AER Regulated Liquids Pipelines – Emergency Response Plan (ERP)

APPROVALS

Approvals and Revisions are captured electronically and attached to the published document

Document Contact	Emergency Management Specialist
Document Owner Manager	Manager, Security & Emergency Management

Information has been redacted from this section to protect the safety and security of South Bow. Information redacted includes Company employees' names.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

ENVIRONMENTAL EMERGENCY PLAN (E2) AUDIT PROTOCOL

Environmental Emergency Plan (E2) Audit Protocol (Environmental Emergency Regulations, 2019)

ERP Audit Information	
Full ERP Name	South Bow AER Regulated Liquid Pipelines **Annexes:** Grand Rapids Pipelines (GRP) MacKay East Pipeline (MEP) White Spruce Pipeline (WSP)
ERP Date	December 12, 2022
Audit Date	November 15, 2023
Auditor Name(s)	Carianne Loach
Auditor Company	Behr Integrated Solutions Inc.
Auditor Email	
Comments	

The environment emergency plan must include the following:

Sec #	Requirement	Comment / Page
4 (2)(a)	description of the properties and characteristics of the substance and the maximum expected quantity of the substance at the facility;	Annex Section 3.4 – Technical Data
4 (2)(b)	a description of the commercial, manufacturing, processing or other activity involving the substance that takes place at the facility	Annex Section 3.1.3 – Site Description of Operations; Section 3.4 – Technical Data
4 (2)(c)	a description of the facility and of the area surrounding the facility that may be affected by an environmental emergency referred to in paragraph (d), including any hospitals, schools, residential, commercial or industrial buildings and any highways, public transit infrastructure, parks, forests, wildlife habitats, water sources or water bodies;	Annex Section 3.1.3 – Site Description of Operations; Section 3.1.3.1 – Inventory of Emergency Planning Zone (EPZ) for the Pipeline
4 (2)(d)	an identification of any environmental emergency that could reasonably be expected to occur at the facility and that would likely cause harm to the environment or constitute a danger to human life or health, including the environmental emergency referred to in paragraph (e) and, if applicable, the environmental emergency that is more likely to occur than the environmental emergency referred to in paragraph (e) and that would have the longest impact distance outside the boundary of the facility;	Section 5.6 – Release of Product Section 5.7 – Response to Fires/Explosions Section 5.8 – Response to Natural Hazards

Sec #	Requirement	Comment / Page
4 (2)(e)	an identification of the harm to the environment or danger to human life or health that would likely result from an environmental emergency involving the release of • **(i)** the maximum quantity of the substance that could be contained in the container system that has the largest maximum capacity, if a quantity of the substance is in a container system, and • **(ii)** the maximum expected quantity of the substance that will not be in a container system, if a quantity of the substance is not in a container system	Section 3.4.2 – Release of Product Annex Section 3.4 – Technical Data – CEPA
4 (2)(f)	an identification of the harm to the environment or danger to human life or health that would likely result from the environmental emergency identified under paragraph (d), if any, that is more likely to occur than the environmental emergency referred to in paragraph (e) and would have the longest impact distance outside the boundary of the facility;	Section 5.6 – Release of Product Section 5.8 – Response to Natural Hazards
4 (2)(g)	a description of the measures to be taken to prevent and prepare for the environmental emergencies identified under paragraph (d) and the measures that will be taken to respond to and recover from such emergencies if they were to occur;	Section 5.4 – Release of Product Section 5.7 – Response to Fires/Explosions
4 (2)(h)	a list of the position titles of the persons who will make decisions and take a leadership role in the event of an environmental emergency and a description of their roles and responsibilities;	Annex Section 3.2.4 – Incident Command Team Positions Appendix C – Roles & Responsibilities Checklist

Sec #	Requirement	Comment / Page
4 (2)(i)	a list of the environmental emergency training that has been or will be provided to prepare personnel at the facility who will respond in the event that an environmental emergency identified under paragraph (d) occurs;	Section 8.3 – Emergency Response Training for South Bow Personnel Section 8.6 – Emergency Response Drills & Exercise
4 (2)(j)	a list of the emergency response equipment that is necessary for the measures described in paragraph (g) and the equipment's location;	Section 5.6.6 – Emergency Response Equipment Annex Section 3.3 – Equipment Lists
4 (2)(k)	a description of the measures that will be taken by a responsible person or by a responsible person and local authorities, acting jointly, to communicate with the members of the public who may be adversely affected by the environmental emergency referred to in paragraph (f) to inform them, before the environmental emergency occurs, of • (i) the possibility that the environmental emergency could occur, • (ii) the potential effects of the environmental emergency on the environment and on human life or health, taking into account the factors referred to in paragraphs (a) to (c), and • (iii) the measures that will be taken by the responsible person to protect the environment and human life or health, and the means by which the responsible person will communicate with them, in the event that the environmental emergency occurs	Section 5.10 – Public Protection Appendix C – Roles & Responsibilities Checklist

Sec #	Requirement	Comment / Page
4 (2)(l)	a description of the measures that will be taken by a responsible person or by a responsible person and local authorities, acting jointly, to, in the event that an environmental emergency involving the release of a substance occurs, communicate with the members of the public who may be adversely affected to provide them, during and after its occurrence, with information and guidance concerning the actions that could be taken by them to reduce the potential harm to the environment and danger to human life or health, including an explanation of how those actions may help to reduce the harm or danger;	Section 5.10 – Public Protection Section 6.1 – Public Response Resources Appendix C – Roles & Responsibilities Checklist • Liaison Officer • Public Information Officer • Public Protection Group Supervisor • Reception Centre Team Leader • Roadblock Team • Evacuation/Search Team
4 (2)(m)	the position title of the person who will communicate with the members of the public referred to in paragraphs (k) and (l)	• Public Information Group • Public Protection Group Supervisor

AER DIRECTIVE 71 ERP AUDIT PROTOCOL

Review of South Bow Regulated Liquid Pipelines Emergency Response Plan
TO
The Alberta Energy Regulator's (AER) Directive 071 – Emergency Preparedness and Response
Effective Date: February 8, 2023

