



Emergency Response Plan

Trans Mountain Pipeline

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Emergency Response Plan

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Emergency Response Plan

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Plan Maintenance

Responsibility

Single point accountability for the Emergency Response Plan development and maintenance rests with the Manager, Emergency Management. This accountability is for:

- The development of the Emergency Response Plan and managing any future revisions,
- Ensuring the pre-plans are evergreen, i.e. review and modify as needed,
- Ensuring the systems (ICS) and response structure are in place and able to meet the requirements set out in the Plan, and
- Ensuring an annual review of the plan is conducted for completeness

Manual holders are responsible:

- For keeping their copies current and ensuring that all revisions are appropriately filed
- Studying all new material issued and incorporating it into their work practice
- Suggesting changes to correct existing material and contributing new text material to improve the quality of the manual

Plan Revisions

Initiating Revisions

All requests for change must be made through the Manager, Emergency Management using the Revision Request Form located in this section of the manual.

Revision Distribution

Plan revisions are issued with an Acknowledgement of Receipt Form and a brief description of the changes itemized by chapter. The Acknowledgment of Receipt form must be signed and returned to the Emergency Management Department as specified. Revisions to the Distribution List will be maintained in a secure KMC (electronic) location and will be distributed to confidential manual holders only. All other revisions will be distributed to manual holders in a timely manner. A revised date is shown at the bottom of each updated or new page. The original date of the manual is 07/2014, with a major revision of 09/2016. All revisions will be tracked on the Control Sheet.

Revisions after Release or Exercise

In the event that Kinder Morgan Canada experiences a release (worst case or otherwise), or conducts an exercise or training session, the effectiveness of the plan will be evaluated and updated as necessary.

Changes in Operating Conditions

If a new or different operating condition or information would substantially affect the implementation of the plan, Kinder Morgan Canada will modify the plan to address such a change.

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Revision Request Form

Requeste	ed by:	C)ate:	
Dept/ Age	ept/ Agency: Phone No.:			
Revision	Type:Addition	Deletion	Correction	
Manual S	Section:		Page:	
Revision	(attach separate sheet if necessary)	:		
Signature	e of Requestor:			
Send to:	Manager, Emergency Managemen Kinder Morgan Canada 2700-300 - 5 th Avenue S.W. Calgary, AB T2P 5J2 Canada Fax: (403) 514-6401	t		

To be completed by Manager, Emergency Management	
Date Received: Comments:	
Date Reviewed:]
Issued as Revision: Y/ N	
If No, reason for Rejection:	
Signature Manager, Emergency Management	

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Control Sheet

Revision Number	Date of Revision	Change(s)	Approval
1	July 2014	New Format Issued with minor updates to all sections.	K. Malinoski
2	October 2015	Minor updates to Preface, Section 2, Section 7 - New valve locations and access added, Section 10 – replaced Air Monitoring Plan & Section 16	K. Malinoski
3	September 2016	Updated minor wording throughout manual, updated Preface, Section 2 and Section 7 extensively. Removed Confidential information to Confidential Appendix.	K. Malinoski
4	September 2017	Updates to minor wording in the Preface and Introduction Section 2.1 Spill Verification, 2.13 Other Notifications, Section 6 all, Section 8.9 Unified Command, 8.13 Liaison Officer, 8.19 Incident Records, Section 9.6 Emergency Equipment and Response Times	K. Malinoski
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Distribution

As of September 2016 the emergency response plan is available online to all external agencies and members of the public. Material that has been placed in a confidential appendix has been protected in accordance with NEB Board Order MO-006-2016. A description of the nature of the protected information and a statement explaining why it has been protected is included in all cases. Controlled copies are distributed as below, however the distribution list may change from time to time, a new version of the emergency response plan will not be issued for a revision to the distribution listing.

No.	Issued To
	Controlled Copies - External
10	National Energy Board
	Controlled Copies - Internal
100	Control Centre – Edmonton
101	Back-up Control Centre – Edmonton
102	Gainford Station
103	Jasper Station
104	Clearwater Office
105	Blue River Station
106	Kamloops Station
107	Hope Station
108	Sumas Station
109	Central Region Office
110	Western Region Office
111	Manager Emergency Management
112	Manager Security
113	Manager Health and Safety
114	Manager Environment
115	EHS Coordinator – Edmonton
116	EHS Coordinator – Kamloops
117	EHS Coordinator – Burnaby
118	Director EHS
119	Director Central Region
120	Director Western Region
121	Regional Engineer – Edmonton
122	Regional Engineer – Kamloops
123	Regional Engineer – Burnaby
124	Manager Damage Prevention and Public Awareness
125	Supervisor Pipeline Protection – Burnaby
126	Supervisor Pipeline Protection – Edmonton
127	Edmonton Terminal Supervisor
128	Stony Plain District Supervisor
129	Jasper District Supervisor
130	North Thompson District Supervisor
131	Kamloops District Supervisor
132	Sumas District Supervisor
133	Supervisor Westridge and Burnaby Terminals
134	Supervisor Puget Sound District

Emergency Response Plan

No.	Issued To
135	Spare
136	KMC Technical Services
137	Trans Mountain Expansion Project
138	Mountain Expansion Project
139	Trans Mountain Expansion Project
140	Trans Mountain Expansion Project
141	Director Emergency Management
142	Trans Mountain Expansion Project
143	Emergency Management Advisor
144	Trans Mountain Expansion Project
145	National Energy Board – Archived Copy – No longer in use
146	Kinder Morgan Canada Emergency Management Advisor
	Uncontrolled Hard Copies
301	Emergency Management British Columbia
302	Environment Canada – NEEC
303	Transport Canada
304	Vancouver Fraser Port Authority

Introduction

Initial Incident Actions

The initial responder to arrive at a spill site will take some immediate actions to ensure responder safety as well as the public and protect the environment. The initial responder will complete the following things, if appropriate and safe to do so while waiting for the Qualified Individual.

- 1. Ensure the safety of all workers and public in the area of the spill
- 2. Assess the situation (i.e., incident size, severity, likely impacts)
- 3. Notify the Control Centre and/or Supervisor immediately to activate the Emergency Response Line (ERL/ERL+) System as outlined in Section 2.
- 4. Take appropriate action to mitigate the impacts to life, safety, the environment, and property prior to the arrival of the Qualified Individual (QI)
- Note: the initial responder will begin documentation on an ICS 201 form, and/or notes on other paper, or will relay the information to personnel at the Control Centre or District Supervisor who will initiate an ICS 201 form. This initial documentation will be kept with all other incident documentation.

How to use this Plan

This Plan is divided into 3 Sections:



Purpose of the Plan

This is the Emergency Response Plan for the assets associated with the Trans Mountain Pipeline System operated by Kinder Morgan Canada. These entities are all referred to as "Kinder Morgan", "Kinder Morgan Canada" or "The Company".

The purpose of this Plan is to provide guidelines to quickly, safely and effectively respond to an emergency, in order to protect the public, personnel, environment and company property.

Scope of the Plan

This Emergency Response Plan (ERP) covers emergencies that originate along the Trans Mountain Pipeline and its associated facilities in Alberta and British Columbia. As part of the Emergency Response Plan maintenance practice, Kinder Morgan Canada implements a Hazard Assessment Process in order to generate an all encompassing hazard inventory list. This list identifies potential emergency conditions that result from hazards associated with the Trans Mountain Pipeline. Emergency Conditions may be defined as the result of a hazard negatively impacting people, property and/or the environment. Through the evaluation of hazards and their subsequent consequences, the Emergency Management Department develops and maintains plans and procedures to assist in mitigation, planning and response efforts for all real or potential emergencies.

The hazard inventory list is reviewed on an annual basis to ensure that new hazards are identified and evaluated against their potential emergency condition. This assessment is also used to determine if existing plans and procedures continue to meet the response requirements for all identified hazards and their associated risks. The Emergency Management Department maintains the hazard inventory evaluation internally.

This plan will not cover the tactical response techniques for a fire, however it will cover the response actions for the effects of radiant heat and air monitoring for plumes (smoke or otherwise), on the public, that result from a fire event. Detailed response actions including tactical information for fires can be found in the site specific "Fire Pre-Plan".

Plan Implementation

This Emergency Response Plan (ERP) will be implemented for any emergency or drill (exercise) within Alberta or British Columbia that results from the Trans Mountain Pipeline System. If a different plan is identified as more applicable it may be used if the decision to use an alternate plan is first approved by Unified Command.

Emergency Definition

An emergency is defined as any condition that results in or may result in:

- Death or injury requiring hospitalization
- Explosion or fire
- Leak, rupture or spill
- Any significant event such as; earthquake, flood, severe storm or bomb threat that may threaten the TMPL

Emergency Levels

The Kinder Morgan Canada Products Emergency Response Organization is based on a three-tiered response structure. Incidents are identified and categorized into one of the three tiers. Each Tier is managed by an escalating degree of management seniority and authority, and assistance from outside the initial response organization. The standardization of the ICS Structure and Incident Management Process provides the flexibility to tailor the size of the response organization to the specifics of the incident and allows for rapid adjustments as an incident evolves. Where appropriate, the Kinder Morgan Incident Commander will invite the participation of Federal, Provincial and Iocal Agencies to form a Unified Command.

Level	Definition	Examples
1	The Company has the capability to manage and control a Level I emergency using company resources available within the area. The District Supervisor will assume the Incident Commander position.	 Oil spills confined to company property (pipeline station, terminal, or scraper trap) Public, contractor, or employee safety not endangered Public property not endangered Local response handled by District personnel Notification may not be required to regulatory authorities Little or no media interest
2	The Company has the capability to manage and control a Level II emergency using company resources and expertise, with some assistance from local contractors. The Region Director or designate may assume the Incident Commander position.	 Oil has migrated beyond company property (pipeline station, terminal, or scraper trap) but not into a waterway Emergency services may be required (e.g., fire, police, ambulance) Public, contractor, or employee safety and/or property may be endangered Notification required to regulatory authorities May use a unified command organizational structure in the emergency Local media interest
3	The Company may request assistance from other Industry, Municipal, or State Agency personnel to support the response to the incident. The Region Director will assume the Incident Commander position.	 Major emergency condition such as: uncontrolled leak spill on a watercourse large fire at an operating facility or office building fatality or serious injury to an employee, contractor, or the public spill of hazardous substances Major off-site environmental impact has occurred Public, contractor, or employee safety and/ or property is endangered Emergency services are required (e.g., police, fire, ambulance) Notification required to regulatory authorities Use of a Unified Command organizational structure in the emergency, as required, to facilitate coordination of company, government and other agency response to the emergency. Local, Provincial/State, and/or National Media interest.

Emergency Response Philosophy

On all emergency incidents, Kinder Morgan will follow the following basic response approach:

- 1. Control the Incident Site
 - The incident scene must first be controlled to ensure a safe and effective response to any incident:
 - Don't rush in; hazards must first be fully assessed
 - Establish and announce command at the ICP, either at the incident scene location or, if necessary at a remote location
 - Establish and maintain an isolation perimeter, with hot, warm and cold zones
 - Establish staging area(s)

2. Size up the Situation

- A site assessment will identify the scope and nature of the incident, as well as any potential hazards to responders:
 - Recognize and identify any hazardous materials involved
 - Source of any releases
 - Potential exposures

3. Evaluate the Hazards and Risks

- An assessment must be conducted to evaluate the level of risk to responders and the public:
 - Assess health, physical and chemical hazards
 - Gather technical data (SDSs, etc.)
 - Conduct vapour monitoring

4. Establish Initial Objectives

- After the potential hazards have been identified, the Incident Commander(s) can establish the initial objectives for the response. Typical initial objectives include:
 - Control the incident Scene
 - Ensure the safety of responders and the public
 - Establish Incident Command Post

5. Select and Don PPE

- All incident responders must be protected with the PPE appropriate to the hazards present:
 - Approved Fire-Resistant Coveralls
 - Hard Hats (where overhead hazards are present)
 - Gloves
 - Splash Goggles
 - Rubber Steel-Toed Boots

Also:

- PPE must be worn properly in order to fully protect responders.
- Damaged or heavily-oiled PPE should be replaced as soon as possible.
- All responders leaving the *Hot Zone* must go through a decontamination zone *(Warm Zone)* to ensure that contamination is not spread into the *Cold Zone.*

6. Manage Information and coordinate Resources

- It is essential that information flows quickly and freely to all resources to ensure a safe and coordinated response:
 - Expand the ICS as needed, especially if a Unified Command is established
 - Ensure that all (internal and external) notifications are made
 - Conduct briefings
 - Confirm all communications to ensure that they are fully understood and implemented

7. Implement Response Objectives

- Once initial objectives have been established, it will be possible to develop, and implement, strategies and tactics to achieve these objectives. These may be:
 - Offensive (i.e., emergency rescue, fire-fighting, spill source control)
 - Defensive (i.e., protecting the public, fire control, spill response)
 - Non-intervention (protecting the public)

8. Manage the Incident

- On larger incidents, it will be necessary be operate over a number of Operational Periods. In these cases, it will be necessary to fully-staff the Incident Management Team, especially the Planning Section:
 - Establish Incident Objectives for each Operational Period
 - Conduct Tactics and Planning Meetings
 - Develop and approve Incident Action Plans
 - Conduct Operations Briefings

9. Terminate the Incident Response

- Once the emergency phase of the incident is over, the Incident Commander will stand down the Incident Management Team and ensure that all post-incident activities are completed:
 - Transition to, and conduct the post-emergency phase of the response
 - Conduct an incident debrief
 - Ensure that all incident documentation is completed
 - Ensure that all equipment, PPE and ICP supplies are replenished
 - Transition from Emergency Phase to Project Phase with adequate documentation and continue any required project phase activities, i.e., site remediation, repair to terminal assets

1.0 <u>RESPONDER HEALTH AND SAFETY</u>

It is important to understand that the different hydrocarbon products handled pose different hazards when spilled, and/or are on fire, depending on their chemical composition. Therefore, the primary hazards, and the need for vapor monitoring, and the cleanup techniques will depend on the characteristics and volume and type of product.

Many crude oils (including "sweet" crudes) can emit potentially dangerous levels of H2S, and most crude oils also contain Benzene. Typically, the risks associated with the concentration of potentially-dangerous vapors will diminish with time, due to reduced vapor production as the lighter components volatize, and vapors disperse. There are exceptions to this however; i.e., in some cases, where crude oil pools into thick layers, a skin may develop on the surface, trapping vapors. Later, if the skin is broken and the oil disturbed, the oil might emit vapors normally associated with freshly-spilled oil. Some crude oils have low flash points, especially during the initial hours after being spilled, when hydrocarbons burn there are other risks to consider, such as the combination of chemicals in the smoke plume and radiant heat emitted by the fire. In all of these cases, the risk of accidental ignition and/or the inhalation of toxic vapors must be mitigated, and a detailed site assessment (see Section 3) must be completed before on-scene operations are initiated. This assessment will be made by the Safety Officer. In all cases, the results of the initial site assessment should be used to develop a Safety and Health Plan.

The Initial Site Health & Safety Plan (ISHSP) should be completed as soon as possible by one of the initial responders, and updated as required. When completing the ISHSP some of the information may not apply during the initial stages of the response, but may change within a short period, thereby altering the PPE and/ or other requirements.

The ISHSP:

- Aids the initial responders in assessing hazards related to the incident
- States the required PPE to be used
- Documents important health and safety information
- Serves as an interim "Plan" until the Site Health & Safety Plan (Section 1.3) is developed
- Assigns responsibilities, i.e., completion of the ICS 201 and notification
- Identifies "site set-up" features that may be required
- Authorizes work to be completed (in lieu of a Safe Work Permit)

Upon the completion and delivery of the Site Health & Safety Plan, the Initial Site Health & Safety Plan becomes void.

1.1 Safety Guidelines

1.1.1 Skin Contact

The accidental absorption of toxins through skin/eye contact can be greatly reduced through the wearing of oil-resistant Personal Protective Equipment (PPE). These include:

- Approved Fire-Resistant Coveralls
- Hard Hats (where overhead hazards are present)
- Gloves
- Splash Goggles
- Rubber Steel-Toed Boots

Also:

- PPE must be worn properly in order to fully protect responders.
- Damaged or heavily-oiled PPE should be replaced as soon as possible.
- All responders leaving the *Hot Zone* must go through a decontamination zone (*Warm Zone*) to ensure that contamination is not spread into the *Cold Zone*.

1.1.2 Inhalation of Vapours

The need for respiratory protection will be determined by the Safety Officer after a review of the SDS and data retrieved from the initial site assessment (see Section 3). If toxic vapour levels are determined to exceed safe working limits (see Section 3.4 for details), it might be possible for responders to work while wearing half-face respirators fitted with Organic cartridges, or SCBA. In this case, on-going vapour monitoring is essential to ensure that vapour levels do not exceed safe working limits.

1.1.3 Fire/Explosion

All hydrocarbon products are capable of ignition if certain conditions are met. It is important to review the SDS to determine the flash point of the material spilled and perform vapour monitoring (for LEL). Whenever vapour levels are approaching 10% of the LEL for any spilled product, responders will leave the area immediately. In the event of a fire and response efforts are required the responders will have radiant heat protection.

1.1.4 Other Hazards

There are a number of additional potential hazards faced during spill response including slips, trips and falls, and working around water and equipment. Special care should be taken when walking on oiled surfaces, especially during night-time operations. The Site-Specific Health and Safety Plan shall identify these potential hazards, and they must be clearly communicated to responders.

1.2 Initial Health and Safety Plan

The Initial Health and Safety Plan form is available on the intranet site or from E:\Manuals\Emergency Management\ICS Guide and Forms

1.3 Health and Safety Plan

The Health and Safety Plan form is available on the intranet site or from E:\Manuals\Emergency Management\ICS Guide and Forms

2.0 INTERNAL AND EXTERNAL NOTIFICATION

Immediate notification is a key element of any emergency response action. The health and safety of employees and the public is paramount and, as a result, immediate notification is essential. This Section describes both the internal and external notification processes, and includes the contact information for Kinder Morgan resources, and external resources.

2.1 Spill Verification

The first step in many incidents is to confirm that an emergency condition exists. Reports may come from a number of sources including KMC personnel and/or contractors, members of the public, Emergency Services (Police, Ambulance, Fire) or via automated detection systems

2.1.1 KMC Personnel Detection

KMC employees and contractors conduct routine maintenance and inspection work along the Trans Mountain Pipeline, associated facilities and the pipeline right-of-way on a regular basis. In the course of this work KMC employees and contractors may come across the signs of a pipeline release. In the event that a KMC employee or contractor identifies or suspects that a pipeline release has occurred they are to follow the internal notification procedure as outlined in section 2.4 of this Emergency Response Plan.

2.1.2 Member of the Public

Pipeline releases, both real and/or suspected, may be identified by a member of the public. Signs of a pipeline release may include;

- A strong petroleum odour (like gasoline or diesel fuel)
- Strong sulphur smell (like rotten eggs)
- Dead or discoloured vegetation
- Pools of liquid when the rest of the right-of-way is dry
- Petroleum sheen on water
- Unusual hissing or roaring sound

In the event that a member of the public identifies or suspects a pipeline release from a Kinder Morgan Canada operated pipeline, they are to call the Emergency Number at **1-888-876-6711**. This number connects directly to Kinder Morgan Canada's Control Centre and is monitored on a 24/7 basis.

2.1.3 Emergency Services

Emergency Services, including Police, Fire and EMS, may in the course of their duties come across or be dispatched to the scene of a real or potential pipeline release. In the event that an Emergency Services Agency identifies or suspects a pipeline release from a Kinder Morgan Canada owned pipeline, they are to call the Emergency Number at **1-888-876-6711**.

2.1.4 Automated -Spill Detection

The pipeline is equipped with pressure and flow monitors, which exercise local control and transmit data to the Control Centre. These systems are set to alarm or shut down on preset deviations of pressure flow. In case of an alarm, the Control Centre personnel will take the appropriate actions in accordance with operating procedures. The following are a summary of the operating procedures for automated spill detection:

- SCADA System 10-Second Data Access Control Centre monitor and control pipeline operations with the SCADA system in the Control Centre. The ultimate decision on leak detection lies with the Control Centre.
- Communication Flexibility/Redundancy the SCADA system acquires data via a satellite network. Satellite communications allow large volumes of data to be transmitted both to an from all field locations very rapidly. Network configuration and transmission protocols provide the flexibility to establish guaranteed delivery transmissions as required. Communication system redundancy provides accurate and reliable data to pipeline operators.
- Parameter Alarms a parameter alarm is a data value limit (high or low) which can be set by the Control Centre operator to alert upset conditions regardless of whether the Operator is actively monitoring the data point in question.
- Operators are required to establish parameter alarm settings on mainline pressures and flow rates for all operating line segments. In combination with ten-second data acquisition rates. Parameter alarms provide near instantaneous notification of potential upset conditions on all operation mainlines.
- Trending the SCADA system includes a trending facility which graphically displays pressures, temperature, and flow rate data for each mainline pump and oil receiving location on the system. This system can provide valuable insight into operations history and can help the operator proactively address potential upset conditions.

2.1.5 Automated/Complaint Detection Verification

If the detection method comes from alarms to the Control Centre Operator (CCO) or a member of the public the potential incident must then be visually verified by KMC personnel. If a leak, fire or other emergency event is confirmed the on-site operator will inform CCO of the incident and CCO will initiate the internal notification procedure.

2.1.6 Early Detection Methods

Aerial patrol flights are made on a regular basis along the right-of-way. The intent of the patrol is to observe the area directly over the pipeline right-of-way for leaks, exposed pipes, washes, missing markers and other unusual conditions. Construction on the right-of-way, or adjacent to the right-of-way is also closely monitored.

Discharge to the land and/or surface waters may also be detected by company personnel when employees perform daily scheduled inspections of the site.

Right-of-way marker signs are installed and maintained at road crossings and other noticeable points and provide an emergency telephone number for reporting emergency situations. The company also participates in the "call before you dig" or "One Call" utility notification services which can be contacted to report a leak and determine the owner/operator of the pipeline.

If a notification is made to a local office or pump station, the Kinder Morgan representative receiving the call will generally implement the following actions:

- Notify the Control Centre and regional office/Qualified Individual
- Dispatch field personnel to the site to confirm discharge and conduct preliminary assessment
- Notify their immediate supervisor and provide assessment results.

2.1.7 Detection in Adverse Weather

Line ruptures that cause worst case spills in adverse weather conditions would normally be detected and acted upon within 5 minutes by the Control Centre Operator. In the event of detection by a member of the public, or where a leak is suspected it must be visually verified. If adverse weather is preventing visual detection the pipeline will be shut down for safety until visual detection occurs. Additional equipment may be use in these situations which includes vapour detection, and thermal/infrared imagery.

2.1.8 Detection of Spills to Groundwater

In an area where a spill occurs that is not on impermeable ground a contractor will be used to assist with the detection and ongoing evaluation of a spill that may impact groundwater.

2.1.9 Shutdown Events

If abnormal conditions exist, Control Centre will take the appropriate actions to ensure that a release does not occur. If a discharge has occurred, Control Centre will take actions to limit the magnitude. In either case appropriate actions taken by the Control Centre may include, but are not limited to:

- Shut down affected line segment if there is an indication of a leak
- Isolate line segment
- Depressurize line
- Start internal and external notifications
- Mobilize additional personnel as required.

Emergency Response Plan

2.2 Spill Verification Flowchart

The first step in many incidents is to confirm that a spill has actually occurred. Spill reports may come from a number of sources including the public, and First Responders (Police, fire and Ambulance). Once receive the following flowchart shows the direction of communication to verify an incident.



Emergency Response Plan

2.3 Internal Notification Flowchart



2.4 Internal Notification Procedure

All spills, regardless of size, must be reported immediately to the Control Center, who will:

- Contact the District Supervisor to verify and Assess the situation
- Determine the Response Level (i.e., Level 1, 2 or 3 See Introduction for a description of the 3 Response Levels)
- Initiate the notification of company and external personnel

2.4.1 Information to Report

Information about the spill should be as clear, concise, accurate and timely as possible. The minimum information reported, for initial report and update reports, should be:

- Name and Telephone Number of the Caller
- Date and Time of the call
- Name of Pipeline
- Location of the Spill
- Product(s) Spilled and associated SDS
- Estimated Quantity
- Actions Taken To-Date
- Assistance Required
- Injuries
- Weather Conditions
- Reason for discharge (if known)

Emergency Response Plan

2.4.2 How to report

Call the Control Centre at 1-888-876-6711

Note: The Control Centre number is monitored 24 hours a day.

2.5 Incident Management Team Notification/Activation

Upon being notified of the incident, the Control Centre will issue an Emergency Response Line (ERL) or ERL+. The ERL system is an online tool that delivers an automated group text message to designated Kinder Morgan personnel when notification of an emergency or non-emergency event is required. The CCO fills in the Emergency Condition Report and issues an ERL/ERL+ call. Once received the mandatory call in personnel will participate in a conference call to determine next actions, and the IMT members that need further contact/mobilization. An initial IMT will be set up using these individuals. The mandatory callers are as follows:

- Regional Director
 - The following people are contacted at the discretion of the Regional Director
 - Pipeline Protection Supervisor, affected area
 - Director, External Relations
 - Scheduler, Shipper Services, affected area
- Director, Central Region and Control Centre
- Director, Technical Services
- Field Representative
- EHS, regional contact
- Director, EHS (Calgary)
- Director, Emergency Management
- Legal Representative
- Manager, Emergency Management

If the on-line system is not operational the CCO will begin a manual call down of the above individuals and request they join the conference call. If the conferencing telephone lines are not operational the flow of information will occur via individual telephone calls until an alternate conferencing solution is available.

The following positions will be assigned at a minimum during this call:

- Safety Officer
- Information Officer
- Liaison Officer
- Legal Officer
- Operations Section Chief
- Planning Section Chief
- Logistics Section Chief
- Finance/Administration Section Chief

As core IMT members arrive at the site or are assigned, they are responsible for contacting the remaining members of their respective sections/units/groups/division, deemed necessary based on the size and nature of the incident.

2.6 Kinder Morgan Contacts

"Kinder Morgan Contacts" consists of a list of Kinder Morgan Canada personnel names and contact information, who have been trained in the use of the Incident Command System (ICS) and their applicable ICS roles. In the event of an emergency, these personnel would fill the ICS functional roles. This information has been removed from the manual following the requirements of the Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation). The information is provided on a controlled basis within the confidential appendix of this manual.

2.7 Emergency Response Line Contacts

The "Emergency Response Line (ERL) Contacts" is a list of Kinder Morgan Canada senior business and Environment Health and Safety managers and their alternates, contact information. If an event were to occur, these personnel participate in the initial emergency notification briefing and any follow-up calls, if required. This briefing normally occurs via a telephone conference call by-way of a predesignated emergency conference call telephone number but could occur in person, if all were in the same location at the same time. This information has been removed from the manual following the requirements of the Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation). The information is provided on a controlled basis within the confidential appendix of this manual.

Emergency Response Plan

2.8 Facility Contact Numbers

District	Facility	Phone
Edmonton Terminal	nonton Terminal Edmonton Terminal	
	Edmonton Office	780-449-5900
	Edmonton PLP	780-449-5960
	Stony Plain Pump Station	780-963-2242
	Gainford	780-797-3007
	Chip	780-325-2575
	Niton	780-795-3733
Alberta District	Wolf Lake	780-723-3597
	Edson	780-723-4425
	Hinton	780-866-2371
	Jasper Station	780-852-4225
	Jasper PLP	780-852-4233
	Rearguard Pump Station	250-566-9734
	Albreda	250-566-9037
	Chappel Pump Station	403-514-6797
	Blue River Station	250-673-8321
	Blue River Maintenance	250-673-8404
North Thompson District	Finn Pump Station	250-673-8361
	McMurphy	250-678-5301
	Blackpool	250-587-6459
	Blackpool Administration	250-587-6372
	Darfield	250-672-5140
	Kamloops Office	250-371-4000
	Kamloops Station	250-371-4050
Kamloops District	Kamloops Central Stores	250-371-4090
	Kamloops Products Take-off	250-554-1955
	Stump Lake Pump Station	403-514-6798
	Kingsvale	250-378-5473
	Норе	604-860-4182
Sumas District	Hope Maintenance	604-869-5993
	Wahleach	604-794-7637
	Sumas Station	604-852-4008

2.9 External Notification – Potential Emergency Condition

In the case of a potential emergency condition¹ notification to National Transportation Safety Board (NTSB) and National Energy Board (NEB), Emergency Management British Columbia (EMBC), and /or Alberta Emergency Management Agency, is made by the on-call EHS Representative when any of the following conditions are met:

- Emergency Shutdown is an event or situation that could imminently be hazardous to persons, property or the environment. This includes but is not limited to component malfunction or personnel error that could cause a hazard to persons, property or the environment, an operational failure causing a hazardous condition, natural disaster, a terrorist threat, third party damage that could affect pipeline operations, leaks or spills, fires or a response to the activation of an emergency system.
- 2. Safety Shutdown is a situation where a pipeline is shutdown due to an emergency or abnormal operating condition along a pipeline, or at a terminal, station or other facility. The automated shutdown of a pipeline due to the activation of a protective device in response to an abnormal operating condition is also considered a Safety Shutdown.
- 3. Odour Complaint in the event of multiple complaints and/or a single complaint in conjunction with available operating data, the CCO has a reason to suspect a release of product and decides to do a Safety Shutdown of the pipeline and/or station.

National Energy Board Online Event Reporting System (OERS)

Emergency Management British Columbia: 800-663-3456

Alberta Emergency Management Agency: 866-618-2362

Notes: The CCO has the authority and the responsibility to shutdown a pipeline, station, or terminal during an emergency or as a precaution when in his/her judgment, further operation is unsafe. The CCO will not be faulted for shutting down under these conditions.

A field technician or District Supervisor may request a shutdown as the result of local conditions in response to the investigation of a complaint or regular duties where a release or other abnormal operating condition is suspected. The CCO will comply with the request and initiate the Emergency Condition Response Procedures.

Notification to the National Energy Board OERS System is through the online portal <u>https://apps.neb-one.gc.ca/ers</u>. NEB Incident Reporting Line 403-807-9473 may also be used when there is a potential emergency situation. If there is some doubt as to whether an event should be reported, or and event has occurred the potential event will be reported.

¹ A potential emergency can be defined as a spill of unknown volume, unconfirmed and is adjacent to water or where there is a pathway to water, and the environmental conditions, such as rain events or known shallow groundwater make impacts to water likely.

Emergency Response Plan

2.10 . External Notification – Confirmed Emergency Condition



Note: Notification to the National Energy Board/Transportation Safety Board is conducted through the one window Online Event Reporting System (OERS) <u>https://apps.neb-one.gc.ca/ers</u> except in a case where the incident is defined as significant. The event must be reported immediately, companies are required to notify the TSB Reporting Hotline and input the details into OERS within 3 hours. See reporting table on next page.

2.11 Reporting Requirements

Call Order	Agency	Notes				
District Supervisor/Incident Commander Initial Calls						
1	911 Call Centre 911 or 9911 - from a company land line)	The local 911 call centre will be notified of any incident to inform the call centre operators of the problem or potential problem so they do not allocate additional unneeded resources to the event.				
District Sup	pervisor/Incident Commander -	- Incident impacting Fraser River or Burrard Inlet				
2	Vancouver Fraser Port Authority 604-665-9086	For spills that impact the Fraser River (from approximately Darby Reach Regional Park to the mouth of the river) and/or Burrard Inlet				
District Sup	pervisor/Incident Commander/I	EHS Representative or Designate				
1	Western Canada Marine Response Corporation (WCMRC) 855-294-9116	Primary Response Contractor to assist with equipment and personnel for spill that impact the Fraser River and/or Burrard Inlet.				
1	Western Canada Spill Services (WCSS) 866-541-8888	Equipment provider for spills that are in Alberta or on land in British Columbia. Note: caller to request a spill specialist				
KMC On-Call EHS Representative – All Incidents						
1	National Energy Board/Transportation Safety Board https://apps.neb-one.gc.ca/ers Significant Event ² TSB Reporting Hotline (819) 997-7887	Reportable Incidents must be reported through the one window Online Event Reporting System (OERS) Where an event qualifies as a significant incident it must be reported immediately, companies are required to notify the TSB Reporting Hotline and input the details into OERS within 3 hours				
KMC On-Ca	all EHS Representative – Incide	ent in Alberta				
2	Alberta Emergency Management Agency 866-618-2362	Coordinates the provincial government response.				
3	Alberta Environment & Alberta Energy Regulator Environment Canada 800-222-6514 780-422-4505	The Canadian environmental notification system uses the provincial/territorial 24-hour authorities as the first point of contact. In turn, these authorities inform Environment Canada of the notifications.				
KMC On-Call EHS Representative – Incident in British Columbia						
1	Emergency Management BC 800-663-3456	Emergency Management BC makes notifications to other provincial agencies as needed.				

² Significant incident is an acute event that results in: death, missing person (as reportable pursuant to the DPR under COGOA or OGOA), a serious injury (as defined in the OPR or TSB regulations), a fire or explosion that causes a pipeline or facility to be inoperative, a LVP hydrocarbon release in excess of 1.5 m3 that leaves company property or the right of way, a rupture; or a toxic plume as defined in CSA Z662. For the purposes of this document, a "rupture" is an instantaneous release that immediately impairs the operation of a pipeline segment such that the pressure of the segment cannot be maintained.

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Call Order	Agency	Notes
1	British Columbia Ministry of Environment (MOE) 800-663-3456	Responsible for the effective protection, management and conservation of B.C.'s water, land, air and living resources. The BC MOE 24-hour, toll free number connects with the Emergency Coordination Centre (part of Emergency Management BC).
2	BC Environment Assessment Office (BC EAO) 877-952-7277	 In the event that a spill originating from the Trans Mountain Expansion Project is confirmed to contaminate drinking water, the company must notify BC EAO and MOE within the following time periods: As soon as practicable; Within 72 hours, whichever is less.

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2.12 External Agency Reporting Form

This form is to document incident information to be sent to external agencies.

Name and Address of Company/Oil Handling Facility Name of Pipeline/Identity of Vessel Involved Name and Position of On-Scene Commander/Person Responsible for Implementing ER Plan Date and Time Discharge Location of Discharge Name of Product Involved and associated SDS Reason for Discharge (i.e., Material Failure, Excavation Damage, Corrosion) Estimated Volume of Discharge Weather Conditions On-Scene Actions Taken or Planned by Persons On Scene

2.13 Other Notifications

2.13.1 Local Governments

Notification of the local government agencies may occur through 911 and on-scene coordination with emergency services. Alternately the impacted communities will be identified based on the location of the incident using the geographic information system mapping applications. The External Relations Group maintains the database of local contacts and will contact affected communities as soon as possible. The Emergency Management Department keeps a database of emergency managers for the communities in which the Trans Mountain Pipeline and associated facilities operates. The Liaison Office will be provided with all local contacts and will conduct notifications as soon as possible.

2.13.2 Aboriginal Communities

Notification of the Aboriginal Communities, including First Nations whose traditional territories are affected, occurs through the Aboriginal Relations Group as part of the incident Liaison Office. The impacted communities, including traditional territories, will be identified based on the location of the incident using the geographic information system mapping applications. The Aboriginal Relations Group maintains a database of Aboriginal Community contacts and will contact affected communities as soon as possible.

2.13.3 Other Provincial Contacts

Alberta and British Columbia have one window reporting which is to trigger call-down of additional resources if required. KMC recognizes that in some situations a provincial response may not be required, however the local authorities and/or other potentially impacted provincial agencies may wish to receive additional information regardless of the decision to respond from the Provincial or Federal governments, therefore is committed to making additional notification calls, as time allows and establish conference call solutions to ensure potential responders are aware of the situation. Such communications are termed "coordination calls".

