	75.00	09/09/2021	11/12/2021	
Major Watercourse #3		249.00	04/01/2021	16/12/2021	
1660 Winter 1		34.00	04/01/2021	11/02/2021	
1660-007	MJ_WCrInst - KP_578+030 - W1120.4 - (BC-112) - (Chappell Creek) (S2)RAP	12.00	04/01/2021	16/01/2021	
1660-075	MJ_WCrInst - KP_588+990 - W1158.4 - (BC-151) - (Miledge Creek) (S1B)RAP	9.00	18/01/2021	27/01/2021	
1660-080	MJ_WCrInst - KP_596+310 - W1175.4 - (BC-168) - (Thunder River) (S1B)RAP*	13.00	28/01/2021	11/02/2021	
1661 Summer 2		17.00	15/07/2021	10/08/2021	
1661-021	MJ_WCrInst - KP_536+100 - W1043.4 - (BC-43) - (Unn. Ch.) (S3)RAP	2.00	15/07/2021	16/07/2021	
1661-022	MJ_WCrInst - KP_540+330 - W1051.5 - (BC-51) - (Unn. Ch.) (S3)RAP	2.00	17/07/2021	19/07/2021	
1661-025	MJ_WCrInst - KP_547+890 - W2039.1 - (BC-64B) - (Unn. Ch.) (S3)RAP	2.00	22/07/2021	23/07/2021	
1661-035	MJ_WCrInst - KP_551+170 - W1072.4 - (BC-71) - (Unn. Ch.) (S4)RAP	2.00	24/07/2021	26/07/2021	
1661-045	MJ_WCrInst - KP_561+960 - W1092.5 - (BC-90) - (Unn. Ch.) (S3)RAP	2.00	27/07/2021	28/07/2021	
1661-075	MJ_WCrInst - KP_605+480 - W1183.3 - (BC-176) - (Cook Creek) (S2)RAP (narrow LRBW)	3.00	07/08/2021	10/08/2021	
1666. Tie-In Welding (from WC#3 Summer)		135.00	15/06/2021	16/12/2021	
1666	MJ_TieInW3.1	20.00	15/06/2021	14/07/2021	
1666-02	MJ_TieInW3.2	98.00	11/08/2021	16/12/2021	
Bank Replacement		378.00	20/07/2020	01/02/2022	
1695	Bank Armouring Materials	264.00	04/01/2021	01/02/2022	
Bank Replacement #1		371.00	20/07/2020	24/01/2022	
1680	MJ_BankRp1 (Summer1)	17.64	20/07/2020	15/08/2020	
1681	MJ_BankRp1 (Winter1)	74.00	04/01/2021	06/05/2021	
1682	MJ_BankRp1 (Summer2)	56.64	03/06/2021	21/08/2021	
1683	MJ_BankRp1 (Winter2)	30.00	07/12/2021	24/01/2022	
Bank Replacement #2		278.64	20/07/2020	17/09/2021	
1684	MJ_BankRp2 (Summer1)	17.64	20/07/2020	15/08/2020	
1685	MJ_BankRp2 (Winter1)	69.00	19/12/2020	30/03/2021	
1686	MJ_BankRp2 (Summer2)	41.64	17/07/2021	17/09/2021	
170.Tie-In Welding		238.00	28/05/2021	19/05/2022	
Tie-In Welding 1		164.00	15/06/2021	02/02/2022	
1711	TI_TIWeld1	164.00	15/06/2021	02/02/2022	
Tie-In Welding 2		164.00	15/06/2021	02/02/2022	
1712	TI_TIWeld2	164.00	15/06/2021	02/02/2022	
Tie-In Welding 3		131.00	28/10/2021	19/05/2022	
1713	TI_TIWeld3_From Bores	131.00	28/10/2021	19/05/2022	
Tie-In Welding 4		70.00	15/11/2021	24/02/2022	
1714	TI_TIWeld4 _From BD	70.00	15/11/2021	24/02/2022	
Tie-In Welding 5		48.00	25/11/2021	02/02/2022	
1715	TI_TIWeld5 _From L-IN	48.00	25/11/2021	02/02/2022	
Tie-In Welding 6		44.00	30/11/2021	02/02/2022	
1716	TI_TIWeld6 _From MN	44.00	30/11/2021	02/02/2022	