ERP Audit Information	
Full ERP Name	South Bow AER Regulated Liquid Pipelines **Annexes:** Grand Rapids Pipelines (GRP) MacKay East Pipeline (MEP) White Spruce Pipeline (WSP)
ERP Date	2024
Review Date	October 31, 2024
Reviewer Name(s)	Brigitte Schnell, V.P. ERP Operations / Brad Foote, Manager ERP Operations
Reviewer Company	Behr Integrated Solutions Inc.
Reviewer Email	brigittes@behrintegrated.com / bradf@behrintegrated.com
Reviewer Comments	At the time of this review, this South Bow Regulated Liquid Pipelines Emergency Response Plan is regulated under ECCC, and has regulatory reporting requirements to AER, CER, TDG and ECCC. The following concordance table presents an independent review of the South Bow Emergency Response Plan (ERP) for Regulated Liquid Pipelines in compliance with the Alberta Energy Regulator's (AER) Directive 071 – Emergency Preparedness and Response (Effective Date: February 8, 2023). In the directive, the term "must" indicates a requirement, while terms such as "should," "recommends," and "expects" indicate a recommended practice. This audit evaluates the alignment of the ERP with the requirements outlined in Directive 071. Each AER requirement that is unique to this directive is numbered 1) through 125). The review was conducted to verify compliance against the directive to ensure that the ERP reliably serves public safety, environmental stewardship, and operational continuity objectives as intended by the AER.

to

The Alberta Energy Regulator's (AER) Directive 071 – Emergency Preparedness and Response
Effective Date: February 8, 2023

Directive 071 sets out the requirements for emergency preparedness and response for sites regulated under the Oil and Gas Conservation Act, Pipeline Act, Oil Sands Conservation Act, and Geothermal Resource Development Act. It is intended for duty holders and those developing, implementing, and maintaining the duty holders' **Emergency Preparedness and Response Program (EMP).**

The concordance table contained in the following pages identifies each element of the directive, whether it is ☐ Applicable or ☐ Not Applicable specifically to this **Emergency Response Plan (ERP),** and where the required element is addressed in the ERP.

Sec #	Requirement	Reference in the ERP
1	**Introduction**	
1.1	**Purpose of Directive 071** The duty holders' **emergency preparedness and response program** includes the following components: This section related to Program Elements	
	▪ hazard identification and consequence analysis	☐ Applicable ☒ Not Applicable
	▪ involvement of the public and appropriate authority in emergency preparedness and response	☐ Applicable ☒ Not Applicable
	▪ emergency response plan (ERP) preparation and contents	☐ Applicable ☒ Not Applicable
	▪ public protection measures	☐ Applicable ☒ Not Applicable
	▪ responder competency and training	☐ Applicable ☒ Not Applicable ERPs are in place to support training activities
	▪ emergency response exercises	☐ Applicable ☒ Not Applicable ERPs are in place to support exercise activities
	▪ incident response	☐ Applicable ☒ Not Applicable ERPs are in place to support incident response activities
	▪ learning from incidents and continuous improvement	☒ Applicable ☐ Not Applicable Sections 8.8.1 – Annual Review 8.8.2 – Review Following an Incident 8.8.3 (Pg 139) – Required Changes
2	**Emergency Management Overview**	
2.1	Emergency preparedness involves being ready to respond to an incident and having the	☒ Applicable ☐ Not Applicable

Sec #	Requirement	Reference in the ERP
	capability to manage the consequences. The ERP is a comprehensive plan to protect the public and the environment and is a critical component of the duty holder's emergency preparedness and response program.	
2.2	**Duty Holder Responsibility**	
	▪ identifying hazards and analyzing consequences	☒ Applicable ☐ Not Applicable Section 3 – Hazard Identification and Risk Assessment
	▪ preparing and maintaining ERPs and response procedures	☒ Applicable ☐ Not Applicable Section 8 - Maintaining Preparedness
	▪ ensuring that the ERPs identify sufficient resources and equipment for use by response personnel during an emergency	☒ Applicable ☐ Not Applicable Section 6 (Pgs 126 - 131) – Response Resources All Annexes – Section 3.3 - Equipment Lists
	▪ designating response personnel and ensuring they are suitably equipped and able to conduct their duties through training, drills, and exercises.	Part of the Emergency Management Program (EMP) Training is referenced in the plan Section 8.3 (Pgs 134 - 136)
3	**Hazard Identification and Consequence Analysis**	
3.1	**Emergency Planning Zone**	☐ Applicable ☒ Not Applicable
	1) The size and shape of the EPZ reflect information gathered during the public involvement program, population density, topography, access and egress routes, and other features that may affect timely emergency response.	☐ Applicable ☒ Not Applicable
	EPZ Measurement The EPZ for a well is measured from the wellhead. The EPZ for a pipeline is measured from the centreline of the pipeline. The EPZ for a storage tank is measured from the centre of the storage tank. The EPZ for a facility handling or processing sour fluids is the largest EPZ of any pipeline entering or leaving the facility measured outward in all directions from the facility lease boundary. However, if the facility has a sour gas well, sour	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	water disposal well, or acid gas disposal well on site, the EPZ for the well may determine the size of the facility EPZ.	
	2) Before filing an ERP, the duty holder must use the ERCBH2S model to calculate the size of the EPZ for operations with a hydrogen sulphide (H2S) concentration of 0.1 moles per kilomole (mol/kmol) or more.	☐ Applicable ☒ Not Applicable
	3) The duty holder must upload a copy of the comma-separated values (CSV) batch export file from ERCBH2S to the Digital Data Submission (DDS) system in support of the ERP application.	☐ Applicable ☒ Not Applicable
	4) The duty holder must calculate the size of the EPZ for operations with high-vapour-pressure (HVP) products.	☐ Applicable ☒ Not Applicable
	5) During any operation involving H2S or HVP products, the duty holder must ensure on-site supervisory personnel are aware of the size of the EPZ.	☐ Applicable ☒ Not Applicable
3.2	**Overlapping Planning Zones**	☐ Applicable ☒ Not Applicable
	Well EPZ Overlap Where two or more wells are close to one another such that their EPZs overlap, duty holders conducting sour drilling or completion operations, wellhead-off workovers, or well servicing operations in any formation containing H2S that is open to the wellbore are expected to • jointly confirm whether the EPZs overlap and if sour operations are scheduled to occur simultaneously, • review and modify ERPs as required (e.g., communication protocol changes), • advise the appropriate AER field centre before conducting sour operations, and Directive 071 • establish, maintain, and document communication among the duty holders. Duty holders may ask the AER for a revised EPZ based on a technical evaluation of the potential release rate. The technical evaluation should	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	consider sour zones isolated behind casing and a valid analysis of the H2S concentration from the zones open to the surface. During drilling operations for critical sour wells with overlapping EPZs, once the first well penetrates about one metre into the critical sour zone porosity top, the second well may proceed to penetrate the critical zone, which could be a standalone zone or a combination of zones that makes the well a critical sour well.	
3.3	**Emergency Response Zones**	☐ Applicable ☒ Not Applicable
	There are two zones in which a duty holder's emergency response resources will be focused during an emergency: the initial isolation zone (IIZ) and the protective action zone (PAZ). Collectively referred to as response zones. The police may establish a different type and size of response zone.	☐ Applicable ☒ Not Applicable Section 5.10.1 (Pg 114) – Planning and Response Zones
3.3.1	**Initial Isolation Zone (IIZ)**	☐ Applicable ☒ Not Applicable Section 5.10.1 (Pg 114) – Planning and Response Zones
	The IIZ is the area near a continuous hazardous release where indoor sheltering may provide temporary protection due to the proximity of the release.	☐ Applicable ☒ Not Applicable Section 5.10.1 (Pg 114) – Planning and Response Zones
	6) If safe to do so, the duty holder must attempt to evacuate the residents from the IIZ.	☐ Applicable ☒ Not Applicable Section 5.10.1 (Pg 114) – Planning and Response Zones
3.3.2	**Protective Action Zone (PAZ)**	☐ Applicable ☒ Not Applicable
	The PAZ is the area downwind of a hazardous release where outdoor pollutant concentrations may result in life-threatening or seriously irreversible health effects on the public. Immediately following a release of H2S or HVP products, the approximate size and shape of the PAZ can be determined using the conditions	☐ Applicable ☒ Not Applicable Section 5.10.1 (Pg 114) – Planning and Response Zones