2.13.3.1 Coordination Call

An inter-agency coordination call will be arranged by the Liaison Officer to provide an incident briefing, including confirming Unified Command membership and establish an ongoing briefing schedule. The call's purpose is to:

- Provide a situation update utilizing <u>verified</u> information only (approved situation reports from previous or current operational period):
 - Incident situation: location, magnitude and potential impacts
 - Consequences (actual and potential) including communities affected; consequences could include:
 - Contamination of water (drinking (human, livestock), irrigation, or agricultural watering)
 - Air contamination
 - o Other actual or potential consequences
 - Initial/ongoing response status including mitigation measures taken
 - Activation (status and level) of the Emergency Response Plan(s)
 - Agencies, stakeholders, and Aboriginal communities who have been notified

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2.13.4 Agency Contacts

The following list is a list of agencies that may be contacted after all other mandatory reporting is complete.

Agency	Contact
When contacting agencies be clear as to whether the call is for the pushport.	urposes of awareness, or for the purposes of requesting
Alberta Health Services	After Hours 780-493-1963
Alberta Flearth Services	M-F (8-4:30) 780-735-1800
Alberta Occupational Health & Safety	866-415-8690
Alberta Ministry of Transportation	800-272-9600
Alberta Energy Regulator (AER)	800-222-6514
RC Oil & Cas Commission	800-663-3456
	250-794-5200
BC Emergency Management Unit (Ministry of Health)	250-952-1687
BC Health Services	250 952-2402
Health Emergency Management BC (HEMBC)*	604-675-7400
Northern Health Authority	250-566-9138
Interior Health Authority	250-469-7070
Fraser Health Authority	604-587-4600
Vancouver Coastal Health Authority*	604-736-2033
BC Ministry of Transportation and Infrastructure	866-707-7862
Workoofo BC	After Hours: 866-922-4357
	M-F (8-4:30): 888-621-7233
Non-Government	
Simon Fraser University – Campus Safety & Security	General Inquiries: 778-782-3100
Services**	Emergency 24/7: 778-782-4500

* If an incident involves either the Westridge Marine Terminal or the Burnaby Terminal, then both HEMBC and the Vancouver Coastal Health Authority should be contacted.

**Notification to SFU is required for all emergencies impacting, or that have the potential to impact Westridge Marine Terminal or Burnaby Terminal.

2.14 Support Services

"Support Services" consists of the names and contact telephone numbers of all entities that have been identified and pre-approved to supply services to Kinder Morgan Canada in day-to-day business or in the event of an emergency. Support Services information consists of primary response contractors, industrial firefighting and air monitoring providers, communications equipment and aviation providers, lodgings, equipment, etc. These are private entities with which KMC has a contractual relationship. The removal of this information follows the requirements of The Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation). The information is provided on a controlled basis within the confidential appendix of this manual.
2.15 Mutual Aid Activation

Mutual Aid Agreement	Activation Instructions
Canadian Energy Pipeline Association (CEPA) Mutual Emergency Assistance Agreement (MEAA)	 Contact the Emergency Response and Security Group to identify nearby resources and request assistance in accordance with the procedures outlined in the MEAA. Activation is with the Emergency Management Department.
Strathcona District Mutual Aid Partnership (SDMAP)	 Provides assistance and equipment in the Edmonton Area for the Terminal Operations. It is activated at the request of Strathcona County Emergency Services, or by directly calling a member company by the Terminal Supervisor.
Kamloops Fire and Rescue	 Emergency Response support for incidents inside the City of Kamloops. Activation is by direct contact between Emergency Services and Kinder Morgan Supervisor or the Emergency Management Department.
Burrard Industrial Mutual assistance Group (BIMAG)	 Agreement amongst operators in the Burrard Inlet area. Includes Shell (Burmount and Shellburn facility), IOR (IOCO and Lougheed facility) and Suncor Activation is with the Emergency Management Department.

Contact information and procedures for the activation of the mutual aid agreements is contained within the confidential appendix of this manual. In many cases these numbers are those of specific personnel or unpublished numbers. The removal of this information is consistent with the requirements of the Personal Information Protection and Electronic Documents Act (PIPEDA).

2.16 Incident Command Post and Staging Area Locations

There are pre-designated potential Incident Command Post (ICP) and Staging Area locations along the pipeline corridor and in communities where its facilities are located. Access to these facilities, and the lead time required varies depending on the location and type of facility being used. Specifically KMC has identified resources in the following communities; In British Columbia; Burnaby, Richmond, City of Vancouver, Abbotsford, Chilliwack, Hope Merritt, Kamloops, Clearwater, Blue River, Valemount, and in Alberta; Jasper, Hinton, Edson, Gainford, Edmonton, Sherwood Park. KMC has agreements and protocols in place where appropriate with the service providers. All facilities meet the requirements for internet and telephone connectivity, food, lodging, meeting space, parking and security for a multi agency response.

Incident Command Post facilities are private entities with which KMC may have contractual relationship. The information is provided on a controlled basis within the confidential appendix of this manual. The removal of this information follows the requirements of The Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation).

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2.17 Media Relations Centre Locations

The designated Media Relations Centre in the event of an emergency will be designated at the time of an emergency, based on the location of the ICP. Media Relations facilities are private entities with which KMC may have contractual relationship. The information is provided on a controlled basis within the confidential appendix of this manual. The removal of this information follows the requirements of The Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation).

3.0 <u>SPILL/SITE ASSESSMENT</u>

The primary purpose of a site assessment is to evaluate the presence of risk to both incident responders and the public. However, if it is safe to do so, information about the incident should be gathered as quickly as possible in order to evaluate the situation and develop an initial action plan. It might also be possible for the Site Assessment Team to take measures to reduce possible impacts.

NOTE: Site Assessment Team members should wear all PPE (boots, FR Coveralls, Gloves, Eye Protection, Hard Hat and half-face respirators) while assessing the incident. This may include radiant heat protection.

If vapour levels reach 10% of the LEL, Site Assessment Team members should leave the area immediately

3.1 Site Assessment Guidelines

3.1.1 Safety Checklist

- Conduct Pre-Entry Safety Checklist (IHSP, or HSP)
- Remove all non intrinsically-safe radios, pagers, etc.
- Establish communications procedures/schedules
- Don appropriate PPE, as per health and safety plan
- Refer to SDS
- Determine wind speed and direction
- Determine current direction
- Approach spill from upwind/up current if possible
- Conduct vapour monitoring

3.1.2 Incident Intelligence checklist

- Determine status of any injured personnel
- Determine spill source
- Confirm spilled product (if different, leave the area)
- Determine if source is isolated
- Estimate spill rate/volume
- Determine if product has or will reach the water
- Determine if product has escaped local containment

3.1.3 Incident Mitigation Checklist

- Evacuate and attend to any injured personnel
- Isolate spill source
- Close all valves

3.2 Vapour Monitoring Site Assessment Procedure

The team should move toward the area and stop at an acceptable location, preferably upwind, to make final preparations for assessment. The team must evaluate its options and decide the best approach route. Frequent reading of air monitoring instruments can ensure the safety of the survey party during the approach. The assessment team leader needs to exercise caution and use controls that will best protect the team.

The survey should continue as long as air monitoring instrument readings remain within acceptable limits, with the objective of (a) obtaining readings across the zone and (b) locating a significant accumulation to provide a detailed assessment. A safe and effective site assessment will require caution, persistence and field decisions.

The team leader must take immediate action if at any time the air monitoring instrument readings meet or exceed "evacuation" levels. If "evacuation" levels are met or exceeded, move upwind from the spill and halt the assessment. Notify the Incident Commander.

When sufficient representative locations have been recorded, the air-monitoring phase of the initial site assessment is complete. The identification of physical, environmental, or other hazards will complete the assessment.

3.3 Vapour Monitoring Flowchart



3.4 Spill Observation/Assessment/Estimation Factors

3.4.1 Spill Surveillance

The following guidelines should assist in spill surveillance:

- Surveillance of an oil spill should begin as soon as possible following discovery to enable response personnel to assess spill size, movement, and potential impact locations. Dispatch observers to crossings downstream or down gradient to determine the spills maximum spread.
- Efforts should be made to approach from an uphill/upwind direction.
- Clouds, shadows, sediment, floating organic matter, submerged sand banks or windinduced patterns on the water may resemble an oil slick if viewed from a distance.
- Spill surveillance is best accomplished through the use of helicopters or small planes; helicopters are preferred due to their superior visibility and manoeuvrability.
- All observations should be documented in writing and with photographs and/ or videotapes.
- Record observations on detailed maps.
- Surveillance is also required during spill response operations to gauge the effectiveness of response operations; to assist in locating skimmers; and assess the spill's size, movement, and impact.

3.4.2 Estimating Spill Volume

If possible the initial assessment should also include an estimate of the volume of oil spilled. Oil volumes can be estimated by multiplying the area of the slick by the average estimated thickness. The following chart applies when the oil is on the water. In the case of an impoundment area the spill can be estimated by multiplying the thickness by the area covered.

Appearance	Slick Thickness	Spill Volume
Barely visible	0.05 μm	50 L/km ²
Visible as silvery sheen	0.08 µm	80 L/km ²
First trace of colours	0.15 μm	150 L/km ²
Bright bands of colour	0.3 µm	300 L/km ²
Colours begin to turn dull	1 μm	1,000 L/km ²
Colours are much darker	2 µm	2,000 L/km ²

3.4.3 Rapid Methods for Estimating Spill Size

- Transfer operations: Multiply the pumping rate by the elapsed time that the leak was in progress, plus the drainage volume of the line between the two closest valves or isolation points (volume loss = pump rate [bbls/ min] x elapsed time [min] + line contents [bbl])
- Tank overfills: Elapsed time multiplied by the pumping rate
- Visual assessment of the surface area and thickness (note that this method may yield unreliable results):
 - Interpretation of sheen color varies with different observers
 - Appearance of a slick varies depending upon amount of available sunlight, seastate/turbulence, and viewing angle
 - Different products may behave differently, depending upon their properties.

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4.0 SPILL CONTAINMENT AND RECOVERY

The containment of spilled oil will:

- Reduce the spread of slicks and their impacts beyond the property
- Reduce potential impacts to the surrounding environment
- Reduce potential economic impacts
- Maximize the thickness of floating slicks
- Maximize the effectiveness of mechanical countermeasures (i.e., skimmers and sorbents)

Where safety allows, every effort should be made to limit the quantity of released product into adjacent waterways:

- Conduct site assessment (see Section 3.1)
- Act quickly and carefully
- Activate the Emergency Shut Down (ESD) from the Control Centre
- Stop all pumps
- Close all valves
- Block potential escape points using sorbent booms

4.1 Initial Containment Actions

Initial containment actions will focus on utilizing containment on site in the most effective manner to:

- Prevent the oil from impacting water, thereby reduce the surface area and shoreline to be cleaned
- Concentrate the oil (when safe to do so), making physical recovery more efficient
- Limit the environmental impact to the immediate spill area.

Selection of the appropriate location and method will depend upon

- Length of time since the spill occurred
- Amount and type of spilled material
- Area of coverage
- Environmental factors such as wind speed and direction

4.2 Spill Mitigation Procedures

Failure	Procedure		
Failure of Transfer Equipment	 Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. Terminate transfer operations and close block valves. Drain product into containment areas if possible. Eliminate sources of vapor cloud ignition by shutting down all engines and motors. 		
Tank Overfill/ Failure	 Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. Shut down or divert source of incoming flow to tank. Transfer fluid to another tank with adequate storage capacity (if possible). Shut down source of vapor cloud ignition by shutting down all engines and motors. Ensure that dike discharge valves are closed. Monitor containment area for leaks and potential capacity limitations. Begin transferring spilled product to another tank as soon as possible. 		
Piping Rupture/ Leak (under pressure and no pressure)	 Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. Shut down pumps. Close the closest block valves on each side of the rupture. Drain the line back into contained areas (if possible). Alert nearby personnel of potential safety hazards. Shut down source of vapor cloud ignition by shutting down all engines and motors. If piping is leaking and under pressure, then relieve pressure by draining into a containment area or back to a tank (if possible). Then repair line according to established procedures. 		
Fire/ Explosion	 Personnel safety is the first priority. Evacuate nonessential personnel or personnel at risk of injury. Notify local fire and police departments. Attempt to extinguish fire if it is in incipient (early) stage. Shut down transfer or pumping operation. Attempt to divert or stop flow of product to the hazardous area (if it can be done safely). Eliminate sources of vapor cloud ignition shutting down all engines and motors. Control fire before taking steps to contain spill. 		
Manifold Failure	 Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. Terminate transfer operations immediately. Isolate the damaged area by closing block valves on both sides of the leak/ rupture. Shut down source of vapor cloud ignition by shutting down all engines and motors. Drain fluids back into containment areas (if possible). 		

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4.3 Spills to Land

The penetration of oil into soil depends on a number of factors, including:

- Oil viscosity
- Soil type, wetness, and permeability
- Ground temperature

Normally, the amount of oil in saturated soil will range from 15-40 litres/m³, however, the amount may exceed 50 litres/m³ in dry soils, i.e., beneath structures. Also, low viscosity products (gasoline, diesel) will tend to penetrate into coarse sediments. In homogenous soils, the deepest penetration will normally be located below pooled oil. In the unlikely event that oil reaches groundwater, the oil will typically move relatively slowly - typically 0.5 to 1 m/day.

On impermeable ground, immediately block drain inlets, drain tiles, conduits, sewage systems, and pipe/cable ducts (limit the spread to waterways).

On permeable ground, pump out pooled product as soon as possible to temporary storage and move contaminated soil to an impermeable surface (HDPE liner).

4.3.1 Interceptor/Trench

The construction of an interceptor/trench requires:

- Excavators/hand tools
- Wood planks (depending on soil type)
- Water pumps

Only use a trench if the water table is less than 3m. below ground. Dig the trench approximately 1m. below oil level, then reduce the water level in trench about 0.75m.

4.3.2 Trench/Berm

Berms can be built from sorbents, earth, or snow to block the spread of oil. Where time allows, an HDPE liner can be used to line a trench.





4.4 Open Water Containment

4.4.1 Open Water Booming

In cases where significant amounts of spilled oil enter a lake type environment, it might be necessary to attempt to contain free-floating oil in open water using the U, J or V-booming techniques. This activity will be conducted by WCMRC.

4.4.2 U-Booming (Open Water Containment)

A single boom can be towed at a low speed (around 0.5 knots) allowing the oil to collect/concentrate in the apex of the boom. The collected oil can then be towed to a location where conditions allow the mechanical recovery of the oil.



4.4.3 J-Booming

A single boom can be towed at a low speed (around 0.5 knots) allowing the oil to collect/concentrate in the apex.

Once oil is collected, the second vessel drops back and deploys a skimmer into the thickest patches of oil.



4.4.4 V-Booming

Two booms are towed at a low speed (around 1 knot) funneling the oil into the mouth of a skimming vessel.

Collected oil is then transferred to a barge or other floating oil storage device. The recovered product could then be transferred to slop oil tanks or to a vacuum truck.



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4.5 Spills to Creeks and Rivers

4.5.1 Small Creeks

On spills to small creeks, a board can be placed across the creek in order to block the surface flow. This technique will only work on very low velocity flow creeks.





Another option on slowly-flowing creeks and rivers is a filter fence. Chicken wire, or open mesh fence material is placed across the waterway, and sorbent pads of booms are positioned against the fence. Sorbents should be monitored as once they waterwet, they will no longer absorb oil.

4.5.2 Ditches/Culverts

Spills into ditches can be blocked at culverts by placing a plywood board against the culvert opening. The plywood should be nailed to stakes to maintain its position. Also, care should be taken to ensure that the board does not block the water flow under the board into the culvert. The board can be repositioned vertically to reduce/increase the water flow under the board.



4.5.3 Inverted Weir Dam

On higher-flow creeks and rivers, angled pipes can be placed in sand bag or earthen dams to allow clean water to flow from the bottom (allowing floating oil to be blocked at the surface).

4.5.4 Deflection Booms

On fast-flowing rivers (exceeding 1 knot), booms should be angled in order to deflect floating oil towards shore. In some cases, it might be necessary to use multiple booms. When booming in rivers, take advantage of natural eddies and collection points.

Spill Containment and Recovery







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4.6 Spills in Cold Weather

4.6.1 Oil Fate in Cold Weather

Cold weather will have a significant impact on the response. Loss of light ends (weathering) slows down at lower temperatures, which can offset some of the temperature effect on viscosity. The evaporation rate at 41°F is approximately 1/3 of what it is at 86°F. As a result, oils may remain amenable to treatment by recovery or burning for a longer period. Water is at or near its maximum density in near-freezing temperatures. Cold, viscous oil will spread slower providing additional time for response.

4.6.2 Spill Response

Frozen conditions can actually serve to facilitate recovery operations by providing a solid working platform over the oil and by creating natural barriers, which can be used to contain and immobilize oil. Downward-growing ice may quickly encapsulate oil under ice, additionally there may be many under-ice pockets where oil can accumulate in natural depressions, providing access for recovery.

Snow and ice can be used to contain oil. Snow is also an effective sorbent. Equipment such as pumps and hoses must be thoroughly dried after use to minimize residual water that can freeze, causing damage or limiting use.

Any available snow near a spill can be used by forming snow berms to help contain oil and minimize its spreading prior to removal by mechanical means.

4.6.3 Biological Issues in Cold Conditions

Biological recovery on shorelines may be slower, although many organisms grow well at near-freezing temperatures. Biodegradation is likely to stop if shorelines freeze solid. Also, vulnerable times for key sensitivities typically are shorter than in temperate settings. Therefore, planning protective strategies requires specialized teams, and tactics related to shoreline protection.

4.6.4 Trenches and Berms

In cases where spilled oil has pooled on snow and ice, efforts should be made to block the spread of oil using trenches and/or berms.

Where possible, trenches should be lined using a HDPE liner or ice layer, using a water spray.



4.6.5 Oil on Ice

Oil that has pooled on top of ice should be removed as soon as possible using Vac trucks or transfer pumps.

The transfer of highly-viscous weathered oil may be difficult, especially in cold temperatures. In this case, steam-injected screw auger pumps should be used to transfer oil to temporary storage.

4.6.6 Oil Under Ice

The containment and recovery of oil under ice involves numerous safety and operational issues. The combination of pre-planning and safe practices will increase the likelihood of success.

Ice safety will be assessed immediately prior to flooding and if weather conditions change during the flooding where personnel are required to be deployed on ice.

4.6.7 Ice Augering

On spills under lake ice, or where oil is trapped and/or migrating slowly, ice augering can be used to create pathways for the oil to float to the surface for removal.

4.6.8 Ice Trenching/Slotting

Where safety allows, ice trenching/slotting can be employed in flowing rivers to provide a means of allowing under ice oil to float to the surface for recovery.

Trenches should be angled relative to the water flow to reduce losses due to entrainment. Note that specialized equipment is required to cut trenches and is available in the OSCAR units in Canada.









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4.7 **Response Tactics for Shorelines**

Kinder Morgan and all contractors/consultants will conduct shoreline assessments and clean-up through the appropriate method on a site-specific basis using overflights and SCAT teams. The following table is a general summary of shoreline types and response tactics.

Type of Shoreline	Recommended Cleanup Activity		
Developed (urban)	May require high pressure spraying:		
or unforested Land	To remove oil.		
	For aesthetic reasons.		
Freshwater Flat	 These areas require high priority for protection against oil contamination Minimal disturbance and low-impact cleanup is usually considered because of the likelihood of mixing oil deeper into the sediments during clean up effort Passive efforts such as sorbent boom can be used to retain oil as it is naturally removed. 		
Fresh marsh	 Marshes require the highest priority for shoreline protection. Natural recovery is recommended when: a small extent of marsh is affected. as small amount of oil impacts the marsh fringe. The preferred cleanup method is a combination of low-pressure flushing, sorption, and vacuum pumping performed from boats. Any cleanup activities should be supervised closely to avoid excessive disturbances of the marsh surface or roots. Debris may be removed by hand 		
Swamp	 Natural recovery and monitoring recommended under light conditions. Under moderate to heave accumulations to prevent pollution of the surrounding areas placement sorbent along the fringe swamp forest may be effective under close scientific supervision. Proper strategic boom placement may be highly effective in trapping large quantities of oil, thus reducing oil impact to interior swamp forests. Oil trapped by boom can be reclaimed through the use of skimmers and vacuums. 		

4.8 Response Tactics for Sunken or Submerged Oil

Submerged oil is defined as those products that are either neutrally buoyant or have slight negative buoyancy such that they lie below the surface of the water. Sunken oils are those products that have fallen to the bottom. Oil has the potential to become submerged or sunken when exposed to the right combination of conditions such as: weathering, over wash, sediment load and mixing energy. Exposure to a single condition is unlikely to cause oil to become submerged or to sink. Oils that have fallen below the surface of the water can also resurface elsewhere. It is possible to have sunken or submerged oil in marine and freshwater environments. A quick systematic response is the best way to prevent oil from becoming submerged or sunken oil, and is the focus of all responses at Kinder Morgan Canada.

4.8.1 Sunken and Submerged Oil – Site Assessment

Site characterization studies will be completed in areas where oil may have become submerged or sink to gather the physical evidence required to establish a plan for recovery.

If the area of response is large, hydraulic models may be used to predict the fate and behaviour of the spill. The process will differ slightly whether the area of response occurs on freshwater or saltwater as specialists establish oil fate and behaviour. Freshwater responses may involve an analysis of the geology of flowing water to establish channel shape, hydraulic gradients, current velocity, sedimentation and impoundments. Flood plane delineation may also be determined the characterization of potential depositional sites. Saltwater responses may use aerial surface surveillance and bathymetric LIDAR to identify bottom contours to predict where submerged and sunken oils may occur.

Once evidence of depositional areas has been established, these locations will be screened, on a priority basis, for positive oil identification. A sample plan may be established to assist with the site characterization. The following actions can be undertaken to determine the horizontal extent of contamination from submerged and sunken oils:

- Manual Assessment This technique typically involves the use of manual probes to disturb the bottom surface contour in an attempt to release oil blooms and sheens that act as witness marks of sunken oil. Additionally, passive collection with weighted sorbents deployed at depth intervals can be used to identify the presence of migrating submerged oils.
- Mechanical Assessment The extraction of sediment core samples may be used to quantitatively screen for the presence of oil.
- Assessment by Telemetry This is a collection of evolving techniques used to delineate, pockets of accumulated oil on the bottom surface profile. Telemetry involves specialists who may employ multi-beam and side scan sonar systems and fluorescence spectroscopy systems to delineate pockets of oil. Simple aerial photographs may also yield telemetric evidence of submerged and sunken oils in shallow waters.
- Remotely Operated Vehicles (ROVs) ROVs with live video feed and manipulator arms may be used to identify sunken or submerged oil. Although valuable under the right conditions, these vehicles are hampered by waters with poor visibility and swift currents, as well as limitation in their range and field of vision.
- Diver Assessment –There are significant safety evaluations to be made before deploying a diver and the diver should only utilize surface-supplied air. Like the ROV, diver reconnaissance is limited by water clarity, current speed, field of vision and length of tether.

4.8.2 Sunken and Submerged Oil – Work Plan

Prior to implementing techniques to recover submerged and sunken oil, a work plan will be developed and approved by Unified Command. The work plan will include the following elements at a minimum:

- Compliance with regulatory directives
- Land owner permission to access private property
- Safety evaluation of current flows and varying water levels associated with tides or flood surges
- Ground-truthed identification of staging and temporary waste storage sites
- Development of containment strategies that will typically involve the deployment of a combination of silt curtains, rigid containment booms and sorbent products
- Development of mechanical and passive recovery tactics
- Integration of communication and data logging between Operations and SCAT
- Crew composition and supervisory span of control

4.8.3 Recovery of Sunken and Submerged Oil

Recovery techniques for sunken or submerged oil will involve actions to re-mobilize the product so that it surfaces where skimmers and sorbents can be used to collect it. The bottom profile is disturbed or agitated such that the sediment releases the sunken oil particles. These particles will float to the surface either whole or as sheen. Recovery of submerged oil involves placement of barriers or diversions to attempt to drive the particles to the surface.

Developing a containment and recovery strategy involves the application of standard oil spill countermeasure tactics. Selecting an appropriate method to agitate bottom sediments, however, involves a careful analysis of water depth, bottom debris and sediment depth. Techniques for agitation may include:

- Wading personnel raking the sediment
- Boats dragging sediment-disturbing devices
- Compressed air lances to encourage bottom sediments to release sunken oil particles.
- Dredging
- Divers operating small airlift dredges

4.8.4 Remediation of Sunken and Submerged Oil

The amount of time it takes to remediate a watercourse to its baseline condition after being impacted by submerged or sunken oil will depend on the size and type of product spilled, the type and size of watercourse and the type of sediment or other substrate material impacted. A remediation plan will be developed with the regulatory bodies in accordance with all environmental legislation. Methods of remediation may include dredging, capping and long-term monitoring and collection programs.

4.9 Response Tactics for Urban Environments

Urban environments pose a challenge to response tactics due to varying surface materials including those that are impermeable such as asphalt and concrete. Initial response tactics should consider if a spill could enter the waste water and/or urban subterranean networks. Possible methods of preventing the spread of a spill include the use of booms, cardboard, plywood, drainage covers, sorbents sandbags and other barriers to contain the spill and prevent entry of product to openings leading to subterranean municipal public works.

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4.10 Recovery

It is Kinder Morgan Canada's policy that, wherever possible, spilled oil be mechanically removed from the environment, using sorbents and/or oil skimmers.

4.10.1 Sorbents

On small spills, sorbent pads should be deployed into the thickest areas of the collected slicks. On heavy oil, the pads should be flipped over to maximize oil recovery. Oil-only pads will water-saturate if left in the water too long. Once pads are oil-soaked, they should be removed using pitch forks, pike poles or debris scoops. Care should be taken when recovering oiled



sorbents, i.e., personnel should wear gloves, oil-resistance coveralls and splash goggles.

Sorbent booms can also be used, either to sweep oil within the contained area to increase the oil thickness or they can be positioned, as a liner, inside skirted booms.

Recovered sorbents should be placed in 6 mil poly bags, with the bag weight limited to 25 - 30 lbs. Bags should then be sealed and then double-bagged and placed in lined bins to avoid secondary contamination.

4.10.2 Skimmers

Where pooled oil is concentrated in sufficient quantities, mechanical skimmers should be used. This activity, would focus on areas where oil has collected, either in downwind/current boom pockets or in near-shore boom pockets. Where possible, recovery efforts should be mounted where recovered oil could be stored temporarily on shore.



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4.10.3 Cleanup Techniques – Removal

Technique	Description	Recommended Equipment	Applicability	Potential Environmental Impacts
Manual Removal	Hand tool (scrapers, wire brushes, shovels, cutting tools, wheel barrows, etc.) are used to scrape oil off surfaces or recover oiled sediments, vegetation, or debris where oil conditions are light or sporadic and/ or access is limited.	<u>Equipment</u> misc. hand tools <u>Personnel</u> 10-20 workers	 Can be used on all habitat types Light to moderate oiling conditions for stranded oil or heavy oils that have formed semi-solid to solid masses In areas where roosting or birthing animals cannot or should not be disturbed. 	 Sediment disturbance and erosion potential.
Mechanical Removal	Mechanical earthmoving equipment is used to remove oiled sediments and debris from heavily impacted areas with suitable access.	Equipment motor grader, backhoe, dump truck elevating scrapers <u>Personnel</u> 2-4 workers plus equipment operators	 On land, wherever surface sediments are accessible to heavy equipment Large amounts of oiled materials. 	 Removes upper 5 to 30 cm of sediments.
Sorbent Use	Sorbents are applied manually to oil accumulations, coatings, sheens, etc. to remove and recover the oil.	Equipment misc. hand tools misc. sorbents <u>Personnel</u> 2-10 workers	 Can be used on all habitat types Free-floating oil close to shore or stranded on shore, secondary treatment method after gross oil removal Sensitive areas where access is restricted. 	 Sediment disturbance and erosion potential Trampling of vegetation and organisms Foot traffic can work oil deeper into soft sediments.
Vacuum/ Pumps/ Skimmers	Pumps, vacuum trucks, skimmers are used to remove oil accumulations from land or relatively thick floating layers from the water.	Equipment 1-2 50- to 100-bbl vacuum trucks w/ hoses 1-2 nozzle screens or skimmer heads <u>Personnel</u> 2-6 workers plus truck operators	 Can be used on all habitat types Stranded oil on the substrate Shoreline access points. 	 Typically does not remove all oil Can remove some surface organisms, sediments, and vegetation.

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4.10.4 Cleanup Techniques - Washing

Technique	Description	Recommended Equipment	Applicability	Potential Environmental Impacts
Flooding	High volumes of water at low pressure are used to flood the oiled area to float oil off and out of sediments and back into the water or to a containment area where it can be recovered. Frequently used with flushing.	Equipment 1-5 380- to 750-lpm pumping systems 1 100-ft perforated header hose per system 1-2 200-ft containment booms per system 1 oil recovery device per system Personnel 6-8 workers per system	 All shoreline types except steep intertidal areas Heavily oiled areas where the oil is still fluid and adheres loosely to the substrate Where oil has penetrated into gravel sediments Used with other washing techniques. 	 Can impact clean down gradient areas Can displace some surface organisms if present Sediments transported into water can affect water quality.
Flushing	Water streams at low to moderate pressure, and possibly elevated temperatures, are used to remove oil from surface or near-surface sediments through agitation and direct contact. Oil is flushed back into the water or a collection point for subsequent recovery. May also be used to flush out oil trapped by shoreline or aquatic vegetation.	Equipment 1-5 189- to 380-lpm/ 689 kpa pumping systems with manifold 1-4 30 m hoses and nozzles per system 1-2 60 m containment booms per system 1 oil recovery device per system Personnel 8-10 workers per system	 Substrates, riprap, and solid man-made structures Oil stranded onshore Floating oil on shallow intertidal areas. 	 Can impact clean down gradient areas Will displace many surface organisms if present Sediments transported into water can affect water quality Hot water can be lethal to many organisms Can increase oil penetration depth.
Spot (High Pressure Washing)	High pressure water streams are used to remove oil coatings from hard surfaces in small areas where flushing is ineffective. Oil is directed back into water or collection point for subsequent recovery.	Equipment 1-5 1,200- to 4,000-psi units with hose and spray wand 1-2 30 m containment booms per unit 1 oil recovery device per unit Personnel 2-4 workers per unit	 Bedrock, man-made structures, and gravel substrates When low-pressure flushing is not effective Directed water jet can remove oil from hard to reach sites. 	 Will remove most organisms if present Can damage surface being cleaned Can affect clean down gradient or nearby areas.

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4.10.5 Cl	eanup Tech	niques – l	In-Situ	Treatment
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Technique	Description	Recommended Equipment	Applicability	Potential Environmental Impacts
Sediment Tilling	Mechanical equipment or hand tools are used to till lightly to moderately oiled surface sediments to maximize natural degradation processes.	Equipment 1 tractor fitted with tines, dicer, ripper blades, etc. or 1-4 rototillers or 1 set of hand tools Personnel 2-10 workers	 Any sedimentary substrate that can support heavy equipment Sand and gravel beaches with subsurface oil Where sediment is stained or lightly oiled Were oil is stranded above normal high waterline. 	 Significant amounts of oil can remain on the shoreline for extended periods of time Disturbs surface sediments and organisms.
In Situ Bioremediation	Fertilizer is applied to lightly to moderately oiled areas to enhance microbial growth and subsequent biodegradation of oil.	Equipment 1-2 fertilizer applicators 1 tilling device if required Personnel 2-4 workers	 Any shoreline habitat type where nutrients are deficient Moderate to heavily oiled substrates After other techniques have been used to remove free product on lightly oiled shorelines Where other techniques are destructive or ineffective. 	 Significant amounts of oil can remain on the shoreline for extended periods of time Can disturb surface sediments and organisms.
Log/ Debris Burning	Oiled logs, driftwood, vegetation, and debris are burned to minimize material handling and disposal requirements. Material should be stacked in tall piles and fans used to ensure a hot, clean burn.	Equipment 1 set of fire control equipment 2-4 fans 1 supply of combustion promoter Personnel 2-4 workers	 On most habitats except dry muddy substrates where heat may impact the biological productivity of the habitat Where heavily oiled items are difficult or impossible to move Many potential applications on ice. 	 Heat may impact local near-surface organisms Substantial smoke may be generated Heat may impact adjacent vegetation.
Natural Recovery	No action is taken and oil is allowed to degrade naturally.	None required	 All habitat types When natural removal rates are fast Oiling is light Access is severely restricted or dangerous to cleanup crews When cleanup actions will do more harm than natural removal. 	 Oil may persist for significant periods of time Remobilized oil or sheens may impact other areas Higher probability of impacting wildlife.

4.11 Alternative Cleanup Techniques

All non-traditional or alternative cleanup techniques require regulatory approval and a net environmental benefit analysis (NEBA) to be completed. This analysis will consider the specific treatment options appropriate to the response; the potential for successfully implementing those discrete options; the environmental trade-off attached to each technique; and, lastly, the types of treatments that can be authorized within the existing regulatory framework. Although each incident is unique, NEBA will conceptually develop a decision flow chart that asks the questions of:

- What recovery techniques should be executed?
- How long should the existing recovery techniques continue?
- Will certain areas within the response become later candidates for natural attenuation?
- Should sunken oil be left for remedial treatment?
- What is the regulatory process for permitting a remedial treatment?

NOTE: Dispersant, In-Situ Burning and Decanting all require regulatory approval.

4.11.1 Decanting

Large quantities of oily fluids can be generated during an oil spill response. These fluids include the products of skimming and vacuuming operations, and usually contain some amount of water. Oil recovery operations can only continue as long as there is place to store the recovered fluids, as such when the field storage capacity is reached, skimming/recovery operations must then cease until additional storage is available.

Decanting is an option for increasing on-site storage capacity by removing the water once the liquids have separated. Separation may occur through the use of on-site vacuum trucks equipped with separator equipment or by allowing the collected fluids to sit in a quiescent state long enough to separate. The separated water can then be siphoned out back to the collection point thus freeing up storage capacity.

4.11.2 Dispersant

The decision to use dispersants must be made as soon as possible after a spill occurs before substantial weathering takes place or the oil has spread. Therefore, early in the spill response Unified Command may evaluate the potential use of dispersants. If Unified Command feels the potential for dispersant use exists, he/she should have their staff gather the information necessary to complete a review of dispersant use and action plan for approval by Unified Command.

4.11.3 In-Situ Burning

Burning is an alternative tactic to provide a rapid means to remove oil in the event of a spill from the pipeline or terminal operations. Advantages of in situ burning include rapid removal of oil from the water surface, requirement for less equipment and labour than many other techniques, significant reduction in the amount of material requiring disposal, significant removal of volatile oil components, and may be the only solution possible, such as for oil-in-ice situations and wetlands. Disadvantages of in-situ burning include creation of a smoke plume, residues of the burn may have to be removed, oil must be a sufficient thickness to burn quantitatively; and therefore, may require containment, and danger of the fire spreading to other combustible materials. Potential human health impacts may result from smoke plume and particulate generation so may not be suitable where public exposure will result.

5.0 **PROTECTION OF SENSITIVE AREAS**

There are environmentally and economically important sites in the vicinity of this pipeline. During a spill event the presence or absence of cultural resources is determined by the Environmental Unit. Regulatory agencies will assist with the identifying of any cultural resources at risk from spills at the time of a spill event. There is a wide diversity of environments along the Pipeline right-of-way including marine and fresh water habitats, shorelines, forested areas, and urban developed areas.