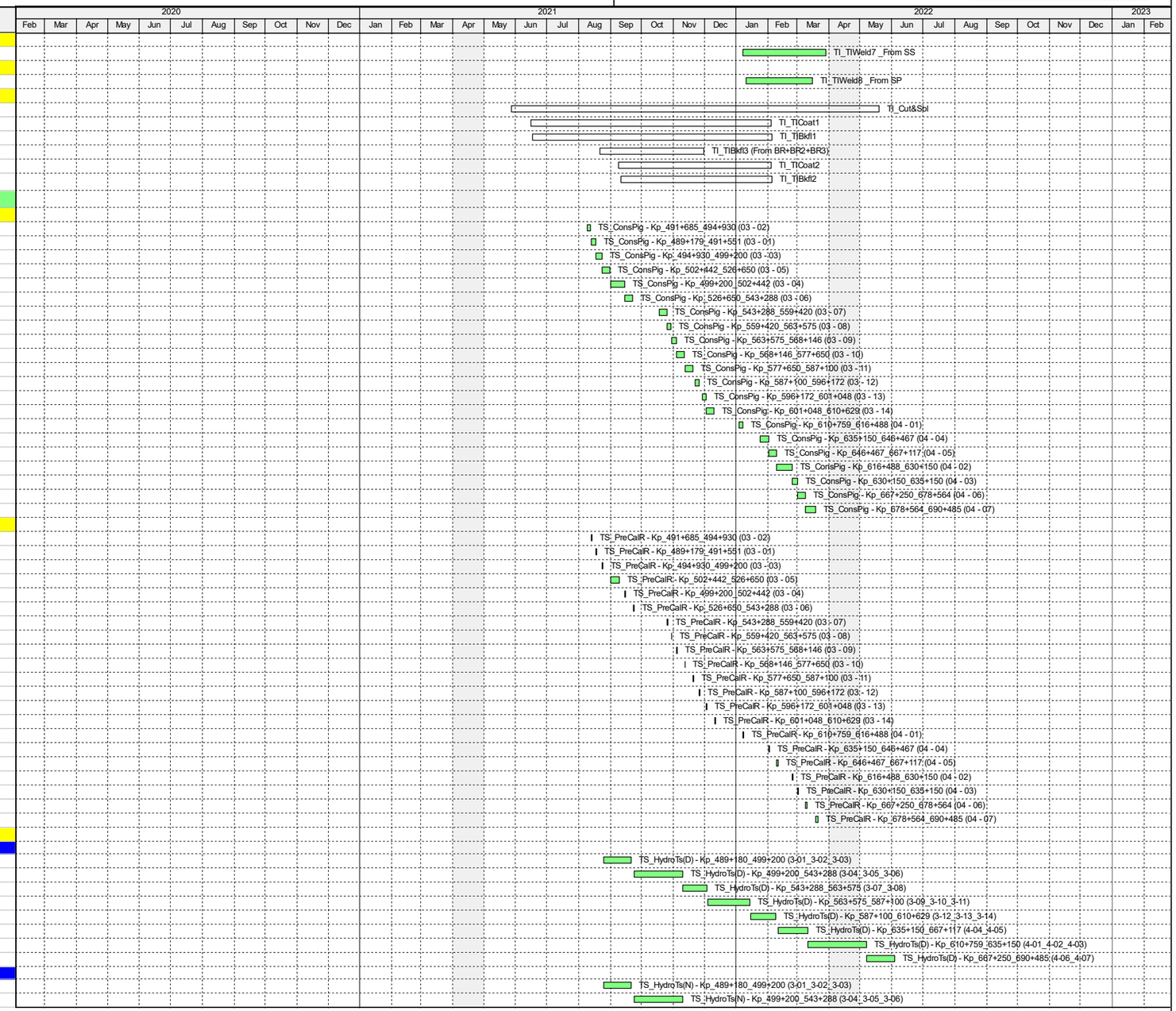


Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
Tie-In Welding 7		63.00	07/01/2022	28/03/2022	
1717	TI_TIWeld7 _From SS	63.00	07/01/2022	28/03/2022	
Tie-In Welding 8		50.00	10/01/2022	15/03/2022	
1718	TI_TIWeld8 _From SP	50.00	10/01/2022	15/03/2022	
Tie-In Coating & Backfill		238.00	28/05/2021	19/05/2022	
1770	TI_Cut&Sbl	238.00	28/05/2021	19/05/2022	
1780	TI_TICoat1	164.00	16/06/2021	03/02/2022	
1791	TI_TIBkfl1	164.00	17/06/2021	04/02/2022	
1793	TI_TIBkfl3 (From BR+BR2+BR3)	74.36	21/08/2021	30/11/2021	
1785	TI_TICoat2	109.00	09/09/2021	03/02/2022	
1792	TI_TIBkfl2	108.00	11/09/2021	04/02/2022	
180.Hydrostatic Testing		202.45	09/08/2021	13/06/2022	
Const Pig & Test Support		161.45	09/08/2021	19/03/2022	
1800-02	TS_ConsPig - Kp_491+685_494+930 (03 - 02)	4.00	09/08/2021*	12/08/2021	
1800-01	TS_ConsPig - Kp_489+179_491+551 (03 - 01)	4.00	13/08/2021	17/08/2021	
1800-03	TS_ConsPig - Kp_494+930_499+200 (03 - 03)	5.00	18/08/2021	23/08/2021	
1800-05	TS_ConsPig - Kp_502+442_526+650 (03 - 05)	7.00	24/08/2021	31/08/2021	
1800-04	TS_ConsPig - Kp_499+200_502+442 (03 - 04)	6.00	01/09/2021	14/09/2021	
1800-06	TS_ConsPig - Kp_526+650_543+288 (03 - 06)	7.00	15/09/2021	22/09/2021	
1800-07	TS_ConsPig - Kp_543+288_559+420 (03 - 07)	7.00	18/10/2021*	25/10/2021	
1800-08	TS_ConsPig - Kp_559+420_563+575 (03 - 08)	4.00	26/10/2021	29/10/2021	
1800-09	TS_ConsPig - Kp_563+575_568+146 (03 - 09)	4.00	30/10/2021	03/11/2021	
1800-10	TS_ConsPig - Kp_568+146_577+650 (03 - 10)	7.00	04/11/2021	11/11/2021	
1800-11	TS_ConsPig - Kp_577+650_587+100 (03 - 11)	7.00	12/11/2021	19/11/2021	
1800-12	TS_ConsPig - Kp_587+100_596+172 (03 - 12)	4.00	22/11/2021*	25/11/2021	
1800-13	TS_ConsPig - Kp_596+172_601+048 (03 - 13)	4.00	29/11/2021	02/12/2021	
1800-14	TS_ConsPig - Kp_601+048_610+629 (03 - 14)	7.00	03/12/2021	10/12/2021	
1800-15	TS_ConsPig - Kp_610+759_616+488 (04 - 01)	4.00	03/01/2022*	07/01/2022	
1800-18	TS_ConsPig - Kp_635+150_646+467 (04 - 04)	7.00	24/01/2022*	01/02/2022	
1800-19	TS_ConsPig - Kp_646+467_667+117 (04 - 05)	7.00	01/02/2022	09/02/2022	
1800-16	TS_ConsPig - Kp_616+488_630+150 (04 - 02)	7.00	09/02/2022	24/02/2022	
1800-17	TS_ConsPig - Kp_630+150_635+150 (04 - 03)	4.00	24/02/2022	01/03/2022	
1800-20	TS_ConsPig - Kp_667+250_678+564 (04 - 06)	7.00	01/03/2022	09/03/2022	
1800-22	TS_ConsPig - Kp_678+564_690+485 (04 - 07)	9.00	09/03/2022	19/03/2022	
Pre-Hydrostatic Test caliper Run		158.45	13/08/2021	21/03/2022	
1805-02	TS_PreCalR - Kp_491+685_494+930 (03 - 02)	1.00	13/08/2021	13/08/2021	
1805-01	TS_PreCalR - Kp_489+179_491+551 (03 - 01)	1.00	18/08/2021	18/08/2021	
1805-03	TS_PreCalR - Kp_494+930_499+200 (03 - 03)	1.00	24/08/2021	24/08/2021	
1805-05	TS_PreCalR - Kp_502+442_526+650 (03 - 05)	2.00	01/09/2021	09/09/2021	
1805-04	TS_PreCalR - Kp_499+200_502+442 (03 - 04)	1.00	15/09/2021	15/09/2021	
1805-06	TS_PreCalR - Kp_526+650_543+288 (03 - 06)	1.00	23/09/2021	23/09/2021	
1805-07	TS_PreCalR - Kp_543+288_559+420 (03 - 07)	1.00	26/10/2021	26/10/2021	
1805-08	TS_PreCalR - Kp_559+420_563+575 (03 - 08)	1.00	30/10/2021	30/10/2021	
1805-09	TS_PreCalR - Kp_563+575_568+146 (03 - 09)	1.00	04/11/2021	04/11/2021	
1805-10	TS_PreCalR - Kp_568+146_577+650 (03 - 10)	1.00	12/11/2021	12/11/2021	
1805-11	TS_PreCalR - Kp_577+650_587+100 (03 - 11)	1.00	20/11/2021	20/11/2021	
1805-12	TS_PreCalR - Kp_587+100_596+172 (03 - 12)	1.00	26/11/2021	26/11/2021	
1805-13	TS_PreCalR - Kp_596+172_601+048 (03 - 13)	1.00	03/12/2021	03/12/2021	
1805-14	TS_PreCalR - Kp_601+048_610+629 (03 - 14)	1.00	11/12/2021	11/12/2021	
1805-15	TS_PreCalR - Kp_610+759_616+488 (04 - 01)	1.00	07/01/2022	08/01/2022	
1805-18	TS_PreCalR - Kp_635+150_646+467 (04 - 04)	1.00	01/02/2022	02/02/2022	
1805-19	TS_PreCalR - Kp_646+467_667+117 (04 - 05)	1.00	09/02/2022	10/02/2022	
1805-16	TS_PreCalR - Kp_616+488_630+150 (04 - 02)	1.00	24/02/2022	25/02/2022	
1805-17	TS_PreCalR - Kp_630+150_635+150 (04 - 03)	1.00	01/03/2022	02/03/2022	
1805-20	TS_PreCalR - Kp_667+250_678+564 (04 - 06)	1.00	09/03/2022	10/03/2022	
1805-22	TS_PreCalR - Kp_678+564_690+485 (04 - 07)	1.00	19/03/2022	21/03/2022	
Hydro Test		180.45	25/08/2021	03/06/2022	
Hydro Test (Day)		180.45	25/08/2021	03/06/2022	
1810-01	TS_HydroTs(D) - Kp_489+180_499+200 (3-01_3-02_3-03)	17.00	25/08/2021	20/09/2021	
1810-02	TS_HydroTs(D) - Kp_499+200_543+288 (3-04_3-05_3-06)	34.00	24/09/2021	09/11/2021	
1810-03	TS_HydroTs(D) - Kp_543+288_563+575 (3-07_3-08)	21.00	10/11/2021	03/12/2021	
1810-04	TS_HydroTs(D) - Kp_563+575_587+100 (3-09_3-10_3-11)	24.00	04/12/2021	14/01/2022	
1810-05	TS_HydroTs(D) - Kp_587+100_610+629 (3-12_3-13_3-14)	21.00	15/01/2022	08/02/2022	
1810-07	TS_HydroTs(D) - Kp_635+150_667+117 (4-04_4-05)	19.00	10/02/2022	11/03/2022	
1810-06	TS_HydroTs(D) - Kp_610+759_635+150 (4-01_4-02_4-03)	23.00	11/03/2022	07/05/2022	
1810-08	TS_HydroTs(D) - Kp_667+250_690+485 (4-06_4-07)	17.00	07/05/2022	03/06/2022	
Hydro Test (Night)		180.45	25/08/2021	03/06/2022	
1815-01	TS_HydroTs(N) - Kp_489+180_499+200 (3-01_3-02_3-03)	17.00	25/08/2021	20/09/2021	
1815-02	TS_HydroTs(N) - Kp_499+200_543+288 (3-04_3-05_3-06)	34.00	24/09/2021	09/11/2021	