Sec #	Requirement	Reference in the ERP
	at the time of the incident (see figure 1). Once monitoring equipment is deployed, the actual size and shape of the PAZ can be established based on the monitored conditions. The size and shape of the PAZ may change over time based on monitored conditions.	
4	**Public and Appropriate Authority Involvement**	
4.1	**Notification and Consultation**	☐ Applicable ☒ Not Applicable
	7) The duty holder must notify and consult with the public and appropriate authority in the situations identified in table 1 of Directive 71 .	☐ Applicable ☒ Not Applicable
	8) If changes to the ERP are necessary because of public consultation, the duty holder must inform and discuss the changes with the appropriate authority. Situations from Table 1 Developing an ERP requiring AER approval Change in EPZ size Before drilling the first sour zone and before nonconsecutive completion operations on a sour well Cancellation of ERP Delayed completion operations End of drilling or completion operations Modifications to an existing facility Public awareness program Temporary surface pipeline Transfer of ownership Workovers with the wellhead removed	☐ Applicable ☒ Not Applicable
4.2	**Preparing for the Public Involvement Program**	
	9) The duty holder must identify all residents and appropriate authority within the EPZ plus those within 25 metres (m) outward of the EPZ boundary.	☐ Applicable ☒ Not Applicable
	10) If an EPZ intersects an urban density development, the duty holder must include the entire development within the EPZ to conduct the public involvement program. 10 Directive 071: Emergency Preparedness and Response	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	(February 2023) Alberta Energy Regulator	
	11) If an EPZ intersects an urban centre, the duty holder is not required to identify each residence within the urban centre when conducting the public involvement program. However, contact must be made with the appropriate emergency management organizations to review key incident response information and confirm and coordinate each party's roles and responsibilities.	☐ Applicable ☒ Not Applicable
	12) Before starting the public involvement program, the duty holder must confirm and coordinate roles and responsibilities in accordance with the protocols established with the appropriate authority.	☐ Applicable ☒ Not Applicable
	13) The duty holder must attempt to reach a mutual understanding with the appropriate authority on each party's specific needs, roles, and responsibilities during an emergency and include a summary of the mutual understanding in the ERP. The AER strongly encourages the duty holder to support and work with local synergy groups established in various areas throughout Alberta.	☒ Applicable ☐ Not Applicable All Annexes – Section 3.2.5 – Mutual Aid Section 3.2.6 – Mutual Understanding with Local Authorities / Municipalities
4.3	**Conducting the Public Involvement Program**	☐ Applicable ☒ Not Applicable
	14) The duty holder must either notify or notify and consult the public as indicated in table 2.	☐ Applicable ☒ Not Applicable
	15) The duty holder must take the following actions: a) Conduct in-person consultation with all requisite individuals listed in table 2. b) Offer to conduct the consultation by telephone if residents do not wish to meet in person. c) Offer residents a public information package sent by a trackable method (e.g., registered mail) if they do not wish to directly participate in the consultation process; regular mail is acceptable if the resident agrees. d) Review key incident response information with the public identified in the EPZ who wish	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	to participate in the consultation process to familiarize them with potential emergencies and corresponding public protection measures for emergency response procedures. The duty holder's representative is expected to have the necessary knowledge to provide details of the emergency response procedures and address any questions and concerns. e) Address any request for additional information or modifications of the ERP by the individual consulted.	
	16) The duty holder must notify residents of urban centres that they are within the EPZ and provide details of the public protection measures available in the event of an emergency.	☐ Applicable ☒ Not Applicable
	17) The duty holder must attempt to contact the persons listed in table 2 to arrange a suitable meeting place and time to address any questions and concerns regarding the ERP or provide a public information package sent by a trackable method (e.g., registered mail) with an offer to meet. It is the duty holder's responsibility to show they made reasonable efforts to meet.	☐ Applicable ☒ Not Applicable
	18) If the duty holder is unable to contact these people, or if they are unwilling to provide emergency contact information, the duty holder is to account for them in the ERP.	☐ Applicable ☒ Not Applicable
4.4	**Public Information Package**	☐ Applicable ☒ Not Applicable
	The public information package is not required with the ERP submission. However, the AER may request the duty holder to provide it at any time (e.g., a hearing or audit).	☐ Applicable ☒ Not Applicable
	19) The duty holder must a) develop a public information package for distribution during the public involvement program and b) provide all persons identified in table 2 with a copy of the public information package.	☐ Applicable ☒ Not Applicable
	20) There are a number of required elements	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	the duty holder must include in the public information package.	
	21) Before starting the public involvement program, the duty holder must provide a copy of the public information package to the local AER field centre so that AER staff can respond to questions and concerns from area residents.	☐ Applicable ☒ Not Applicable
4.5	**Information Required From the Public Involvement Program**	☐ Applicable ☒ Not Applicable
	22) The duty holder must attempt to obtain the following information for inclusion in the ERP: a) the exact location of the residence, place of business, or public facility, including egress route issues (legal description or address) b) name of key contact and a 24-hour contact telephone number (home, business, cell phone, or other) and an alternate contact if possible c) names of all family members in the residence d) number of residents, specifying adults and children e) names of those with special needs or specific requirements—the duty holder representative is expected to inform members of the public that they can be considered to have special needs and require early notification or evacuation without having to divulge personal health issues f) any other information deemed necessary to allow for effective emergency response procedures to be developed	☐ Applicable ☒ Not Applicable
	23) The duty holder must consider any resident unwilling to provide personal information as having special needs.	☐ Applicable ☒ Not Applicable
5	**Preparation of Emergency Response Plans**	
	Two types of ERPs may be used: an AER-approved ERP and a corporate ERP. The duty holder will determine the type and amount of information in the ERP based on the potential hazards identified by the duty holder	☒ Applicable ☐ Not Applicable Regulated Liquid Pipeline ERP is in effect Annexes for each pipeline are in effect Section 8.8.1 – Annual Review
	24) The duty holder must have an ERP with procedures that will aid in effective response to	☒ Applicable ☐ Not Applicable Regulated Liquid Pipeline ERP in effect