In addition to this manual there is a Field Handbook and Control Points Manual which identifies control points and access points to water bodies for equipment deployment to prevent migration of oil downstream.

5.1 General Sensitive Areas

5.1.1 Inlets, Intakes, Harbors and Marinas

Inlet, intakes, harbors and marinas are inhabited by a variety of fish, invertebrates and waterbirds that would be at risk if an oil spill occurs near any of these facilities. Marinas have a great potential for public exposure to hazards and damage claims and should be boomed to exclude oil. Intakes for commercial, industrial and municipal water usage areas are subject to impact due to safety hazards for both humans and animals, loss of use and damage claims. Protective measures could include exclusionary booming to prevent or exclude oil from entering these areas. Booms should be placed at an angle to the current to guide oil to an area where it can be recovered. The deployment of a second boom behind the first may be desirable to contain any oil that escaped under the primary boom.

It is also important to recognize that while certain immediate environment protection response strategies must be planned for in advance, the ongoing protection and cleanup during a major spill would involve professional input from the company's oil spill advisors and the environmental regulatory bodies.

5.1.2 Recreational Areas

Publicly accessible recreation areas including parks and recreation sites generally have good water/shoreline access for logistical purposes. These areas should be protected using various booming strategies outlined in this section.

5.1.3 Salmon and other Spawning Streams

Numerous streams throughout the area have been identified as environmentally sensitive due to the presence of spawning areas for salmon and other species.

The following factors are detrimental to spawning fishes, their nests and eggs:

- Changes in water temperature
- Increased siltation or turbidity
- Increased amount of dissolved gases in the water column
- Physical destruction of habitat by personnel and/or equipment.

To reduce the impact of an oil spill and response activities to streams identified as spawning habitat, the following steps would be taken:

- Attempt to contain spilled product as far upstream of spawning areas as possible
- Minimize the number of personnel working at each response site

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- Minimize use of heavy equipment at each response site
- Eliminate warm/hot water flushing tactics at response sites.

5.2 Booming Techniques

5.2.1 Exclusion Booming

Description

Boom is deployed across or around sensitive areas and anchored in place. Approaching oil is deflected or contained by boom.

Primary Uses

This method is often used across small bays, harbor entrances, inlets, river, and creek mouths with currents less than 1 knot (0.5 m/s) and breaking waves of less than 1.5 ft (0.5 m) high.

Environmental Effects

Typically, effects are limited to minor disturbance to substrate at shoreline anchor points.

5.2.2 Deflection Booming

Description

Boom is deployed at an angle to the approaching slick. Oil is diverted away from the sensitive area to a less sensitive location for recovery.

Primary Uses

Angle across small bays, harbor entrances, inlets, river and creek mouths with currents exceeding 1 kt (0.5 m/s) and breaking waves of less than 1.5 ft (0.5 m). On straight coastline areas to protect specific sites, where breaking waves are less than 1.5 ft (0.5 m).

Environmental Effects

Typically, effects are limited to minor disturbance to substrate at shoreline anchor points, however, diverted oil may cause shoreline oil contamination down-wind and down-current. A Net Benefit Analysis should be conducted to determine if deflection booming should be conducted.





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5.2.3 Along-Shore Booming

Description

Boom is positioned along the shoreline to provide a barrier to floating oil. Oil is diverted away from the sensitive area to a lesssensitive location for recovery. Along-shore booming might be difficult during a falling tide because constant attention is required to ensure the boom doesn't strand.

Primary Uses

This technique can be used in quiet areas with breaking waves of less than 1 ft (0.3 m).

Environmental Effects

Typically, effects are limited to possible shoreline oil contamination down-wind and down-current.



5.2.4 Shore-Seal Booming

Description

Specially-designed, shore-sealing boom is positioned in the inter-tidal zone to deflect oil.

Primary Uses

This technique can be used in a wide range of substrates, but is most often used on mud and sand flats.

Environmental Effects

Typically, effects are limited to minor disturbance to substrate at shoreline anchor points.



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5.2.5 Use of Passive Sorbents

Description

Sorbents are positioned in the swash zone to absorb incoming oil.

Primary Uses

This technique can be used in a wide range of lowslope substrates. Pom-Poms normally work best on heavier, weathered crude oil, while sorbent rolls work best on lighter, fresher crudes.

Environmental Effects

The environmental effects of passive sorbents are typically limited to the minor disturbance to the substrate.



6.0 <u>MULTIPLE HAZARDS</u>

Kinder Morgan Canada's Trans Mountain Pipeline extends from the City of Edmonton in central Alberta to the Lower Mainland of British Columbia. Following this route the pipeline passes through a variety of landscapes each with their own diverse geographic features and climates. As the pipeline passes through each local environment it may be exposed to a range of natural and human induced hazards each with the ability to negatively impact operations and personnel. The following section aims to describe hazards that could negatively impact the Trans Mountain Pipeline and workers in order to provide both hazard context and to outline actions that may be undertaken in order to mitigate and/or respond to such events.

6.1 Natural Hazards

Natural Hazards may be defined as naturally occurring physical phenomena caused either by rapid or slow onset events which may be geophysical (earthquakes), hydrological (avalanches, floods), climatological (extreme temperatures, wildfires), meteorological (hurricanes and storms/wave surges) or biological (disease epidemics and insect/animal plagues). While the Trans Mountain Pipeline may not be exposed to the entirety of the aforementioned hazards there are some naturally occurring hazards that could certainly be expected to impact pipeline operations and personnel.

6.1.1 Wildfire/Grass Fires

Wildfires, including forest fires and grassland fires, are a natural hazard in any forested and grassland region of Alberta and British Columbia. These fires are common between May and September and are most often caused by human activity and lightening strikes. Of particular concern are interface wildfires, the area where wildfire and human development meet. Interface fires often destroy homes and other critical infrastructure and typically lead to local or large scale public evacuations.

In the event that KMC personnel identify a significant wildfire or grassfire they are to report the fire immediately to the local fire department and the provincial wildfire agency. In Alberta contact **Alberta Wildfire at 310-FIRE (3473)**, in B.C. contact the **British Columbia Wildfire Service at 800-663-5555**. Be prepared to provide the following information;

- Location
 i.e. Where is the fire? How far up the hillside?
 Size
 e.g. Metres? Hectares? Size of a house? Size of a football field?
 Rate of spread
 - i.e. How quickly is the fire spreading?
- 4. Fuel
 - i.e. What is burning? Grass, bushes, trees?
- 5. Smoke/flames *i.e. What colour is the smoke? Are flames visible?*
- Threat
 i.e. Are there any people or infrastructure at risk?
 Action
 - *i.e.* Is anyone fighting the fire?

In the event KMC personnel discover a small grass fire along access roads or the pipeline Right-of-Way personnel may utilize small handheld equipment including shovels and portable fire extinguishers to suppress the fire if it is safe to do so. If the fire increases in size, spreads or presents a threat to life safety then personnel are to evacuate the area and contact the local fire department and the provincial wildfire body.

6.1.1.1 Wildfire/Grass Fire Checklist

- □ Notify Edmonton Control Center and your supervisor, issue ERL (+)
- □ For large, uncontrolled fires, notify local fire department (call 911) & Provincial Wildfire Authority. In Alberta call toll free 310-3473. In British Columbia call 800-663-5555
- Evacuate all non essential personnel and secure area
- □ Muster company response personnel at a safe location
- □ Conduct initial wildfire assessment and following the wildfire decision tree as outlined in Section 2 of the "*Wildfire Emergency Response Plan Supplement*"
- □ Determine strategic options, including offensive, defensive or monitoring as per Section 3 of the "Wildfire Emergency Response Plan Supplement"
- Determine strategies and tactics as per Section 4 of the "Wildfire Emergency Response Plan Supplement"
- **D** Coordinate response with the fire department or provincial wildfire officials

6.1.2 Earthquake

An earthquake is a sudden and/or violent shaking of the ground, sometimes causing great destruction and injuries, as a result of movements within the earth's crust or volcanic action. While earthquakes may occur anywhere along the Trans Mountain Pipeline it is the costal areas of British Columbia that pose the greatest risk.

In the even that KMC operations are affected by an earthquake it is vital to first ensure personnel safety and immediately notify the on-site supervisor and Edmonton Control Centre. Additional details including facility, pipeline or equipment damage and shutdowns should also be communicated at this time.

At the outset of an earthquake KMC personnel should follow the **Drop, Cover and Hold-On** technique. This technique involves dropping to the ground once shaking is felt and moving underneath sturdy furniture such as a table or desk. Once safely underneath solid furniture, cover your head and torso to avoid being hit by falling objects. Finally hold onto the object you are underneath in order to remain covered. Once the shaking has stopped remain in place for a least one minute to let any loose objects settle. Before exiting your safety location scan the area to look for additional hazards that may have developed as a result of the shaking. Examples may include broken glass, fallen objects and fire. While completing this scan consider the most appropriate means of exiting the building as quickly and safely as possible. Once outdoors personnel should gather at pre-determined muster points in order to complete head counts.

KMC personnel who are outdoors during the onset of an earthquake should attempt to move to a clear area if it is safe to do so. Extra attention should be paid towards over head power lines, trees, signs, buildings, vehicles, and other potential falling hazards. The *Drop, Cover, and Hold-On* technique

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should be utilized as it will protect individuals from objects thrown horizontally, even if nothing is directly above them.

If KMC personnel are in a vehicle during the onset of an earthquake they should immediately and safely pull over to the side of the road, stop, and set the parking brake. Drivers should avoid overpasses, bridges, power lines, signs and other hazards. Stay inside the vehicle until the shaking stops. After the shaking has stopped proceed carefully by avoiding fallen debris, cracked or shifted payment, and emergency vehicles. If a power line falls on the car, stay inside until a trained person removes the wire.

6.1.2.1 Earthquake Checklist

- **General Properties of Cover and Hold-On technique once an earthquake is felt**
- □ Shutdown any transfer/loading operations and secure facilities:
 - Close isolation valves and tank valves
 - Shut off nonessential power supplies
- □ Monitor site for evidence of leaks from pipelines and storage tanks
- Notify the Edmonton Control Center Operator and Site Supervisor of response steps taken and obtain further instructions
- □ Evacuate all nonessential personnel and third parties to a safe location
- □ In the event of earthquake damage to critical KMC infrastructure enact the Emergency Response Plan.
- □ Refer to the facilitates Fire-Pre Plan in the event of Tank Fire or 3-Dimensional Fire
- □ Secure facility for aftershocks
- Exercise caution when entering damaged buildings Watch for:
 - Downed power lines
 - Fire
 - Flooding
 - Debris

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6.1.3 Floods

Floods are the most frequent and costly natural disaster often causing large-scale damage to properties, facilities and infrastructure while also posing a threat to life safety. Flooding events known as flash floods are of particular concern. Flash floods are typically caused by abrupt and extreme rain fall that causes a river, stream, pond or other body of water to swiftly overflow its banks in a short period of time, often in several hours or less. Flashfloods can also be caused by erosion of soil and sand, or by ice jams on rivers/streams in conjunction with a winter or spring thaw.

If a flood does occur and impacts KMC personnel while working in the field or at an office location, personnel should take steps to ensure the safety of themselves and coworkers. Notify your supervisor and/or the Edmonton Control Centre as soon as safely possible.

Actions that KMC personnel may undertake as part of a proactive response to imminent floods, **if safe** to do so, include:

- Understand the difference between a Flood Watch and a Flood Warning.
 - **Flood WATCH** flooding is possible watch out for it and be alert.
 - **Flood WARNING** flooding has been reported take precautions to ensure your safety.
- Moving critical equipment and records to higher ground.
- Remove hazardous materials and dangerous goods from the flood area to prevent environmental damage.
- Shut in electricity and electrical equipment as required. (Do not attempt to shut off electricity if water is already present, the combination of water and live electrical current can be lethal).
- In some cases, buildings or equipment may be protected with sandbags or polyethylene barriers.

If it is determined that evacuation is needed during a flooding situation, KMC personnel should:

- Inform the Edmonton Control Centre
- Take action to shut down, isolate and de-pressurize equipment, as required
- Vacate the work area as soon as possible or if advised to do so by their supervisor and/or emergency authorities. Never ignore an evacuation order because it may endanger your safety, the safety of coworkers or emergency responders who may come to your rescue
- While evacuating the work area always follow the specified evacuation route. Do not attempt to take short cuts as they may lead to a dangerous or blocked in area.

In the case that KMC personnel are evacuating by vehicle;

- Do not drive through flood waters or underpasses. Water will often prove deeper than it looks and the vehicle could get stuck or swept away by fast water.
- If you are caught in fast-rising waters and your vehicle stalls, exit and remain with the vehicle until help arrives.
- Avoid driving across bridges if the water is high and flowing quickly, unless advised by local authorities that it is safest evacuation route.

In the event that flooding has been mitigated and it is now safe to re-enter the work site/area, personnel must exercise great caution before returning to a work area after a flood has occurred.

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Re-entry must be approved by the Site Supervisor prior to building, facility or work site re-entry. Regardless of re-entry approval it is essential that personnel look for and/or report any indications that the area and buildings may not be safe.

Indicators to watch for may include:

- Buckled walls or floors. Holes in the floor, bent or broken piping, broken glass and other potentially dangerous debris.
- Flood water that is heavily contaminated with sewage and other pollutants that can cause sickness and infections.
- Electrical components and panels that need to be cleaned, dried, and tested by a qualified electrician. All equipment, heating, pressure, or sewage systems (including appliances) will need to be thoroughly cleaned, dried, inspected and deemed safe before use.

6.1.3.1 Flood Checklist

- □ Shut down and isolate the section of the pipeline/tank farm area at risk
- □ Notify Edmonton Control Centre, issue ERL (+)
- □ Monitor the pipeline route for potential damage
- Buoy any above-ground facilities that could become submerged to prevent damage from craft operating in flooded areas
- □ Never try to walk, swim or drive through swift water
- □ Evacuate if necessary
- When flooding subsides, perform survey to determine if there is sufficient cover over pipeline
- □ Notify landowners of areas of reduced cover
- In the event of flood damage, follow the Emergency Response Plan for site assessment
- □ Conduct an aerial overflight

6.1.4 Avalanche

An avalanche is a mass of snow, often mixed with ice and debris which travels down mountain sides, and causes massive destruction to objects located within its pathway. Avalanches occur due to any of the following triggers: overloading, temperature, slope angle, snow pack conditions, and vibration. Avalanches typically occur in mountainous regions of Canada and while unlikely to impact KMC operations they can still prove hazardous to operators in the field.

Response to an avalanche incident must be orderly and efficient, and keep the safety of rescuers in mind at all times. A successful rescue depends on a rapid response by appropriately trained and equipped personnel.

The full Avalanche Safety Plan is available by request or on KMonline EHS - Manuals

6.1.4.1 Avalanche Response Checklist

If you witness an avalanche, or an avalanche incident is reported to you:

- □ Notify Emergency Services, call 911
- Retain Witness(es) and ensure safety of personnel
- □ Note and Record Preliminary Accident Details

Time and Date	
Reporting Persons Name	
Witness Name (hold witness)	
Time of Accident	
Location of accident (ROW KP or	
access route) GPS	
Number of persons involved,	
injured and/or missing	
Number of responders with	
avalanche equipment	
Vehicular involvement	
Additional relevant information	
(weather [flyable?] and road	
condition, special requirements)	
A call back number for reporting	
personnel.	

Relay the above Preliminary Accident Details to the Edmonton Control Centre 888-876-6711

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6.1.4.2 Avalanche Rescue Card



While tornadoes are not common along the majority of the Trans Mountain Pipeline there are locations, particularly in Alberta District, where tornado activity could develop and negatively impact KMC operations and personnel.

Tornadoes are defined as a violently rotating column of air which is in contact with the ground. They often develop during severe thunderstorms with frequent thunder and lightning. Tornadoes usually hit in the afternoon and early evening, but have been known to strike at night as well.

KMC personnel should be aware of the potential signs of an incoming tornado. These may include;

- An extremely dark sky, sometimes highlighted by green or yellow clouds
- A rumbling sound or a whistling sound
- A funnel cloud at the rear base of a thundercloud, often behind a curtain of heavy rain or hail

In Canada, Environment Canada is responsible for warning the public when conditions exist that may produce tornadoes. It does this through radio, television, newspapers, its internet site, as well as through its weather phone lines.

It is important to know the difference between a Tornado Watch and a Tornado Warning.

Tornado Watch – A tornado formation is likely in the area

Tornado Warning – A tornado has been sighted or seen on radar

6.1.5.1 Tornado Response Checklist

Before the Storm

- □ Notify Supervisor if you see tornado approaching
- Seek shelter, preferably in a basement of a strong building. Stay away from windows. If there is no basement take cover under heavy furniture in the centre part of the building.
- If caught in open country move away from the tornado's path at a right angle. If you cannot escape lie flat in the nearest depression such as a ditch or ravine. Cover your head to protect yourself from flying debris.
- If possible, continuously monitor the radio and/or television for information updates.

After the Storm

- Before moving out from cover survey the local area for any hazards that may have developed as a result of the tornado. Take caution against down power lines, fallen debris including broken glass, fires and potential flooding
- Provide first aid to anyone injured
- Notify your supervisor and Edmonton Control Centre of the situation status including injuries and infrastructure damage.

□ If damage has occurred to KMC infrastructure such as the pipeline follow the Emergency Response Plan Section 3.0 Spill/Site Assessment

6.2 Seasonal Response Hazards

As response to pipeline and facility emergencies may occur at any time of year there is a possibility that personnel may be required to respond during adverse weather conditions. Given the location of the Trans Mountain Pipeline and its related facilities, responders may face conditions ranging from high heat to extreme cold, blizzard like conditions. It is imperative that responders take weather conditions into consideration as part of their overall response planning. Responders themselves must be aware of their own personal health at all times if effective operations are to be conducted. Ensuring a thorough Hazard Assessment/Tailgate Meeting is completed and a Safety Watch is appointed prior to operations cannot be overstated.

6.2.1 Winter Response Considerations

During a winter response personnel must consider the impacts that wind-chill and cold temperatures may have on responder health. Winter hazards that should be considered as part of the Health and Safety Plan include;

- **Hypothermia** when the body loses heat faster then it can be produced leading to a reduced overall body temperature. Characterized by shivering, clumsiness and/or confusion.
- **Frostbite** a freezing of the skin and underlying tissue leading to numbness, hard, red and/or pale skin.
- Visibility during blizzards, especially when driving and operating equipment
- Warm-up areas, including tents and vehicles, should be available and on-site in order to provide responders with a place to take breaks and effectively recover.

6.2.2 Responding on Ice Covered Waterbody

If response operations occur on an ice covered waterbody additional precautions must be undertaken.

Before an ice surface can be worked on or crossed it must be checked and evaluated for a safe loadcarrying capacity for the equipment, people or vehicles going onto the surface. A thorough safety evaluation must be completed and an Ice Safety Plan developed and shared with all workers expected to be working near or on any ice covered waterbody. Rescue equipment with trained personnel should be available and on standby in the event that they are needed.

The Ice Safety Plan should include a list of communication and response activities to be undertaken in the event of a breakthrough. A list of resources should be outlined and confirmed prior to any on-ice work commencing.

6.2.3 Summer Response Considerations

During the summer months personnel must be aware of the impact that heat and/or humidity will have on overall health. Summer related hazards that should be considered as part of the Health and Safety Plan include;

- **Heat Exhaustion** a condition that occurs when the body is overheated and dehydrated. Symptoms associated with this illness may include heavy sweating, dizziness and fainting
- Heat Stoke occurs when the body is overheated, at or above 104 F (40 C), due to prolonged heat exposure. Is considered a medical emergency requiring immediate treatment in order to prevent permeant physical damage
- **Biological hazards** a review of potentially hazardous wildlife (insects, mammals) and plants (poisonous weeds) should be completed with responders as part of the pre-job Tailgate Meeting
- Shaded areas with adequate rehab supplies, including water, should be established on-site in order to provide responders with an area to rest and recover during break periods

6.3 Fire Hazards

Fire Hazards, other then wildfire, which could impact KMC operations can be grouped into three main categories;

- Terminal and Tank Farm fires
- Pump Station fires
- Pipeline Right-of-Way fires

In general there are three classes of fire that KMC responders should be familiar with .These classifications stem from the type of fuel that ignited and maintains the fire. The following descriptions provide a brief overview of these classes.

- **Class A Fires** Consist of ordinary combustibles such as wood, paper, trash or anything else that leaves an ash. Water works best to extinguish a Class A fire.
- **Class B Fires** Are fueled by flammable or combustible liquids, which include oil, gasoline, and other similar materials. Class B fires often spread rapidly and, unless properly secured, can reflash after the flames are extinguished. Smothering effects which deplete the oxygen supply work best to extinguish Class B fires.
- Class C Fires Energized electrical fires are known as Class C fires. Always de-energize the circuit then use a non-conductive extinguishing agent, such as Carbon dioxide. They can be caused by a spark, power surge or short circuit and typically occur in locations that are difficult to reach and see.

In the event of a fire originating from a KMC facility priority must be given to life safety. Notification and evacuation of the hazard area are the primary means of initial response. Once personnel are accounted for the On-Scene Commander may determine response options including offensive, defensive or non-intervention strategies.
6.3.1 Terminal/Tank Farm Fires

Strategies and tactics to be utilized when responding to a Terminal and/or Tank Farm fire are specifically outlined in their corresponding facility *Fire Pre-Plan*. Fire Pre-Plans provide initial responders with immediate response options including defensive and offensive fire fighting tactics. The plans incorporate fire calculations for necessary amounts of water, foam concentrate and pumping capacities needed to extinguish rim seal, full surface and containment bay fires. They also include strategies for the extinguishment of three dimensional fires that may occur at valve and/or manifold locations.

In addition to Fire-Pre Plans all Terminals and Tank Farms have Fire Safety Plans which provide information regarding building evacuation procedures, evacuation routes, on-site fire equipment and fire prevention practices. For additional information refer to the specific facility Fire Safety Plan.

6.3.2 Pump Station Fires

Pump Station fires may originate from a variety of ignition sources including faulty electrical wiring, overheated materials such as flammable liquids, and lightening.

Prevention is the best method for avoiding pump station fires. Prevention activities can include;

- monitoring the accumulation of flammable and combustible waste and residues that contribute to fires
- ensuring that general equipment maintenance procedures are followed
- all flammable liquids are stored properly
- proper hot work permitting is issued
- appropriate level of fire detection and extinguishment systems and resources are available onsite (i.e. fire extinguishers)

6.3.2.1 Pump Station Fire Response Checklist

- □ Once fire is confirmed sound fire alarm to alert all on-site staff and contractors
- □ Following designated evacuation routes as outlined in the facility *Fire Safety Plan* and proceed to the designated muster station. Conduct head count.
- □ Call 911 or the local fire department
- □ Notify the Edmonton Control Centre in order to issue ERL (+).
- □ Shutoff or isolate fuel sources feeding the fire if this can be done safely
- □ Provide first aid to any personnel who may be injured or require assistance
- For small fires consider an offensive attack utilizing handheld fire extinguishers (ABC and/or CO2) and wheeled dry chemical extinguishers
- If the fire grows in size or if extinguishment cannot be safely achieved utilize and defensive strategy and retreat from the area
- □ Coordinate response with local fire
- Monitor weather conditions, including wind direction, as excessive smoke may impact members of the public

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6.3.3 Right-of-Way Pipeline Fires

Right-of-way fires typically originate from failed piping/flanged connections causing a release of product into the ground with possible surface pooling. In order for a right-of way- fire to occur the released products vapours must reach a source of ignition, such as from equipment, machinery and/or vehicles near right-of-way.

Prevention is the best method for avoiding right-of-way fires. Prevention activities include;

- 24/7 monitoring of pipeline operations via SCADA system
- Aerial patrols of right of way looking for signs of
 - Vehicles/machinery on right of way
 - Discolored vegetation
 - o melted snow
- Local visual inspections from operators
- In depth maintenance/integrity program

6.3.3.1 Right-of-Way Pipeline Fire Response Checklist

- □ Once fire is confirmed muster any personnel in area upwind of incident
- □ Call 911 or local Fire Department
- □ Notify control center in order to issue ERL (+)
- □ Shut off or isolate fuel source feeding fire if this can be done safely
- □ Refer to the *Right-of-Way Fire Emergency Response Plan Supplement* for a list of strategies and tactics
- For small fires consider an offensive attack utilizing handheld fire extinguishers (ABC)
- □ If fire grows in size or if extinguishment cannot be safely achieved utilize a defensive strategy and retreat from area
- □ If fire impacts adjacent wildland, follow the *Wildfire Emergency Response Plan Supplement* and ensure the appropriate Provincial Wildfire Agency is notified
- □ Coordinate response with local Fire Department
- Monitor weather conditions, including wind direction, as excessive smoke may impact members of the public

6.3.4 Vehicle Fires

Most vehicle fires are a result of malfunctioning electrical components, fuel lines or a fuel pipe splitting. In the case that Kinder Morgan personnel are in a vehicle and begin to see smoke or smell burning material they should safely pull over and shut off the vehicle. Shutting off the engine will stop the flow of fuel and may prevent a full-blown fire. It is critical for the driver and other personnel to ensure they immediately exit the vehicle, and if safe, move off the road in order to reduce the likelihood of secondary accidents.

- For small fires only (passenger section, electrical fault, fires contained to contents of cargo space or trunk) use a vehicle ABC type fire extinguisher, if it is safe to do so.
- For large fires or fires involving fuel or storage tanks on the vehicle, evacuate the area by at least 25 metres and call for assistance from emergency responders. Once in a safe area you should stand by, assess the situation, and wait for assistance from emergency responders.

6.3.4.1 Vehicle Fire Response Checklist

- □ If smoke or flames are detected from an operating vehicle, safely pull to the side of the road and exit the vehicle.
- □ Move away from the vehicle and call 911 for any large or out of control fire
- □ If the fire is small in size attempt extinguishment with vehicle fire extinguisher if it is safe to do so
- □ Notify your supervisor and the Edmonton Control Centre

6.4 Security Hazards

Security hazards present themselves in a variety of ways including, terrorism, breach of security events and vandalism. Often the main objective of these actions is to halt or disrupt normal operations. For these reasons Kinder Morgan Canada has established robust security protocols for the Trans Mountain Pipeline and its related facilities. Security protocols and response actions are further supported by an active Security Management Program. The Security Management Program focuses on direct and/or impending threats to ongoing operations and in most instances resolves issues without concern. However in the event that a substantial security incident results in an impact to operations there is a strong likelihood that the Incident Management Team and Emergency Response Plans are activated. For these reasons a brief overview of common security hazards and response actions are outlined in the following subsections.

6.4.1 Terrorism

Terrorism is used to intimidate, coerce or attain ransom through the use of violence and/ or threats against persons (employees, general public, governing bodies, etc.) or property (pipeline, facilities, equipment, etc.). Violence is not the main goal of terrorism but a means to draw the attention of the local public, the government and the world to their cause.

The main reasons terrorist groups commit acts of violence to:

- Satisfy vengeance
- Create a desired influence on Governing bodies decisions, legislations or other crucial decisions
- Attract media attention in order to acquire worldwide, national or local recognition for their cause
- Discourage foreign investment, tourism or assistance programs that may affect the target country's economy
- Produce widespread fear of society
- Destroy key infrastructure and facilities that will disturb lines of communication and create societal uncertainty about the Governments ability to protect and provide for its citizens

6.4.1.1 Terrorism Response Checklist

If you experience or witness a direct, credible threat to Kinder Morgen personnel or property;

- □ Call 911 immediately to report the situation
- □ If possible evacuate the site and move to a secure location
- □ If unable to leave the facility/building choose a safe location such as an office to hide. Lock and/or barricade yourself in a secure room if possible.
- Notify your supervisor and the Edmonton Control Centre as soon as safely possible

6.4.2 Breach of Security or Vandalism

In the event that a KMC employee or contractor arrives at a company owned site and notices suspicious and/or unusual activity, including property damage they should contact local police/security and the Edmonton Control Centre before proceeding to investigate.

Other unusual activity may include;

• The presence of drones flying overhead or hovering around the incident site

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- Media representatives or unidentified individuals using cameras, cell phones, video recorders or any other devices to document the incident site
- Fixed wing aircraft or helicopters exhibiting behaviour indicating their presence is related to the incident

6.4.2.1 Breach of Security or Vandalism Checklist

- Notify the Control Centre immediately of any of the following in the vicinity of an active Kinder Morgan site; provide details to the Control Centre Operator:
 - Suspicious individuals
 - Suspicious vehicles parked at, or near, the incident site
 - Suspicious packages located at, or near, the incident site
 - Signs of unauthorized access including vandalism or breach of security
- □ If the situation is judged to be UNSAFE in any way:
 - Withdraw to what is judged to be a safe distance
 - Immediately contact Police (911)
 - Do not engage any individuals in any way
 - Await the arrival of the Police at the incident site
- □ If the situation is considered SAFE:
 - Request that Police (911) be called to the site
 - Try to preserve any possible evidence found which may indicate malicious activity
 - Notify KMC Security Manager
- □ Remain on-site to serve as a point of contact for the authorities.
- Be available as a liaison between Company Management and the local authorities.
- □ Inventory damages/ property loss and estimate cost of repair or replacement.
- □ Make notes of evidence obtained.
- Obtain duplicate photos taken during the investigation.
- Evaluate the necessity of security personnel during non-business hours

6.4.3 Bomb Threat

A bomb threat or threat of any other nature may be received by anyone in Kinder Morgan. In most cases, persons making such threats will deliver their message by phone to the first person contacted and will not wait for the call to be transferred. Consequently, it is important that a call of this nature be handled in accordance with an established plan.

6.4.3.1 Bomb Threat Checklist

All threats must be taken seriously.

- □ If threat is received by telephone, record the following information:
 - Exact wording
 - Time call was received
 - Record callers phone number if available on call display
 - Time the device or bomb is set to go off
 - Sex of caller
 - Age (young, old, teen)
 - Accent
 - Background noise (music, traffic, etc.)
- □ If the caller remains on the line, attempt to ascertain the following information:
 - Exact location of the bomb or nature of any other threat
 - When it is set to go off?
 - The kind and size of bomb?
 - Why it was put there?
 - How did it get into the facility?
- □ While the caller in on the line, attempt to locate your supervisor to listen in on the call.
- □ If the threat is received by email, do not delete, and contact management immediately

If threat is received by mail:

- Do not handle it unnecessarily
- Place it in a plastic cover immediately
- After call is over, or email/mail received contact your supervisor, and VP Operations or designate to determine further actions i.e. tank farm shut down and evacuation

Emergency Response Plan

Emergency Response Plan

7.0 SITE INFORMATION

7.1 Trans Mountain Pipeline Overview

In operation since October1953, the Trans Mountain Pipeline (TMPL) was established to create a reliable energy supply for Canada and the United States. Today over its1149 kilometer length the Trans Mountain pipeline transports approximately 300,000 barrels per day of crude oil and other refined products.

Starting in Sherwood Park, Alberta the pipeline travels west across the prairie paralleling Hwy16 and enters the mountains south of Jasper, AB. Continuing westward through the mountains, the pipeline crosses into British Columbia continuing to where the pipeline intersects Hwy. 5 northeast of Valemount BC. At this point the pipeline travels southwest though mountains and valleys paralleling Hwy 5 until it reaches Kamloops BC. From Kamloops BC the pipeline continues its southwesterly route through the Coquihalla Canyon until it reaches Abbotsford, BC. In Abbotsford the pipeline then turns to the northwest paralleling Hwy 1 where it eventually ends in Burnaby, BC at the Tank Farm and the Westridge Marine Terminal.

Along the pipeline's length are a number of control valves and pump stations which assist in controlling the flow of the pipeline. The control valves are strategically located at major water crossings and at other specific locations to control not only the flow of the pipeline but also the amount of product that could be released in the unlikely event of a pipeline rupture. Many of the valves and all pump stations are operated from our Control Centre in Sherwood Park, Alberta. The Control Centre personnel monitor and record pipeline flow rates, pressures and fluid characteristics twenty-four hours a day, seven days a week. When a fluctuation is detected SCADA alerts the Control Centre operators to the potential for a leak and allows them to shutdown the pipeline and dispatch crews.

To ensure a quick and effective response to any pipeline emergency, KMC stores and maintains emergency response equipment including sorbent materials, boom, response boats, recovery equipment, fire equipment and additional specialized equipment along the pipeline route at KMC facilities.

Additionally, KMC response personnel periodically train and exercise on the use of spill response equipment and application of the Incident Command System (ICS). ICS is a standardized, structured and scalable incident management system used by industry and government alike when responding to an incident (see Sections 8-13 for more details)

The pipeline operation is divided into four planning districts to aid in emergency planning on a regional basis. Each of the planning districts also represents the operational boundaries of the pipeline. Emergency planning for each of the four planning districts includes the calculation of a worst case discharge spill volume and stream tracing analysis of where a low likelihood spill could migrate to.

7.2 Owner/Operator Information

Owner:	Trans Mountain Pipeline L.P. 2700, 300-5th Avenue S.W. Calgary, Alberta Canada T2P 5J2
Operator:	Kinder Morgan Canada Inc. 2700, 300-5th Avenue S.W. Calgary, Alberta T2P 5J2

7.3 Response Zone Summary

7.3.1 Alberta District

The Alberta District starts in Sherwood Park, AB and ends at the Alberta/British Columbia border covering approximately 406 km of pipeline. The land around the pipeline varies from an urban environment in the east then travelling west through primarily flat agricultural land and finally into the eastern slopes of the Rocky Mountains where the district ends at the provincial boundary. The pipeline crosses the jurisdictional boundaries of Sherwood Park, Edmonton, Stony Plain, Edson, Hinton, Parkland County, Yellowhead County and Jasper National Park. The pipeline varies in size from 24" in diameter leaving Edmonton Terminal to 36" through Jasper National Park.

Spill modeling has shown that in many cases the spill will be contained by land around the pipeline right of way. However, there are a number of unnamed streams and rivers in the Alberta District that could be impacted. These water bodies include the Athabasca River, Wabamum Lake, and the North Saskatchewan River. The worst case discharge volume for the Alberta District section of pipeline occurs between Edson and Hinton and has been calculated to be 30,613 bbl.

Worst Case Volume	30613 bbl		
	Total Storage (bbls)	Total Recovery (EDRC)	Total Boom (ft)
2 hr available	0	17,704	2,400
2 hr required	0	0	2,000
meets standard	Yes	Yes	Yes
6 hr available	9,435	17,704	7,400
6 hr required	3,061	3,061	7,000
meets standard	Yes	Yes	Yes
12 hr available	18,870	26,556	27,400
12 hr required	15,306	7,653	27,000
meets standard	Yes	Yes	Yes
24 hr available	128,316	26,556	27,400
24 hr required	41,328	13,776	27,000
meets standard	Yes	Yes	Yes
48 hr available	128,316	26,556	27,400
48 hr required	64,287	21,429	27,000
meets standard	Yes	Yes	Yes

	7.3.1.1	Planning	Standard	Compliance -	Alberta	District
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Trans Mountain Pipeline

Emergency Response Plan

7.3.1.2 Alberta District Map



Alberta_District_July2016.mxd

Emergency Response Plan

7.3.2 North Thompson District

The North Thompson District begins at the Alberta/British Columbia border and ends close to the Hamlet of Blackpool, BC covering approximately 294 km. The pipeline travels west through Mount Robson Provincial Park paralleling Hwy 16 and then southwest paralleling Hwy 5 (North and South) through a mountainous environment crossing numerous creeks and rivers including the Miette, Albreda, Canoe, North Thompson and Fraser River's. The pipeline also passes in close proximity to a number of population centres including Rear Guard, Tete Jaune Cache, Valemount, Blue River, McMurphy, Vavenby, Clearwater, Chu Chua, Darfield, Chinook Cove, Barriere, Lois Creek, Vinsulla of which Valemount, BC is the largest (~1,100 people).