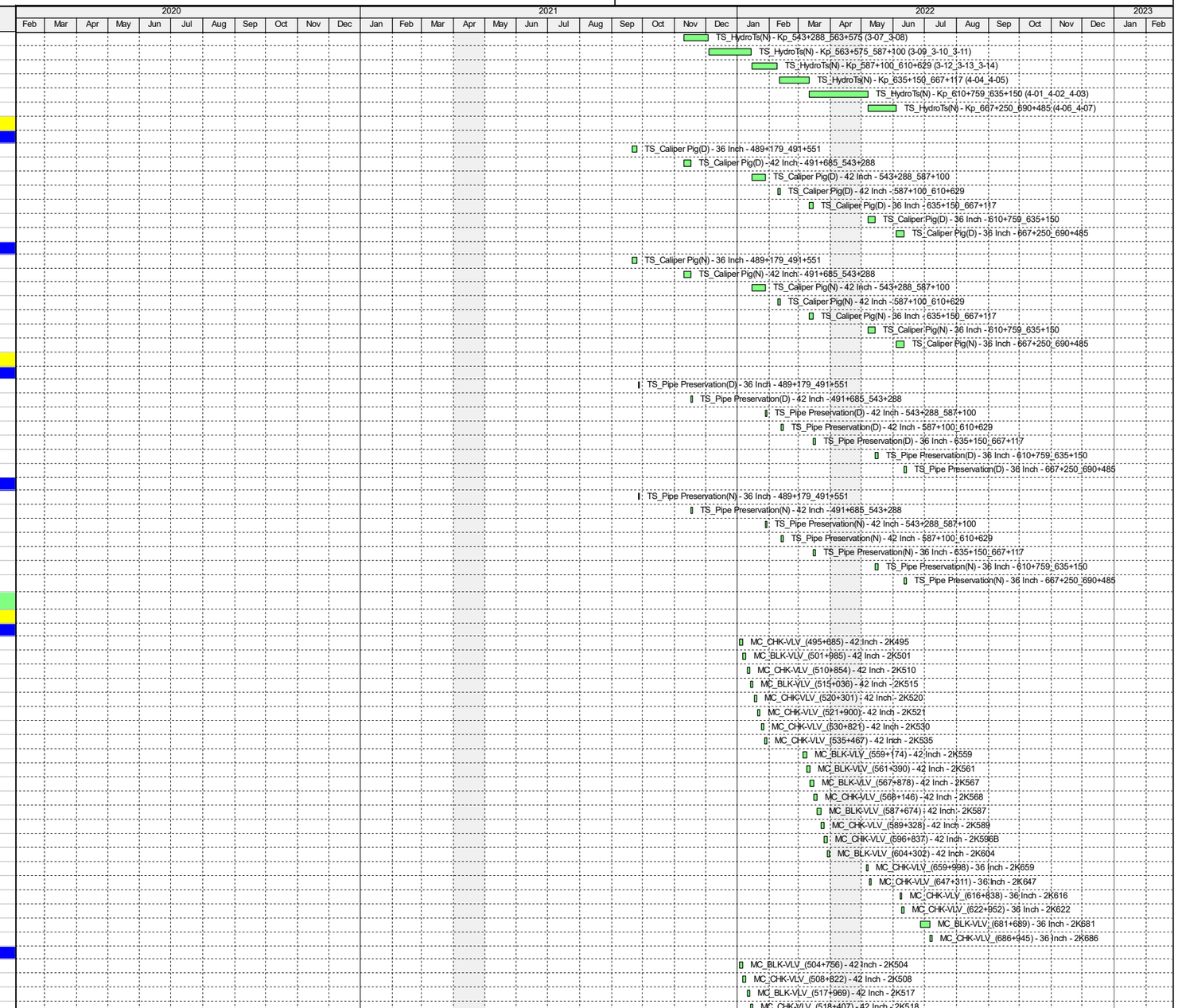


Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

DRAFT

TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1815-03	TS_HydroTs(N) - Kp_543+288_563+575 (3-07_3-08)	21.00	10/11/2021	03/12/2021	
1815-04	TS_HydroTs(N) - Kp_563+575_587+100 (3-09_3-10_3-11)	24.00	04/12/2021	14/01/2022	
1815-05	TS_HydroTs(N) - Kp_587+100_610+629 (3-12_3-13_3-14)	21.00	15/01/2022	08/02/2022	
1815-07	TS_HydroTs(N) - Kp_635+150_667+117 (4-04_4-05)	19.00	10/02/2022	11/03/2022	
1815-06	TS_HydroTs(N) - Kp_610+759_635+150 (4-01_4-02_4-03)	23.00	11/03/2022	07/05/2022	
1815-08	TS_HydroTs(N) - Kp_667+250_690+485 (4-06_4-07)	17.00	07/05/2022	03/06/2022	
Caliper Pig Run (36" & 42")		170.45	21/09/2021	11/06/2022	
Caliper Pig Run (36" & 42") (Day)		170.45	21/09/2021	11/06/2022	
1830-00	TS_Caliper Pig(D) - 36 Inch - 489+179_491+551	5.00	21/09/2021	25/09/2021	
1830-10	TS_Caliper Pig(D) - 42 Inch - 491+685_543+288	6.00	10/11/2021	16/11/2021	
1830-20	TS_Caliper Pig(D) - 42 Inch - 543+288_587+100	11.00	15/01/2022	27/01/2022	
1830-25	TS_Caliper Pig(D) - 42 Inch - 587+100_610+629	3.00	09/02/2022	11/02/2022	
1830-35	TS_Caliper Pig(D) - 36 Inch - 635+150_667+117	3.00	11/03/2022	15/03/2022	
1830-30	TS_Caliper Pig(D) - 36 Inch - 610+759_635+150	6.00	07/05/2022	14/05/2022	
1830-40	TS_Caliper Pig(D) - 36 Inch - 667+250_690+485	7.00	03/06/2022	11/06/2022	
Caliper Pig Run (36" & 42") (Night)		170.45	21/09/2021	11/06/2022	
1835-00	TS_Caliper Pig(N) - 36 Inch - 489+179_491+551	5.00	21/09/2021	25/09/2021	
1835-10	TS_Caliper Pig(N) - 42 Inch - 491+685_543+288	6.00	10/11/2021	16/11/2021	
1835-20	TS_Caliper Pig(N) - 42 Inch - 543+288_587+100	11.00	15/01/2022	27/01/2022	
1835-25	TS_Caliper Pig(N) - 42 Inch - 587+100_610+629	3.00	09/02/2022	11/02/2022	
1835-35	TS_Caliper Pig(N) - 36 Inch - 635+150_667+117	3.00	11/03/2022	15/03/2022	
1835-30	TS_Caliper Pig(N) - 36 Inch - 610+759_635+150	6.00	07/05/2022	14/05/2022	
1835-40	TS_Caliper Pig(N) - 36 Inch - 667+250_690+485	7.00	03/06/2022	11/06/2022	
Pipe preservation & Inhibitor/Bioacide		166.45	27/09/2021	13/06/2022	
Pipe preservation & Inhibitor/Bioacide (Day)		166.45	27/09/2021	13/06/2022	
1831-50	TS_Pipe Preservation(D) - 36 Inch - 489+179_491+551	1.00	27/09/2021	27/09/2021	
1831-60	TS_Pipe Preservation(D) - 42 Inch - 491+685_543+288	2.00	17/11/2021	18/11/2021	
1831-70	TS_Pipe Preservation(D) - 42 Inch - 543+288_587+100	2.00	28/01/2022	29/01/2022	
1831-100	TS_Pipe Preservation(D) - 42 Inch - 587+100_610+629	2.00	12/02/2022	14/02/2022	
1831-110	TS_Pipe Preservation(D) - 36 Inch - 635+150_667+117	2.00	15/03/2022	17/03/2022	
1831-90	TS_Pipe Preservation(D) - 36 Inch - 610+759_635+150	2.00	14/05/2022	17/05/2022	
1831-80	TS_Pipe Preservation(D) - 36 Inch - 667+250_690+485	1.00	11/06/2022	13/06/2022	
Pipe preservation & Inhibitor/Bioacide (Night)		166.45	27/09/2021	13/06/2022	