Sec #	Requirement	Reference in the ERP
	an emergency originating from its operations.	Section 5 (Pgs 67 – 124)
	25) The duty holder must develop ERPs at a level of detail proportionate to its operations and address hazards and potential consequences of the emergency scenarios that its operations pose to the public and the environment.	☒ Applicable ☐ Not Applicable Regulated Liquid Pipeline ERP is in effect Section 5.5 – 5.10.7 Pgs 77 – 120 I ncident Specific Response Actions
5.1	**AER-Approved Emergency Response Plan**	☐ Applicable ☒ Not Applicable **Not currently an AER-Approved Plan**
	26) The duty holder must submit an ERP and the ERP Application form to the AER using the DDS system for approval if any of the following conditions apply: a) The EPZ includes surface developments or egress routes through the EPZ for residents of nearby residences. b) The operation includes critical sour wells. c) The operation includes a cavern storage facility storing HVP products.	☐ Applicable ☒ Not Applicable
	27) For sour wells, until a hard copy or electronic copy of all applicable ERPs and the AER approval letter are available on site for the duration of the operations, the duty holder must not: a) spud the well, drill out the surface casing, remove any component of an existing wellhead; b) conduct testing; or c) perform workovers, completions, or well servicing.	☐ Applicable ☒ Not Applicable
	28) Where an AER-approved ERP is required, the duty holder must ensure it is approved before starting operations. Appendix 3 provides examples of when an ERP requires AER approval.	☐ Applicable ☒ Not Applicable
	29) If the AER determines a hearing will be conducted to consider an application, the duty holder must provide its relevant ERP to the AER for review. Once the AER has determined that the duty holder's ERP is technically complete, a notice of hearing may be issued.	☐ Applicable ☒ Not Applicable
5.1.1	**Supplements to an AER-Approved ERP**	☐ Applicable ☒ Not Applicable
	A supplement to an AER-approved ERP may be required when wells or operations are added,	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	such as new well or pipeline tie-ins or facilities, new operating areas, significant changes to the EPZ or new residences within the EPZ, drilling or completion operations, and • sour well workovers, well servicing, and testing. The examples in appendix 3 also apply to ERP supplements requiring AER approval.	
	30) Where a supplement to an AER-approved ERP requires AER approval, the duty holder must submit the supplement to the AER for approval via the DDS system before starting operations unless the added wells or operations are currently operating.	☐ Applicable ☒ Not Applicable
	31) Where a supplement to an AER-approved ERP requires AER approval, the duty holder must a) conduct a public involvement program for all surface developments within the proposed well's EPZ when the supplement is for drilling and completions for sour wells and, b) for all other activities, conduct a public involvement program for all new surface developments in the portion of the EPZ extending beyond the existing EPZ boundary.	☐ Applicable ☒ Not Applicable
5.1.2	**Multiwell Programs**	☐ Applicable ☒ Not Applicable
	ERPs may be developed and submitted for multiwell programs if they include site-specific information for each well. The duty holder may develop common procedures and response infrastructure for the entire program as long the ERP remains current throughout the project and is maintained in accordance with this directive.	☐ Applicable ☒ Not Applicable
5.1.3	**Temporary Surface Pipelines**	☐ Applicable ☒ Not Applicable
	A duty holder may include a temporary surface pipeline in its ERP for sour well site-specific drilling or completion, provided that the	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	pipeline EPZ is within the well EPZ.	
	32) The duty holder must develop and submit a separate ERP for approval where the temporary surface pipeline EPZ extends beyond the well EPZ boundary and includes surface developments.	☐ Applicable ☒ Not Applicable
5.1.4	**Sour Underbalanced Drilling**	☐ Applicable ☒ Not Applicable
	The duty holder may conduct underbalanced drilling operations before entering a sour zone with surface developments within the EPZ. Before conducting underbalanced drilling operations, the duty holder is expected to • file the sour well ERP as a nonroutine application in accordance with Directive 056 and • submit a letter to the AER providing the start and end dates for the underbalanced drilling operation and confirmation that no sour formation will be encountered while drilling underbalanced. The AER will consider licensing sour underbalanced drilling operations if the public were to be relocated from the EPZ before the start of drilling operations.	☐ Applicable ☒ Not Applicable
5.2	**Corporate Emergency Response Plans**	☒ Applicable ☐ Not Applicable
	Not every operation requires an AER-approved ERP. When an AER-approved ERP is not required, the duty holder may use its corporate ERP to manage incidents. Although corporate ERPs do not require AER approval, they are subject to AER review and audit.	☒ Applicable ☐ Not Applicable
	33) The duty holder must develop and maintain its corporate ERP, which must include the common components set out in section 6.1.	☒ Applicable ☐ Not Applicable Refer to 6.1 of this review for the locations of the required common components of this ERP.
5.3	**Emergency Response Plan Management**	☒ Applicable ☐ Not Applicable
	The purpose of the ERP management process is	☒ Applicable ☐ Not Applicable