Spill modeling has shown that in many cases a spill would be contained by land around the pipeline right of way. However, there are a number of unnamed streams and named rivers in the North Thompson District that could be impacted which are identified above. The worst case discharge volume for the North Thompson District occurs east of Rearguard BC and is calculated to be 14,518 bbl.

Worst Case Volume	14518 bbl		
	Total Storage (bbls)	Total Recovery (EDRC)	Total Boom (ft)
2 hr available	0	17,704	2,200
2 hr required	0	0	2,000
meets standard	Yes	Yes	Yes
6 hr available	9,435	17,704	7,600
6 hr required	1,459	1,459	7,000
meets standard		yes	Yes
12 hr available	18,870	17,704	27,600
12 hr required	7,274	3,637	27,000
meets standard	Yes	Yes	Yes
24 hr available	128,316	17,704	27,600
24 hr required	19,623	6,541	27,000
meets standard	Yes	Yes	Yes
48 hr available	128,316	17,704	27,600
48 hr required	30,513	10,171	27,000
meets standard	Yes	Yes	Yes

7.3.2.1 Planning Standard Compliance – North Thompson District

Trans Mountain Pipeline

Emergency Response Plan

7.3.2.2 North Thompson District Map



NorthThompson_District_July2016.mxd

Emergency Response Plan

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7.3.3 Kamloops District

The Kamloops District boundary starts close by the Hamlet of Blackpool, BC and ends southwest of the City of Merritt, BC covering approximately 255 km. As the pipeline travels southwest paralleling Hwy 5, it travels through a predominantly dry, open and hilly environment crossing numerous unnamed streams and rivers including the Nicola and Coquihalla Rivers. The pipeline also passes in close proximity to a number of population centres including Kamloops, Merritt, Kingsvale, Stump, Brookmere and Hope of which Kamloops BC is the largest (~90,000 people). The Kamloops District office is located in Kamloops BC.

Spill modeling has shown that a spill should be contained to land in the District. However, as stated before, there are a number of unnamed streams and rivers (Nicola and Coquihalla) in the Kamloops District that could be impacted. The worst case discharge volume for the Kamloops District section of pipeline occurs between Stump and Kingsvale BC and is calculated to be 26,178 bbl

Worst Case Volume	26478 bbl		
	Total Storage (bbls)	Total Recovery (EDRC)	Total Boom (ft)
2 hr available	0	8,852	5,400
2 hr required	0	0	2,000
meets standard	Yes	Yes	Yes
6 hr available	112,591	19,604	7,400
6 hr required	2,618	2,618	7,000
meets standard	Yes	Yes	Yes
12 hr available	128,316	19,604	27,400
12 hr required	13,090	6,545	27,000
meets standard	Yes	Yes	Yes
24 hr available	128,316	19,604	27,400
24 hr required	35,343	11,781	20,000
meets standard	Yes	Yes	Yes
48 hr available	128,316	19,604	27,400
48 hr required	54 978	18 326	20.000

Yes

7.3.3.1 Planning Standard Compliance – Kamloops District

meets standard

Yes

Yes

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7.3.3.2 Kamloops District Map



Kamloops_District_July2016.mxd

7.3.4 Sumas District

The Sumas District boundary starts southwest of the City of Merritt, BC and ends in Burnaby, BC covering approximately 184 km. As the pipeline continues travelling southwest paralleling the Coquihalla Highway (Hwy 5), it travels through the Coquihalla Canyon crossing numerous unnamed streams and rivers including the Chilliwack, Coquihalla and Fraser Rivers. The pipeline also passes close by Hope, Chilliwack, Sumas, Abbottsford, Fort Langley, and through the City of Burnaby, BC (~225,000 people) where the pipeline terminates at a tank farm and the Westridge Marine Terminal. The Sumas District offices are located in Hope, Abbottsford and Burnaby BC.

Just east of Abbottsford there is a second pipeline system that branches off of the Trans Mountain Pipeline and heads southwest to Washington State known as the Puget Sound Pipeline. The Canadian portion of the Puget Pipeline System travels for approximately 9 kilometres and then crosses into the state of Washington.

Spill modeling has shown that a spill should be contained to land in the District. However, there are a number of unnamed streams and the Chilliwack, Coquihalla and Fraser Rivers in the Sumas District that could be impacted. The worst case discharge volume for this section of pipeline occurs east of Hope, BC and is calculated to be 28,788 bbl.

Worst Case Volume	28788 bbl		
	Total Storage (bbls)	Total Recovery (EDRC)	Total Boom (ft)
2 hr available	0	19,604	2,600
2 hr required	0	0	2,000
meets standard	Yes	Yes	Yes
6 hr available	103,156	28,456	8,000
6 hr required	2,879	2,879	7,000
meets standard	Yes	Yes	Yes
12 hr available	118,881	28,456	28,000
12 hr required	14,394	7,197	27,000
meets standard	Yes	Yes	Yes
24 hr available	118,881	28,456	28,000
24 hr required	38,865	12,955	27,000
meets standard	Yes	Yes	Yes
48 hr available	128,316	28,456	28,000
48 hr required	60,456	20,152	27,000
meets standard	Yes	Yes	Yes

7.3.4.1	Planning Standard	Compliance -	Sumas	District
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KIND	ERZMO	ORGAN
		CANADA INC.

Trans Mountain Pipeline

Emergency Response Plan

7.3.4.2 Sumas District Map



Emergency Response Plan

7.4 Trans Mountain Products Summary

Product Name	Product Identifier	Vapor Density	Specific Gravity	API	Oil Group Number	Total Sulfur (wt%)
SUPER LIGHTS					•	× /
Caroline Condensate	CCA	>1	0.75	56.0	2	0.49
Fort Sask Condensate	FSC	>1	0.68	76.7	2	0.06
Rangeland Condensate	CRL	>1	0.74	59.9	2	0.35
Premium Gasoline	G91	>1	0.70	70.9	2	0.02
Pembina Condensate	CPM	>1	0.76	54.5	2	0.16
Peace River Condensate	PCON	>1	0.75	57.3	2	0.15
LIGHTS						
BC Light Crude	BCL	>1	0.83	39.8	2	0.60
Boundary Lake Crude	BLK	>1	0.84	36.1	2	0.83
Bonnie Glen Crude	BOG	>1	0.82	41.3	2	0.41
Bonnie Glen Sour Crude	BGS	>1	0.88	29.3	3	1.22
Horizon Synthetic	CNS	>1	0.85	34.4	3	0.08
Central Alberta KOC	KOC	>1	0.85	35.4	3	1.07
Light Sour Oil	LSO	>1	0.83	39.4	2	0.76
Suncor Synthetic A	OSA	>1	0.86	32.7	3	0.20
Suncor Synthetic C	OSC	>1	0.88	30.0	3	0.22
Premium Albian	DAS	1	0.96	22.1	2	0.10
Synthetic	FA3	~	0.00	55.1	3	0.10
Peace River Crude	PCR	>1	0.83	39.8	2	0.54
Peace River Sour	PCSR	>1	0.87	31.8	3	2.59
Pembina Crude	PEM	>1	0.83	38.9	2	0.43
Pembina North	PNC	>1	0.83	40.0	2	0.45
Premium Synthetic	PSC	>1	0.84	37.0	2	0.08
Rainbow Crude	RBW	>1	0.84	37.8	2	0.49
Mixed Sweet Blend	SW	>1	0.84	37.6	2	0.47
Shell Synthetic Light	SSX	>1	0.87	31.6	3	0.22
Syncrude	SYN	>1	0.86	32.4	3	0.18
MEDIUM					,	
Strathcona Special	SSS	>1	0.90	26.0	3	1 08
Stream	000	•	0.00	20.0	Ũ	
HEAVY	0.05		0.04			
Suncor Synthetic PTCN	OSP	>1	0.91	23.8	3	3.26
Suncor Synthetic S	OSS	>1	0.91	24.0	3	2.83
SUPER HEAVY						
Albian Residual Blend	ARB	>1	0.93	20.5	3	2.70
Albian Heavy Synthetic	AHS	>1	0.94	19.6	3	2.47
Albian Muskeg Heavy	AMH	>1	0.93	20.7	3	3.95
Albian Vacuum Gas Oil	AVB	>1	0.92	22.3	3	3.16
Access Western Blend	AWB	>1	0.92	22.6	3	3.82
Borealis Heavy Blend	BHB	>1	0.92	22.0	3	3.60
Cold Lake Blend	CL	>1	0.93	21.4	3	3.72
Kearl	KRL	>1	0.91	23.7	3	3.29
McKay Heavy	MKH	>1	0.93	21.0	3	2.60

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Product Name	Product Identifier	Vapor Density	Specific Gravity	API	Oil Group Number	Total Sulfur (wt%)
Oil Sands Q	OSQ	>1	0.92	22.3	3	3.90
Long Lake Heavy	PSH	>1	0.93	20.4	3	3.22
Peace Heavy	PH	>1	0.93	21.3	3	5.11
Seal Heavy	SH	>1	0.93	20.5	3	4.79
Statoil Cheecham Blend	SCB	>1	0.93	20.5	3	3.83
Statoil Cheecham Syn- Bit	SCS	>1	0.94	19.0	3	2.86
Statoil Cheecham Mixed Blend	SCM	>1	0.94	19.8	3	3.3
Suncor Synthetic H	OSH	>1	0.94	19.8	3	3.09
Surmont Heavy	SHB	>1	0.94	19.7	3	2.97
Wabasca Crude	WH	>1	0.93	21.2	3	4.02

7.5 Summary Safety Data Sheet

This Summary Safety Data Sheet represents the range of crude oil products that may be stored at the Burnaby Terminal or shipped in the Trans Mountain Pipeline. The ranges provide information on the most extreme to least extreme of the specifications a Safety Data Sheet (SDS) or Material Safety Data Sheet (SDS) will be provided to all responders upon arrival at site which will outline the specific hazards for the product involved.

Physical Description

Liquid, black to colourless, Odors include rotten eggs, sulphur, hydrocarbon, petroleum and solvent

Route of Exposure

Inhalation, Skin absorption, skin or eye contact, accidental ingestion

Hazards

- Inhalation of oil mist vapors from hot oil may cause irritation of the upper respiratory tract. Can also cause headaches, nausea, loss of appetite, drowsiness, vomiting, loss of consciousness and death
- Carcinogenic
- May affect fetal development and heritable genetic damage
- Prolonged exposure may cause serious health effects
- Flammable Liquid
- Extremely toxic and H2S may be present
- Irritating to eyes, skin, nose, throat and lungs
- May cause headaches and dizziness
- Ingestion may cause chemical pneumonia, sever lung damage, and respiratory failure
- Combustible and can accumulate static charges which may cause an ignition
- Can cause central and peripheral nervous system damage
- May produce thermal burn
- Toxic gases will form upon combustion
- Vapor accumulation could flash and/or explode if ignited

Chemical Properties

High	Low
Boiling Point	
1100°C	-89°C
Density	
1200 kg/m3 (1.013	800 kg/mc (0.661
g/cm3)	g/cm3)
Vapor Density	
7.8	>1
Specific Gravity	
1.03	0.7
Flashpoint	
260°C	-40°C
Auto Ignition	
537°C	229°C
Viscosity	
350 mm²/s	0.11 mm²/s
Water Solubility	
Slight	Insoluble

Toxicological Information

Benzene	
LD50 High:8260 mg/kg Low: 690 mg/kg	LC50 High: 13700 ppm Low: 4000 ppm
H2S	
LD50: 390 mg/kg	LC50: 444 ppm

7.6 Pipeline Technical and Tactical Response Information

7.6.1 Valve Locations and Access

"Valve Location and Access" is a table listing the kilometre location of each valve and how to access the valves by way of road. The directions to valve sites are considered to be security sensitive. The information is provided on a controlled basis within the confidential appendix of this manual.

7.6.2 Route Maps and Site Diagrams

Pipeline route maps and site diagrams can be found in the Emergency Response Field Guide Manual.

8.0 INCIDENT MANAGEMENT

8.1 Incident Management Team Organization

Kinder Morgan Canada has a pre-defined Incident Command Structure with role descriptions defined and personnel pre-assigned to the key roles. In addition to the ICS Management Structure, Kinder Morgan has a number of response operations components:

8.2 Initial Response Team

Initial Response resources are managed by the Senior On-Site Individual who assumes the role of Incident Commander until such time as a more senior employee takes over.

8.3 Local Incident Management Team

The Local Incident Management Team (IMT), which is comprised of terminal personnel in each response area, will respond to incidents beyond the capability of the Initial Responders.

If deployed, the Local IMT's primary tasks are to:

- Ensure the safety of all workers in the area of the spill
- Assess the situation (i.e., incident size, severity, likely impacts)
- Take appropriate action to mitigate the impacts to life safety, the environment, and property

The Local IMT will perform these tasks until relieved or replaced by a higher level of management within the response organization

8.4 Kinder Morgan Incident Management Team

On larger spills, where the local IMT cannot manage a response without assistance, additional IMT personnel will we asked to attend from within Kinder-Morgan's company-wide support system.

The IMT is headed by the Incident Commander who directs and coordinates all response activities and resources. The Deputy Incident Commander provides on-site staff support to the Incident Commander through the Command Staff and relieves the Incident Commander as required.

Each Section is headed by a Section Chief reporting directly to the Incident Commander. The Initial Response Team and initial IMT may be absorbed into the response organization as additional IMT personnel arrive on the scene. The Operations Section Chief is also responsible for directing the activities of outside contractors called in to assist with the response.

8.5 Response Team Organization

The following diagram depicts a typical response organization to the branch director/unit leader level. If a position below a specific chief, director, supervisor, manager, or unit leader is not filled then the chief, director, supervisor, manager, or unit leader must complete the tasks of reporting position as well. For further information on each position and the supporting roles, please see the Kinder Morgan ICS Guide.



8.6 Initial Response

The initial response will be carried out by local Kinder Morgan personnel.

These are employees who are present at or near the scene of an incident who are properly trained in emergency response, defensive fire-fighting, safety and first aid. All other employees should be cleared from the incident scene immediately.

The senior person at the scene is automatically designated as the Incident Commander. Depending on the circumstances, the person-in-charge may be replaced by the Terminal Supervisor.

The initial responder's primary tasks are to:

- Ensure the safety of all workers and public in the area of the spill
- Assess the situation (i.e., incident size, severity, likely impacts)
- Notify the Terminal Supervisor immediately
- Take appropriate action to mitigate the impacts to life safety, the environment, and property

Initial responders will perform these tasks until relieved or replaced by a higher level of management within the IMT organization. In the event of a Level 1 incident, the initial responders may conduct the entire response effort. On larger incidents, the initial responders will typically be incorporated into the Operations Section of the IMT organization.

8.7 Control Centre Emergency Duties

8.7.1 Control Centre Operator

- Initiate the Emergency Conditions Report (ECR)
- Advise caller as appropriate
- Contact first responders, as required
- Contact "affected" Field Supervisor(s)
- Contact the Supervisor, Control Centre Operations
- Record all events in the "Additional Information" section of the ECR for the full duration of the incident
- Assume notification role of the Supervisor, Control Centre Operations, if no contact acknowledgment is received

8.7.2 Supervisor, Control Centre

- Send an ERL/ERL + using the appropriate ERL list
- If the ERL system in unavailable, contact personnel as shown in Section 2 for back up ERL contacts.
- Call into the ERL line to start the Initial Information Exchange
- Participate in conference calls as required
- Send additional ERL updates as needed or required
- Forward the completed ECR to the Manager, Technical Services and Control Centre, for approval

Emergency Response Plan

8.8 Transfer of Command

The Kinder Morgan Incident Management Team is designed to work on a 24-hour basis. If 24-hour coverage is required, Command Staff and other response personnel will normally be relieved on a 12-hour shift schedule. Briefing meetings for Command Staff and other essential response personnel will be held at the time of each shift change. The Planning Section will be responsible for providing a summary of the ending shift activities along with a plan for the next shift. Written plans will be made in consultation with government agencies. Key ICS positions will be transferred on a 4-7 day rotation as needed after the initial transfer of command. The resources unit has the responsibility to identify and obtain any additional personnel required.

Whether internal or external, transfers of command for ICS positions will overlap to ensure that operations are not interrupted. The individual incoming and the individual leaving are required to meet and discuss any relevant information so that the position can be properly filled in and necessary task accomplished.

Emergency Response Plan

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8.9 Unified Command

Wherever possible, the IMT will establish, and operate within, a Unified Command structure as warranted by the circumstances of an incident. When a federal or state/provincial agency arrives on-scene to participate in managing a response action, the agencies will utilize a unified command structure to jointly manage the spill incident. In the unified command, decisions with regard to the response will be made by consensus and documented through a single Incident Action Plan (IAP) for each operational period. In the event that the Unified Command is unable to reach consensus, the FOSC/FIC has ultimate decision making authority. The unified command may incorporate additional tribal/first nations or local government on-scene coordinators into the command structure as appropriate.

Incident Commanders for oil discharges and hazardous substance releases will, whenever possible and practical be organized under the Unified Command Structure which includes, but not limited to:



- The pre-designated Federal On Scene Coordinator (FOSC)/Incident Commander (FIC);
- The State/Provincial On Scene Coordinator (SOSC)/Incident Commander (PIC);
- The representative of the Responsible Party (RP); and
- The local and/or tribal/first nations On Scene Coordinators, as appropriate.

To be considered for inclusion as a UC member, the following criteria must be considered:

- The organization must have jurisdictional authority or functional responsibility under a law or ordinance for the incident; and
- The organization must be specifically charged by law or ordinance with commanding, coordinating or managing a major aspect of the incident response; and
- The incident or response operations must have impact on the organization's Area Of Responsibility; and
- The organization should have the resources to support participation in the response organization.

Note: Incidents occurring within Jasper National Park will see the participation of a Parks Canada Incident Commander within Unified Command, *not* an Alberta provincial agency Incident Commander.

The Alberta Environment and Parks (AEP) will have an advisory role within the Incident Command Post. A municipality of Jasper Incident Commander may also participate within Unified Command, depending upon the incident situation.

Actual Unified Command makeup for a specific incident will be determined on a case-by-case basis taking into account:

- The specifics of the incident;
- Determinations outlined in the four criteria listed above; and
- Decisions reached during the initial meeting of the Unified Command

Emergency Response Plan

The Unified Command is responsible for the overall management of the incident. The Unified Command directs incident activities including the development and implementation of strategic decisions, approval of the incident action plan, and approves the ordering and releasing of resources. It is expected that each Unified Command member will have the authority to make decisions and commit resources on behalf of their organization.

8.10 Incident Commander/Deputy Incident Commander

The Incident Commander's responsibility is the overall management of the incident. On Level 1 incidents, the command activity will likely be carried out by a single (Kinder Morgan Canada) Incident Commander. On larger, Level 2 and 3 incidents, a Unified Command structure will be employed, with additional Incident Commanders from key agencies.

The initial IC is the senior person witnessing the incident. One or more changes of the IC role might take place during the initial phase of the incident, as more-senior personnel arrive on-scene until the ultimate IC takes over and the ICP is established.

The Incident Commander may have a deputy, who may be from Kinder Morgan Canada, or from an assisting agency. Deputies must be fully qualified to take over that position at any time.

The Incident Commander/Deputy IC Responsibilities can be found in the ICS Guide; in general the duties are to:

- Ensure that adequate safety measures are in place.
- Assess the situation and/or obtains a briefing from the prior Incident Commander.
- Determine Incident Objectives and strategy.
- Establish the immediate priorities.
- Establish an Incident Command Post.
- Establish an appropriate organization.
- Ensure planning meetings are scheduled as required.
- Approve and authorize the implementation of an Incident Action Plan.
- Coordinate activity for all Command and General Staff.
- Coordinate with key people and officials.
- Approve requests for additional resources or for the release of resources.
- Keep agency administrator informed of incident status.
- Approve the use of trainees, volunteers, and auxiliary personnel.
- Authorize release of information to the news media.
- Order the demobilization of the incident when appropriate.

8.11 Safety Officer

The Safety Officer's function on the Command Staff is to develop and recommend measures for assuring personnel safety, and to assist and/or anticipate hazardous and unsafe situations.

Only one Safety Officer will be assigned for each incident. The Safety Officer may have assistants as necessary, and the assistants may also represent assisting agencies or jurisdictions. Safety assistants may have specific responsibilities such as air operations, hazardous materials, etc.

The specific duties related to the Safety Officer's responsibilities can be found in the ICS Guide; in general the duties are to:

Emergency Response Plan

- Develop a Site-Specific Health and Safety Plan.
- Participate in planning meetings.
- Identify hazardous situations associated with the incident.
- Review the Incident Action Plan for safety implications.
- Exercise emergency authority to stop and prevent unsafe acts.
- Investigate accidents that have occurred within the incident area.
- Assign assistants as needed.
- Review and approve the Medical Plan.

8.12 Information Officer

The Information Officer is responsible for implementing the external communications plan during any emergency incident.

The external communications plan objectives are to:

- Provide information about the incident and the related response effort to all stakeholders in a timely, accurate, and responsible fashion.
- Ensure that information about the incident is clear, factual and consistent with that provided by other responders and government agencies.
- Minimize unnecessary speculation, rumour, or concerns about the incident and potential risks to the public.
- Protect the company's reputation as a responsible corporate citizen.

The Information Officer is supported by a team of pre-assigned employees to assist in implementing the communications plan. This group is known as the External Communications Team.

The Information Officer, in consultation with the Incident Commander, ensures that the necessary contacts have been made to Kinder Morgan Canada public affairs staff at the Kinder Morgan Canada's head office in Calgary.

The Information Officer's responsibilities are to:

- Determine from the Incident Commander if there are any limits on information release.
- Develop material for use in media briefings.
- Obtain Incident Commander's approval of media releases.
- Establish a Media Relations Center.
- Inform media and conduct media briefings.
- Arrange for tours and other interviews or briefings that may be required.
- Obtain media information that may be useful to incident planning.
- Maintain current information summaries and/or displays on the incident and provide information of status of incident to assigned personnel.
- Activate a 24-hour, recorder public information line.

8.13 Liaison Officer

The Liaison Officer is the contact point for agency representatives assigned to the incident by assisting or cooperating agencies. These are personnel other than those on direct tactical assignments or those involved in a Unified Command.

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The Liaison Officer's responsibilities are to:

- Be a contact point for Agency representatives.
- Organize and chair inter-agency coordination calls in order to provide incident status updates. Refer to the Liaison Office Toolkit for coordination call agenda.
- Maintain a list of assisting and cooperating agencies and Agency Representatives.
- Assist in establishing and coordinating interagency contacts.
- Keep agencies supporting the incident aware of the incident status.
- Monitor incident operations to identify current or potential inter-organizational problems.
- Participate in Planning Meetings, providing current resource status, including limitations and capability of assisting agency resources.
- Arrange for and provide personnel to act as an External Liaison Officer at any responding agency Incident Command Post, and/or Emergency Operations Centre as needed/requested by a local authority.

8.14 Government Agency Representatives

Agency Representatives assigned to an incident from Federal, Provincial or local government agency report to the Liaison Officer or to the Incident Commander in the absence of a Liaison Officer. These representatives should have full authority to make decisions on all matters affecting that agency's participation at the incident.

8.14.1 Agency Representatives Responsibilities

- Ensure that all agency resources are properly checked-in at the incident.
- Attend briefings and planning meetings as required.
- Provide input on the use of agency resources unless resource technical specialists are assigned from the agency.
- Cooperate fully with the Incident Commander and the General Staff on agency involvement at the incident.
- Ensure the well-being of agency personnel assigned to the incident.
- Advise the Liaison Officer of any special agency needs or requirements.
- Report to home agency dispatch or headquarters on a prearranged schedule.
- Ensure that all agency personnel and equipment are properly accounted for and released prior to departure.

8.14.2 National Energy Board (NEB)

The NEB's top priority in any emergency is to make sure that people are safe and secure, and that property and the environment are protected. Any time there is a serious incident, NEB Inspectors may attend the site to oversee a company's immediate response. The NEB will require that all reasonable actions are taken to protect employees, the public and the environment. Further, the NEB will verify that the regulated company conducts adequate and appropriate clean-up and remediation of any environmental effects caused by the incident.

- Monitors, observes and assesses the overall effectiveness of the company's emergency response in terms of:
 - Emergency Management
 - Safety
 - Security
 - Environment

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Emergency Response Plan

- Integrity of operations and facilities; and
- Energy Supply
- Investigates the event, either in cooperation with the TSB, under the Canada Labour Code, or as per the National Energy Board Act or Canada Oil & Gas Operations Act (whichever is applicable)
- Inspects the pipeline or facility
- Examines the integrity of the pipeline or facility
- Requires appropriate repair methods are being used
- Requires appropriate environmental remediation of contaminated areas is conducted
- Coordinates stakeholder and Aboriginal community feedback regarding environmental clean-up and remediation
- Confirms that a company is following its Emergency Procedures Manual(s) commitments, plans, procedures, and NEB regulations and identifies non-compliances
- Initiates enforcement actions as required
- Approves the restart of the pipeline

8.14.3 Transportation Safety Board

The TSB's role is to advance transportation safety through the investigation of transportation occurrences in the marine, pipeline, rail and aviation modes

TSB Classification System - The primary criterion for determining if an occurrence in any mode will be investigated is whether or not such analysis is likely to lead to a reduction of risk to persons, property, or the environment.

Class 1 Occurrences (Public Inquiry)

- the potential for reducing the risk to persons, property, or the environment;
- whether an inquiry would uncover facts that might not otherwise be made known;
- whether an inquiry would result in quicker remedial action;
- the actual or potential extent of injuries and/or loss of life;
- the degree of public interest in and concern about public safety; or
- the possible involvement of an arm of government.

Class 2 Occurrence (Individual Occurrence Investigation)

- there is a high probability of advancing Canadian transportation safety in that there is significant potential for reducing the risk to persons, property, or the environment; or
- the Governor in Council so requests (pursuant to Section 14(1) of the CTAISB Act).

Class 3 Occurrences (Individual Occurrence Investigation)

- there is significant public expectation that the TSB should independently make findings as to cause(s) and contributing factors; or
- there is potential for better understanding the latent unsafe conditions contributing to a significant safety issue; or
- a government representative so requests (pursuant to Section 14(2) of the CTAISB Act); or
- the Board must do so to meet its obligations or commitments.

Class 4 Occurrences (Safety Issue Investigation)

Multiple occurrences, which the Board deems to be indicative of significant unsafe situations or conditions, will be subject to a safety issue investigation when:

- there is a high probability of advancing Canadian transportation safety by reducing the risk to persons, property, or the environment; or
- in the Board's opinion, there is widespread public expectation that the TSB should independently analyze a particular safety issue.

Class 5 Occurrences (Data Collection)

Data pertaining to occurrences that do not meet the criteria of classes 1 through 4 will be recorded in suitable scope and detail for possible safety analysis, statistical reporting, or archival purposes.

8.14.4 Strathcona County Emergency Services

Strathcona County Emergency Services has provided KMC with a list of duties and response capabilities. This document is included at the end of this section.

8.14.5 Kamloops Fire and Rescue Department

Kamloops Fire and Rescue Department has provided KMC with a list of duties and response capabilities. This document is available from the Emergency Management Group.

8.14.6 Alberta Health Services

Alberta Health Services has provided KMC with a list of duties and response capabilities. This document is included at the end of this section.

8.14.7 British Columbia Health Authorities

British Columbia Health Authorities will aid in an emergency response through the following duties and response capabilities:

- Act as a consultant utilizing provided information on toxic chemicals to the Emergency Operations Center.
- Monitor health effects of the incident to ensure appropriate data is collected and investigate such health effects.
- Provide advice to the government on the existing or potential health effects of the incident.
- Establish and operate trauma teams for emergency health services.
- Provide health advice and safety levels for any health care or special care facility and for the more vulnerable residents.
- Monitor adverse effects/contamination of water systems.
- Enforce and regulate Public Health Regulations.

8.15 Legal Officer

The Legal Officer is responsible for providing advice and direction on all matters that may have a legal impact on Kinder Morgan Canada and should participate in:

- Legal requirements in execution of agreements
- Incident investigation report reviews/meetings
- Environmental damage assessments
- Claims, where applicable
- Any major contracts that are not standard to the operation
- Any insurance issues/concerns
- Major health & safety issues/injuries
- Information releases
- Government Agency requests
- Reporting to Incident Commander

Note: Legal maintains contact information for Insurance other agencies for claims in the Calgary office.

Emergency Response Plan

8.16 Response Planning (Short-Term and Initial Phase of Long-Term Events)

Short-term responses that are small in scope and/or duration, and require few resources can often be managed using only the Incident Command Briefing (ICS 201 Form). Responses to longer-term events will also begin with the completion of the ICS 201 and Incident Briefing.

8.16.1 Incident Briefing

During the transfer of command process, an Incident Briefing provides the incoming Incident Commander with basic information regarding the incident situation and the resources allotted to the incident. Most importantly, it is the de facto Incident Action Plan (IAP) for the initial response and remains in force and continues to develop until the response ends or the Planning Section generates the incident's first IAP. It is also suitable for briefing individuals newly assigned to Command and General Staff, as well as needed assessment briefings for the staff.

When	• Upon the arrival of a new Incident Commander a transfer of Command will take place. The Incident Briefing also serves as an opportunity to provide initial information to incoming key IMT and agency personnel.
Facilitator	 The Incident Briefing is facilitated by the Current (and often initial) Incident Commander.
Attendees	 The Incident Briefing is attended by the incoming IC, the Command and General Staffs, as well as any senior responding Government Agency personnel and senior contractor representatives.
Agenda	 Situation (note territory, exposures, safety concerns, etc. use map/charts) Objectives and priorities Strategy(s) and tactics Current organization Resource assignments Resources enroute and/or ordered Facilities established

8.17 Response Planning (Long-Term Events)

Kinder Morgan Canada follows the ICS model for incident response planning. The planning cycle and associated meetings can be found in the Kinder Morgan Canada Incident Command System Guide located on e:\manuals.

8.18 Terminating/Downgrading the Response

The decision to terminate and/or downgrade emergency operations and to demobilize personnel and equipment shall be made on a site-specific basis, based on the status of the incident. Factors that may affect the decision to terminate/downgrade the response include the following:

- The emergency condition has been controlled and immediate threats to the health and safety of the public have been eliminated
- Any leaks or spills have been contained, and all remaining free oil, petroleum products, or hazardous materials have been recovered from the site
- Repair operations have been undertaken to prevent further leaks or spills from occurring
- Further emergency operations at the site will cause more damage to property and the environment than that which resulted from the leak or spill initially.

The Regional Director or designee shall consult appropriate government agencies and other involved parties before making any decisions related to terminating/downgrading response activities. These agencies and involved parties include representatives from federal, provincial and/or municipal agencies with jurisdiction in the emergency.

Prior to terminating/downgrading the response the following issues should be considered by the Unified Command:

- Demobilize equipment and personnel at the first opportunity in order to reduce cost
- Consider which resources should be demobilized first; for example, berthing expenses can be saved by demobilizing out-of-area contractors before local ones
- Equipment may need both maintenance and decontamination before being demobilized
- All facilities (staging area, Incident Command Post, etc.) should be returned to their preincident condition before terminating operations
- Determine what documentation should be maintained, where, and for how long
- Contract personnel may be more susceptible to "suffering" injuries as they approach termination
- Some activities will continue after the cleanup ends; examples include incident debriefing, bioremediation, claims, and legal actions
- Express gratitude to the community, police department, fire department, and emergency crews for their work during the response.

8.19 Incident Records

Kinder Morgan Canada utilizes the Incident Command System when responding to any real and/or potential emergency. As part of this process Kinder Morgan Canada's Incident Management Team utilizes ICS Forms in order to support and respond to the emergency. Any sustained response will result in the Incident Management Team establishing a Planning Cycle in order to generate an Incident Action Plan that will address all aspects of the emergency.

All forms generated as part of the incident response will be submitted to the Documentation Unit, under the Planning Section. Upon termination of the incident the Documentation Unit will ensure all original documents are properly stored with the Legal Department. Incident Records will be used to generate reports and for any follow up investigations, both internal and external, if required.

Incident Records are retained by the Legal Department who store all incident files in accordance with KMC's Record Retention Policy and procedures.



STANDARD OPERATING GUIDELINES Volume 2, Chapter 4 – General Operations Section 3 – Emergencies at Response-capable Industrial Sites

GOAL

To provide clarity on the division of responsibilities and mutual support offered between Strathcona County Emergency Services (SCES) and major industrial facility operators, through:

- 1. Definitions
- 2. Notification
- 3. Resources
- 4. Command
- 5. Availability of response
- 6. Public Protection and Emergency Response
- 7. Emergency Operations Centres (EOCs)
- 8. Exercises

SCOPE

- This Standard Operating Guideline outlines SCES responses to industrial facilities that maintain their own emergency response resources (ERT/response units), facilities (EOC) and capability.
 - Applicable to all operations members.

1.0 DEFNIITIONS

- 1.1 Emergency Planning Zone (EPZ) Where an EPZ is defined in regulation, it shall take the meaning as defined by that regulation.
 - 1.1.1 An EPZ is essentially a geographic area of primary risk to the public. This area is normally pre-defined by the Industrial Facility Operator as an irregular circular area surrounding their facility.
- 1.2 Emergency Awareness Zone (EAZ) Where an EAZ is defined in regulation, it shall take the meaning as defined by that regulation.
 - 1.2.1 An EAZ is essentially a geographic area outside of the EPZ that may be of secondary concern or potential risk to the public.
- 1.3 Emergency Operations Centre (EOC) means a place of coordination that supports the activities of the Incident Command Post (ICP) while undertaking those aspects of the emergency response not directly managed by the ICP.

1.3.1 This may be further specified as an industrial, departmental, municipal, or regional EOC.

- 1.4 Emergency Response Team (ERT) means employees of the Industrial Facility Operator predesignated and present on a twenty-four hour basis to serve as first responders to an emergency at the facility.
- 1.5 Industrial Facility Operator (IFO) means the responsible duty holder in charge of the operations of an industrial facility within Strathcona County, specifically Shell Scotford Complex, Alberta Envirofuels Refinery, Suncor Refinery/Upgrader and Imperial Oil Refinery.
- 1.6 Incident Command System (ICS) all ICS terms are defined in the ICS SOG.
- 1.7 **Resource** means equipment, personnel, or facilities.
- 1.8 **Response-capable Industrial site** means an industrial facility with resources that are suitable to provide a competent response to foreseeable emergencies at the industrial facility, specifically Shell Scotford Complex, Alberta Envirofuels Refinery, Suncor Refinery/Upgrader and Imperial Oil Refinery.



2.0 NOTIFICATION

- 2.1 The IFO shall notify the Strathcona County Regional Emergency Communications Centre (ECC) by telephoning only 9-1-1 immediately (to a maximum of ten minutes) whenever an actual or potential emergency at their facility or off-facility property:
 - 2.1.1 requires the mustering of their Emergency Response Team (ERT); or
 - 2.1.2 requires the activation of their Emergency Operations Centre (EOC); or
 - 2.1.3 attracts or is likely to attract the attention of the public or media (including perception of risk/emergency issues such as smoke, flames or fire not contained in flare stacks, unusual/unexpected or emergency flares, explosive or other loud noises, atypicial odours, site emergency alarms, gas/smoke clouds.)