1830-190	TS_Pipe Preservation(N) - 36 Inch - 489+179_491+551	1.00	27/09/2021	27/09/2021	
1832-200	TS_Pipe Preservation(N) - 42 Inch - 491+685_543+288	2.00	17/11/2021	18/11/2021	
1832-210	TS_Pipe Preservation(N) - 42 Inch - 543+288_587+100	2.00	28/01/2022	29/01/2022	
1832-240	TS_Pipe Preservation(N) - 42 Inch - 587+100_610+629	2.00	12/02/2022	14/02/2022	
1832-250	TS_Pipe Preservation(N) - 36 Inch - 635+150_667+117	2.00	15/03/2022	17/03/2022	
1832-230	TS_Pipe Preservation(N) - 36 Inch - 610+759_635+150	2.00	14/05/2022	17/05/2022	
1832-220	TS_Pipe Preservation(N) - 36 Inch - 667+250_690+485	1.00	11/06/2022	13/06/2022	
190.Fabrication (Valves)		122.45	03/01/2022	15/07/2022	
Valves Installation - Mechanical Works		116.45	03/01/2022	08/07/2022	
Valves Installation - Mechanical Works 1		116.45	03/01/2022	08/07/2022	
1910-0020	MC_CHK-VLV_(495+685) - 42 Inch - 2K495	3.00	03/01/2022	05/01/2022	
1920-0040	MC_BLK-VLV_(501+985) - 42 Inch - 2K501	3.00	06/01/2022	08/01/2022	
1910-0100	MC_CHK-VLV_(510+854) - 42 Inch - 2K510	3.00	10/01/2022	12/01/2022	
1920-0120	MC_BLK-VLV_(515+036) - 42 Inch - 2K515	3.00	13/01/2022	15/01/2022	
1910-0180	MC_CHK-VLV_(520+301) - 42 Inch - 2K520	3.00	17/01/2022	19/01/2022	
1920-0200	MC_CHK-VLV_(521+900) - 42 Inch - 2K521	3.00	20/01/2022	22/01/2022	
1910-0260	MC_CHK-VLV_(530+821) - 42 Inch - 2K530	3.00	24/01/2022	26/01/2022	
1920-0280	MC_CHK-VLV_(535+467) - 42 Inch - 2K535	3.00	27/01/2022	29/01/2022	
1910-0340	MC_BLK-VLV_(559+174) - 42 Inch - 2K559	3.00	05/03/2022	09/03/2022	
1920-0360	MC_BLK-VLV_(561+390) - 42 Inch - 2K561	3.00	09/03/2022	12/03/2022	
1910-0420	MC_BLK-VLV_(567+878) - 42 Inch - 2K567	3.00	12/03/2022	16/03/2022	
1920-0440	MC_CHK-VLV_(568+146) - 42 Inch - 2K568	3.00	16/03/2022	19/03/2022	
1910-0500	MC_BLK-VLV_(587+674) - 42 Inch - 2K587	3.00	19/03/2022	23/03/2022	
1920-0520	MC_CHK-VLV_(589+328) - 42 Inch - 2K589	3.00	23/03/2022	26/03/2022	
1910-0580	MC_CHK-VLV_(596+837) - 42 Inch - 2K596B	2.00	26/03/2022	29/03/2022	
1920-0600	MC_BLK-VLV_(604+302) - 42 Inch - 2K604	2.00	29/03/2022	31/03/2022	
1920-0760	MC_CHK-VLV_(659+998) - 36 Inch - 2K659	2.00	06/05/2022	07/05/2022	
1910-0740	MC_CHK-VLV_(647+311) - 36 Inch - 2K647	2.00	09/05/2022	10/05/2022	
1910-0660	MC_CHK-VLV_(616+838) - 36 Inch - 2K616	2.00	07/06/2022	09/06/2022	
1920-0680	MC_CHK-VLV_(622+952) - 36 Inch - 2K622	2.00	09/06/2022	11/06/2022	
1910-0820	MC_BLK-VLV_(681+689) - 36 Inch - 2K681	2.00	27/06/2022	06/07/2022	
1920-0840	MC_CHK-VLV_(686+945) - 36 Inch - 2K686	2.00	06/07/2022	08/07/2022	
Valves Installation - Mechanical Works 3		116.45	03/01/2022	08/07/2022	
1930-0060	MC_BLK-VLV_(504+756) - 42 Inch - 2K504	3.00	03/01/2022	05/01/2022	
1940-0080	MC_CHK-VLV_(508+822) - 42 Inch - 2K508	3.00	06/01/2022	08/01/2022	
1930-0140	MC_BLK-VLV_(517+969) - 42 Inch - 2K517	3.00	10/01/2022	12/01/2022	
1940-0160	MC_CHK-VLV_(518+407) - 42 Inch - 2K518	3.00	13/01/2022	15/01/2022	