Sec #	Requirement	Reference in the ERP
	to ensure ERPs are kept up to date and are provided to plan holders, the parties noted in table 3, and persons who have requested a copy (e.g., residents in the EPZ). The AER does not approve annual ERP updates but will audit duty holders to verify the accuracy of their ERPs. Out-of-date ERPs that could result in ineffective emergency response will be subject to enforcement action.	Record of Changes Sections 8.8.1 – Annual Review
	34) The duty holder must demonstrate that its plan management process will keep its ERPs up to date and include the following activities: a) Reviewing plans annually and updating them with necessary changes to ensure that information remains accurate. b) Contacting residents within the EPZ to update their information. c) Conducting ground truthing to verify changes, such as new residents, businesses, and renters, and verify the ERP maps. The duty holder may use any method for ground truthing.	☒ Applicable ☐ Not Applicable Record of Changes Sections 8.8.1 – Annual Review
	35) The duty holder must conduct a public awareness program (table 1) every two years with residents within the EPZ through consultative processes.	☐ Applicable ☒ Not Applicable
	36) Regardless of whether residents wish to meet with the duty holder, the duty holder must provide an updated public information package to each residence. The duty holder must a) provide key emergency response information, b) review public protection measures, and c) answer any concerns or questions from residents. Duty holders may choose to send an updated public information package every year, depending on changes in the area. If a resident does not wish to participate in the public awareness program, the duty holder is expected to note that in its records.	☐ Applicable ☒ Not Applicable
	37) The duty holder must immediately correct errors in the ERP upon discovery or when	☒ Applicable ☐ Not Applicable Record of Changes

Sec #	Requirement	Reference in the ERP
	reported to them by the AER or other parties.	Sections 8.8.1 – Annual Review
	38) The duty holder must notify those persons holding copies of the approved ERPs of the completion of an operation and that the ERP is no longer in effect. Notification includes the AER and all residents within the EPZ who asked to be notified of completion.	☒ Applicable ☐ Not Applicable
5.3.1	**Distribution of AER-Approved ERPs**	☐ Applicable ☒ Not Applicable
	Once the AER approves an ERP, including approval of supplements, it becomes a public document subject to disclosure, except for confidential resident and personal information.	☐ Applicable ☒ Not Applicable
	39) The duty holder must a) distribute copies of approved ERPs to the parties listed in table 3 within ten business days of AER approval unless otherwise requested in writing by a party during the planning process; b) provide a copy of the ERP, excluding confidential resident and personal information, to any resident within the EPZ who requests in writing to have a copy; and c) ensure that all required plan holders have the AER-approved ERPs.	☒ Applicable ☐ Not Applicable Distribution List (Pg 44)
5.3.2	**Updates and Amendments to AER-Approved ERPs**	☐ Applicable ☒ Not Applicable
	40) Until the AER-approved ERP is updated to capture the content of the supplement, the duty holder must keep the current AER-approved ERP and the supplements in place. An update or amendment does not require AER approval. The duty holder may update or amend an existing AER-approved ERP for well or pipeline tie-ins, facilities, and operating areas, if • the EPZ size is unchanged, or • there are no surface developments within the area of a new EPZ extending beyond the boundary of the existing EPZ.	☐ Applicable ☒ Not Applicable Record of Changes Sections 8.8.1 – Annual Review
6	**Emergency Response Plan Contents**	

Sec #	Requirement	Reference in the ERP
6.1	**Common Components**	
	Regardless of whether an ERP is approved by the AER, all ERPs have the following common components:	☒ Applicable ☐ Not Applicable
	▪ the assessment matrix for classifying incidents	☒ Applicable ☐ Not Applicable Section 5.3 .1 – AER Classification Matrix
	▪ communications plan	☒ Applicable ☐ Not Applicable Section 5.12 Communications
	▪ telephone lists	☒ Applicable ☐ Not Applicable Appendix A – Company Contact Information All Annexes – Section 4 Directory
	▪ mutual aid understandings	☒ Applicable ☐ Not Applicable
	▪ duty holder's emergency response personnel responsibilities	☒ Applicable ☐ Not Applicable
	▪ incident management procedures	☒ Applicable ☐ Not Applicable Section 4.3.4 Section 5.1.2
	▪ reception centre activation procedures	☒ Applicable ☐ Not Applicable Section 4.3.4 Appendix C – Roles and Responsibilities Checklist
	▪ equipment list	☒ Applicable ☐ Not Applicable Section 6.3 Company Owned Equipment
	▪ ERP distribution list	☒ Applicable ☐ Not Applicable Controlled Copy Distribution List (Pg 44)
6.1.1	**Assessment Matrix for Classifying Incidents**	
	The AER has developed an assessment matrix to classify incidents so the duty holder can consistently communicate with the appropriate authority and other industry operators. There are four levels of incident classification (in ascending order of risk and severity): alert, level 1, level 2, and level 3. For more information, see appendix 4.	☒ Applicable ☐ Not Applicable AER Incident Classification Matrix Section 5.3 (Pg 71)
	41) The duty holder must include the AER's	☒ Applicable ☐ Not Applicable