NOTE: The intent of 2.1.3 is to ensure Emergency Services is advised by the IFO concurrent with persons on-site - or those observing the site - making calls to 9-1-1 based on their perception of risk.

- 2.2 When notified via a 9-1-1 line of an actual or potential emergency including activities that could be perceived by the public as an emergency as outlined in 2.1.3 the Emergency Communication Operator (ECO) and the Platoon Chief shall take the actions as outlined in item 2.5, regardless of any indication by the IFO caller to the effect that an emergency response to the site is not required.
- 2.3 Where the perception of risk/emergency issues referred to in 2.1.3 are predictable or planned by the IFO, an advance advisory call shall be made to the SCES ECC land line at 780-464-8465. This number shall not be used by the IFO to report an emergency.
- 2.4 The IFO shall provide to the 9-1-1 Centre the general information known about the emergency and a telephone call-back number for return calls.
 - 2.4.1 It shall be the responsibility of the IFO to provide to the person designated to call 9-1-1 sufficient specific information to answer the questions of the 9-1-1 Emergency Communications Operator to facilitate the appropriate kind and type of response.
 - 2.4.2 Where this information is not initially provided, the IFO shall ensure the information necessary to answer the questions is immediately gathered and a follow-up call placed to 9-1-1.
- 2.5 If the IFO is advising of:
 - 2.5.1 an undetermined emergency, the ECO shall:

2.5.1.1 In the event of no or substantially insufficient detail provided by the caller, immediately initiate a Protocol 69D4 response, Code 3, ensuring that the PC and Chief-on-call are dispatched.

2.5.1.2In the event the caller is providing notification only - or indicates an emergency that is now over - and the ECO does not have reason to believe there is a hazard to life or property, the ECO shall dispatch the Platoon Chief (PC) Code 1 to attend the facility. The PC, in conjunction with the IFO, shall determine the nature of the emergency and whether additional response is required. The PC shall advise the Chief-on-call of the situation, and update once circumstances are known.

- 2.5.2 a **known emergency**, the ECO shall dispatch according to protocol and shall notify the PC if they are not selected for the specific determinant. 69D4 shall be used if questioning does not lead to a proper determinant. The PC shall communicate with the IFO to evaluate the emergency and determine any change to the required response. The PC shall advise the Chief-on-call of the situation.
- 2.5.3 Notwithstanding the above, the ECO shall verify that the Chief-on-call is immediately aware of any fire or rescue response to an IFO or any other major industrial facility (e.g. tank farm, chemical plant, bulk fuel terminal).



STANDARD OPERATING GUIDELINES Volume 2, Chapter 4 – General Operations Section 3 – Emergencies at Response-capable Industrial Sites

- 2.6 If the IFO is advising 9-1-1 of the activation of their EOC, the ECO shall respond the Platoon Chief on duty and Chief-on-call. The Chief-on-call shall attend the industrial EOC or designate the PC to attend.
- 2.7 In the case of an emergency requiring urgent & immediate response actions, the IFO may begin to take those actions necessary to protect the health and safety of the public while concurrently advising 9-1-1.
- 2.8 If the IFO is notifying the public or if, in the opinion of the PC the public needs to be notified, the PC shall notify the Chief-on-call. In the event that public warning is urgently required and immediate notification to the Chief-on-call is not possible, the PC shall take action as necessary to notify the public.
- 2.9 If the IFO is advising 9-1-1 of an event that may attract attention of the public or media, the ECO shall notify the PC, who shall then notify the Chief-on-call.
- 2.10 In cases where the PC is unavailable, the Chief-on-call shall be contacted directly by the ECO.
- 2.11 Secondary and subsequent notifications may include requests for specific resources and assistance.
- 2.12 The IFO shall, within the first thirty minutes of an emergency or other condition as outlined in 2.1.3, ensure that a message is posted to the Update Line and otherwise made available to the public or media on request.
- 2.13 The message shall explain the current circumstances and actions being taken by the IFO and/or Emergency Services. The message may be required to be modified after creation if, in the opinion of Emergency Services, it is lacking in detail, accuracy or currency.

3.0 RESOURCES

- 3.1 If a request is made to 9-1-1 for specific resources, the ECO shall supply the resources (per existing policy) and/or notify the PC and/or the Chief-on-call.
- 3.2 The IFO making the request or, security personnel acting on their behalf, shall immediately facilitate and/or provide unhindered and safe access to the site and/or EOC for responding SCES personnel. SCES reserves the right to directly observe the response actions being taken within the facility by the ERT as reflected by their jurisdiction and responsibility for emergencies, as well as their authority to investigate origin, cause and circumstance.
- 3.3 As resources become available, command (as outlined below) will determine the most appropriate assignment of those resources.
- 3.4 Requests for resources and the confirmation of the request are to be as specific as possible to ensure clarity.
- 3.5 Responses to resource requests will detail the specific resources being made available (e.g. one pumper with four, NFPA 1001-trained firefighters).
- 3.6 The Chief-on-call shall ensure appropriate regulatory agencies have been notified by the IFO (i.e. Alberta Environment, Health Authority),

4.0 COMMAND

- 4.1 SCES utilizes ICS as its response management structure. The IFO shall utilize ICS or a response management structure compatible with ICS in the determination of SCES.
- 4.2 Where either party is actively engaged in assisting the other and clear communications has been established, the process of Unified Command shall be initiated.
- 4.3 Where either party is assisting the other in an advisory or support capacity for a response within the fence line of the industrial facility, Single Command with Deputies should be utilized.



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- 4.4 For responses outside of the fence line of the industrial facility, SCES shall utilize Unified Command or other command options to ensure flow of information and an effective response.
- 4.5 Regardless of where an emergency response occurs within the County, SCES will not relinquish our overall authority and jurisdiction for life safety and public/property protection. SCES reserves the right to assume sole command over emergencies.

5.0 AVAILABILITY OF RESPONSE

- 5.1 Availability of SCES response to an industrial facility emergency is subject to the overall needs of the municipality at the time and availability of resources (personnel in sufficient numbers to safely staff equipment), as governed by SCES departmental SOG's.
- 5.2 SCES will assist the on-site response provided by the IFO, and arrange for additional resources as they are available from SCES, mutual aid from other municipalities or other industry.
- 5.3 The IFO is expected to have sufficient resources on-site to respond to an industrial emergency and/or to mitigate hazards, assisted by SCES.
 - 5.3.1 Any extraordinary resources that may be necessary from time to time, or for sustained responses beyond 48 hours, will be the responsibility of the IFO.
- 5.4 Where applicable, the minimum regulatory requirements for public protection and EPZ response by the IFO must be met or exceeded.

6.0 PUBLIC PROTECTION AND EMERGENCY RESPONSE

- 6.1 For industrial facilities where no EPZ and/or EAZ are pre-designated by the IFO:
 - 6.1.1 Response within the facility fence line is the primary responsibility of the facility operator, with assistance, observation, guidance and authority provided by SCES.
 - 6.1.2 Response to impacts at the fence line and beyond is the primary responsibility of SCES, for those portions that lay within Strathcona County. Assistance from the IFO may be requested.
- 6.2 Where an EPZ and/or EAZ has been pre-designated for an industrial facility, the following general response principles apply:
 - 6.2.1 Response within the facility fence line and within the EPZ is the primary responsibility of the facility operator, with assistance, observation, guidance and authority provided by SCES for those portions of the EPZ that lay within Strathcona County.
 - 6.2.2 Response within the EAZ is a shared responsibility of the IFO and SCES, for those portions of the EAZ that lay within Strathcona County.
 - 6.2.3 Response beyond the EAZ is the primary responsibility of SCES, for those portions that lay within Strathcona County. Assistance from the IFO may be requested.
- 6.3 Where required by regulation & directive the IFO will retain the primary responsibility to undertake the response required to protect the public. This includes but is not limited to public notification & warning, evacuation, shelter-in-place, EPZ isolation and air monitoring.
- 6.4 SCES may assist the IFO or undertake these responsibilities on their behalf at the time of the emergency, subject to the availability of response (as outlined above) and as determined through Unified Command discussions.

7.0 EMERGENCY OPERATIONS CENTRES (EOCS)

7.1 When an emergency involving the IFO & SCES necessitates the activation of the Strathcona County EOC, both parties will make reasonable effort to ensure a representative is available within the other party's EOC to facilitate information exchange and decision making.



8.0 EXERCISES

8.1 As part of the IFO's exercising of their Emergency Response Plan, SCES shall be requested to participate in EOC and/or ERT exercises by the IFO. SCES shall determine their ability and need to participate.

9.0 NOTIFICATION OF CHANGE

9.1 When revised, a copy of this SOG shall be provided in either a profiled e-mail or hard-copy letter to the Emergency Response focal point for Shell Scotford, Alberta Envirofuels, Suncor and Imperial Oil. The change(s) shall be highlighted.


Oil and Gas Industry Emergency Preparedness and Response

ENVIRONMENTAL PUBLIC HEALTH ROLES AND RESPONSIBILITIES

Alberta Health Services (AHS) - Environmental Public Health (EPH) roles and responsibilities in public health emergency preparedness and response to the oil and gas industry are outlined below. The provision of services during an emergency depends upon our assessment of legislative responsibilities, impact to services, and business continuity.

EPH will endeavor to:

- Participate with the Licensee in the development of their Emergency Response Plans as it relates to the Environmental Public Health Program's role and responsibility.
- Provide the AHS Zone Single-Point-of-Contact (SPOC) emergency phone number to enable the Licensee to notify and alert the Zone of an emergency. From the initial notification or alert, AHS emergency response will fan out to and coordinate with other AHS programs and facilities as necessary. The 911 EMS services remain independent of the Zone SPOC notification/alert process.
- Participate with stakeholders in preparedness training and exercises associated with a Licensee's simulated activation of an Emergency Response Plan in which EPH has a role and responsibility.
- Participate in public information sessions during the Licensee's Emergency Response Plan development process when appropriate and as resources allow.
- Provide guidance to stakeholders and local municipal authorities in identifying sites suitable for establishing and operating an evacuation centre and/or reception centre, including operational requirements.
- Provide guidance to stakeholders on substances that may affect public health in consultation with the Zone Medical Officer of Health (MOH), including Alberta Health Acute Exposure Health Effects for Hydrogen Sulphide and Sulphur Dioxide information.
- Conduct assessments, inspections and give regulatory direction, when appropriate, to ensure the requirements of provincial legislation and EPH program areas of responsibilities for public health protection and disease prevention are maintained.
- Notify the Zone Medical Officer of Health of any incident affecting or potentially affecting other AHS programs or facilities. The Zone MOH will notify and coordinate emergency response in other program areas and facilities as necessary.

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- Establish EPH emergency management operations, when appropriate, to support regional response efforts and liaise with the Government Emergency Operations Centre, Municipal Emergency Operations Centre and/or Industry Emergency Operations Centre, if needed.
- Assist the Zone Medical Officer of Health, local municipal authority, and Public Information/ Communication officers in the development, issuance, and rescinding of public health, public evacuation and shelter-in-place advisories.
- Provide guidance to stakeholders on matters relating to evacuation of the public and/or public facilities, and the re-occupancy of those evacuated areas or facilities.
- Record and respond to health complaints or concerns from the public during and following an incident.
- Participate in stakeholder debriefings as necessary.

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9.0 OPERATIONS SECTION

The Operations Section is responsible for the oversight of all tactical assignments in the response. These include all contractors or other agencies that supply tactical resources in response to the incident. These might include representatives from the Fire Department, the police, the Ambulance Service as well as response organizations. Detailed duties and responsibilities for individuals in the Operations Section can be found in the Kinder Morgan Canada Incident Command System Guide on E:\Manuals\Emergency Management\ICS Guide and Forms.

The Operations Section may consist of numerous (functional) Groups and Branches, (geographic) Divisions. If Staging Areas are used, these are also managed by the Operations Section.



9.1 Response Objectives

Once the safety of all personnel has been ensured, the source of discharge is secured, and initial notification has been activated, the overall tactical priorities covered are:

- Containment and Recovery of Spilled Oil
- Protection of Sensitive Resources
- Site and Shoreline Clean-Up

Response objectives and priorities will be determined by the Incident Commander, Unified Command, and the Planning and Operations Section members. Critical advice will be provided by representatives of key government agencies.

Emergency Response Plan

9.2 Operations Section Organization Chart

Not all roles will be filled for all incidents; however the following chart is an outline of the possible positions to be filled. Detailed descriptions of each position and its duties can be found in the Kinder Morgan ICS Guide.



9.3 Operations Section Chief

The Operations Section Chief, a member of the general staff, is responsible for managing all operations directly applicable to the primary mission. The Operations Chief activates and supervises elements in accordance with the Incident Action Plan and directs its execution; activates and executes the Site Safety and Health Plan; directs the preparation of unit operational plans, requests or releases resources, makes expedient changes to the Incident Action Plans as necessary, and reports such to the Incident Commander.

9.4 Temporary Storage

All waste materials collected from a spill should be sorted and stored in separate containers or piles that are clearly marked showing the type of waste they contain. Temporary storage locations on the terminal premises should be totally contained and secure to prevent further leakage or migration of spilled product.

9.4.1 Temporary Storage Methods

Mathad of	Product							
Containment	OIL	Oily Water	Oily Soil	Oil/Debris (Small)	Oil/Debris (Medium)	Oil/Debris (Large)	Capacity	
Drums	✓	✓	~				0.2-0.5 yd ³	
Bags		✓	~	✓			1.0-2.0 yd ³	
Boxes			~	✓			1-5 yd ³	
Open top roll-off	✓	✓	~	✓	\checkmark	✓	8-40 yd ³	
Roll top roll-off	✓	✓	~	✓	\checkmark	✓	15-25 yd ³	
Vacuum box	✓	✓					15-25 yd ³	
Frac tank	✓	✓					500-20,000 gal	
Poly tank	✓	✓					200-4,000 gal	
Vacuum truck	✓	✓	~				2,000-5,000 gal	
Tank trailer	✓	✓					2,000-4,000 gal	
Barge	✓	✓					3,000+gal	
Berm, 4 ft		✓	~	✓	\checkmark	✓	1 yd ³	
Bladders	~	~					500-1,500 gal	

9.4.2 Initial Handling and Storage

Initial oil handling and storage needs may be overlooked in the emergency phase of a response, which could result in delays and interruptions of cleanup operations. Initially, waste management concerns should address:

- Equipment capacity
- Periodic recovery of contained oil
- Adequate supply of temporary storage capacity and materials.

The following action items should be conducted during a spill response:

- Development of a Site Health and Safety Plan (see Section 1)
- Development of a Disposal Plan in accordance with any federal, provincial, and/or local regulations
- Continuous tracking of oil disposition in order to better estimate amount of waste that could be generated over the short and long-term
- Organization of waste collection, segregation, storage, transportation, and proper disposal
- Minimization of risk of any additional pollution
- Regulatory review of applicable laws to ensure compliance and (if appropriate) obtain permits
- Documentation of all waste handling and disposal activities
- Disposal of all waste in a safe and approved manner.

Good hazardous waste management includes:

- Reusing materials when possible
- Recycling or reclaiming waste
- Treating waste to reduce hazards or reducing amount of waste generated.

The management of the wastes generated in cleanup and recovery activities must be conducted with the overall objective of ensuring:

- Worker safety
- Waste minimization
- Cost effectiveness
- Minimization of environmental impacts
- Proper disposal
- Minimization of present and future environmental liability.

Solid wastes such as sorbents, PPE, debris, and equipment will typically be transported from the collection site to a designated facility for:

- Storage
- Waste segregation
- Packaging
- Transportation

Once this process is complete, the waste will be shipped off-site to an approved facility for required disposal.

9.5 Waste Disposal

9.5.1 Types of Spill-Related Waste Materials

The most common types of waste likely to be generated from an oil spill are:

- Contaminated Liquids Mixture of oil and water recovered from the surface of the water usually by skimmer
- Contaminated Debris Twigs, leaves, vegetation/seaweed, dead animals or birds coated with pollutant
- Contaminated Sediment Sand or gravel removed from the shoreline or spill site
- Clean-up Materials Oily/contaminated rags, oiled sorbents, oil PPE and clothing worn by response team personnel

9.5.2 Waste Management Plan

Before any waste materials are transported off the site for disposal, a Waste Management Plan should be prepared in consultation with the provincial agencies. Responsibility for working with the provincial authorities to develop a proper Waste Management Plan lies with the Environmental Unit Leader. More information on the duties of the Disposal (Waste Management) Technical Specialist can be found in the Incident Command System Guide on e:\manuals

9.5.3 Waste Transport Procedures

Once a decision has been made to transport wastes off the site for final disposal, KMC, as the Consignor or generator of the waste, is responsible for:

- Ensuring that the person or company transporting the waste is qualified and licensed.
- Ensuring that the place where the waste is transported to is approved as a waste storage and/or disposal site.
- Completing all necessary documentation (e.g., transport manifest) and retaining records for two years.

9.6 Emergency Equipment and Response Times

Kinder Morgan Canada (KMC) owns and maintains a large fleet of emergency response equipment strategically placed at various points along the Trans Mountain Pipeline. The equipment ensures that the company is able to respond to any emergency in a timely manner in accordance with the planning standard.

9.6.1 Planning Standard

The planning standard establishes the desired response outcomes and forms the basis for KMC's emergency response plans, procedures and processes.

The planning standard:

- Outlines the hazard assessment process, which includes a hazard listing (spill, fire, explosion);
- Specifies the quantity and location of response equipment and personnel needed to respond within maximum target response times; and
- Defines maximum target response times to be used for response planning to warrant a prompt, safe and effective response to an emergency

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Maximum target times are based, in part, on a variety of regulatory requirements. Real response times are reviewed after any event requiring activation of the Emergency Response Plan to confirm KMC has resources and equipment placed in the appropriate location to meet the maximum target response times.

Current emergency response capabilities and equipment are strategically placed to meet the planning standard and include:

- Early detection systems/alarms and firefighting equipment for fires and spills (storage tanks and pump stations);
- Personnel and company vehicles to respond to spill and fires (terminal storage tanks, pump stations and right-of-way); and
- Oil Spill Containment and Response (OSCAR) units strategically placed to ensure rapid response along the right-of-way and at facilities.

9.6.2 Response Equipment

Emergency response equipment, such as spill drums with absorbent material to assist in immediate cleanup of any local spill, is available at all facilities. Other emergency resources, such as river boats and response trailers, are located at strategic locations along the Trans Mountain Pipeline.

Boats - KMC owns and maintains a number of boats along the pipeline route to ensure response actions can be carried out on rivers and lakes in locations where a spill could potentially impact water bodies. Response boats are jet drive boats that range in size from 18' to 24' and allow for response in all expected water environments, including shallow water.

Boom trailer - Boom trailers may vary in size however their primary purpose is to house containment boom for on-water spill operations. The trailers contain supplementary equipment, such as additional rope, to assist with boom deployment.

Decontamination trailer - Decontamination trailers are sized to be towed by half-ton or three-quarter ton trucks and contain equipment to facilitate the cleaning of personnel and small equipment. The use of decontamination trailers ensure when personnel leave an impacted area they are not tracking contaminates with them. The trailer includes wash stations, pools, tents, detergent, hand sprayers and other equipment necessary to decontaminate people and small equipment.

Fire Foam Trailer – Fire Foam Trailers are used as mobile foam concentrate storage systems. Fire Foam Trailers may be designed to inject water/foam mixtures into a tanks foam piping systems in order to extinguish rim seal fires, others are used to store large quantities of foam concentrate for larger spills and/or fires.

Fire Hose Trailer – Hose trailers contain large quantities of fire hoses to support fire response efforts as required.

Foam Bladder Trailer – A Foam Bladder Trailer is a wheel mounted bladder foam storage tank with inline proportioning used to mix and inject firewater/ foam concentrate into a facilities fire piping system. The trailers can draw water/foam directly from the

bladder or externally from foam concentrate drums utilizing a hose. The trailers include a mounted monitor which may be used for direct fire suppression.

Foam Cannon – Foam cannons are located at KMC Terminals and Tank Farms for use in the unlikely event of a tank fire. These mobile large-volume discharging platforms are capable of delivering water or foam solution for fire suppression, tank cooling, personnel protection and vapour suppression.

OSCAR trailer - Oil Spill Containment and Recovery (OSCAR) trailers are located strategically at various points along the Trans Mountain Pipeline. These trailers contain various tools and spill response equipment ranging from absorbent materials and skimmers, to booms and other cleanup tools specific to the area.

Portable Fire Pump – Portable fire pumps are located at KMC Terminals and Tank Farms for use in the unlikely event of a large tank fire. These mobile pumps assist the existing fire systems by providing higher capacity pumping of water and/or foam solution.

Rapid Response Trailer - Rapid Response trailers are similar to OSCAR trailers, however they are smaller in size (typically under 30' long), can be towed behind a half-ton or three-quarter ton truck and are more maneuverable in tight locations. Rapid response trailers have containment, recovery and storage equipment on board.

Wildlife Response Trailer – Wildlife Response Trailers are deployed to spill locations in order to deter wildlife, including birds and a variety of ground animals, from entering or landing near the contaminated area(s). A variety of equipment including fencing, flags and effigies are housed within these trailers.

Wildfire Response Trailer – Wildfire Response Trailers are designed as a self supplied fire water and/or foam deployment system. The trailers are designed to protect at risk facilities along the pipeline right-of-way.

Winter Response Trailer - Winter Response Trailers contain specialized equipment designed to be used in ice and snow. Winter response equipment includes specialized ice cutting devices (ice auger, chainsaw), ice rescue equipment, specialized ice lifting devices and additional rehabilitation supplies. Personal protective equipment and safety equipment that would be useful during a cold weather response, such as blankets, heaters, winter liners for hard hats, are also included.

9.6.3 Response Equipment Maintenance

KM response equipment is tested and inspected as noted below.

- Daily and weekly portions of the fire suppression systems are tested and inspected on a weekly and daily basis depending on the system component and regulatory requirements.
- Monthly all emergency response equipment is inspected and inventoried on a monthly basis to ensure response readiness.

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- Spring Inspection all emergency response equipment undergoes a thorough spring maintenance check which may include inspection by a third party inspection facility. All equipment is function tested at this time.
- Fall Inspection all emergency response equipment undergoes a thorough fall inspeption and maintenance check which includes winterizing any equipment that is at risk of freezing. Some equipment is also inspected by a third party inspection facility.
- Exercises all equipment is deployed at least annually during an exercise at which time all
 components are inspected and tested in a response environment. All equipment used during
 an exercise is inspected in accordance with its Post-use Inspection procedures, which may
 include decontamination of watercraft, function testing pumps/generators, drying ropes and
 boom etc.
- Multi-year programs some emergency equipment such as fixed fire suppression systems undergo 3 year inspections and 5 year inspection and maintenance activities in accordance with guidance provided by industry standards.

9.6.4 Response Times

KMC has a planning standard to identify the maximum times by which specific activities are anticipated to occur. The planning standard is used to strategically locate people and equipment to ensure a prompt response to any event involving the Trans Mountain Pipeline. These response times are for planning purposes only and do not act as target times. All incidents are responded to immediately upon notification of a potential incident or at the confirmation of an incident. Response times are reviewed after any event requiring activation of the Emergency Response Plans to ensure they are adequate and effective. Response times are divided into six response targets and are measured from the time an emergency is confirmed.

Activity	Response Time
Confirmed Emergency – Shutdown of Operations	Immediate
Internal Emergency Response (ERL) conference call	30 Minutes
Initial Site Safety Assessment	1 Hour
Emergency Response Equipment on-site	2 Hours
Emergency Response Equipment deployed	6 Hours
Incident Command Post established	6 Hours
Advanced Response Equipment	12 Hours
Additional Equipment as needed	24+ Hours

9.6.5 Equipment Requirements

To determine equipment placement and requirement the worst case discharge volume is used. The worst case discharge volume is calculated based on the highest volume for each response zone using the highest volume for each of the following criteria:

- The maximum time to detect the release, plus the maximum shutdown response time multiplied by the maximum flow rate per hour, plus the largest line drainage volume after shutdown;
- The maximum historic discharge from the pipeline; or
- The largest single breakout tank or battery of breakout tanks, without a secondary containment system.

Emergency Response Plan

9.6.6 Mobile Spill Equipment List

KMC Location	Boat	Boom Trailer	Decon Trailer	OSCAR Trailer	Rapid Response Trailer	Wildlife Response Trailer	Wildfire Trailer	Winter Response Trailer
Gainford Station	х	х		х				x
Edson Station			х					
Jasper Station	х	х		х		x		x
Rearguard Station			х	х				
Blue River Station	х	х		х			х	x
Blackpool Station			х					
Kamloops Terminal	х	х		х		х	х	x
Kingsvale Station		х	х					
Hope Station	х				х			
Sumas Station		х	х			x		
Burnaby Terminal	х			х				
Westridge Marine Terminal	x							
Laurel Station	x			x				
Burlington Station				х				

9.6.7 Mobile Fire Equipment List

KMC Location	Fire Foam Trailer	Fire Hose Trailer	Fire Truck	Foam Bladder Trailer	Foam Cannon	Portable Fire Pump
Edmonton Terminal	х	х		x	х	
Gainford Station						
Edson Station	x					
Kamloops Terminal			X			
Sumas Station	x					
Sumas Tank Farm						х
Burnaby Terminal	х	х			х	х
Westridge Marine Terminal				х		

9.6.8 Contractors, Contractor Equipment and Labor

Kinder Morgan's primary response contractors and support services are private entities with which KMC has a contractual relationship. The removal of this information follows the requirements of The Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation). The information is provided on a controlled basis within the confidential appendix of this manual.

9.7 Decontamination Plan

All personnel and equipment must go through a decontamination process to ensure spilled material does not contaminate a larger area than needed. The Decontamination Group Supervisor will work under the Recovery and Protection Branch Director. The Decontamination Group Supervisor is responsible for creating and implementing the Decontamination Plan. A copy of the Decontamination Plan form can be found in E:\Manuals\Emergency Management\ICS Guide and Forms\ICS Guide Job Aids.

9.8 Public Evacuation Plan

The Incident Commander and other company employees shall cooperate and work closely with responding emergency agencies. Appropriate information will be provided as required to enable community emergency operations to be conducted.

KM personnel will work with local authorities to assist with the preparation of an evacuation plan, when requested. KMC will at the very least provide company spokespeople at any evacuation/reception centre to answer questions from the public, if the local authority does not require help to develop the evacuation plan. This plan will take into consideration the following:

- Weather conditions
- Evacuation sites for receiving evacuees
- Ensuring that all residents of the area to be evacuated receive emergency instructions
- Time it will take for evacuation
- Method for evacuation
- Evacuation routes
- Capacity of the evacuation routes
- Awareness of the needs of "special needs" people
- Awareness of the needs of farm animals and pets
- Security of evacuated properties
- Notification for controlled re-entry into the area.

The public evacuation guideline can be found in E:\Manuals\Emergency Management\ICS Guide and Forms\ICS Guide Job Aids.

If the public is immediately threatened in the initial stages of the incident and evacuation is required before local response agencies arrive at the scene of the emergency, the Incident Commander must ensure public protection and may request available company personnel to initiate an evacuation and/or site perimeter security, which may include roadblocks. Evacuation duties will be turned over to local response agencies as soon as possible.

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9.8.1 Post Evacuation Procedures

The Incident Commander, together with local emergency agencies and pertinent government agencies, will make the decision to return residents to the area. KMC will work with the local authorities to determine the procedures for returning to the area.

10.0 PLANNING SECTION

The Planning Section is responsible for the gathering of incident intelligence, and the development of Incident Action Plans. This includes the tracking of incident information and resources, and the documentation of the incident. Detailed duties and responsibilities for individuals in the Planning Section can be found in the Kinder Morgan Canada Incident Command System Guide on E:\Manuals\Emergency Management\ICS Guide and Forms.

Technical Specialists, i.e., fire or oil spill specialists will also be assigned to the Planning Section.



10.1 Planning Section Chief

The Planning Section Chief, a member of the General Staff, is responsible for collecting, evaluating, disseminating, and using information about the incident and status of resources. Information is needed to:

- 1) understand the current situation,
- 2) predict probable course of incident events, and
- 3) prepare alternative strategies for the incident.

Emergency Response Plan

10.2 Planning Section Organization Chart

Not all roles will be filled for all incidents; however the following chart is an outline of the possible positions to be filled. Detailed descriptions of each position and its duties can be found in the Kinder Morgan ICS Guide.



10.3 Monitoring and Sampling

10.3.1 Spill Monitoring

Visual observations of spilled product will be reported using a standard format on a map. If weather allows, the best surveillance is done from helicopter overflights. Overflights should be planned at least twice per day; at first light and just prior to sunset to provide timely input to operations plans. Overflight observations should be annotated on maps or charts of the area, and preferably include photography or video recordings of the oiled and non-oiled areas.

Emergency Response Plan

Note: For tank farms the surrounding area will be monitored to ensure the spill has not left the KMC property.

10.3.2 Sampling

Oil samples will be collected from the source of the spill and from key concentrations of oil in the environment. Source samples should be collected as soon as possible after the incident to help characterize the spilled oil. Field samples should be collected to characterize the oil that has impacted shorelines or sensitive areas.

All samples for chemical analysis must be collected in chemically clean jars, sealed, labelled, and kept refrigerated until processed in the laboratory. **Chain-of-Custody** forms must be initiated by the person collecting the samples and maintained through delivery to the laboratory. Specific lab analyses to be performed will depend on the situation and needs to be established at the time of the incident. Accredited laboratories, to be recommended by Technical Advisors at the time of an incident, are to be used for all analyses.

10.4 Demobilization

KMC will develop a Demobilization Plan, to ensure the resources available are what is required. Therefore, emphasis must be placed on establishing efficient demobilization procedures. Further information on he Demobilization Unit Leader is available in the Incident Command System Guide located on e:\manuals

10.4.1 Demobilization Procedures

- Operations Section will determine which resources are ready for release from a specific collection site
- The Planning Section will provide guidance on release priorities and demobilization recommendations
- Information maintained by the Planning Section will be utilized to assist in the prioritization
- Decontaminated equipment will be returned to appropriate staging area for release or redeployment
- Transports for equipment will be required if remote from staging area
- The Planning Section will document all demobilization and decontamination activities
- Equipment designated for re-assignment will be mobilized to the appropriate staging area
- The Division Supervisor will ensure a log is maintained documenting that proper decontamination procedures are performed for each piece of equipment
- The Operations Section will ensure that redeployed personnel receive proper rest prior to returning to duty. The Planning Section Chief will monitor personnel redeployment activities to ensure number of hours worked is within acceptable guidelines

Emergency Response Plan

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10.5 Fate of Spilled Oil

Different oil products behave very differently when spilled. The below chart provides an estimate of how each product would behave in a marine spill. In some cases, i.e., a Jet Fuel spill, emulsification can increase the volume of oily mixture to be recovered. With heavier products, such as Crude Oil, evaporation will reduce the volume of oil requiring recovery to a maximum of about 50%. In all cases, predictive models, should be run in the event of a spill, based on specific spill conditions.



is shown as a percentage of the original volume spilled

10.6 Shoreline Cleanup Assessment Technique (SCAT)

The SCAT process is conducted as part of the overall planning activity to identify sensitive shoreline resources, develop appropriate protection plans as outlined above, and identify recommended pretreatment and cleanup techniques. A SCAT Team Leader, under the Environmental Unit Leader, is responsible for coordinating and directing these activities.

The specific goals of the SCAT process are to:

- identify the shoreline areas that are, and are not, oiled as a result of the spill through aerial • surveys
- conduct ground surveys of these areas if necessary to define precise oil conditions, • operational limitations, and to establish clean-up locations and priorities
- determine the most environmentally-suitable methods of clean-up based on shoreline type • and characteristics
- conduct and monitor shoreline clean-up operations

A comprehensive, practical description of the SCAT process is contained in Environment Canada's Oil Spill SCAT Manual for the Coastlines of British Columbia.

10.7 Air Monitoring Plans

KMC contractors will conduct air monitoring during an unplanned release event to obtain accurate and reliable data. KMC will utilize the Air Monitoring Plan to determine action level criteria and subsequent actions to be taken to protect the public and all workers. KMC will continue its initial air monitoring until additional equipment and resources arrive. The Air Monitoring Plan is a supplemental document to the emergency response plan stored in E:\Manuals\Emergency Management\ICS Guide and Forms, however the following page contains the decision tree that assists responders in making decisions during an incident.

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Air Monitoring Plan

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1.0 DEFINITIONS & ACRONYMS

1.1 Definitions

Action Level Criteria	Criteria used by the Response Team to alert the KMC EUL that levels outside the exclusion zone are elevated and response strategies may need to be changed.
Direct Reading	Instruments that permit real-time measurements of air contaminants.
Exclusion Zone	Area where contamination or product hazards are expected. Exclusion zone is determined by the KMC Incident Commander.
Field Monitors	A member of the Response Team who conducts air monitoring using direct reading and analytical sampling.
Ghost Response Team	A group of individuals identified as having have the training and qualification necessary to conduct the Response Team responsibilities and may be available to respond to the unplanned release and/or fire.
Grab Sample	A single sample of air collected at a particular time and place that is analysed for contaminant composition.
Guideline Criteria	Guideline Criteria are airborne concentrations of chemicals that, if exceeded for a sustained period, may warrant actions by the Unified Command to protect impacted community areas and/or recommend shelter-in- place or evacuations if conditions persist. They do not represent chemical concentrations that necessarily produce health effects from short duration exposures, nor should they be used to set guidelines for repatriation and long-term exposure.
ICS 201	An Incident Command System form designed to brief involved parties on the situation, objectives and strategies to mitigate or control the product release and/or fire.
Incident Command System	A standardized on-site management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure (as per ICS Canada website).

	Air Monitoring Plan
1-888-876-6711	Emergency Response Plan
ISHSP	The Initial Site Health & Safety plan that aids the initial responders in assessing hazards related to the incident, states the PPE requirements, documents important health and safety information, assigns responsibilities, identifies site set-up features and authorizes work to be completed. It serves as an interim Plan until the "Site Health & Safety Plan" is developed.
Long-interval sampling	Collection of air samples on media over a pre-determined length of time, for submission to a laboratory for analysis.
Mobile Unit	A mobile vehicle or trailer with more accurate and responsive real-time monitoring equipment than hand-held devices. At the discretion of KMC, this unit may be deployed in areas where there is a large uncontrolled product release and/or fire or in proximity to sensitive receptors.
Potential Chemicals of Concern (PCOC)	A pre-determined list of chemicals that may be released to atmosphere during a product release or fire.
Product release	Any liquid hydrocarbon released from KMC site, equipment or facilities.
Qualified Person	A person with adequate training and experience to be deemed competent.
Receptors	The public population outside of the exclusion zone, at risk of exposure to contaminants during a product release and/or fire.
Response Team	A team of KMC staff and external third parties, who are prepared and trained to respond in the event of a product release and/or fire.
Response Team–Unit Lead	Directs activities of the Response Team and
Sensitive Receptors	Receptors that may be more susceptible to PCOC exposures and are given additional considerations when developing sampling strategies and monitoring.
SHSP	A more specific and detailed version of the Initial Site Health & Safety Plan
Tier 1 Compounds	PCOC's that will be measured during the initial phases of monitoring. These PCOC's have been selected based on their ease of direct monitoring and use as an indirect indicator for other air contaminants.

Tier 2 CompoundsAll PCOC's that have been identified in crude oil, refined
product or isooctane. These chemicals will be measured
if thresholds for Tier 1 compounds have been exceeded.
Tier 2 compounds are measured by both direct reading
and analytical media.