Actual Work
Remaining Work
Critical Remaining Work
Remaining Level of Effort
Milestone

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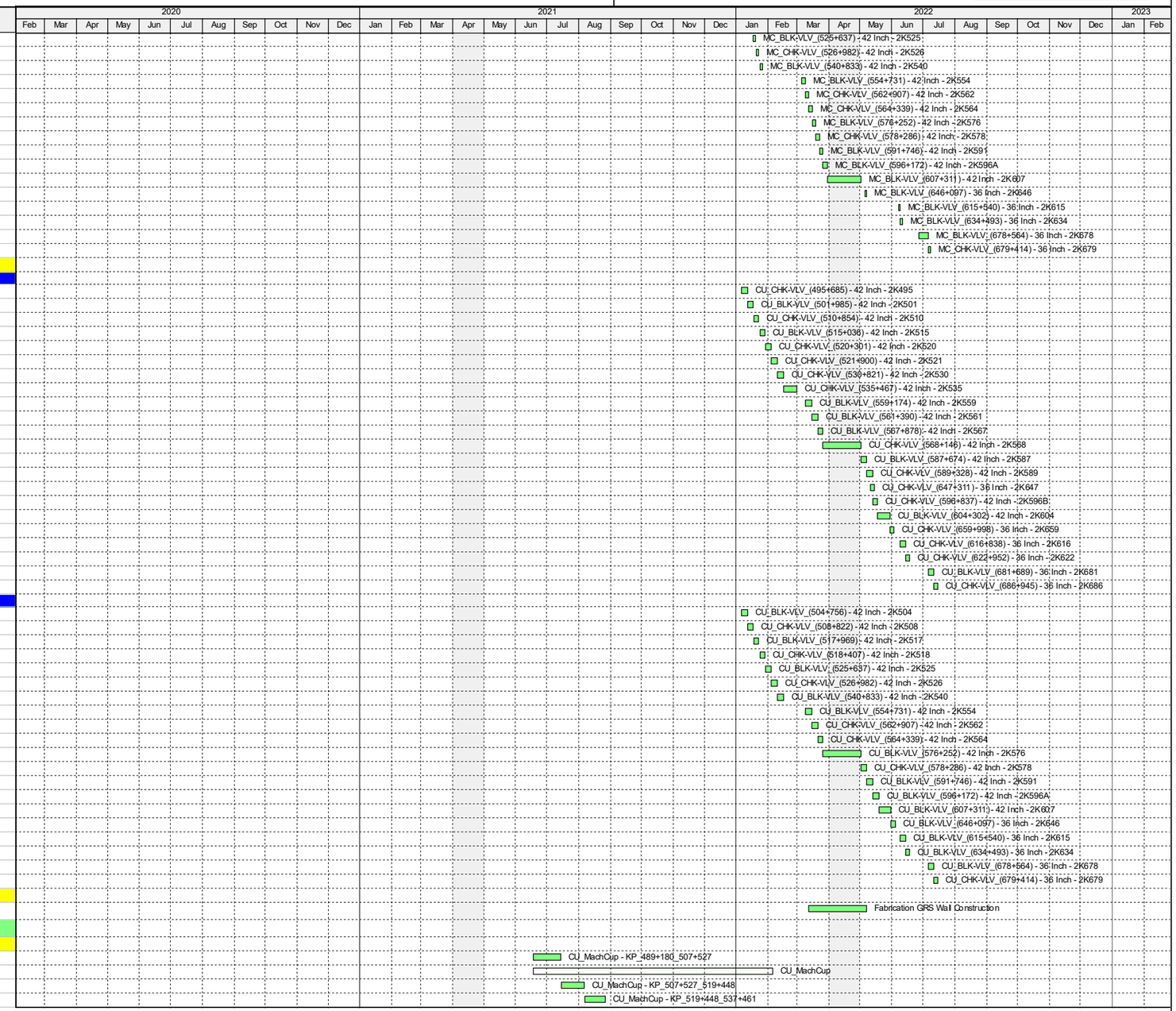
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
1930-0220	MC_BLK-VLV_(525+637) - 42 Inch - 2K525	3.00	17/01/2022	19/01/2022	
1940-0240	MC_CHK-VLV_(526+982) - 42 Inch - 2K526	3.00	20/01/2022	22/01/2022	
1930-0300	MC_BLK-VLV_(540+833) - 42 Inch - 2K540	3.00	24/01/2022	26/01/2022	
1940-0320	MC_BLK-VLV_(554+731) - 42 Inch - 2K554	3.00	05/03/2022	09/03/2022	
1930-0380	MC_CHK-VLV_(562+907) - 42 Inch - 2K562	3.00	09/03/2022	12/03/2022	
1940-0400	MC_CHK-VLV_(564+339) - 42 Inch - 2K564	3.00	12/03/2022	16/03/2022	
1930-0460	MC_BLK-VLV_(576+252) - 42 Inch - 2K576	3.00	16/03/2022	19/03/2022	
1940-0480	MC_CHK-VLV_(578+286) - 42 Inch - 2K578	3.00	19/03/2022	23/03/2022	
1930-0540	MC_BLK-VLV_(591+746) - 42 Inch - 2K591	3.00	23/03/2022	26/03/2022	
1940-0560	MC_BLK-VLV_(596+172) - 42 Inch - 2K596A	3.00	26/03/2022	30/03/2022	
1930-0620	MC_BLK-VLV_(607+311) - 42 Inch - 2K607	2.00	30/03/2022	02/05/2022	
1940-0720	MC_BLK-VLV_(646+097) - 36 Inch - 2K646	2.00	06/05/2022	07/05/2022	
1940-0640	MC_BLK-VLV_(615+540) - 36 Inch - 2K615	2.00	07/06/2022	09/06/2022	
1930-0700	MC_BLK-VLV_(634+493) - 36 Inch - 2K634	2.00	09/06/2022	11/06/2022	
1930-0780	MC_BLK-VLV_(678+564) - 36 Inch - 2K678	2.00	27/06/2022	06/07/2022	
1940-0800	MC_CHK-VLV_(679+414) - 36 Inch - 2K679	2.00	06/07/2022	08/07/2022	
Valves Installation - Clean Up		119.45	06/01/2022	15/07/2022	
Valves Installation - Clean Up 1		119.45	06/01/2022	15/07/2022	
1912-0020	CU_CHK-VLV_(495+685) - 42 Inch - 2K495	5.00	06/01/2022	11/01/2022	
1922-0040	CU_BLK-VLV_(501+985) - 42 Inch - 2K501	5.00	12/01/2022	17/01/2022	
1912-0100	CU_CHK-VLV_(510+854) - 42 Inch - 2K510	5.00	18/01/2022	22/01/2022	
1922-0120	CU_BLK-VLV_(515+036) - 42 Inch - 2K515	5.00	24/01/2022	28/01/2022	
1912-0180	CU_CHK-VLV_(520+301) - 42 Inch - 2K520	5.00	29/01/2022	03/02/2022	
1922-0200	CU_CHK-VLV_(521+900) - 42 Inch - 2K521	5.00	04/02/2022	09/02/2022	
1912-0260	CU_CHK-VLV_(530+821) - 42 Inch - 2K530	5.00	10/02/2022	15/02/2022	
1922-0280	CU_CHK-VLV_(535+467) - 42 Inch - 2K535	5.00	16/02/2022	28/02/2022	
1912-0340	CU_BLK-VLV_(559+174) - 42 Inch - 2K559	5.00	09/03/2022	15/03/2022	
1922-0360	CU_BLK-VLV_(561+390) - 42 Inch - 2K561	5.00	15/03/2022	21/03/2022	
1912-0420	CU_BLK-VLV_(567+878) - 42 Inch - 2K567	5.00	21/03/2022	26/03/2022	
1922-0440	CU_CHK-VLV_(568+146) - 42 Inch - 2K568	5.00	26/03/2022	02/05/2022	
1912-0500	CU_BLK-VLV_(587+674) - 42 Inch - 2K587	5.00	02/05/2022	07/05/2022	
1922-0520	CU_CHK-VLV_(589+328) - 42 Inch - 2K589	5.00	07/05/2022	13/05/2022	