Sec #	Requirement	Reference in the ERP
	incident classification matrix in its ERP.	AER Incident Classification Matrix – Section 5.3 (Pg 71)
	42) The duty holder must define and set out in the ERP the appropriate actions to be taken, including public protection measures, for each incident level.	☒ Applicable ☐ Not Applicable Levels of Emergency & Response Actions Sections 5.3 (Pg 72) & 5.4 (Pg 73)
6.1.2	**Communications Plan**	
	The development and implementation of an effective communications plan is essential to incident response.	☒ Applicable ☐ Not Applicable Section 4 – Section 5.3.1 to 6.1.4 Appendix C Public Information Officer Checklist Liaison Officer Checklist
	43) The duty holder's ERP must include a communications plan that includes	☒ Applicable ☐ Not Applicable Section 5.12 Communications
	a) procedures for contacting and maintaining communication with key duty holder personnel, appropriate authorities, support services, emergency social services, the public, the media, and other affected duty holders;	☒ Applicable ☐ Not Applicable Appendix A – Company Contact Information All Annexes – Section 4 - Directory
	b) clearly defined roles and responsibilities to contact the AER and other responders identified in the ERP in an emergency—the AER recommends a communications flowchart be included that identifies responsibilities by role;	☒ Applicable ☐ Not Applicable Appendix C Roles and Responsibilities Checklists
	c) procedures that will be implemented during an incident to contact and maintain communication with persons directly affected to keep them informed of the situation and actions being taken, including plans for communicating the implementation of public protection measures, such as evacuation and sheltering in place for residents within and beyond the EPZ if applicable;	☒ Applicable ☐ Not Applicable Section 5.10.1 to 5.10.7 Public Protection Appendix C Roles and Responsibilities Checklists
	d) procedures to inform and update the media and to distribute factual messages to the public in an expeditious manner; and	☒ Applicable ☐ Not Applicable Section 5.14 (pg 122) Social Impact Considerations
	e) procedures to downgrade an incident or stand down an incident.	☒ Applicable ☐ Not Applicable Section 5.15 Post Emergency Response Actions

Sec #	Requirement	Reference in the ERP
		Appendix C - Incident Commander Responsibilities & Actions Checklist
6.1.3	**Telephone Lists**	☒ Applicable ☐ Not Applicable
	44) The duty holder's ERP must include the following:	☒ Applicable ☐ Not Applicable
	a) a telephone list of internal incident response personnel and the duty holder's 24-hour emergency phone number	☒ Applicable ☐ Not Applicable Appendix A Pipeline Control Centre, EOC and 24 Hr Number listed Section 5.2.1 24-Hour Emergency Line
	b) a telephone list of external emergency support services that might be required during an incident, including government departments and agencies, First Nations and Métis contacts, communication services, air monitoring services, emergency support services, emergency social services, and spill cooperatives	☒ Applicable ☐ Not Applicable All Annexes – Section 4 Directory
	c) the Energy and Environmental Emergency 24-Hour Response Line phone number	☒ Applicable ☐ Not Applicable All Annexes – Section 4 Directory Alberta Edge
6.1.4	**Mutual Aid Understandings**	☒ Applicable ☐ Not Applicable
	45) The duty holder's ERP must include a summary of any mutual aid understandings with third parties. The duty holder is encouraged to include copies of mutual aid understandings in the ERP.	☐ Applicable ☒ Not Applicable All Annexes – Section 3.2.5 Mutual Aid
	46) Where duty holders have operations that are tied together (i.e., operations that are physically connected or assets operated by a third party), each duty holder's ERP for those operations must include a bridging statement summary that a) outlines the communications between the duty holders during an incident, b) describes any shared emergency response procedures and support, and c) lists all the related ERPs for the operations tied together.	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	The AER strongly encourages the duty holder to support and work with local mutual aid groups in areas throughout Alberta.	☐ Applicable ☒ Not Applicable Section 5.14 Social Impact Considerations All Annexes – Section 3.2.5 Mutual Aid
6.1.5	**Duty Holder's Emergency Response Personnel Responsibilities**	☒ Applicable ☐ Not Applicable
	47) The duty holder's ERP must identify the roles and responsibilities of its emergency response personnel and the titles of those personnel.	☒ Applicable ☐ Not Applicable Appendix C Roles and Responsibilities Checklist
6.1.6	**Incident Management Procedures**	☒ Applicable ☐ Not Applicable
	The AER strongly supports using the incident command system to ensure consistent command, control, and communication among all parties during an incident.	☒ Applicable ☐ Not Applicable Section 4.2.2 On Scene Management - ICS Appendix C Roles and Responsibilities Checklist ICS is referenced to through out document
	48) The duty holder's ERP must set out a) the procedures to manage and coordinate incident response and b) the roles and responsibilities of personnel at its operational command and incident support facilities.	☒ Applicable ☐ Not Applicable Section 4.2.2 On-Scene Management - ICS Appendix C Roles and Responsibilities Checklist
6.1.7	**Reception Centre Activation Procedures**	☒ Applicable ☐ Not Applicable
	49) The duty holder's ERP must set out a) the procedures for activating a reception centre situated a safe distance from the release source and b) procedures for meeting and registering evacuees at the reception centre.	☒ Applicable ☐ Not Applicable Section 4.3.4 Reception Centre Appendix C – Roles and Responsibilities: Public Protection Group Supervisor Checklist, Reception Centre Team Lead Checklists
6.1.8	**Equipment List**	☒ Applicable ☐ Not Applicable
	50) The duty holder's ERP must include a list of equipment, including the location, number, and type of the equipment for use in incident response, including	☒ Applicable ☐ Not Applicable Section 5.4.1.1 Air Monitoring Section 5.6.6 – Emergency Response Equipment Section 5.12 – Communications Equipment All Annexes – Section .3.3 Equipment Lists
	a) communications equipment for the public safety coordinator, rovers, roadblock and air monitoring personnel, and other personnel that	☒ Applicable ☐ Not Applicable Section 5.12 Company First Responder