1.2 Acronyms

AAQO	Ambient Air Quality Objectives
AEGL	Acute Exposure Guideline Levels
AIHA (LAP)	American Industrial Hygiene Association – Laboratory Accredited Program
BC CSR	British Columbia Contaminated Sites Regulation
BEI	Biological Exposure Indices
CAS	Chemical Abstract Services
СО	Carbon monoxide
EPEA	Environmental Protection and Enhancement Act
EUL	Environmental Unit Lead
Hr	hour
H₂S	Hydrogen Sulphide
ICS 201	Incident Command System Form 201
ISHSP	Initial Site Health and Safety Plan
ISLMS	Integrated Safety and Loss Management System
КМС	Kinder Morgan Canada
LEL	Lower Explosive Limit
LLC	Limited Liability Company
mg/m³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
NO ₂	Nitrogen dioxide
PAH	Polycyclic aromatic hydrocarbons
PCOC	Potential Chemicals of Concern
PM ₁₀	Particulate matter measuring less than 10 micrometers in diameter
PM _{2.5}	Particulate matter measuring less than 2.5 micrometers in diameter
ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
SHSP	Site Health and Safety Plan
SO ₂	Sulphur Dioxide
TLV	Threshold Limit Value
TVOC	Total Volatile Organic Compounds
µg/m³	micrograms per cubic meter
US EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds (and Total VOC, TVOC)
VPHv	Volatile Petroleum Hydrocarbons

2.0 <u>PURPOSE & SCOPE</u>

2.1 Purpose

To identify, characterize and minimize public exposures to PCOC in the event of an unplanned product release and/or fire from a KMC site, facility or process.

2.2 Objectives

The objectives of this program are to:

- Proactively anticipate and identify PCOC hazards from unplanned releases and fires;
- Evaluate, via proper monitoring principles, public health exposures (potential and real);
- Protect public through the development and implementation of specific air monitoring and response protocols.

2.3 Scope

This program applies to all KMC Employees and Contractors that may respond to an uncontrolled product release and/or fire from a KMC site, facility or process in British Columbia, Alberta or Washington (USA) from a public health perspective. The scope of this program is limited to air quality to PCOCs outside the exclusion zone that may impact the public. KMC has developed an Incident Command System and Emergency Response Plans/Procedures that relate to requirements inside the exclusion zone (as defined by the KMC Emergency Response Plan). This Program will be incorporated into the overall Emergency Response Plan developed by KMC.

3.0 APPLICABLE STANDARDS AND GUIDELINES

The following objectives, guidelines and standards are used in determining the applicable action level criteria for PCOC in the event of an unplanned release or fire:

- Alberta Occupational Health and Safety Code, Occupational Exposure Limits for Chemical Substances Schedule 1 Table 2
- WorkSafe BC, Occupational Health and Safety Regulation, Table of Exposure Limits
- Department of Health (Health Canada) document 93-EHD-166 Indoor Air Quality in Office Buildings: A Technical Guide.
- American Conference of Governmental Industrial Hygienists, 2015 TLVs and BEIs
- USEPA Subcommittee on Consequence Assessment and Protective Action (SCAPA) Protective Action Criteria (PACs), February, 2012

Although this Program relates to the public and the expectation is that low level concentrations for PCOC may be found, the Response Team must be able to identify when there is an elevated concern in the community and when to inform the KMC EUL of this concern, either based on changing site conditions, wind patterns, etc. As such, Guideline and Action Level Criteria have been developed for Tier 1 compounds. The Action Level Criteria are not to be interpreted as safe or unsafe levels and have been loosely adapted from occupational or industrial hygienic criteria. Where the occupational criteria are typically for 8-hour exposures, Action Level Criteria will be based on spot measurements. Long-term ambient air quality standards are not employed in emergency situations because they are not intended to advise first responders on whether the public and sensitive receptors are at risk in the short term. Ambient air quality objectives may be adopted when it comes to repatriation or allowing the public to return to the areas of concern.

Emergency Response Plan

The following long-term ambient objectives and guidelines would be used when acute criteria are not appropriate in an emergency situation:

- BC Ambient Air Quality Objectives, Updated October 21, 2014
- Alberta Ambient Air Quality Objectives and Guidelines, Issued August 2013
- Washington State Ambient Air Quality Standards, Issued November 2013
- USEPA Regional Screening Levels for Residential Air, June 2015

4.0 ROLES & RESPONSIBILITIES

The following personnel are responsible and accountable for carrying out their specific duties to complete the requirements under this Program.

4.1 Kinder Morgan Canada – Environmental, Health and Safety Department

- Endorse and promote this Program;
- Ensure the Response Team are informed of the contents of this Program;
- Assign clear roles and responsibilities;
- Assign program administration to a qualified and competent Program Administrator;
- Assign a qualified and trained KMC EUL to coordinate and approve the Response Team Activities;
- Assign a qualified and trained Response Team to develop a strategy and conduct the required monitoring;
- Ensure required tools, resources and support is provided, and utilized by the KMC EUL and the Response Team;
- Ensure this program is reviewed annually or sooner, when required.

4.2 Kinder Morgan Environmental Unit Lead

- Liaise between with the Emergency Response Personnel and Response Team referred in this Program;
- Verify and approve the development and implementation of sampling strategies;
- Provide the necessary documentation and instruction (as outlined in this Program) to the Response Team; and
- Forward documents/records to the Program Administrator.

4.3 Response Team/Field Monitors (Third Party Contractor)

- Facilitate monitoring as per the requirements of this Program;
- Participate in education and training in relation to this Program;
- Properly inspect, verify functioning, use and maintain sampling equipment and other equipment, as per their training and the manufacturer's specifications;
- Tag out and remove from service damaged/non-functional monitoring equipment, and repair/replace the equipment, prior to use; and
- Assist in identifying, characterizing and minimizing public health exposures to the chemicals identified.

4.4 Response Team – Unit Lead (Third Party Contractor)

In addition to the Response Team roles and responsibilities in (Section 4.3)

- Liaise between the KMC EUL and the Response Team;
- Submit sample strategies to the KMC EUL for approval prior to implementation;
- Revise sample strategies as required given site conditions and activities;
- Submit Daily and Completion Reports to the KMC EUL as required;
- Verify the Response Team has the necessary qualifications and training; and
- Forward other documents/records to the KMC EUL as requested.

4.5 Program Administrator (Kinder Morgan Canada - Air Quality Environmental Specialist):

- Administer this Program and its contents;
- Maintain and file relevant documents/records in accordance with the KMC file management protocols; and
- As required, review and make revisions to this Program and its contents in collaboration with KMC Management.

5.0 <u>SAMPLE STRATEGY – GENERAL REQUIREMENTS</u>

5.1 Pre-Planning

On notification that an unplanned event or fire has occurred, the Response Team will begin planning as soon as possible and no later than 24 hours after notice. Pre-planning will include a review of the following details:

- Incident details
- Emergency response actions
- Initial air monitoring
- MSDS's
- PCOC
- Required PPE
- Monitoring equipment availability
- Sample media availability
- Laboratory capabilities
- Travel/accommodation logistics
- Public complaints (if any)
- Nearby Receptors
- Sensitive Receptors
- Location Map
- Ghost Response Team

KMC will collect site information using documents ICS 201 and the ISHSP. Once this information is collected it will be forwarded to the Response Team – Unit Lead who will utilize this information in the pre-planning stage. Refer to Appendix I – Response Team Manager Contact List

5.2 Sampling Strategy

Various factors are involved when deciding how to best approach the monitoring during/after an unplanned product release and/or fire. The strategy for monitoring will depend on a variety of factors including, but may not be limited to:

Incident details – Location (i.e. urban versus remote), type and amount of product released and/or on fire, MSDSs, description of the environmental impacts (i.e. soil, water), site air monitoring results. **Receptors** – Location in relation to unplanned release and/or fire (i.e. distance, down-wind/stream, up wind/stream), type of receptors (i.e. intermediate, commercial, industrial, farmland, residential, schools, daycares, hospitals, immune compromised individuals).

Location Details – Urban versus remote, accessibility, weather conditions, flooding, run-off, inversions, exclusion zone boundary, private versus public land, aerial maps.

<u>Sample Methodologies</u> – Equipment/Sample Media capability (i.e. range, resolution, specificity), availability, chemical interferences, previous results, data extrapolation, laboratory capabilities.

The Response Team will discuss the above details to determine the most practical sampling strategy. Sample strategy details are outlined in the Air Sampling and Analysis Plan found in **Appendix II**. *The Air Sampling and Analysis Plan* will be updated as necessary during the course of monitoring. All revisions will be discussed by the Response Team and the sample strategy form will be updated by the Response Team – Unit Lead as required.

5.3 Monitoring Equipment

Direct Reading Monitors

Direct reading monitors that may be used include the following:

- PPB RAE (TVOC's ppb)
- Mini RAE (TVOC's ppm)
- Multi-RAE (Lite, Regular or Pro), Q-RAE Plus or VRAE (H2S, SO2, LEL, CO, NO2)
- Jerome H2S Analyzer (H2S) (Note: this unit is not intrinsically safe).
- Ultra RAE or Ultra RAE-3000 (benzene when equipped with benzene SEP tubes)
- SidePak AM510 Aerosol Monitor or Dusttrak DRX Aerosol Monitor (Not intrinsically safe) (PM10, PM2.5)
- GPS device

Application and operational information for direct reading monitoring equipment as it pertains to monitoring during an unplanned event or fires can be found in **Appendix III**, *Sampling Methodologies*.

Direct reading information in the field will be collected on the *Direct Reading Air Monitoring Sampling* Forms found in **Appendix IV** (Unplanned Release) and **Appendix V** (Fire) or when available digitally to be communicated in real time to the Incident Command Post. When available, a GPS device will be used to record the coordinates of sampling locations.

Analytical Sampling

Analytical sampling includes collection of samples in the monitoring area using valid and established methods and submitting these samples to an accredited laboratory for analysis. This type of monitoring is generally more sensitive and will be used when additional chemical information and sensitivity is needed. Decision to collect analytical samples will be mainly due to results of real-time air monitoring and colorimetric tubes as well as the limitations of any such monitoring. Initial monitoring may be done

to assist in determining the relationship between a group of chemicals and its constituents (i.e. TVOC and VOC, PM10,2.5 and PAH's)

Equipment that may be used for analytical sampling, include but may not be limited to:

- Air sampling pumps;
- Primary calibrators;
- Summa canisters;
- Sampling media
 - Thermal Desorption Tubes (various VOC's)
 - Treated Glass Fiber Filter (mercaptans)
 - PTFE Filter Cassette (coal tar pitch volatiles)
 - Activated Charcoal (Isooctane)

Application, methodology and equipment/media used for analytical sampling can be found in **Appendix III**, *Sampling Methodologies*.

Air sampling information will be collected on the Air Sampling form found in **Appendix VI**. This form will be submitted to the laboratory with the COC for analytical samples.

5.4 Field Data

Field data will be recorded by the Response Team on an ongoing basis using the appropriate data recording forms found in **Appendix IV**, **V** and **VI**. Daily inspection reports will be produced by the Response Team summarizing the activities, conditions and sampling. A copy of the daily inspection reports for unplanned releases and fires can be found in **Appendix VII** & **VIII** respectively, *Daily Inspection Report – Unplanned Release* and *Daily Inspection Report – Fire*. The inspection report will be submitted daily or sooner if there are any milestone events that occur (i.e. phase of on-site clean-up completed, significant weather changes, exclusion zone expansion/contraction). The report will include, but is not limited to, the following information:

- Clean-up activities/status
- Control status of unplanned release and/or fire
- Wind direction/intensity
- Weather conditions (e.g. temperature, precipitation, humidity)
- Sensitive receptor description/locations
- Summary of PCOC's
- Summary of sample locations (including latitude and longitude coordinates)
- Summary of direct reading sample results
- Summary of analytical samples collected

6.0 <u>SAMPLE STRATEGY – UNPLANNED RELEASE</u>

6.1 Potential Chemicals of Concern

Potential chemicals of concern for an unplanned release are determined by incident details (e.g. volume, product characteristics). The list of chemicals has been pre-determined by KMC based on available chemical product information. Unplanned releases have typically been crude oil, refined product and/or isooctane.

The list of PCOCs originally identified by KMC would be difficult to manage in the event of an emergency unplanned release, mostly due to the lack of direct reading monitors for many of the compounds. Through analysis of previous VOC scan results on petroleum products and side by side monitoring with direct reading monitors and analytical monitoring, it has been determined that the majority of the sampling can be conducted using real time monitors, especially during the initial monitoring phase. The Program will then outline when it may be appropriate to conduct further laboratory based monitoring, using thresholds established from the direct reading results. This initial monitoring will be designated as Tier 1 Unplanned Release Monitoring, with any further monitoring designated as Tier 2 Unplanned Release Monitoring. Table 6-2 outlines the Tier 1 unplanned release compounds:

Table 6-2 – List of all Tier 1 PCOC identified by KMC – Unplanned Release

Product Type: Crude Oil				
Benzene*	Sulfur dioxide			
Total volatile organic compounds	Hydrogen sulfide			

Where specific equipment for direct reading of benzene is not available in a timely fashion, levels of benzene will be estimated utilizing a 1% of TVOC approach.

Benzene is known to naturally occur in crude oil and is also a by-product of processing crude oil. The most in depth study for Canadian crude oil and gasoline estimates benzene at approximately 0.33% and 1.6% respectively¹. In addition, Canada has implemented regulations limiting the amount of benzene to 1% by volume in refined product. An estimate of 1% benzene in TVOC content may be used as screening criteria for Tier 1 unplanned release compounds. While 1% may not be the most restrictive criteria based on the literature reviewed, it has been chosen based on the ease of use for field personnel and for the purpose being used, still provides a significant margin of control given that the guideline criteria for benzene (i.e. 0.009 ppm) is very low (~ one fifty-fifth of the ACGIH 2014 TLV) and the variation in benzene concentration at these low levels would not be so significant to warrant additional actions during the screening period.

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Product Type: Crude Oil and Gasoline				
Benzene	 Isopropylbenzene (cumene) 			
Toluene	n-decane			
Ethylbenzene	n-hexane			
Xylenes	Methylcyclohexane			
Naphthalene	Methanethiol			
 1,3-butadiene 	Ethanethiol			
 1,2,4-trimethylbenzene 	 sec-butyl mercaptan 			
 1,3,5-trimethylbenzene 	Hydrogen sulfide			
Sulfur dioxide	VPHv			
Product Type: Added to	List for Only Gasoline			
Ethanol				
Product Type: List	for Only Isooctane			
Isooctane				

Table 6-1 outlines PCOCs, action levels and monitoring details for various unplanned release types:

Table 6-1 – List of all PCOC identified by KMC – Unplanned Release

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1-888-876-6711

¹ Dave K. Verma & Karen des Tombe (2002) Benzene in Gasoline and Crude Oil: Occupational and Environmental Implications, AIHA Journal, 63:2, 225-230, DOI: 10.1080/15428110208984708

6.2 Applicable Criteria and Response

Applicable criteria for all the unplanned release PCOC have been determined as per Section 3.0 of this Program. The following table summarizes the Acute Health-Risk Air Monitoring Criteria and Source:

Parameter	CAS Number	Guideline Criteria ¹	Units	Source ²
		Tier 1 Compoun	ds	
Hydrogen sulphide	7783-06-4	0.51	ppm	PAC-1 (AEGL 1-hr average)
Sulphur dioxide	7446-09-5	0.2	ppm	PAC-1 (AEGL 1-hr average)
Benzene	71-43-2	0.05	ppm	UltraRAE detection limit
TVOCs	NA	0.4	ppm	Health Canada, Indoor Air Quality in Office Buildings: A Technical Guide (Revised 1995)

Table 6-3 – Community Acute Health-Risk Air Monitoring Criteria & Source – Unplanned Release

¹Guideline Criteria are airborne concentrations of chemicals that, if exceeded for a sustained period, may warrant actions by the Unified Command to protect impacted community areas and/or recommend shelter-in-place or evacuations if conditions persist. They do not represent chemical concentrations that necessarily produce health effects from short duration exposures, nor should they be used to set guidelines for repatriation and long-term exposure.

Parameter	CAS Number	S Guideline Criteria Ur		Source	
		Tier 2 Compounds			
Ethyl benzene	100-41-4	2	ppm		
Toluene	108-88-3	2	ppm		
Xylenes (Total)	1330-20-7	10	ppm		
n-Hexane	100-54-3	5	ppm	average)	
Isopropylbenzene	98-82-8	5	ppm		
1,2,4-Trimethylbenzene	95-63-6	2.5	ppm		
1,3,5-trimethylbenzene	108-67-8	2.5	ppm		
1,3-butadiene	106-99-0	0.2	ppm	Health Canada, Indoor Air	
Methylcyclohexane	108-87-2	40	ppm	Quality in Office Buildings:	
Naphthalene	91-20-3	1	ppm	A Technical Guide (Revised	
Sec- butyl mercaptan	513-53-1	0.05	ppm	1995) (Spot	
Ethyl mercaptan	75-08-01	0.05	ppm	Measurements)	
Methyl mercaptan	74-93-1	0.05	ppm		
Ethanol	64-17-5	100	ppm		
n-Decane	124-18-5	0.43	ppm	British Columbia	
C6-C13 Hydrocarbons (VPHv)	NA	0.2837	ppm	Contaminated Sites Regulation 375/96, Schedule 11 (Spot Measurements)	

Table 6-3 – Community Acute Health-Risk Air Monitoring Criteria & Source – Unplanned Release

Emergency Response Plan

As discussed in Section 6.1, a two tier sampling strategy will be used in order to efficiently determine if the unplanned release Acute Health Risk Air Monitoring Criteria has or has the potential to be exceeded. As such, guideline criteria for the Tier 1 unplanned release compounds using specific direct reading instruments have been developed as outlined in Table 6-4.

and Recommended Direct Reading mati unem				
Parameter	Direct Reading Instrument			
Hydrogen sulphide	Jerome H2S Analyzer or Rae Systems H2S Sensor			
Sulphur Dioxide	QRAE Plus, Multi RAE (Lite, Regular or Pro) or VRAE			
Benzene	1ppbRAE, 2Ultra-RAE or Ultra-RAE-3000 with benzene sep tube			
TVOCs	ppbRAE			

Table 6-4 – Tier 1 Unplanned Release Air Monitoring Parameters and Recommended Direct Reading Instruments

Please refer to *Air Sampling and Analysis Plan* **Appendix II** that would be executed in the event of an unplanned release or fire for the action level criteria. The guideline criteria may differ from the action level criteria expressed in the Air Sampling and Analysis Plan to ensure timely response for the incident command center to adjust or modify the sampling plan to reflect the conditions present. Based on the sampling results for the Tier 1 compounds, consideration will be made to conduct sampling for Tier 2 unplanned release compounds. Tier 2 unplanned release sampling includes analytical air sampling for the following chemicals using the described method. Refer to Table 6-5.

If Tier 1 unplanned release criteria are exceeded, KMC will consult with the Regulatory and Public Health Authorities as well as the Response team involved in the Unified Command to determine appropriate steps to protect the public. As a result, local health authorities may recommend shelter in place or evacuation.

and Analytical Sampling Method – Onplained Release					
Parameter	Analytical Method				
Benzene					
Ethyl benzene					
Toluene					
Xylenes (Total)					
n-Hexane					
Isopropylbenzene					
TVOC	TO 17 (modified) NIOSH				
1,2,4-Trimethylbenzene					
1,3,5-trimethylbenzene	1501				
1,3-butadiene					
Methylcyclohexane					
Naphthalene					
n-Decane					
VPHv					
Ethanol					

Table 6-5 – Tier 2 Acute Health Risk Air Monitoring Parameters and Analytical Sampling Method – Unplanned Release

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Parameter	Analytical Method			
Sec- butyl mercaptan				
Ethyl mercaptan	NIOSH 2542			
Methyl mercaptan				
Isooctane	OSHA ID-07			
Isooctane	OSHA ID-07			

7.0 <u>SAMPLE STRATEGY – FIRE</u>

7.1 Potential Chemicals of Concern

PCOC for fires are determined by incident details (e.g. volume, product characteristics). The list of chemicals has been pre-determined by KMC based on available chemical product information. Fires may involve crude oil, refined product and/or isooctane.

Table 7-1 outlines PCOCs for various fire types:

Product Type: Crude Oil and Gasoline					
Benzene	 Isopropylbenzene (cumene) 				
Toluene	n-decane				
Ethylbenzene	 n-hexane 				
Xylenes	 Methylcyclohexane 				
Naphthalene	Methanethiol				
• 1,3-butadiene	Ethanethiol				
 1,2,4-trimethylbenzene 	 sec-butyl mercaptan 				
 1,3,5-trimethylbenzene 	Hydrogen sulfide				
Sulfur dioxide	VPHv				
Carbon monoxide	Nitrogen dioxide				
• PM2.5	• PM10				
Ozone	Acenaphthene				
Anthracene	 Benzo(a)pyrene 				
 Benzo(k)fluoranthene 	 Dibenz(a,h)anthracene 				
Fluorene	Pyrene				
 1-methyl-7-(1-methylethyl)phenanthrene 	1,2-dibromoethane				
1,2-dichloroethane	Acenaphthylene				
Benz(a)anthracene	 Benzo(g,h,i)perylene 				
Chrysene	Fluoranthene				
 Indeno(1,2,3-c,d)pyrene 	Phenanthrene				
Product Type: Added to List for Only Gasoline					
Ethanol					
Product Type: List for Only Isooctane					
Isooctane					

Table 7-1 – List of all PCOC identified by KMC - Fire

As with an unplanned release, the list of PCOCs for a fire originally identified by KMC would be difficult to manage in the event of a fire, mostly due to the lack of direct reading monitors for many of the compounds. See section 6.1 for TVOC and VOC discussion which is also relevant to PCOCs due to a fire. In addition, there are no direct reading monitors for the select PAHs identified as PCOCs during a

fire. These chemicals are a product of incomplete combustion of organic fuels and may be present in the plume of smoke created during a fire. The PAHs generated during a fire are typically emitted as bound to particulate matter and as such, direct monitoring for PM10 and PM2.5 will be used as a an indirect indicator of the levels of PAHs present. Research has shown low levels of PAHs (less than 0.01 ppm) in the plume of experimental oil burns and they are regarded as presenting only a small exposure hazard, especially at distances from the source where public health may be of a concern¹.

As with TVOC's, the Program will then outline when it may be appropriate to conduct further laboratory based monitoring, using thresholds established from the direct reading results.

7.2 Applicable Criteria and Response

This initial fire monitoring will be designated as Tier 1 Fire Monitoring, with any further monitoring designated as Tier 2 Fire Monitoring. Table 7-2 outlines the Tier 1 Fire Compounds:

Product Type: Crude Oil						
Benzene*	Sulfur dioxide					
 Total volatile organic compounds 	Hydrogen sulfide					
Carbon monoxide	Nitrogen dioxide					
• PM10	• PM2.5					

Table 7-2 – List of Tier 1 Fire Compounds

*Where specific equipment for direct reading of benzene is not available in a timely fashion, levels of benzene will be estimated utilizing a 1% of TVOC approach.

These criteria will be used by the Response Team to alert KMC EUL that levels outside the exclusion zone are elevated. The KMC-EUL may use these data to assist in determining if the exclusion zone should be expanded.

As discussed in Section 7.1, a two tier sampling strategy will be used in order to efficiently determine if the Acute Health Risk Air Monitoring Criteria for fires has been, or has the potential to be, exceeded. As such, guideline criteria for the Tier 1 compounds using specific direct reading instruments have been developed as outlined in Table 7-3.

and Recommended Direct Reading Instruments				
Daramotor	Direct Reading			
Faiaillelei	Instrument			
	Jerome H ₂ S Analyzer or	1		
Hydrogen sulphide	Rae Systems H ₂ S			
	Sensor			
	QRAE Plus, Multi RAE	1		
Sulphur Dioxide	(Lite, Regular or Pro) or			
	VRAE			
Panzana	¹ ppbRAE, ² Ultra-RAE or			
Delizerie	Ultra-RAE-3000 with			

Table 7-3 – Tier 1 Air Monitoring Criteria and Recommended Direct Reading Instruments – Fire

¹ Barnea, N (n,d) Health and Safety Aspects of In-situ Burning of Oil, National Oceanic and Atmospheric Administration, Seattle, WA 98115 USA, last updated Jan. 26, 2012

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Parameter	Direct Reading			
	Instrument			
	benzene sep tube			
TVOCs	ppbRAE			
Carbon monoxide	QRAE Plus, Multi RAE			
Nitrogon diovido	(Lite, Regular or Pro) or			
Nillogen aloxide	VRAE			
PM ₁₀	Dusttrak AM510 Aerosol			
10	Monitor or Dusttrak DRX			
PM _{2.5}	Aerosol Monitor			

7.3 Applicable Criteria and Response

Applicable criteria for all the fire PCOCs have been determined as per Section 3.0 of this Program. The following table summarizes the Acute Health-Risk Air Monitoring Criteria and Source for fires:

Parameter	CAS Number	Guideline Criteria ¹	Units	Source
	-	Tier 1 Compoun	ds	-
Hydrogen sulphide	7783-06-4	0.51	ppm	PAC-1 (AEGL 1-hr average)
Sulphur dioxide	7446-09-5	0.2	ppm	PAC-1 (AEGL 1-hr average)
Benzene	71-43-2	0.05	ppm	UltraRAE detection limit
TVOCs	NA	0.4	ppm	Health Canada, Indoor Air Quality in Office Buildings: A Technical Guide (Revised 1995)
Carbon monoxide	630-08-0	2.5	ppm	10% of ACGIH TLV (8-hr average)
Nitrogen dioxide	10102-44- 0	0.5	ppm	PAC-1 (AEGL 1-hr average)
PM10	N/A	0.138	mg/m ³	California Wildfire Smoke Guidelines for 1 hr avg. upper-bound breakpoint for unhealthy for sensitive groups AQI

 Table 7-4 – Community Acute Health-Risk Air Monitoring Criteria & Source - Fire

¹Guideline Criteria are airborne concentrations of chemicals that, if exceeded for a sustained period, may warrant actions by the Unified Command to protect impacted community areas and/or recommend shelter-in-place or evacuations if conditions persist. They do not represent chemical concentrations that necessarily produce health effects from short duration exposures, nor should they be used to set guidelines for repatriation and long-term exposure.

Emergency Response Plan

	Table 7-4 – Community	Acute Healt	h-Risk Air	Monitoring	Criteria	a & Source –	Fire (Cont'd)
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Parameter	CAS Number	Guideline Criteria	Units	Source	
PM2.5	N/A	0.138	mg/m ³	California Wildfire Smoke Guidelines for 1 hr avg. upper-bound breakpoint for unhealthy for sensitive groups AQI	
		Tier 2 Compounds			
Ethyl benzene	100-41-4	2	ppm		
Toluene	108-88-3	2	ppm		
Xylenes (Total)	1330-20-7	10	ppm		
n-Hexane	100-54-3	5	ppm	average)	
Isopropylbenzene	98-82-8	5	ppm		
1,2,4-Trimethylbenzene	95-63-6	2.5	ppm		
1,3,5-trimethylbenzene	108-67-8	2.5	ppm		
1,3-butadiene	106-99-0	0.2	ppm		
Methylcyclohexane	108-87-2	40	ppm	Health Canada. Indoor Air	
Naphthalene	91-20-3	1	ppm	Quality in Office Buildings:	
1,2-dibromoethane	106-93-4	0.05	ppm	A Technical Guide	
1,2-dichloroethane	107-06-2	0.1	ppm	(Revised 1995) (Spot	
Sec- butyl mercaptan	513-53-1	0.05	ppm	Measurements)	
Ethyl mercaptan	75-08-01	0.05	ppm		
Methyl mercaptan	74-93-1	0.05	ppm		
Ethanol	64-17-5	100	ppm		
n-Decane	124-18-5	0.43	ppm	British Columbia	
C6-C13 Hydrocarbons (VPHv)	NA	0.2837	ppm	Contaminated Sites Regulation 375/96, Schedule 11 (Spot Measurements)	
Ozone	10028-15- 6	0.082	ppm	BC AAQO (1-hr average period)	
Isooctane	540-84-1	30	ppm		
Benzo(a)pyrene	50-32-8				
Acenaphthene	83-32-9				
Anthracene	120-12-7				
Benzo(k)fluoranthene	207-08-9			Health Canada, Indoor Air	
Dibenz(a,h)anthracene	53-70-3			Quality in Office Buildings:	
Fluorene	86-73-7			A Technical Guide	
Pyrene	129-00-0	0.00*		(Revised 1995) (Spot	
1-methyl-7-(1- methylethyl)phenanthrene	483-65-8	0.02	mg/m*	Measurements) *Measured as Coal Tar Pitch Volatiles	
Acenaphthylene	208-96-8			(Benzene Soluble Fraction)	
Benz(a)anthracene	56-55-3				
Benzo(g,h,i)perylene	191-24-2	1			
Chrysene	218-01-9	1			
Fluoranthene	206-44-0				

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Parameter	CAS Number	Guideline Criteria	Units	Source
Indeno(1,2,3-c,d)pyrene	205-893-2	. 0.02*	mg/m ³	Health Canada, Indoor Air Quality in Office Buildings: A Technical Guide (Revised 1995) (Spot
Phenanthrene	85-01-8			Measurements) *Measured as Coal Tar Pitch Volatiles (Benzene Soluble Fraction)

Table 7-4 – Acute Health-Risk Air Monitoring	g Criteria & Source – Fire (Cont'd)
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*There is no published occupational exposure criteria for the individual polyaromatic hydrocarbons (PAHs) listed in Table 7-3. The criteria level was determined based on utilizing Coal Tar Pitch Volatiles (benzene soluble fraction) as an indicator of PAHs and utilizing 10% of the ACGIH TLV.

Please refer to *Air Sampling and Analysis Plan* **Appendix II** that would be executed in the event of an unplanned release or fire for the action level criteria. The guideline criteria may differ from the action level criteria expressed in the Air Sampling and Analysis Plan to ensure timely response for the incident command center to adjust or modify the sampling plan to reflect the conditions present. Based on the sampling results for the Tier 1 compounds, consideration will be made to conduct sampling for Tier 2 unplanned release compounds. Tier 2 unplanned release sampling includes analytical air sampling for the following chemicals using the described method. Refer to Table 7-5.

If Tier 1 fire action level criteria are exceeded, KMC will consult with the Regulatory and Public Health Authorities as well as the Response team involved in the unified command to determine appropriate steps to protect the public. As a result, the local health authorities may recommend shelter in place or evacuation and also determine the necessity of a mobile unit.

Parameter	Analytical Method
Benzene	
Ethyl benzene	
Toluene	
Xylenes (Total)	
n-Hexane	
Isopropylbenzene	
TVOC	
1,2,4-Trimethylbenzene	EPA TO-17 (modified) or NIOSH 2549
1,3,5-trimethylbenzene	or OSHA ID-07
1,3-butadiene	
Methylcyclohexane	
Naphthalene	
n-Decane	
VPHv	
Ethanol	
1,2-dibromoethane	
1,2-dichloroethane	

Table 7-5 – Tier 2 Acute Health Risk Air Monitoring Parameter and Analytical Sampling Method – Fire
Parameter	Analytical Method		
Sec- butyl mercaptan			
Ethyl mercaptan	NIOSH 2542		
Methyl mercaptan			
Isooctane	OSHA ID-07		

Table 7-4 – Tier 2 Acute Health Risk Air Monitoring Parameter and Analytical Sampling Method – Fire (Cont'd)

Parameter	Analytical Method
Benzo(a)pyrene	
Acenaphthene	
Anthracene	
Benzo(k)fluoranthene	
Dibenz(a,h)anthracene	
Fluorene	
Pyrene	
1-methyl-7-(1-	NIOSH 5023 or Mathad 5506
methylethyl)phenanthrene	
Acenaphthylene	
Benz(a)anthracene	
Benzo(g,h,i)perylene	
Chrysene	
Fluoranthene	
Indeno(1,2,3-c,d)pyrene	
Phenanthrene	

*Measured as coal tar pitch volatiles – benzene soluble fraction.

Please refer to *Air Sampling and Analysis Plan* **Appendix II** that would be executed in the event of an unplanned release or fire for the action level criteria based on the two different sampling locations:

- Plan 1: Work Area Air Monitoring
- Plan 2: Community Air Monitoring

This criteria outlined in **Appendix II** will be used by the Response Team to alert KMC EUL that levels outside the exclusion zone are elevated. The KMC-EUL may use this data to assist in determining if the exclusion zone should be expanded.

8.0 QUALITY ASSURANCE/CONTROL

The Response Team will make every effort to follow the established QA/QC protocols. To assist, sampling methodologies for all PCOC's have been developed and are included in **Appendix III**, *Sampling Methodologies*. The following were considered while developing the Sampling Methodologies:

- Published valid analytical sampling methods (where available);
- Laboratory capabilities and limitations;
- Calibration requirements; and
- Manufacturer's specifications.

8.1 Sampling Methods

The Response Team will only use valid and established methods while conducting analytical sample collection. This includes but may not be limited to methods published by the:

- U.S. Environmental Protection Agency (EPA) published Test Methods;
- National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, 4th Edition (August 1994), published by the United States Department of Health and Human Services, as amended up to and including the 2nd supplement (January 15, 1998);
- U.S. Occupational Safety and Health Administration (OSHA) published Sampling and Analytical Methods;

The Response Team will ensure that field blanks are collected for each set of samples per specific chemical (or group of chemicals) measured, as per the requirements of the respective method utilized.

For direct reading monitors, manufacturers' specifications will be followed for operation, care, calibration and maintenance.

8.2 Laboratory Selection

The Response Team will only utilize properly accredited laboratories (i.e. AIHA-LAP, LLC) in Canada or the United States. These laboratories have stringent sample analysis quality assurance/quality control protocols. Field Monitors will ensure quality assurance/control protocols regarding sample media shipment requirements are implemented and strictly adhered to, in order to maintain sample integrity during transportation.

Field Monitors will ensure that all sample media information is recorded and documented on the appropriate Chain of Custody form that will be provided by the respective laboratory.

8.3 Sampling/Calibration Equipment

Field Monitors will utilize several different types of sampling equipment to conduct the monitoring. Field Monitors will properly and regularly maintain service and calibrate the selected equipment, refer to Appendix III, Sampling Methodologies for further details on Sampling and Calibration.

8.4 Inspection, Cleaning, Maintenance and Storage

Field Monitors will ensure that:

Prior to each use, equipment is properly inspected for proper functioning, and potential damage or defects;

Non-functioning or damaged equipment is not used, and is removed from service and repaired/replaced;

Equipment is properly cleaned and maintained after each use, to maintain functional integrity; and Equipment is stored and kept in clean, non-contaminated cases and work areas when not in use.

9.0 <u>COMMUNICATION</u>

Communication between the KMC EUL and the Response Team is critical for the success of this Program. The KMC EUL will initiate communication with the Response Team and authorize the Response Team to begin preparation for sampling. As per Section 5.1 the Response Team will begin to mobilize as soon as possible once authorization has been received. Details of the unplanned

product release will be collected from the KMC EUL (i.e. ICS 201, ISHSP). A draft sample strategy (see Appendix II) will be developed and forwarded to the KMC EUL for review. Once approved, authorization to proceed will be given by the KMC EUL and the Response Team will mobilize to conduct the site monitoring.

Once on-site monitoring begins, the Response Team – Unit Lead will communicate results above the Tier 1 Acute Health Risk Criteria to the KMC EUL as soon as possible. If this criterion is exceeded, Tier 2 sampling will be conducted. Sampling results will be continuously evaluated by the Response Team. Monitoring following these methods will continue until Tier 1 Air Monitoring Criteria are not exceeded and the status of the unplanned product release and/or fire is contained and stable.