1912-0740	CU_CHK-VLV_(647+311) - 36 Inch - 2K647	4.00	11/05/2022	14/05/2022	
1912-0580	CU_CHK-VLV_(596+837) - 42 Inch - 2K596B	4.00	13/05/2022	18/05/2022	
1922-0600	CU_BLK-VLV_(604+302) - 42 Inch - 2K604	4.00	18/05/2022	30/05/2022	
1922-0760	CU_CHK-VLV_(659+998) - 36 Inch - 2K659	4.00	30/05/2022	03/06/2022	
1912-0660	CU_CHK-VLV_(616+838) - 36 Inch - 2K616	4.00	09/06/2022	14/06/2022	
1922-0680	CU_CHK-VLV_(622+952) - 36 Inch - 2K622	4.00	14/06/2022	18/06/2022	
1912-0820	CU_BLK-VLV_(681+689) - 36 Inch - 2K681	4.00	06/07/2022	11/07/2022	
1922-0840	CU_CHK-VLV_(686+945) - 36 Inch - 2K686	4.00	11/07/2022	15/07/2022	
Valves Installation - Clean Up 3		119.45	06/01/2022	15/07/2022	
1932-0060	CU_BLK-VLV_(504+756) - 42 Inch - 2K504	5.00	06/01/2022	11/01/2022	
1942-0080	CU_CHK-VLV_(508+822) - 42 Inch - 2K508	5.00	12/01/2022	17/01/2022	
1932-0140	CU_BLK-VLV_(517+969) - 42 Inch - 2K517	5.00	18/01/2022	22/01/2022	
1942-0160	CU_CHK-VLV_(518+407) - 42 Inch - 2K518	5.00	24/01/2022	28/01/2022	
1932-0220	CU_BLK-VLV_(525+637) - 42 Inch - 2K525	5.00	29/01/2022	03/02/2022	
1942-0240	CU_CHK-VLV_(526+982) - 42 Inch - 2K526	5.00	04/02/2022	09/02/2022	
1932-0300	CU_BLK-VLV_(540+833) - 42 Inch - 2K540	5.00	10/02/2022	15/02/2022	
1942-0320	CU_BLK-VLV_(554+731) - 42 Inch - 2K554	5.00	09/03/2022	15/03/2022	
1932-0380	CU_CHK-VLV_(562+907) - 42 Inch - 2K562	5.00	15/03/2022	21/03/2022	
1942-0400	CU_CHK-VLV_(564+339) - 42 Inch - 2K564	5.00	21/03/2022	26/03/2022	
1932-0460	CU_BLK-VLV_(576+252) - 42 Inch - 2K576	5.00	26/03/2022	02/05/2022	
1942-0480	CU_CHK-VLV_(578+286) - 42 Inch - 2K578	5.00	02/05/2022	07/05/2022	
1932-0540	CU_BLK-VLV_(591+746) - 42 Inch - 2K591	5.00	07/05/2022	13/05/2022	
1942-0560	CU_BLK-VLV_(596+172) - 42 Inch - 2K596A	5.00	13/05/2022	19/05/2022	
1932-0620	CU_BLK-VLV_(607+311) - 42 Inch - 2K607	4.00	19/05/2022	31/05/2022	
1942-0720	CU_BLK-VLV_(646+097) - 36 Inch - 2K646	4.00	31/05/2022	04/06/2022	
1942-0640	CU_BLK-VLV_(615+540) - 36 Inch - 2K615	4.00	09/06/2022	14/06/2022	
1932-0700	CU_BLK-VLV_(634+493) - 36 Inch - 2K634	4.00	14/06/2022	18/06/2022	
1932-0780	CU_BLK-VLV_(678+564) - 36 Inch - 2K678	4.00	06/07/2022	11/07/2022	
1942-0800	CU_CHK-VLV_(679+414) - 36 Inch - 2K679	4.00	11/07/2022	15/07/2022	
Fabrication GRS Wall Construction		22.00	12/03/2022	07/05/2022	
1945	Fabrication GRS Wall Construction	22.00	12/03/2022	07/05/2022	
200.Clean-Up		267.00	18/06/2021	27/07/2022	
Machine Cleanup		164.00	18/06/2021	05/02/2022	
2005-01	CU_MachCup - KP_489+180_507+527	17.00	18/06/2021	14/07/2021	
2005	CU_MachCup	164.00	18/06/2021	05/02/2022	
2005-02	CU_MachCup - KP_507+527_519+448	14.00	15/07/2021	06/08/2021	
2005-03	CU_MachCup - KP_519+448_537+461	17.00	07/08/2021	26/08/2021	