Sec #	Requirement	Reference in the ERP
	require it (the duty holder is responsible for ensuring that communications equipment is made available to response personnel);	
	b) roadblock kits;	☒ Applicable ☐ Not Applicable All Annexes – Section 3.3.2 Equipment in Roadblock Kits
	c) on-site ignition equipment (if applicable); and	☐ Applicable ☒ Not Applicable
	d) gas monitoring equipment (if applicable)	☒ Applicable ☐ Not Applicable 5.4.1.1 Air Monitoring Section 5.6.6 – Emergency Response Equipment
6.1.9	**ERP Distribution List**	☒ Applicable ☐ Not Applicable
	51) The duty holder's ERP must include a list of all plan holders and ERP recipients, including the entities listed in table 3.	☒ Applicable ☐ Not Applicable Controlled Copy Distribution List – Page 44 All Annexes – Plan Distribution and Maintenance
6.2	**Content Specific to an AER-Approved Emergency Response Plan**	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	In addition to the information required in section 6.1, the following information is required for an ERP submitted to the AER for approval:	☐ Applicable ☒ Not Applicable
	▪ overview and other high-level information	☐ Applicable ☒ Not Applicable Section 1 – Introduction Section 2 – Facility Description Section 4 Organizational Control of Emergency Section 4.1 Standard
	▪ operational information	☐ Applicable ☒ Not Applicable Section 2 – Facility Description GRP Annex 1004298468 MEP Annex 1012946593 WSP Annex 1012947110
	▪ maps	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
		GRP Annex 1004298468 – Section 3.7 Maps MEP Annex 1012946593 – Section 3.6 Maps WSP Annex 1012947110 – Section 3.5 Maps
	▪ incident detection, notification, and confirmation procedures	☐ Applicable ☒ Not Applicable Section 7 – Release Detection Section 5.1 Response Process and Scope Section 5.11 Documentation of Initial Response Section 5.2 – Notifications Section 5.5 Response Actions
	▪ hazard monitoring procedures	☐ Applicable ☒ Not Applicable Section 5.4.1 Health & Safety Section 5.4.1.1 Air Monitoring Section 5.4.2 Personal Protective Equipment Section 5.7 – 5.10 Incident Specific Responses Appendix C – Roles and Responsibilities Action Checklists - Environmental Unit Leader Environmental Monitoring Team
	▪ isolation procedures	☐ Applicable ☒ Not Applicable Section 5.10.6 Isolation Section 5.10.7 Roadblocks
	▪ evacuation or shelter-in-place procedures	☐ Applicable ☒ Not Applicable 5.10.4 Evacuation 5.10.5 Shelter in Place
	▪ ignition procedures	☐ Applicable ☒ Not Applicable
6.2.1	**Overview and Other High-Level Information**	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	52) The duty holder's AER-approved ERP must include the following information:	☐ Applicable ☒ Not Applicable
	a) an introduction and summary	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
		Section 1 Introduction Section 2 – Facility Description
	b) a brief overview of the operations	☐ Applicable ☒ Not Applicable Section 2 – Facility Description
	c) the name of the operating area or system	☐ Applicable ☒ Not Applicable Front Page Header of the Document
	d) a schedule (e.g., expected spud date, date of entry into the sour zone, and estimated time in the sour zone), if relevant to the ERP	☐ Applicable ☒ Not Applicable
	e) general land use in the surrounding area, including population density, number of residents, level of transient usage, public facilities, and roads	☐ Applicable ☒ Not Applicable GRP Annex 1004298468 – Section 3.7 Maps MEP Annex 1012946593 – Section 3.6 Maps WSP Annex 1012947110 – Section 3.5 Maps
	f) the distance to the nearest urban centre and residence	☐ Applicable ☒ Not Applicable All Annexes: Section 3 – Site Specific Information GRP Annex 1004298468 – Section 3.7 Maps MEP Annex 1012946593 – Section 3.6 Maps WSP Annex 1012947110 – Section 3.5 Maps
	g) information on residents in EPZ	☐ Applicable ☒ Not Applicable
	h) any additional emergency response procedures specific to the operation	☐ Applicable ☒ Not Applicable Section 5 – Plan Implementation
	i) date of the latest revision	☐ Applicable ☒ Not Applicable Header of the Document Record of Changes – Page 43
6.2.2	Operational Information	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	53) The duty holder's AER-approved ERP must include the following information on its	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	operations:	
	a) name and legal descriptions of the locations and type of operation	☐ Applicable ☒ Not Applicable GRP Annex 1004298468 - Section 3 Site Specific Information MEP Annex 1012946593 Section 3 Site Specific Information WSP Annex 1012947110 Section 3 Site Specific Information
	b) licence or approval numbers for wells, facilities, and pipelines and pipeline line numbers	☐ Applicable ☒ Not Applicable GRP Annex 1004298468 – Section 3.4 Technical Data MEP Annex 1012946593 – Section 3.4 Technical Data WSP Annex 1012947110 – Section 3.4 Technical Data
	c) operational status	☐ Applicable ☒ Not Applicable
	d) identified hazards with the potential to result in high consequences to public safety and the environment	☐ Applicable ☒ Not Applicable Section 3 – Hazard Identification and Risk Assessment
	e) size and configuration of the EPZ with supporting information for EPZ modelling	☐ Applicable ☒ Not Applicable
	f) if applicable, sour wells, sour pipelines, and facilities information, including i) surface location of wells, emergency shutdown (ESD) valves, pipelines, and facilities ii) name and legal description of wells (surface and bottomhole location), pipelines, and facilities iii) maximum cumulative H2S release rate and concentrations	☐ Applicable ☒ Not Applicable
	if applicable, HVP cavern storage facility and HVP pipeline information, including i) name or legal description of facilities and pipelines ii) maximum cumulative HVP release volume or release rate for the facility iii) routing maps of the pipelines iv) maximum potential HVP release volumes for	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	all pipeline segments within the system v) maximum licensed operating pressure, internal diameter, and minimum operating temperature of the pipelines vi) length of pipeline between ESD valves	
6.2.3	**Maps**	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	54) The duty holder's AER-approved ERP must include clear maps sized to represent the entire mapped area with the following information: a) surface locations of the operations and access roads b) the EPZ boundary c) residences within the EPZ, residences within 25 m outward of the EPZ boundary, and residences on dead-end roads where residents would need to egress through the EPZ— include residence reference numbers d) provincial, local, and access roadways and dead ends in the EPZ e) lakes, rivers, streams, and any elevation feature that could affect incident response in the EPZ f) urban density developments, campgrounds, recreation areas, public facilities (e.g., churches, schools, hospitals), and any other publicly used development within the EPZ g) trapping areas, grazing leases, and range allotment boundaries and their reference numbers h) other industrial operations, including oil and gas operations i) railways and airports j) municipal boundaries (e.g., hamlets, villages, towns) k) health authority boundaries l) a legend, scale, and north directional indicator m) potential roadblocks for sour well site-specific drilling and completions	☐ Applicable ☒ Not Applicable GRP Annex 1004298468 – Section 3.7 Maps MEP Annex 1012946593 – Section 3.6 Maps WSP Annex 1012947110 – Section 3.5 Maps All maps are hyperlinked in the plan to the internal GIS b) c) EPZs are not applicable
6.2.4	**Incident Detection, Notification, and**	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	Confirmation Procedures	
	55) The duty holder's AER-approved ERP must set out the following procedures for incident detection, notification, and confirmation: a) How incidents are detected. b) How the duty holder is alerted of an incident. c) How incidents are confirmed (e.g., a release).	☐ Applicable ☒ Not Applicable Section 7 – Release Detection Section 5.1 Response Process and Scope Section 5.11 Documentation of Initial Response Section 5.2 – Notifications Section 5.5 Response Actions GRP Annex 1004298468 – Section 3.2.7 Detection / Shut down Procedures MEP Annex 1012946593 – Section 3.2.7 Detection / Shut down Procedures WSP Annex 1012947110 - Section 3.2.7 Detection / Shut down Procedures
	56) The duty holder's AER-approved ERP must include specific procedures for how and when notification will occur within the EPZ.	☐ Applicable ☒ Not Applicable Section 5.2 Notifications Section 5.10 Evacuation 5.10.3 Public Safety Decision Process Section 5.10.5 Shelter in Place
6.2.5	**Hazard Monitoring Procedures**	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	57) The duty holder's AER-approved ERP must a) provide details on the intended use and procedures to activate hazard monitoring equipment, such as stationary and mobile air quality monitoring units and personal handheld monitors, and b) procedures for continuously monitoring the dispersion of hazardous substances during an incident.	☐ Applicable ☒ Not Applicable Section 3.2.7 Detection and Shut Down Procedures Section 3.3 Equipment in Roadblock Kits
	58) The duty holder's AER-approved ERP must specify the type and number of hazard monitoring devices appropriate for addressing the following considerations: a) the type of hazard b) entry and egress points c) population density and distance to urban	☐ Applicable ☒ Not Applicable Section 3.3 Equipment in Roadblock Kits MEP Annex 1012946593 – Section 3.2.7 Detection and Shut Down Procedures GRP Annex 1004298468 – Section 3.2.7 Detection and Shut Down Procedures