If levels are above the Action level Criteria (Tables 6-4 and 7-4), the KMC EUL will be notified immediately. Depending on the circumstances immediate consideration will be given to expand the exclusion zone to include areas where high levels are found. The scope of this decision will fall under the requirements on the KMC Emergency Response Plan.

As per Section 5.4, a daily inspection report will be produced and forwarded to the KMC EUL (see **Appendix VII & VIII**). This report will be reviewed and evaluated for any trends. Based on these trends and feedback from the Response Team the KMC EUL will make a decision to increase, decrease or discontinue further sampling.

See Appendix IX for the Acute Health Risk Response Flow Chart.

10.0 TRAINING AND EDUCATION

Basic training for all Response Team Members includes but may not be limited to:

- KMC Environmental Health and Safety Orientation
- H2S Alive
- Petroleum Safety Training
- First Aid (OFA 1 or Standard)
- KMC Emergency Response Training for Contractors

In addition, all members of the Response Team must be trained in this Program as well as air monitoring principles. A thorough understanding of the operation, selection, limitations, of the sampling equipment and methodologies is required.

Training is also implemented by KMC by way of annual emergency response exercises. In addition, monitoring conducted during actual unplanned releases and/or fires, or community monitoring is also regarded as training.

11.0 <u>RECORDS & RECORD MAINTENANCE</u>

11.1 Records

All related Public Health air monitoring documentation will be maintained in accordance with the Environmental Health and Safety Management System which falls under the ISLMS. Records will be maintained by the Program Administrator and shall be kept in the KMC Head Office location in Calgary, Alberta.

The following documents will be maintained by KMC:

- Public Health Air Monitoring Program Unplanned Release and/or Fire;
- Sampling Methodologies;
- Sample Strategy Forms
- Daily Inspection Reports
- Completion Reports
- Training and education record

<u>APPENDIX I</u>

Air Monitoring Plan contact information is located with other Support Services in Section 2. Refer to Section 2 of this Emergency Response Plan for Air Monitoring phone numbers.

APPENDIX II

Plan 1: Worker Exposure Monitoring

Objective: Report air levels before they reach those requiring respiratory protection

PCOC	Action Level Criteria	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Total VOCs	30 ppm	Assess for the presence of benzene/toluene/hexane, Report reading to PM	To avoid over exposure to benzene/toluene/hexane - Reading sustained for 5 minutes	MultiRAE AreaRAE	0.1 ppm	Measuring range: 1 – 200	NA
Ronzono	0.5	Confirm reading with secondary instrument,	OSHA PEL Action level	UltraRAE 3000	0.05 ppm	UltraRAE - Change SEP tube frequently	NA
Benzene ppm Exit Area (purifying report read)	purifying respirator; report reading to EUL	minutes	Gastec tube #121L	0.05 ppm	Range: 0.1 to 65 Volume: Variable	Var.	
Ponzono	2.5 Exit Area or don air	ACGIH STEL Action level – Reading sustained for 5 minutes	UltraRAE 3000	0.05 ppm	UltraRAE - Change SEP tube frequently	0.55	
ppm ppm	report reading to EUL		Gastec tube #121L	0.05 ppm	Range: 0.1 to 65 Volume: Variable	Var.	
Toluene	20 ppm	Sample only as requested, Report reading to EUL	ACGIH [®] TLV	Gastec tube #122L	0.5 ppm	Range: 1 to 100 Volume: Var.	Var.
Hexane	50 ppm	Sample only as requested, Report reading to EUL	ACGIH [®] TLV (n-hexane)	Gastec tube #102L	1 ppm	Range: 4 to 1200 Volume: Variable	Var.
				MR Sensor	1 ppm	MultiRAE - Measuring range: 0 – 100 ppm	NA
Hydrogen Sulfide	1 ppm	Exit Area, report reading to EUL	ACGIH [®] TLV – Reading sustained for 5 minutes	MR Pro Sensor	0.1 ppm	MR Pro - Measuring range: 0 – 100 ppm	NA
				Gastec tube #4LL	0.1 ppm	Range: 0.25 to 120 Volume: Variable	Var.

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PCOC	Action Level Criteria	Corrected Value	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
LEL	1 %	2.5 %	Notify EUL	Elevated LEL sustained 1 min	MultiRAE AreaRAE	1 %	Measuring range: 1 – 100%	2.5*
LEL	4 %	10 %	Exit area and Notify EUL		MultiRAE AreaRAE	1 %	Measuring range: 1 – 100%	2.5*

*Rough estimate based on common crude oil volatiles.

	Combustion PCOCs						
PCOC	Action Level Criteria	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Particulate Matter (PM2.5 or PM10)*	351 µg/m3 sustained for 5 min	Report reading to EUL	Wildfire Smoke Guidelines for 1 hr avg. upper-bound breakpoint for unhealthy AQI	DustTrak Aerosol Monitor	0.001 mg/m3	PM2.5 impactor – 50% cut-off at 2.5 micron PM10 impactor – 50% cut- off at 10 micron	NA
Particulate Matter	200 µg/m3 for 8 hrs	Report reading to EUL	See above – 8 hr guideline	DustTrak Aerosol Monitor	0.001 mg/m3	See above	NA
Carbon Monoxide 25 ppm		ACGIH® TLV -	MultiRAE Sensor	1ppm	Range: 0-500 ppm	NA	
	25 ppm	Report reading to EUL	Reading sustained for 5 minutes	Gastec tube #1LC	0.5ppm	Range: 1-30 ppm Volume : 100	1
Sulfur	Sulfur Dioxide 0.2 ppm Exit area- Report reading to EUL	Exit area- Report reading	ACGIH® STEL –	MultiRAE Sesnor	1ppm	Range: 0-20 ppm	NA
Dioxide		to EUL	Reading sustained for 5 minutes	Gastec tube #5Lb	0.5ppm	Range: 0.05-10 ppm Volume : Variable	Variable
Nitrogen Dioxide 0.2 ppm			MultiRAE PID	1ppm	Measuring Range: 1- 5,000	16	
	0.2 ppm	Report reading to EUL	Reading sustained for 5 minutes	MultiRAE Sesnor	0.1ppm	Range: 0-20 ppm	NA
				Gastec tube #9L	0.1ppm	Range: 0.05-125 ppm Volume : Variable	Variable

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Plan 2: Community Exposure Monitoring

Objective: Report air levels before they reach those causing nuisance issues

PCOC	Action Level Criteria	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Total VOCs	0.5 ppm	Report reading to PM. Assess for the presence of benzene/toluene/ hexane, if requested	Approximate background level - Reading sustained for 5 minutes	MultiRAE AreaRAE	0.1 ppm	Measuring range: 1 – 200	NA
Benzene	Detection	Sample only as requested. Report	Inform PM/PTD of potential	UltraRAE 3000	0.05 ppm	UltraRAE - Change SEP tube frequently	NA
	reading to EUL	off-site issues	Gastec tube #121L	0.05 ppm	Range: 0.1 to 65 Volume: Variable	Var.	
Toluene	Detection	Sample only as requested, Report reading to EUL	Inform PM/PTD of potential off-site issues	Gastec tube #122L	0.5 ppm	Range: 1 to 100 Volume: Variable	Var.
Hexane	Detection	Sample only as requested, Report reading to EUL	Inform PM/PTD of potential off-site issues	Gastec tube #102L	1 ppm	Range: 4 to 1200 Volume: Variable	Var.
		¥		MR Sensor	1 ppm	MultiRAE - Measuring range: 0 – 100 ppm	NA
Hydrogen Sulfide Detection	Detection	etection Exit Area, report	Inform PM/PTD of potential off-site issues	MR Pro Sensor	0.1 ppm	MR Pro - Measuring range: 0 – 100 ppm	NA
				MultiRAE PID	0.1 ppm	Measuring range: 0 – 100 ppm	3.3
				Gastec tube #4LL	0.1 ppm	Range: 0.25 to 120 Volume: Variable	Var.

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Combustion PCOCs							
PCOC	Action Level Criteria	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Particulate Matter (PM2.5 or PM10)*	138 µg/m3 sustained for 5 min	Report reading to EUL	Wildfire Smoke Guidelines for 1 hr avg. upper-bound breakpoint for unhealthy AQI	DustTrak Aerosol Monitor	0.001 mg/m3	PM2.5 impactor – 50% cut-off at 2.5 micron PM10 impactor – 50% cut-off at 10 micron	NA
Particulate Matter	79 µg/m3 for 8 hrs	See above – 8 hr guideline	See above – 8 hr guideline	DustTrak Aerosol Monitor	0.001 mg/m3	See above	NA
Carbon	Carbon Inform FUL of potential	Inform EUL of potential	ACGIH® TLV – Reading sustained for 5 minutes	MultiRAE Sensor	1ppm	Range: 0-500 ppm	NA
Monoxide 25 ppm	25 ppm	off-site issues		Gastec tube #1LC	0.5ppm	Range: 1-30 ppm Volume : 100	1
Sulfur		Inform ELIL of potential	ACGIH® STEL –	MultiRAE Sesnor	1ppm	Range: 0-20 ppm	NA
Dioxide	Dioxide 0.1 ppm off-site issues	off-site issues	Reading sustained for 5 minutes	Gastec tube #5Lb	0.5ppm	Range: 0.05-10 ppm Volume : Variable	Variable
				MultiRAE PID	1ppm	Measuring Range: 1-5,000	16
Nitrogen 0.2 Dioxide	0.2 ppm	Inform EUL of potential	Reading sustained for 5	MultiRAE Sesnor	0.1ppm	Range: 0-20 ppm	NA
	ο.z ρρπ	off-site issues	minutes	Gastec tube #9L	0.1ppm	Range: 0.05-125 ppm Volume : Variable	Variable

PCOC	Action Level Criteria	Corrected Value	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
LEL	1 %	2.5 %	Notify EUL	Elevated LEL sustained 1 min	MultiRAE AreaRAE	1 %	Measuring range: 1 – 100%	2.5*
LEL	4 %	10 %	Exit area and Notify EUL		MultiRAE AreaRAE	1 %	Measuring range: 1 – 100%	2.5*

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	Analytical Methods				
Analyte	Media/Can	Method	Notes		
VOCs	Mini - Cans	EPA TO-15 with TICs or EPA TO-17			
Benzene	Charcoal tube	NIOSH 1501			
BTEX (+Hexane)	3M 3520 Badge or Assay 566	Modified NIOSH 1500/1501			
PAHs (18 PNAH Profile - Galson)	37PTFE 2.0/Treated Amberlite XAD-2	Method 5506			

General Information on Procedures (Assessment Techniques) Used

Procedure	Description
Hand-held Survey	Air monitoring technicians may utilize handheld instruments (e.g. MultiRAE Plus; ppbRAE, Gastec colorimetric detector tubes, etc.) to measure airborne chemical concentrations. Air monitoring technicians will use these hand-held instruments primarily to measure for potential breathing zone exposures. Additionally, measurements can be made at grade level, as well as in elevated workspaces, as indicated by chemical properties or site conditions. Air monitoring technicians may also use these techniques to verify detections observed by the AreaRAE network.
Fixed Real-Time Monitoring locations	Multiple community locations may be identified and monitored at the same location approximately once per hour using hand-held instruments. This allows use statistical analysis more effectively than with a random approach.
Analytical sampling	Analytical sampling may be used to validate the fixed station and hand-held data monitoring data, or to provide data beyond the scope of the real-time instruments. Analytical samples may be collected as whole air samples in evacuated canisters or on specific collection media, and sent to an off-site laboratory for further chemical analysis.
Particulate Monitoring Network	A network of data-logging particulate monitors may be set up and positioned around the Community Area.

Sampling Plans	Description
Worker Exposure	Potential Worker breathing zone exposures in the area directly surrounding the incident site and occupied by workers actively or sporadically involved in remediation and/or normal work activities
Community Exposure	Potential Community breathing zone exposures in residential and commercial locations in the area immediately surrounding the Work Area.
Site Characterization	During the course of the response, some additional tasks may require unique sampling (e.g. worst case determination, container head space, etc.)

Quality Assurance/Quality Control Procedures

Method	Procedure
Real-time	 Real time instruments may be calibrated in excess of the manufacturer's recommendations. At a minimum whenever indicated by site conditions or instrument readings. Co-located sampling for analytical analysis may be conducted, if necessary, to assess accuracy and precision in the field. Lot numbers and expiration dates may be recorded with use of Gastec colorimetric tubes.
Analytical	Chain of custody documents may be completed for each sample.
Other	

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Glossary

Term	Definition
Sustained	Instrument reading above the action level continuously for the listed time period.
Excursion Limit	Whenever a reading exceeds a ACGIH® TLV reading by 3 times (if the chemical does not have a STEL or Ceiling based action level), exit the area and notify the PM
Breathing zone	The area within an approximate 10-inch radius of an individual's nose and mouth.

Change from version 1.0 to 1.1

• In the section titled:

	Name/Organization	Signature	Date Signed
Prepared by:			
Review by:			
Approved by:			
Approved by:			
Approved by			
Approved by			

Change from version 1.1 to 1.2

• In the section titled:

	Name/Organization	Signature	Date Signed
Prepared by:			
Review by:			
Approved by:			
Approved by:			
Approved by:			
Approved by:			

APPENDIX III

- mL = millilitres
- ppb = parts per billion
- TD = thermal desorption
- PCOC = Potential Chemicals of Concern
- TVOC = total volatile organic compounds
- EPA = Environmental Protection Agency
- NIOSH = National Institute for Occupational Safety and Health

TOTAL VOLATILE ORGANIC COMPOUNDS – ppbRAE			
SAMPLING/CALIBRATION EQUIPMENT & PROCEDURES:	 Equipment: ppbRAE or Mini RAE direct reading monitor Equipment Set Up: Spot Measurements – Record reading range and peak every 30 minutes Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement. Calibration: Fresh air zero calibration prior to use, bump test daily and span calibration monthly or if equipment malfunctions. Type of Sampling: Area. Procedure: <u>Area Monitoring:</u> Monitoring downwind of source generation point(s) (perimeter, step-out locations) Control sampling upwind of source generation points(s) 		
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer and regular calibration and maintenance (inspection, cleaning, maintenance, storage).		
ANALYSIS PROCEDURE:	Data collected downloaded onto PC computer using appropriate ProRAE-Suite software. Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.		
ALARM LEVEL	50ppm		

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VOLATILE ORGANIC COMPOUNDS – THERMAL DESORPTION TUBES			
	Media: Thermal Desorption (TD) Tube		
	Equipment: SKC air sampling pumps, low-flow adapter, BIOS Dry Cal (Primary Calibrator).		
	Flow Rate: 0.050 LPM for ~1 hour.		
	Calibration: Pre- and post-sampling. Sample discarded if >10% discrepancy between two averaged readings.		
	Type of Sampling: Area.		
SAMPLING/CALIBRATION	Procedure:		
PROCEDURES:	 <u>Area Monitoring:</u> Stationary monitors set up downwind of source generation point(s) (perimeter, step-out locations) when consistent TVOC levels of >0.9 ppm or greater are measured on the direct reading monitor (ppbRAE), samples will be taken up to 2 times per day to support data interpretation from direct reading monitors. Control sampling upwind of source generation points(s) (where determined necessary) 		
	Primary Calibrator: Annual factory calibration by manufacturer.		
QA/QC PROTOCOLS:	Sampling Pumps: Regular maintenance by supply company (inspection, cleaning, maintenance, storage).		
	Field Blank: As specified by sampling method, and sent to accredited laboratory for analysis.		
	EPA TO-17 (modified), NIOSH 2549, or OSHA ID-07		
ANALYSIS PROCEDURE	Samples sent to accredited laboratory for analysis of PCOC.		
	Analytical data from the laboratory analyzed and evaluated by a trained and qualified Monitor.		

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F			
VOLATILE ORGANIC COMPOUNDS – SUMMA CANISTER			
	Equipment: Summa Canister (6 litre), 1 to 24 hour regulator (if necessary)		
	Calibration: Not required		
	Type of Sampling: Area		
SAMPLING/CALIBRATION	Procedure:		
EQUIPMENT &	<u>Grab Sampling:</u>		
PROCEDURES:	Canister set up downwind of source generation point(s) (perimeter, step-out locations) when consistent TVOC levels of >2 ppm or greater are measured on the direct reading monitor (ppbRAE). Samples will be taken if a certain time period or condition needs to be captured.		
QA/QC PROTOCOLS: Summa Canister: Regular maintenance and quality control checks by supply company.			
	EPA Method: TO-15 (modified)		
	Samples sent to accredited laboratory for analysis for PCOC.		
ANALISIS PROCEDURE:	Analytical data analyzed and evaluated by a trained and qualified Monitor.		

BENZENE (Spot Reading Estimation)		
SAMPLING/CALIBRATION EQUIPMENT & PROCEDURES:	 Equipment: UltraRAE or UltraRAE-3000 direct reading monitor equipped with benzene SEP tube Equipment Set Up: Spot Measurements – Record reading range and peak every 30 minutes Calibration: Fresh air zero calibration prior to use, bump test daily and span calibration montly or if equipment malfunctions. Type of Sampling: Area Procedure: Spot Measurements: Monitoring downwind of source generation point(s) (perimeter, step-out locations) when consistent TVOC levels of >40 ppm or greater are measured on the direct reading monitor (ppbRAE). Control samples upwind of source generation points(s) (where determined necessary) 	
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer and regular calibration and maintenance (inspection, cleaning, maintenance, storage).	
ANALYSIS PROCEDURE:	Spot measurements analyzed and evaluated by a qualified and trained Monitor.	

SULPHUR DIOXIDE (Spot Reading)		
	Equipment: MultiRAE (Lite, Regular or Pro) and/or QRAE Plus and/or VRAE direct reading monitors with sulphur dioxide sensors	
	Equipment Set Up:	
	 Spot Measurements – Record reading range and peak every 30 minutes 	
SAMPLING/CALIBRATION	 Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement. 	
PROCEDURES:	Calibration: Fresh air zero calibration prior to use, bump test daily and span calibration monthly or if equipment malfunctions.	
	Type of Sampling: Area.	
	Procedure:	
	<u>Area Monitoring:</u>	
	Monitoring downwind of source generation point(s) (perimeter, step-out locations)	
	Control sampling upwind of source generation points(s)	
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer and regular calibration and maintenance (inspection, cleaning, maintenance, storage).	
	Data collected downloaded onto PC computer using appropriate software.	
ANALISIS FROCEDORE.	Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.	
ALARM LEVEL	2ppm	

CARBON MONOXIDE (Spot Reading)		
	Equipment: MultiRAE (Lite, Regular or Pro) and/or QRAE Plus and/or VRAE direct reading monitors with sulphur dioxide sensors	
	Equipment Set Up:	
	 Spot Measurements – Record reading range and peak every 30 minutes 	
SAMPLING/CALIBRATION	 Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement. 	
PROCEDURES:	Calibration: Fresh air zero calibration prior to use, bump test daily and span calibration monthly or if equipment malfunctions.	
	Type of Sampling: Area.	
	Procedure:	
	<u>Area Monitoring:</u>	
	Monitoring downwind of source generation point(s) (perimeter, step-out locations)	
	Control sampling upwind of source generation points(s)	
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer and regular calibration and maintenance (inspection, cleaning, maintenance, storage).	
	Data collected downloaded onto PC computer using appropriate software.	
ANALISIS FROCLOORE.	Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.	
ALARM LEVEL	25ppm	

NITROGEN DIOXIDE (Spot Reading)		
	Equipment: MultiRAE (Lite, Regular or Pro) and/or QRAE Plus and/or VRAE direct reading monitors with sulphur dioxide sensors	
	 Spot Measurements – Record reading range and peak 	
	every 30 minutes	
SAMPLING/CALIBRATION	 Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement. 	
PROCEDURES:	Calibration: Fresh air zero calibration prior to use, bump test daily and span calibration monthly or if equipment malfunctions.	
	Type of Sampling: Area.	
	Procedure:	
	<u>Area Monitoring:</u>	
	Monitoring downwind of source generation point(s) (perimeter, step-out locations)	
	Control sampling upwind of source generation points(s)	
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer and regular calibration and maintenance (inspection, cleaning, maintenance, storage).	
	Data collected downloaded onto PC computer using appropriate software.	
ANALISIS FROCLOOKE.	Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.	
ALARM LEVEL	0.2ppm	

LOWER EXPLOSIVE LIMIT (Spot Reading)		
	Equipment: MultiRAE (Lite, Regular or Pro) and/or QRAE Plus and/or VRAE direct reading monitors with sulphur dioxide sensors	
	Equipment Set Up:	
	 Spot Measurements – Record reading range and peak every 30 minutes 	
SAMPLING/CALIBRATION	 Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement. 	
EQUIPMENT & PROCEDURES:	Calibration: Fresh air zero calibration prior to use, bump test daily and span calibration monthly or if equipment malfunctions.	
	Type of Sampling: Area.	
	Procedure:	
	<u>Area Monitoring:</u>	
	Monitoring downwind of source generation point(s) (perimeter, step-out locations)	
	Control sampling upwind of source generation points(s)	
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer and regular calibration and maintenance (inspection, cleaning, maintenance, storage).	
	Data collected downloaded onto PC computer using appropriate software.	
ANAL 1313 FROCEDORE:	Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.	
ALARM LEVEL	10%	

HYDROGEN SULPHIDE (Spot Reading)		
SAMPLING/CALIBRATION EQUIPMENT & PROCEDURES:	 Equipment: Jerome H₂S Analyzer direct reading monitor. Equipment Set Up: Spot Measurements – Record reading range and peak every 30 minutes Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement Calibration: Fresh air zero calibration prior to use. Sensor regeneration as required. Type of Sampling: Area. Procedure: <u>Area Monitoring:</u> Monitoring downwind of source generation point(s) (perimeter, step-out locations) Control sampling upwind of source generation points(s) NOTE: THIS UNIT IS NOT INTRINSICALLY SAFE. LEL LEVELS MUST BE CHECKED AND DETERMINED TO BE BELOW 10% PRIOR TO UTILIZING THIS EQUIPMENT 	
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer via supply company and regular maintenance by supply company (inspection, cleaning, maintenance, storage).	
ANALYSIS PROCEDURE:	Data collected downloaded onto PC computer using appropriate software. Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.	
ALARM LEVEL	1ppm	

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PM ₁₀ & PM _{2.5} (Spot Reading)	
	 Equipment: Dusttrak AM510 or Dusttrak DRX direct reading aerosol monitor. Equipment Set Up: Spot Measurements – Record reading range and peak every 30 minutes
	 Data-logging, Sampling/Recording Interval: One minute intervals, average and peak data points per measurement
SAMPLING/CALIBRATION	Calibration: Fresh air zero calibration prior to use.
EQUIPMENT &	Type of Sampling: Area.
PROCEDURES:	Procedure:
	<u>Area Monitoring:</u>
	Monitoring downwind of source generation point(s) (perimeter, step-out locations)
	Control sampling upwind of source generation points(s)
	NOTE: THE DUSTTRAK DRX UNIT IS NOT
	INTRINSICALLY SAFE. LEL LEVELS MUST BE CHECKED AND DETERMINED TO BE BELOW 10% PRIOR TO UTILIZING THIS EQUIPMENT
QA/QC PROTOCOLS:	Monitor: Annual factory calibration by manufacturer via supply company and regular maintenance by supply company (inspection, cleaning, maintenance, storage).
	Data collected downloaded onto PC computer using appropriate software.
ANAL 1313 FROCEDORE.	Spot measurements and data analyzed and evaluated by a qualified and trained Monitor.
ALARM LEVEL	PM₁₀ : 10 mg/m ³ ; PM_{2.5} : 3 mg/m ²

Emergency Response Plan

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MERCAPTANS – GLASS FIBER FILTER CASSETTE						
	Media: 3-piece 37-mm cassette, Glass fiber filter, impregnated with mercuric acid, back up pad.					
	Equipment: SKC air sampling pumps (XR2000 or XR5000), low-flow adapter, BIOS Dry Cal (Model No. Defender 510L or DC Lite-L).					
	Flow Rate: 0.200 LPM for 5-6 hours					
	Calibration: Pre- and post-sampling. Sample discarded if >10% discrepancy between two averaged readings.					
SAMPLING/CALIBRATION	Type of Sampling: Area					
EQUIPMENT & PROCEDURES:	Procedure: Standard and accepted industrial hygiene monitoring practices					
	<u>Area Monitoring:</u>					
	Stationary monitors set up downwind of source generation point(s) (perimeter, step-out locations) when consistent levels above 0.5 ppm received on direct reading tube. Samples will be taken in conjunction with either TD tubes or Summa canisters.					
	Control sampling upwind of source generation points(s) (where determined necessary)					
	Primary Calibrator: Annual factory calibration by manufacturer.					
QA/QC PROTOCOLS:	Sampling Pumps: Regular maintenance by supply company (inspection, cleaning, maintenance, storage).					
	Field Blank: As specified by sampling method, and sent to accredited laboratory for analysis.					
	NIOSH Method 2542					
LABORATORY ANALYSIS PROCEDURE:	Samples sent to accredited laboratory for analysis for n-butyl mercaptan, ethyl mercaptan and methyl mercaptan.					
	Analytical data analyzed and evaluated by a trained and qualified Monitor.					

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COAL TAR PITCH VOLATILES – PTFE FILTER CASSETTE						
SAMPLING/CALIBRATION EQUIPMENT & PROCEDURES:	 Media: 3-piece 37-mm PTFE filter cassette, back up pad. Equipment: SKC air sampling pumps (XR2000 or XR5000), BIOS Dry Cal (Model No. Defender 510M or DC Lite-M). Flow Rate: 2 LPM for 4-5 hours Calibration: Pre- and post-sampling. Sample discarded if >10% discrepancy between two averaged readings. Type of Sampling: Area Procedure: Standard and accepted industrial hygiene monitoring practices <u>Area Monitoring:</u> Stationary monitors set up downwind of source generation point(s) (perimeter, step-out locations) when consistent levels of PM₁₀ above 0.1 mg/m³ and/or levels of PM_{2.5} above 0.03 mg/m³ are observed on the direct reading monitor. Control sampling upwind of source generation points(s) (where determined necessary) 					
QA/QC PROTOCOLS:	 Primary Calibrator: Annual factory calibration by manufacturer. Sampling Pumps: Regular maintenance by supply company (inspection, cleaning, maintenance, storage). Field Blank: As specified by sampling method, and sent to accredited laboratory for analysis. 					
LABORATORY ANALYSIS PROCEDURE:	NIOSH Method 5023 Samples sent to accredited laboratory for analysis for coal tar pitch volatiles (benzene soluble fraction). Analytical data analyzed and evaluated by a trained and qualified Monitor.					

ISOOCTANE – ACTIVATED CHARCOAL TUBE					
	Media: Activated charcoal tube				
	Equipment: SKC air sampling pumps (XR2000 or XR5000), low-flow adapter, BIOS Dry Cal (Model No. Defender 510L or DC Lite-L).				
	Flow Rate: 0.1 LPM for 1 hour				
	Calibration: Pre- and post-sampling. Sample discarded if >10% discrepancy between two averaged readings.				
	Type of Sampling: Area				
SAMPLING/CALIBRATION EQUIPMENT &	Procedure: Standard and accepted industrial hygiene monitoring practices				
PROCEDURES:	<u>Area Monitoring:</u>				
	Stationary monitors set up downwind of source generation point(s) (perimeter, step-out locations) when consistent TVOC levels of >0.9 ppm or greater are measured on the direct reading monitor (ppbRAE), samples will be taken up to 2 times per day to support data interpretation from direct reading monitors.				
	Control sampling upwind of source generation points(s) (where determined necessary)				
QA/QC PROTOCOLS:	 Primary Calibrator: Annual factory calibration by manufacturer. Sampling Pumps: Regular maintenance by supply company (inspection, cleaning, maintenance, storage). Field Blank: As specified by sampling method, and sent to accredited laboratory for analysis. 				
	Method: OSHA ID-07				
LABORATORY ANALYSIS PROCEDURE:	Samples sent to accredited laboratory for analysis for isooctane. Analytical data analyzed and evaluated by a trained and qualified Monitor.				

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Emergency Response Plan

<u>APPENDIX IV</u>

Project Number:	Date of Collection:	
Project Name:	Collected By:	
Project Location:	Weather Conditions:	

Time	Wind	Location	LEVELS (Include asterix * if datalogging)						
Time	Direction	Location	TVOCs	Benzene	SO ₂	H ₂ S			
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							
		Lat: Long:							

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Emergency Response Plan

<u>APPENDIX V</u>

Project Number:	Date of Collection:	
Project Name:	Collected By:	
Project Location:	Weather Conditions:	

Time	Wind		Location			(Inclue	LEV de asterix	ELS * if datalog	gging)		
Time	Direction		Location		Benzen e	SO ₂	H₂S	СО	NO ₂	PM ₁₀	PM _{2.5}
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								
		Lat:	Long:								

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Emergency Response Plan

<u>APPENDIX VI</u>

Project Number:	Date of Collection:	
Project Name:	Collected By:	
Project Location:	Weather Condition	

Samula #	Pump	Type of	Description/Leastion		Flow Rate (L/min)		Start		St	Stop		Total	
Sample #	#	Sample	Description	on/Location	Pre	Post	Avg	Date	Time	Date	Time	Time	Volume
			Lat:	Long:									
			Lat:	Lona:									
				0									
			Lat:	Lona:									
				0									
			Lat:	Lona:									
			Lat:	Lona:									
			Lat:	Lona:									
			Lat:	Lona:									
				- 5									
			Lat:	Lona:									
				- 5									
			Lat:	Long:									
				0									
			Lat:	Long:									
				0									
			Lat:	Long:									
				0									
			Lat:	Long:									

Emergency Response Plan

APPENDIX VII

INSPECTION REPORT						
То:		Location:				
Project No.:		Report No.:		Date:		
Project Name:		Time In:		Time Out:		
POTENTIAL CHEMICALS OF CONCERN						
	CLEAN-UP AC	TIVITIES/STATUS				



WEATHER CONDITIONS					
Wind Direction:	Temperature:	Precipitation			
Wind Intensity:	Humidity:	Other:			

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MONITORING LOCATIONS										
1.	Lat:	Lon	g:		6.	Lat:		Long	r.	
2.	Lat:	Lon	g:		7.	Lat:		Long	ŗ.	
3.	Lat:	Lon	g:		8.	Lat:		Long	j:	
4.	Lat:	Lon	<u>-</u>		9.	Lat:		Long		
5.	Lat [.]	Lon	n.		10.	Lat:		Long:		
	Lut.	DIREC	T READI	NG SAMP	LE R	ESUL	TS SUMMA		,	
()	Location (reference # TVOCs Ben above)						SO	SO ₂ H		
ANALYTICAL SAMPLE SUMMARY										
Time Type of Sample				Location			R	ational f	or Sampling	
Lat: Long:										

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Time	Type of Sample	Locati	on	Rational for Sampling
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
		Lat: Lon	g:	
	CON	IMENTS (i.e. nearb	y activities, odo	our, etc.)
Nome			Emoil:	
iname:				
Title:			Tel:	

Emergency Response Plan

APPENDIX VIII

INSPECTION REPORT								
То:	Location:							
Project No.:	Report No.:		Date:					
Project Name:	Time In:		Time Out:					
POTENTIAL CHEMICALS OF CONCERN								
CONTROL ACTIVITIES/STATUS								



Wind Intensity:

Humidity:

Other:

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MONITORING LOCATIONS										
1.	Lat:		Long:		6.	Lat:		Long	<u>):</u>	
2.	Lat:		Long:		7.	Lat:		Long	<u>j:</u>	
3.	Lat:		Long:		8.	Lat:		Long	j :	
4.	4. Lat: Long:				9.	Lat: Long:				
5.	5. Lat: Long:			10.	Lat: Long:					
	L		DIRECT R	EADING SA	MPLE R	ESULTS	SUMI	MARY		
Location (reference # above) TVOCs Benzene SO ₂				H₂S	CO NO ₂ PM ₁₀ PM _{2.5}					

Air Monitoring Plan

Emergency Response Plan

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ANALYTICAL SAMPLE SUMMARY								
Time	Type of Sample	Loca	tion	Rational for Sampling				
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
		Lat: Lo	ong:					
	COMM	ENTS (i.e. nearby	activities, odou	r, etc.)				
Name:			Email:					
Title:			Tel:					



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11.0 LOGISTICS SECTION

The Logistics Section is responsible for providing support to the incident, including all incident facilities (including the Incident Command Post). The Logistics Section will also source all required resources, including personnel and equipment, accommodations, food and supplies. Detailed duties and responsibilities for individuals in the Logistics Section can be found in the Kinder Morgan Canada Incident Command System Guide on E:\Manuals\Emergency Management\ICS Guide and Forms.



11.1 Logistics Section Chief

The Logistics Section Chief, a member of the General Staff, is responsible for providing facilities, services, and material in support of the incident response. The Logistics Section Chief participates in developing and implementing the Incident Action Plan and activates and supervises Branches and Units within the Logistics Section.

Emergency Response Plan

11.2 Logistics Section Organization Chart

Not all roles will be filled for all incidents; however the following chart is an outline of the possible positions to be filled. Detailed descriptions of each position and its duties can be found in the Kinder Morgan ICS Guide.



11.3 Facilities

11.3.1 Incident Command Post

Typically, the ICP is located near the incident site and is the focus for the conduct of direct, on-scene control of tactical operations. Incident planning is also conducted at the ICP; an incident communications center also would normally be established at this location. The ICP may be collocated with the incident base, if the communications requirements can be met. The ICP may perform local Emergency Operations Center-like functions in the context of smaller jurisdictions or less complex incident scenarios.

Upon arrival at the site, IMT members should go directly to the primary ICP location. The IMT will assemble at the designated Command Post as soon as possible following notification. If another location is being utilized, team members will be notified upon arrival.

There are pre-designated potential Incident Command Post (ICP) and Staging Area locations along the pipeline corridor and in communities where its facilities are located. Access to these facilities, and the lead time required varies depending on the location and type of facility being used. Specifically KMC

has identified resources in the following communities; In British Columbia; Burnaby, Richmond, City of Vancouver, Abbotsford, Chilliwack, Hope Merritt, Kamloops, Clearwater, Blue River, Valemount, and in Alberta; Jasper, Hinton, Edson, Gainford, Edmonton, Sherwood Park. KMC has agreements and protocols in place where appropriate with the service providers. All facilities meet the requirements for internet and telephone connectivity, food, lodging, meeting space, parking and security for a multi agency response.

Incident Command Post facilities are private entities with which KMC may have contractual relationship. The information is provided on a controlled basis within the confidential appendix of this manual. The removal of this information follows the requirements of The Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation).

11.3.2 Media Relations Centre

The designated Media Relations Centre in the event of an emergency will be designated at the time of an emergency, based on the location of the ICP. Media Relations facilities are private entities with which KMC may have contractual relationship. The information is provided on a controlled basis within the confidential appendix of this manual. The removal of this information follows the requirements of The Personal Information Protection and Electronic Documents Act (PIPEDA) (federal legislation).

11.3.3 Staging Areas

A number of locations may serve as the key staging areas for response activities, the actual location of the staging area will depend on the type of emergency event. It is important to note that Logistics is responsible for establishing staging areas but once established Operations is responsible for their continued operation and staffing.