Actual Work | Critical Remaining Work | ◆ Milestone
Remaining Work | Remaining Level of Effort

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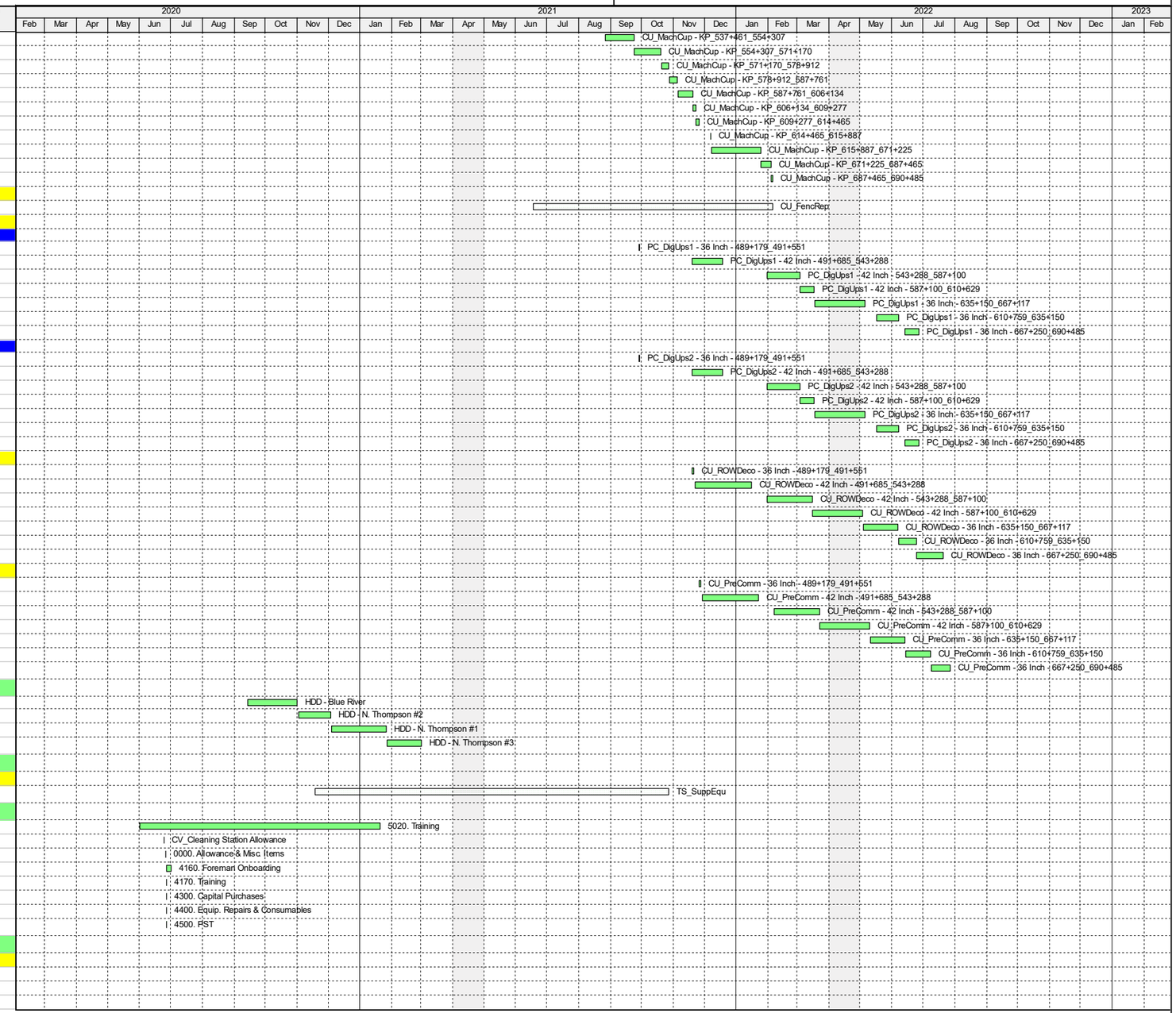
TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
June to August NTP

Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
2005-04	CU_MachCup - KP_537+461_554+307	18.00	27/08/2021	23/09/2021	
2005-05	CU_MachCup - KP_554+307_571+170	16.00	24/09/2021	19/10/2021	
2005-06	CU_MachCup - KP_571+170_578+912	7.00	20/10/2021	27/10/2021	
2005-07	CU_MachCup - KP_578+912_587+761	7.00	28/10/2021	04/11/2021	
2005-08	CU_MachCup - KP_587+761_606+134	13.00	05/11/2021	19/11/2021	
2005-09	CU_MachCup - KP_606+134_609+277	2.00	20/11/2021	22/11/2021	
2005-10	CU_MachCup - KP_609+277_614+465	3.00	23/11/2021	25/11/2021	
2005-11	CU_MachCup - KP_614+465_615+887	1.00	07/12/2021	07/12/2021	
2005-12	CU_MachCup - KP_615+887_671+225	29.00	08/12/2021	24/01/2022	
2005-13	CU_MachCup - KP_671+225_687+465	9.00	25/01/2022	03/02/2022	
2005-14	CU_MachCup - KP_687+465_690+485	2.00	04/02/2022	05/02/2022	
Fencing Replacement		**164.00**	**18/06/2021**	**05/02/2022**	
2010	CU_FencRep	164.00	18/06/2021	05/02/2022	
Dig Ups		**177.45**	**28/09/2021**	**27/06/2022**	
Dig Ups Crew #1		**177.45**	**28/09/2021**	**27/06/2022**	
1850-00	PC_DigUps1 - 36 Inch - 489+179_491+551	2.00	28/09/2021	29/09/2021	
1850-10	PC_DigUps1 - 42 Inch - 491+685_543+288	26.00	19/11/2021	18/12/2021	
1850-20	PC_DigUps1 - 42 Inch - 543+288_587+100	22.00	31/01/2022	03/03/2022	
1850-25	PC_DigUps1 - 42 Inch - 587+100_610+629	12.00	04/03/2022	17/03/2022	
1850-35	PC_DigUps1 - 36 Inch - 635+150_667+117	16.00	18/03/2022	05/05/2022	
1850-30	PC_DigUps1 - 36 Inch - 610+759_635+150	12.00	17/05/2022	07/06/2022	
1850-40	PC_DigUps1 - 36 Inch - 667+250_690+485	12.00	13/06/2022	27/06/2022	
Dig Ups Crew #2		**177.45**	**28/09/2021**	**27/06/2022**	
1855-00	PC_DigUps2 - 36 Inch - 489+179_491+551	2.00	28/09/2021	29/09/2021	
1855-10	PC_DigUps2 - 42 Inch - 491+685_543+288	26.00	19/11/2021	18/12/2021	
1855-20	PC_DigUps2 - 42 Inch - 543+288_587+100	22.00	31/01/2022	03/03/2022	
1855-25	PC_DigUps2 - 42 Inch - 587+100_610+629	12.00	04/03/2022	17/03/2022	
1855-35	PC_DigUps2 - 36 Inch - 635+150_667+117	16.00	18/03/2022	05/05/2022	
1855-30	PC_DigUps2 - 36 Inch - 610+759_635+150	12.00	17/05/2022	07/06/2022	
1855-40	PC_DigUps2 - 36 Inch - 667+250_690+485	12.00	13/06/2022	27/06/2022	
ROW Decommissioning		**153.00**	**19/11/2021**	**20/07/2022**	
1830-120	CU_ROWDeco - 36 Inch - 489+179_491+551	2.00	19/11/2021	20/11/2021	
1833-130	CU_ROWDeco - 42 Inch - 491+685_543+288	36.00	22/11/2021	15/01/2022	
1833-140	CU_ROWDeco - 42 Inch - 543+288_587+100	32.00	31/01/2022	15/03/2022	
1833-150	CU_ROWDeco - 42 Inch - 587+100_610+629	16.00	16/03/2022	03/05/2022	
1833-160	CU_ROWDeco - 36 Inch - 635+150_667+117	23.00	04/05/2022	06/06/2022	
1833-170	CU_ROWDeco - 36 Inch - 610+759_635+150	16.00	07/06/2022	24/06/2022	
1833-180	CU_ROWDeco - 36 Inch - 667+250_690+485	16.00	25/06/2022	20/07/2022	
Pre-commissioning/Final Walk Downs		**153.00**	**26/11/2021**	**27/07/2022**	
1835-260	CU_PreComm - 36 Inch - 489+179_491+551	2.00	26/11/2021	27/11/2021	
1835-270	CU_PreComm - 42 Inch - 491+685_543+288	36.00	29/11/2021	22/01/2022	
1835-280	CU_PreComm - 42 Inch - 543+288_587+100	32.00	07/02/2022	22/03/2022	
1835-310	CU_PreComm - 42 Inch - 587+100_610+629	16.00	23/03/2022	10/05/2022	
1835-320	CU_PreComm - 36 Inch - 635+150_667+117	23.00	11/05/2022	13/06/2022	
1835-300	CU_PreComm - 36 Inch - 610+759_635+150	16.00	14/06/2022	08/07/2022	
1835-290	CU_PreComm - 36 Inch - 667+250_690+485	16.00	09/07/2022	27/07/2022	
210.Designed River/HDD		**121.00**	**14/09/2020**	**01/03/2021**	
1516-035	HDD - Blue River	36.00	14/09/2020*	31/10/2020	
1516-040	HDD - N. Thompson #2	28.00	02/11/2020	03/12/2020	
1516-030	HDD - N. Thompson #1	34.00	04/12/2020	26/01/2021	
1516-050	HDD - N. Thompson #3	23.00	27/01/2021	01/03/2021	
220.Towing Support		**221.00**	**18/11/2020**	**27/10/2021**	
Towing Support		**221.00**	**18/11/2020**	**27/10/2021**	
2250B	TS_SuppEqu	221.00	18/11/2020	27/10/2021	
50. Specialty Items		**165.00**	**01/06/2020**	**20/01/2021**	
5020A	5020. Training	171.00	01/06/2020	20/01/2021	
1224B	CV_Cleaning Station Allowance	0.00	25/06/2020	25/06/2020	
0000B	0000. Allowance & Misc. Items	0.00	26/06/2020	26/06/2020	
4160B	4160. Foreman Onboarding	4.00	27/06/2020	01/07/2020	
4170B	4170. Training	0.00	27/06/2020	27/06/2020	
4300B	4300. Capital Purchases	0.00	27/06/2020	27/06/2020	
4400B	4400. Equip. Repairs & Consumables	0.00	27/06/2020	27/06/2020	
4500B	4500. PST	0.00	27/06/2020	27/06/2020	
Rap with concrete Coating		**42.00**	**28/01/2019**	**16/03/2019**	
Prepatarion Out of LRBW		**25.00**	**28/01/2019**	**25/02/2019**	
4500B50	Welding	3.00	28/01/2019	30/01/2019	
4500B20	Concrete coating & curing	10.00	31/01/2019	11/02/2019	
4500B40	Bank prep (no in-stream activity)	12.00	12/02/2019	25/02/2019	