Factors considered in the selection of staging areas include:

- Safety and security
- Accessibility by road, water
- Available space for storing equipment
- Suitability for landing helicopters
- Ease of providing long-term logistics support (personnel changes, fueling, and provisioning)

11.4 Communications

11.4.1 Emergency Communications System

During a response, communications will take place through one of the following modes:

- Landline and/or cellular telephones
- Radio System
- Satellite Communication
- Electronic Mail (email) Communications

11.4.2 Telephone Communications

Regular or cellular telephones will be the primary mode of communications between team members to whom cellular phones have been assigned, and the Incident Command Post, and between the Incident Command Post and various outside agencies and organizations. Regular and cellular telephone contacts for all IMT personnel and agencies are provided in the confidential appendix of this manual.
11.4.3 Radio Communications

The radio system utilizes Motorola portable radio units. Separate channels may be used for the incident response and normal operations. Also, different contractors operate a number of radios on separate channel. When necessary to facilitate communications between Kinder Morgan and contract personnel, radios may be shared during an incident. During an incident, all radio frequencies used will be tracked using the ICS 205.

11.5 Security

Due to the large amount of public attention created at an incident site, additional security measures are required. Security needs will be evaluated for any command post, staging area as well as the incident site. Additional duties for security can be found in the Incident Command System Guide.

12.0 FINANCE AND ADMINISTRATION SECTION

The Finance and Administration Section is responsible for all financial aspects of the response, including assisting in establishing contracts with suppliers, and setting up systems to monitor time and costs. Detailed duties and responsibilities for individuals in the Finance and Administration Section can be found in the Kinder Morgan Canada Incident Command System Guide on E:\Manuals\Emergency Management\ICS Guide and Forms..



12.1 Finance Section Chief

The Finance/Administration Section Chief, a member of the General Staff, is responsible for all financial and cost analysis aspects of the incident and for supervising members of the Finance/Administration Section.

12.2 Finance Section Organization Chart

Not all roles will be filled for all incidents; however the following chart is an outline of the possible positions to be filled. Detailed descriptions of each position and its duties can be found in the Kinder Morgan ICS Guide.



12.3 Managing Spill Liability Claims

The Insurance/Risk Management Department will do the following things while managing spill liability claims. The Compensation and Claims unit leader will either work closely with the Kinder Morgan Insurance Risk Management Department, or the Insurance/Risk Management Department will deploy specific personnel to the ICP.

- Participation in the initial ERL+ conference call to gather information.
- Provide notice of incident to appropriate insurers.
- Coordinate with legal, operations & procurement to investigate any contractual protections available.
- Establish contact with liability adjuster and instruct them to proceed immediately to the incident site. Adjuster(s) can usually be on site within 4-12 hours of notification.
- Member of Risk Management group will travel to site to work with the adjuster and act as the liaison with the incident commander on site.
- Adjuster can make contact with the displaced residents at the discretion of KM or the local authorities. Adjuster will gather pertinent information (phone no., address, damage assessments, costs incurred) and will provide contact information to them for later follow-up.
- If needed, set up an 800 number for the intake of damage claims to be funneled back through the adjuster for processing. This would be coordinated through the Communications Department.
- Adjuster and/or Risk Management to follow-up with displaced residents to address concerns regarding damage claims or out of pocket expenses that resulted from the incident.
- Risk Management to coordinate with the business unit to set up a property damage/liability AFE to cover the costs of damage claims of third parties.
- Instruct adjuster to gather documentation from third party claimants in order to settle and/or resolve any damage claims arising from the incident.
- Risk Management to coordinate with legal department on those third party claims in which KM is sued or third party has legal representation.

12.4 Managing Spill Liability Claims – Informal Claims Process

A land agent ("Adjustor" in this context) enters the field as soon as possible after the report of the incident, often within hours. The land agent begins identifying and communicating with parties that are either directly affected by the incident or close enough to warrant communications on what is occurring. This land agent has the authority to immediately compensate or make arrangements with affected parties to mitigate the negative effect the event has had on their lives. Examples of this "immediate compensation" might be: Short term accommodations for displaced persons; water, food or groceries provision or compensation; short term lost income payment (in cases where the party has limited resources); payment for boarding of livestock or household pets; rental vehicle compensation necessitated due to loss of access to their own car; travel costs to stay with relatives or to get away from trauma of situation; compensation for short term counseling; payment for destroyed tools/equipment that might prevent the person from carrying on their livelihood until replaced.

These immediate "claims" are identified in the field, settled immediately (with consultation with the Claims Unit Leader, or under agreed terms of reference) and either cash or check is completed on the spot, or company credit cards are used to procure things like hotel rooms. Formal paperwork is not required on these payments, the party must sign a receipt acknowledging the payment. If there are additional claims, the formal process will be followed.

12.5 Managing Spill Liability Claims –Formal Claims Process

In the event that the informal process cannot settle claims by individuals, this formal process will be followed.

12.5.1 Oil Spill Claims Event Tiers

Oil spill claims events can be generally classified by the number of claims anticipated rather than the quantity of product released. These tiers are defined as follows:

- Tier 1 up to 50 oil spill claims anticipated
- Tier 2 between 50 and 500 spill claims are anticipated
- Tier 3 over 500 spill claims are anticipated

12.5.2 Oil Spill Claims Management

Management of oil spill claims will be provided by the Claims Unit Leader and the KM Insurance/Risk Management Department representatives in cooperation with the Incident Commander. Outside contractors will support claims processing during all events.

12.5.3 Insurance

KMC currently has \$750 million of spill liability insurance, the first \$2 million which is covered by self insurance.

12.5.4 Oil Spill Claims Handling Process

After an oil spill occurs, KMC will advertise for claims. Oil spill claims information and forms will be made available through local claims centers, if established, or via the internet. Depending on the anticipated number of claims related to the spill, KMC will establish local claim centers. Oil spill claims will be accepted by KMC up to 3-years from the date that KMC began advertising for claims or 3-years from the date that the injury or damage being claimed was reasonably discovered – whichever date is earlier.

12.5.5 Oil Spill Claims Advertisements

KMC will advertise for claims after being advised to do so by our legal department, or within 15-days after being designated as the Responsible Party. The geographic extent of the oil spill will dictate the publications in which claim advertisements will be placed. The length of time advertisements will run in local publications will be based on recommendations provided by our legal department or the length of time specified by the regulatory authority.

12.5.6 Oil Spill Claims Contact Information

In the event of an oil spill contact information for oil spill claims, location of local claim centers and mailing address for claims submission will be available via the toll free Public Information Line, established at the time of an incident, and on the website established at the time of an incident, as well as in advertisements placed in local publications.

12.5.7 Local Claims Centers

Local claims centers will be established based on community need and/or the number anticipated claims. Local claims centers will remain in operation for as long as warranted by workload and community need.

12.5.8 Oil Spill Claims Forms

The claims form used by KMC will be made available at the time of an incident as soon as the claims process is determined. Information entered in any claim form must be typed or legibly hand-written in blue or blue-black ink. The claim form must include the "sum-certain" monetary amount being claimed and be signed by the claimant in black or blue-black ink. The Claims Tracking Sheet may be used in the claims adjudication process to track the status of claims received and a Claim Check Sheet may be used to record the type of documentation provided with each claim. Samples of the forms are available on e:\manuals.

12.5.9 Oil Spill Claims Adjudication and Timeframe

KMC will process claims in the order they are received. Each claim will be assigned a unique identification number which will be used to track the claim internally. The identification number can also be used by claimants who wish to provide additional information to support their claim, or inquire about the status of a claim. KMC will review each claim received to ensure, as much as possible, that all needed information to make a claim decision has been provided by the claimant. If additional information is needed, we will request that the claimant forward that information to us so it can be added to the claim and considered during adjudication. If the information requested is not received within 90 days, KMC will adjudicate the claim with the available information. This may result in a reduction of possible claim compensation or an outright denial of the claim.

Once KMC sends the claimant a claim determination, the claimant must either accept or reject the offer within 60 days. The claimant must sign a release before the claim will processed for payment. If the claimant takes no action within 60 days after receiving the claim determination, the offer to pay the claim will be voided and the claim will be closed. If the claimant rejects the offer, they can provide additional information and ask KMC to reconsider the claim determination; typically, this would start an entirely new review process with another claim determination made as a result of the reconsideration. Claims submitted to KMC will be paid in the order that accepted offers (with signed releases) are received. Claims are usually paid with 30-days from the date KMC receives the claimant's signed release.

12.6 Oil Spill Claims Documentation

The amount and type of documentation needed to make a claim determination depends on many factors, including the claim type and the monetary amount claimed.

The following types of claims may be submitted to KMC. Example types of documentation are also included below within the listing of each claim type. The examples provided are for reference only; they may or may not represent everything needed to adjudicate a claim.

12.6.1 Removal Costs

Costs to prevent, minimize, mitigate, or clean up the oil spill. Examples of Proof and Documentation that may be needed:

- Proof that actions were coordinated with the FOSC.
- Witness statements
- Detailed description of actions
- Dates on which work was performed
- Analysis of spill substance
- Map of area

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- Pictures of area, damage, and spill
- Receipts, invoices, or similar records with description of work
- How rates were determined and any comparison of rates
- Daily records of personnel costs including details on labor rates, hours, travel, and transportation
- Daily records of equipment costs including description and use
- Signed disposal manifests and proof of payment for disposal
- Payroll verification of hourly rate at the time of spill
- Verification of equipment rates for equipment used

12.6.2 Property Damage

Injury or damage to or economic loss resulting from destruction of real property (land or buildings) or other personal property including a boat. Examples of Proof and Documentation that may be needed:

- Proof of ownership or leasehold interest in the property; lease or rental agreement of any substitute property used
- Proof or evidence that property was injured, destroyed, or not usable because of the oil spill
- Report of any expenses or money lost while the property was unavailable because of spill damage
- Proof of value of property both before and after the spill or injury
- Documented cost of repair or replacement of the property
- Proof of value of property before and after the spill
- Documentation that shows whether or not substitute property was available, and related costs of substitute property if used.
- Documentation that shows how claimant lost money from the damage to the property
- Witness statements
- Copy of title, deed, lease, or license to property in claimant's name
- Pictures or videotape of property and/or damage
- Maps or legal documents showing the location of the property within the spill area
- Professional property appraisals for the value of the property prior to and after the spill, actual selling price of the property, and evidence connecting the depressed selling price to the oil spill rather than to other economic or real property factors
- Copies of bills paid for repair of damage or two estimates showing activities and costs to repair the damage

12.6.3 Loss of Profits or Earning Capacity

Damages equal to the loss of profits or impairment of earning capacity due to the injury, destruction, or loss of property or natural resources. Examples of Proof and Documentation that may be needed:

- Proof that property or natural resources that were damaged, destroyed or lost, resulted in claimant's loss
- Proof the claimant's income was reduced due to the damage or loss of the property or natural resources and how much it was reduced
- Documentation showing the amount of profits and earnings in similar time periods
- Documentation showing any alternative employment or business during the period claimed and any income received during that period
- Documentation showing and savings to overhead costs or other normal expenses those not paid as a result of the spill (commuting costs, utility fees, employee salaries)
- Photos of damaged property (before and after the spill)
- Witness Statements on how the spill led to loss of business income or earning capacity; explain any earnings anomalies
- Statement on how the spill caused a loss in income
- Affidavit from claimant's employer about the impact the spill had on an employees work or income, and if the employer intends to file a claim for lost profits or earning capacity.
- Copies of pay stubs, receipts, timesheets from before, during, and after the spill
- Personnel records from claimant's employer before, during, and after the spill, showing employment
- Claimant's description of efforts to reduce loss, including job search
- Copies of any job-hunting expenses (e.g., travel costs)
- Signed copies of income tax returns and schedules for at least two years prior to spill
- Details of employment expenses not paid during period being claimed (e.g., commuting costs)
- Copies of pay stubs, receipts, timesheets from alternative employment during time of spill (including unemployment compensation)
- Description and documentation of business losses due to spill
- Copies of letters of business cancellations caused by the spill damage
- Maps or descriptions of the area showing the business location and the spill impact area
- Financial statements for at least two years prior to spill and from the year of the spill
- Signed copies of business income tax returns and schedules for at least three years prior to spill
- Details on efforts to mitigate business losses or why no efforts were taken
- For hotels, daily and monthly occupancy information for two years prior to spill and the year of the spill
- Description of marine charter business losses caused by the spill
- Evidence that charter vessel(s) was in the area impacted by the spill and were unable to carry on their business due to the spill
- Maps or descriptions of the area showing charter business location within spill area
- Signed copies of income tax returns (for charter boat business) and schedules for at least three years prior to spill
- Details on expenses not paid out during period being claimed (e.g., wages)
- Booking records for three years prior to spill and year of spill
- List of charter rates, including any services the business specializes in (e.g., sport fishing)
- Copies of any logs relating to boating activities for the year prior to and the year of the spill
- Registration documents for the vessel

12.6.4 Loss of Subsistence Use of Natural Resources

Loss of subsistence use claim if natural resources claimants depend on for subsistence use purposes that have been injured, destroyed, or lost by an oil spill event. Examples of Proof and Documentation that may be needed:

- Proof that injury, destruction, or loss of natural resources would have been used by the claimant to obtain food, shelter, clothing, medicine, or other minimum necessities of life.
- Documentation identifying each specific natural resource for which compensation for loss of subsistence use is being claimed
- Description of the actual subsistence use you make of each specific natural resource you identify;
- Description of how and to what extent claimant's subsistence use of the natural resource was affected by the injury to, destruction of, or loss of, each specific natural resource;
- Description of claimant's efforts to mitigate subsistence use loss
- Description of alternative source(s) or means of subsistence available to claimant during the period

12.6.5 Loss of Government Revenue

Net loss by Federal, State, or Local Governments of taxes, royalties, rents, fees, or net profit shares due to the injury, destruction, or loss of real property, personal property, or natural resources. Examples of Proof and Documentation that may be needed:

- Information showing that the loss of revenue was caused by the injury to, destruction of, or loss of real or personal property or natural resources caused by the discharge
- Information showing the amount, identity, and description of the revenue loss for which compensation is claimed, including the applicable authority for collecting the revenue, method of assessment, applicable rate, and dates of collection or periods of loss
- Documentation showing expenditures saved because revenue was not collected
- The total assessment or revenue collected and related expenditures for comparable revenue periods, typically covering two years
- Description of what revenues were impacted and how the spill caused a loss of revenues
- Copies of statutes, regulations, ordinances, etc., outlining applicable authority to raise such revenues, property affected, method of assessment, rate of assessment, and method and dates of collection of assessment
- Government financial reports showing total assessment or revenue collected for comparable periods, typically covering two years
- Details of any expenses not paid out by government

12.6.6 Increased Public Service Costs

Net costs by State & Local Governments for providing increased or additional public services during or after removal activities, including protection from fire, safety, or health hazards, caused by a discharge of oil or directly attributable to response to the oil spill Event. *Examples of Proof and Documentation that may be needed:*

- Documentation showing justification for the public services provided, including documentation of what specific services were provided and the relationship to the spill.
- Documentation showing when services were provided during and after the oil spill removal.
- Documentation showing services were in addition to services normally provided
- Documentation showing the net cost for the services and the methods used to compute those costs
- Reports showing the increased public services were required and if the services were due to fire, health, or safety hazards
- Detailed description of what increased services were necessary and why, including a distinction between removal activities, safety acts, and law enforcement acts, and if the increase was actually incurred or if normal resources were diverted for use
- Daily reports on the activities of the government personnel and equipment involved Government Labor and Equipment Rates:
- Payroll verification of the government hourly rate at the time
- Verification of the standard government equipment rates for any equipment claimed
- Signed and dated records of the spill including hourly rates for labor and equipment
- Explanation as to whether rates are fully loaded or not and formulas used
- Certification that rates used reflected actual costs incurred and did not include punitive damages or fees

13.0 WILDLIFE CARE

The key objective of wildlife response is to minimize animal suffering. Prompt initiation of oiled wildlife response operations will help achieve this objective. There are, however, other objectives to consider, including the provision of an organized, transparent, stakeholder-inclusive and fair process. Application of proven incident management and wildlife care protocols are fundamental in achieving these objectives. When an oil spill occurs, wildlife can become a primary focus of the media and the general public and may be perceived as the highest priority for response attention. Birds are often the most visual of impacted and at-risk wildlife; however other groups of animals, including invertebrates, fish, reptiles and mammals can also be affected.

13.1 Wildlife Operations

The organizational structure of wildlife branch operations within the Incident Command System is depicted below. In addition to the full development of the Wildlife Branch within the Operations Section, wildlife might also have specialists in the Planning and Logistics sections of the ICS to ensure the unique needs of the wildlife response are met.



13.2 Wildlife Response Strategies

Proactive wildlife response strategies are the key to mounting a wildlife response that minimizes wildlife impacts. Immediate appraisal and monitoring of the spill in relation to wildlife resources allows for timely, efficient and effective activities. Generally, the best response strategy is to prevent wildlife from being impacted by the product via an effective monitoring, reconnaissance and hazing program. If wildlife impacts are unavoidable, proactive search and collection to quickly retrieve contaminated animals is imperative. The sooner an animal is brought into care for treatment, the healthier it is, and the faster it will progress through the wildlife care centre and return to the wild.

13.3 Operational Aspects

When live animals are impacted or potentially impacted by an oil spill, time is of the essence. There is also the matter of public attention, which can be greatly exaggerated by media interest. A number of operational aspects that require careful planning follow:

13.3.1 Mobilization

An initial wildlife impact assessment should be performed as soon as safely possible following the spill event. This initial assessment will provide information and opportunity for proactive deterrence activities to prevent wildlife impacts, while also providing invaluable information regarding the scale of potential response activities. If wildlife impact occurs, depending on the rate of recovery from the field, response will either occur while the organizational structure is being established, or after the response organization has had an opportunity to create the wildlife plan.

13.3.2 Coordination

The Wildlife Care Centre (WCC) is the place from where all oiled wildlife response activities are monitored and directed. It is a space where principal officers meet and where they can be contacted. The WCC is ideally integrated with the Incident Command Post in some way. The WCC is typically a temporary facility, developed at the time of a wildlife response to accommodate the particular needs of the spill.

Those managing the WCC need to be aware of, and have access to, every level of the wider response organization. In turn, each key player in the response organization needs to know how the WCC can be contacted. For the WCC to be an effective coordinating unit, communication and reporting protocols must be established. All response units must report in accordance with protocols to allow for efficient data processing.

13.3.3 Facilities

There are very specific and well-documented facility requirement for the successful care of oiled wildlife. These requirements must be incorporated into the development of the Wildlife Care Centre to ensure a successful response effort.

13.3.4 Phasing

Upon activation, responders and equipment must be mobilized and facilities developed. This is the emergency response phase of the wildlife response. At this point, decisions are guided by pre-defined priorities which will facilitate wildlife response managers to efficiently perform their duties.

The next phase of the response will arise gradually, incident-dependent. Once the operational structure is developed and effective, the main influx of wildlife will normally have peaked. Ongoing, but smaller,

intake peaks might occur according to weather, animal movements, fate and effects of the product, spill cleanup progress and degree of search and collection activities. At this stage, the WCC can begin to transition from emergency response to project management, including demobilization.

13.3.5 Workforce

Volunteer manpower is often required to ensure adequate operations of the time and energy intensive requirements of successful oiled wildlife response. For liability reasons, those interested and qualified to assist response operations volunteer to be 'hired' as workforce personnel. As such, these personnel receive a nominal fee in exchange for their participation in response operations. This group of people is referred to as workforce personnel.

13.3.6 Health and Safety

Oiled wildlife response presents many unique concerns regarding personnel health and safety. Along with general issues pertaining to product exposure, there are additional issues relating to exposure to wild animals. Considerations for zoonotic disease factors, personal protective equipment, safety protocols should be addressed in pre-determined guidelines for wildlife response personnel.

Cleanup personnel should also be made aware of health and safety concerns pertaining to wildlife in case they are exposed to them in the field. All field personnel should understand the reporting line to ensure that impacted wildlife discovered in the field is dealt with safely, efficiently and in accordance with the wildlife plan.

13.4 Wildlife Protection and Rehab

In the event of a spill, wildlife may come into contact with oil – especially on the surface of water or along shorelines. The numbers and types of animals affected will depend on factors such as: the size and distribution of the spill; the weather; wind and current conditions; the habitats affected by the oil; and the time of year that the spill occurs. Birds have historically been the most likely wildlife to be affected during on-water spills, but both land and aquatic mammals may also come into contact with the oil. In addition to direct oiling, birds and mammals may become indirectly impacted if they feed on oiled animals.

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14.0 SAFETY DATA SHEETS

SDSs for products shipped through the Trans Mountain Pipeline and/or stored at the Terminal Sites are available online at the following websites or in the SDS binder at the Terminal.

http://kmonline/ehs/pages/sdsvault.aspx (no login required) or,

https://ww1.actiocms.com/login.cfm (login required)

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15.0 EMERGENCY MANAGEMENT PROGRAM POLICIES

15.1 Environment, Health and Safety Policy



Environment, Health and Safety Policy

Every employee is expected to share Kinder Morgan's commitment to pursue the goal of not harming people, protecting the environment, using material and energy efficiently and promoting best practices, thereby earning the confidence of customers, security holders and society at large, being a good neighbor and contributing to sustainable development. Kinder Morgan's policy is to comply with all health, safety, security and environmental laws, rules and regulations, not just because it is legally required but also because we believe it is the responsible way to conduct our business. Kinder Morgan has systems in place that prepare for emergencies and procedures that coordinate our response plans with emergency response organizations in the communities where we operate. Kinder Morgan has a systematic approach to health, safety, security and environmental management designed to ensure compliance with the law, to train employees to be aware of and meet their responsibility for protection of health, safety and the environment, and to achieve continuous performance improvement. In addition to the Kinder Morgan commitment, contractors are required and joint ventures under Kinder Morgan's operational control are expected to apply this policy. Employees, supervisors or operational managers who knowingly engage in or condone environmental health or safety violations are subject to disciplinary action including suspension or termination.

Ian D. Anderson President Kinder Morgan Canada A Member of the Kinder Morgan Group of Companies



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15.2 Emergency Management Commitment Statement

KMC is committed to maintaining a high level of preparedness, and coordination with internal and external stakeholders ensuring the Company is prepared to respond, and recover from emergencies. The Emergency Management Program provides leadership and support to ensure the safety and security of the public, workers, company property and the environment through an all-hazards emergency management program of mitigation, preparedness, response and continual improvement. Any employee or contractor who reports an emergency condition will be granted immunity from disciplinary action.

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16.0 REGULATORY BACKGROUND

16.1 Federal

Agency	Responsible For Contact	Reporting Requirements	Comments
NEB/CTSB Single Window Occurrence Reporting	EH&S department	Effective September 01, 1999 the NEB & CTSB have a single window incident reporting hot line Reporting to this one number satisfies the requirement to advise both these Boards. Note: The same information as that detailed in the NEB & CTSB sections below is required.	The single window initiative does not detract from the substantive reporting obligations set out in section 52 of the OPR-99. The information required by the NEB under section 52 of the OPR 1999 must now be sent to the CTSB in accordance with the time frames established by the NEB under the OPR-99 and the OPR-99 Guidance Notes.
National Energy Board	EH&S Department	All "Significant Incidents" must be immediately reported to the CTSB	Typically within 1 hour, a company should communicate all available factual information to the CTSB. The
Report to NEB through Canadian Transportation Safety Board		reporting line via the Reporting Hotline telephone number (1-819) 997-7887). A Significant Incident may be defined as; (1) fatality; (2) missing person (as reportable pursuant to the Canadian Oil & Gas Drilling & Production Regulations (DPR) under the Canadian Oil & Gas Operations Act (COGOA) or the Oil & Gas Operations Act (OGOA); (3) a serious injury (as defined in OPR or TSB regulations); (4) a fire or explosion that causes a pipeline or facility to be inoperative; (5) a LVP hydrocarbon release in excess of 1.5 m3 that leaves company property or right f way; (6) a rupture (defined as an instantaneous release that immediately impairs the operation of a pipeline segment such that pressure of the segment cannot be maintained; (7) a toxic plume as defined in CSA Z662 Other events that do not meet the NEB/CTSB "Significant Event" criteria but are still deemed reportable (see below) , must be reported via the NEB's Online Event Reporting System (OERS) (https://apps.neb-one.gc.ca/ers) within 24 hours of occurrence or discovery include;	factual information to the CTSB. The preliminary incident report should: (a) describe the incident, including the events leading up to and following the incident; (b) list all relevant agencies contacted and persons affected by the incident; (c) summarize any losses or impacts to people (e.g., injury, fatalities), environment (e.g., terrain, habitats, animals), production (e.g., interruption or reduction in service), and property; (d) identify any unsafe acts or conditions contributing to or causing the incident; (e) provide details on any emergency response; and (f) state any corrective actions taken or planned to be taken to minimize the effects of the incident. A detailed incident report should correct any information provided in the preliminary incident report and/or provide additional information. The detailed incident report should (a) provide any details regarding the failure mechanism and detailed analysis of the failed component (if necessary); (b) identify the underlying causes and contributing factors of the incident; (c) update the progress of any corrective actions taken or planned to be taken to minimize the effects of the incident; and

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Agency	Responsible For Contact	Reporting Requirements	Comments
		 (1) incidents as defined under the OPR, PPR, and DPR/Oil & Gas Drilling Regulations; (2) unauthorized activities under the NEB Pipeline Crossing Regulations Part II; (3) emergency burning or flaring under PPR; (4) hazard identification under the PPR; (5) suspension of operations under the PPR; (6) near-misses under the DRP; (7) serious accidents or incidents under the Canadian Oil & Gas Geophysical Operations Regulations/Oil & Gas Geophysical Operations Regulations; (8) emergencies or accidents under the Canadian Oil & Gas Installations Regulation; and (9) accidents, illness, and incidents under the Canadian Oil & Gas Diving Regulations/Oil & Gas Diving Regulations 	(d) state any actions taken or planned to be taken to prevent a similar incident. If the OERS is not available, all pipeline occurrences must be reported by telephone to the CTSB NEB Incident Line 403-807-9473
Canadian Transportation Safety Board	EH&S Department	Verbal notification of "significant pipeline occurrences" to the CTSB must be made immediately. Such occurrences include; (1) loss of human life; (2) a serious injury (defined in the Onshore Pipeline Regulations or the Transportation Safety Board Regulations); (3) a fire or explosion that causes a pipeline or facility to be inoperative; (4) a low vapour pressure hydrocarbon release in excess of 1.5 m ³ that leaves company property or the right-of-way; (5) a rupture (an instantaneous release that immediately impairs the operation of a pipeline such that pressure cannot be maintained); or (6) a toxic plume (defined in Canadian Standards Association Standard Z662).	The report must contain the following information: (a) the name of the operator; (b) the date and time of the operator; (c) the unique identifier of the pipeline or portion of pipeline, such as its name or number; (d) the specific pipeline components that malfunctioned or failed; (e) the location of the occurrence by reference to a specific designation point such as the operator's facility or the pipeline's kilometre post location; (f) the closest city, town or village to the occurrence site; (g) the number of persons who were killed or sustained serious injuries as a result of the occurrence; (h) a list of any commodity contained in or released from the pipeline and an estimate of the volume of commodity released and recovered; (i) the actual or anticipated duration of any interruption of the operation of the pipeline or a portion of the pipeline; (j) a description of the occurrence, the events leading up to it and the extent of any damage, including the consequences on the pipeline or portion of the pipeline and on any

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Agency	Responsible For Contact	Reporting Requirements	Comments
			other property and the environment; (k) a description of any action taken or planned to address the consequences of the occurrence; (I) a description of any action taken or planned to protect persons, property and the environment, including any evacuation as a result of the occurrence; (m) the name and title of the person making the report and the phone number and address at which they can be reached; and; (n) any information specific to the occurrence that the Board requires
Canadian Transportation Safety Board, Continued	EH&S Department	Other pipeline occurrences that must be submitted into the Online Event Reporting System (OERS) include (1) a person is killed or sustains a serious injury; (2) the safe operation of the pipeline is affected by; a) damage sustained when another object came into contact with it, or b) fire or explosion or an ignition that is not associated with normal pipeline operations; (3) an event or an operational malfunction results in; a) an unintended or uncontrolled release of gas, b) an unintended or uncontrolled release of tVP hydrocarbons, c) an unintended or uncontrolled release of 1.5 m3, or d) an unintended or uncontrolled release of a commodity other than gas, HVP hydrocarbons or LVP hydrocarbons; (4) there is a release of a commodity from the line pipe body; (5) the pipeline is operated beyond design limits or any operating restrictions imposed by the National Energy Board; (6) the pipeline restricts the safety operation of any mode of transportation; (7) an unauthorized third party activity within the safety zone poses a threat to the safe operation of the pipeline: (8) a geotechnical.	The Online Event Reporting System (OERS) automates the single-window pipeline occurrence notification process that was established by the CTSB and the National Energy Board (NEB) in 1999. Starting 1 January 2015, the OERS must be used to report all pipeline occurrences. Except for significant occurrences as listed in the previous section, telephone notification will no longer be required. If the OERS is not available, all pipeline occurrences must be reported by telephone to the CTSB Information must be entered in the OERS even if the occurrence has been reported by telephone. Incident Line 819-997-7887, Fax 819- 953-7876, email pipelinenotifications@tsb.gc.ca

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Agency	Responsible For Contact	Reporting Requirements	Comments
		hydraulic or environmental activity poses a threat to the safe operation of the pipeline; (9) the operation of a portion of the pipeline is interrupted as a result of a situation or condition that poses a threat to any person, property or the environment; or (10) an unintended fire or explosion has occurred that poses a threat to any person, property or the environment.	
Environment Canada For Environmental Emergencies pertaining to Gasoline	EH&S Department	Under requirements of the Environmental Emergency Regulations, notification of an environmental emergency is required for all substances which are accidentally released in quantities which exceed the criteria specified by Environment Canada in the regulations. At least 200 litres of Gasoline. Alberta Alberta Ministry of Environment Telephone: 780-422-4505 or 1- 800-222-6514i British Columbia Emergency Management British Columbia Ministry of Justice Telephone: 1-800-663-3456	The verbal report should include the following information as it is known at the time of the report: (a) the reporting person's name and telephone number at which the person can be immediately contacted (b) the name of the person who owns or has charge, management or control of the substance immediately before the environmental emergency (c) the date and time of the release (d) the location of the release (e) the name/ UN number of the substance (f) the estimated quantity (g) the means of containment (from which the substance was released) and a description of its condition (h) the number of deaths and injuries resulting (i) the surrounding area affected and potential impact of the release (j) a brief description of the circumstances leading to the release (k) the cause of the release (if known) (l) details of the actions taken or further actions contemplated (m) names of the agencies notified or on- scene (n) other pertinent information. Under requirements of the E2 Regulation a written report should be made within 30 days.
Environment Canada (EC)	Liaison Officer	For spills or deleterious substances (i.e. silt) of any size that enter (or may enter) waters frequented by fish (includes creeks, ditches, fresh water streams, tidal and marine waters) EC should be notified.	Provides advice to federal and provincial agencies for spill response and protection of sensitive habitat. EC administers Section 36(3) (pollution provisions) of the Fisheries Act. EC will notify EMBC, Canadian Coast Guard, other affected federal agencies and BC Ministry of Environment.

Agency	Responsible For Contact	Reporting Requirements	Comments
Transport Canada	Liaison Officer	For spills involving transportation of dangerous goods (other than in the pipeline eg. tanker truck). Transport of Dangerous Goods Regulation.	Call local police or CANUTEC. For CANUTEC, Tel: (collect) 0-613- 996-6666+

16.2 Provincial – Alberta

Agency	Responsible For Contact	Reporting Requirements	Comments
Alberta Environment & Alberta Energy Regulator	Liaison Officer	Spills on the pipeline right-of-way or lands not owned by the Company may be reportable to AER. Generally, spills of refined products in excess of 200 litres and unrefined products in excess of $2m^3$, and which have or may have an adverse effect on the environment are reportable. Note: Contact Law Department before notification for spills on company owned land or for clarification of "reportable" thresholds. Environmental Protection and Enhancement Act (ss. 99 and 100), Release Reporting Regulation; Oil and Gas Conservation Act and Regulations.	Notifications for all environmental emergencies, including spills, can be made by one call to the Alberta Energy & Environment 24 Hour Response Line (1-800-222-6514).
Alberta Environment & Sustainable Resource Development	Liaison Officer	In certain areas and at certain times of the year, a fire caused by a leak from the pipeline or by construction or maintenance activities which the Company is unable to extinguish must be reported to a forest officer, the municipality, or the RCMP. Alberta Forest and Prairie Protection Act.	Wildfires should be reported through the 24 hour Wildfire Reporting Line at Toll Free: 310-FIRE (3473)

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1-888-876-6711 **16.3 Provincial – British Columbia**

Agency	Responsible For Contact	Reporting Requirements	Comments
BC Emergency Management	Liaison Officer	For spills equal or greater than 100 litres (0.1 m3) of petroleum (does not apply to NEB regulated facilities). (1-800-663-3456) Spill Reporting Regulation, Waste Management Act (Aug/ 1990).	If EMBC cannot be contacted within a reasonable time, the local police must be notified. EMBC will notify other agencies including: BC Ministry of Environment, Lands & Parks, Environment Canada, Canadian Coast Guard and affected municipal governments.
Ministry of Forests	Liaison Officer	In the event of fire associated with pipeline maintenance work or a leak. Forest Fire Practices Code (Bill 40, Section 86, 88- duty to report and control fires). Fire Prevention and Suppression Regulation.	
BC Ministry of Environment, Lands and Parks (BC MOE)	Liaison Officer		EMBC and/ or Environment Canada will advise BC MOE of reportable spills. BC MOE provides advice on response and protective measures to minimize the environmental impacts of spills. Approvals for waste storage, treatment and disposal should be coordinated through this agency.

17.0 TRAINING AND EXERCISES

17.1 Training

KMC ensures that employees receive the training necessary to protect themselves, the public, the local community and the environment during and incident. Training will be provided to enable employees to perform their designated emergency responsibilities. Formal training will be reinforced by a program of regular emergency response exercises. KMC will make reasonable efforts to coordinate training and exercising plans with those of key outside emergency agencies.

There are several types of training available to KMC employees for emergency response, at a minimum all employees who could be involved in emergency response will receive Incident Command System level 100 training, and additionally field operations staff will receive Incident Safe Approach training. Some employees will receive HAZWOPER training if they could reasonably be asked to respond to incidents in Washington State. Employees will also receive training on the Emergency Response Program and all the plan elements.

Training records are the joint responsibility of the Operations Training coordinator, and Manager, Emergency Management. All training is conducted in accordance with the requirements as set out in the Integrated Safety and Loss Management System.

17.2 Exercises

Response exercises practice the knowledge and skills received in training, identify areas of future training priority, identify areas to improve current emergency procedures or equipment, engage with local response communities, and to share exercise learning's to ensure a smooth response in the unlikely event of an incident.

Members of the various response teams will participate in exercises each year that are relevant to their individual operations as outlined in the Integrated Safety and Loss Management System. At a minimum each district will participate in one exercise per year which may be a deployment, table top or functional exercise. The exercise may be organized by KMC or may be organized by a response partner.

The Incident Management Team will participate in one Level 3 (all resources deployed) exercise per year, the location of the IMT exercise will change from year to year and will be held throughout the communities that KMC operates the Trans Mountain Pipeline System. The IMT exercise will test different areas and scenarios each year. The IMT is the same for the pipeline ERP, Westridge Marine Terminal ERP, Trans Mountain Pipeline ERP, Trans Mountain (Jet Fuel) and the Trans Mountain (Puget Sound) Pipeline ERP; therefore the IMT will be trained / exercised annually regardless of the ERP used for the actual exercise.