Actual Work
Remaining Work
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Milestone

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TRANS MOUNTAIN EXPANSION PROJECT (TMEP)
Spread 3 & 4A - North Thompson Section
Project Execution - Gantt Chart Rev.06AQ - April 21, 2020
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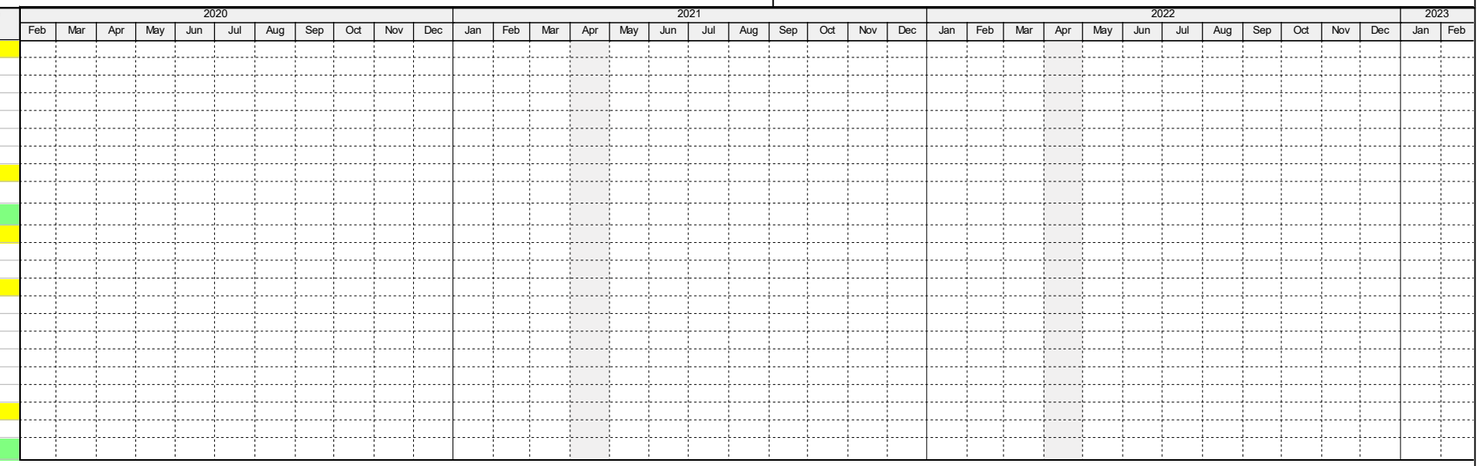
Activity ID	Activity Name	Remaining Duration	Start	Finish	Scope
LRBW Period		14.00	26/02/2019	13/03/2019	
4500B60	Isolation	3.00	26/02/2019	28/02/2019	
4500B70	Fishing (removing fishes out of isolation ponds)	2.00	01/03/2019	02/03/2019	
4500B80	Digging (no rock - include remove and stock first layers of boulders)	3.00	04/03/2019	06/03/2019	
4500B90	Pipeline Installation	2.00	07/03/2019	08/03/2019	
4500B100	Pipeline Backfilling	2.00	09/03/2019	11/03/2019	
4500B10	Remove isolation	2.00	12/03/2019	13/03/2019	
Post LRBW		3.00	14/03/2019	16/03/2019	
4500B30	Bank replacement: performed by other crews keep out	3.00	14/03/2019	16/03/2019	
Rap without concrete Coating		32.00	28/01/2019	05/03/2019	
Prepatarion Out of LRBW		15.00	28/01/2019	13/02/2019	
4500B150	Welding	3.00	28/01/2019	30/01/2019	
4500B140	Bank prep (no in-stream activity)	12.00	31/01/2019	13/02/2019	
LRBW Period		14.00	14/02/2019	01/03/2019	
4500B160	Isolation	3.00	14/02/2019	16/02/2019	
4500B170	Fishing (removing fishes out of isolation ponds)	2.00	18/02/2019	19/02/2019	
4500B180	Digging (no rock - include remove and stock first layers of boulders)	3.00	20/02/2019	22/02/2019	
4500B190	Pipeline Installation	2.00	23/02/2019	25/02/2019	
4500B200	Pipeline Backfilling	2.00	26/02/2019	27/02/2019	
4500B110	Remove isolation	2.00	28/02/2019	01/03/2019	
Post LRBW		3.00	02/03/2019	05/03/2019	
4500B130	Bank replacement: performed by other crews	3.00	02/03/2019	05/03/2019	
TMEP Spread 3/4a (2018/2019)_200303 Project Execution Ramp-up		54.00	09/03/2020	01/06/2020	



Actual Work
Remaining Work
Critical Remaining Work
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Appendix K – Avalanche Management Plan

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