Sec #	Requirement	Reference in the ERP
	centres or rural subdivisions d) local weather conditions and topographical features	
6.2.6	**Isolation Procedures**	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	59) To prevent potentially jeopardizing public safety, the duty holder's AER-approved ERP must include procedures to restrict unauthorized entry into the response zones during an incident. For example, isolation procedures to establish and manage manned access control points.	☐ Applicable ☒ Not Applicable Section 5.10.6 Isolation Section 5.10.7 – Establishing Roadblocks
	60) The duty holder's AER-approved ERP must identify any special procedures needed to address major highways and railways passing through the EPZ that could be affected by a hazard.	☐ Applicable ☒ Not Applicable **Note there are no EPZs identified in this plan.** Section 5.10.6 Isolation Section 5.10.7 – Establishing Roadblocks Section 4.0 Directory in each Annex lists contact information for Alberta Edge for contacting highways
6.2.7	**Evacuation or Shelter-in-Place Procedures**	☐ Applicable ☒ Not Applicable **Note: This is not currently an AER-Approved Plan, items under this element are not applicable.**
	61) The duty holder's AER-approved ERP must address how evacuation from or shelter in place within the response zones will be accomplished during an incident, including how transients, such as hunters, trappers, recreational users, and nonresident landowners, will be found and evacuated.	☐ Applicable ☒ Not Applicable Section 5.10 – Public Protection Appendix B – Forms Appendix C – Public Protection Group Supervisor Checklist Reception Centre Team Lead Checklist
	62) The duty holder's AER-approved ERP must address any special procedures required for evacuating public facilities involving large numbers of people, including assistance with transportation (e.g., providing school buses) or changes in the normal notification procedures.	☐ Applicable ☒ Not Applicable Section 5.14 – Social Impact Considerations Section 5.10 – Public Protection
	63) The duty holder's AER-approved ERP must include shelter-in-place instructions.	☐ Applicable ☒ Not Applicable Section 5.10.5 – Shelter in Place
	64) As part of its consultation with the	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	appropriate authority, the duty holder must discuss how notification and evacuation will occur outside the EPZ and include a summary of that discussion in the ERP.	Section 5.14 – Social Impact Considerations
6.2.8	**Ignition Procedures**	☐ Applicable ☒ Not Applicable
	65) The duty holder's AER-approved ERP must include the following information concerning the ignition of sour gas wells and HVP product releases: a) The ignition decision procedures (e.g., ignition criteria flowchart), including a description of the equipment to be used in the event ignition criteria are met. b) An acknowledgement that one of its on-site representatives has been designated as the ignition authority.	☐ Applicable ☒ Not Applicable
	66) In addition to requirement 65, the duty holder's AER-approved ERP must address the following concerning releases from sour gas wells: a) The approach to identifying the location of a plume. b) The factors to consider when deciding whether to ignite a release, such as changing weather conditions. c) The ignition decision procedures.	☐ Applicable ☒ Not Applicable
	67) In addition to requirement 65, the duty holder's AER-approved ERP must address the following concerning HVP product releases from a pipeline or cavern storage facility: a) The approach to identifying the location of a plume. b) The factors to consider when deciding whether to ignite a release, such as changing weather conditions. c) The ignition decision procedures, including a copy of figure 2. d) Protocols for supporting a decision to ignite a release, including emergency response procedures for immediate ignition and actions to be taken if a release occurs while personnel are on site. e) The actions required before attempting to	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	ignite a dispersing HVP product plume, such as establishing the boundary of the dispersing vapour cloud. f) The names of personnel authorized to conduct the ignition and a description of the follow-up actions.	
7	**Emergency Response Training, Exercises and Review Meetings**	
7.1	**Training**	☒ Applicable ☐ Not Applicable
	68) The duty holder must train its response personnel to ensure they are competent in the emergency response procedures.	☒ Applicable ☐ Not Applicable Section 8.1 – Emergency Preparedness Standards Section 8.7 – Training, Drills and Exercise Record Keeping
	69) The duty holder must provide ERP training that includes the following topics: a) all aspects of the plan b) roles and responsibilities during an incident c) public protection measures used during an incident d) available communication methods	☒ Applicable ☐ Not Applicable Section 8.1 – Emergency Preparedness Standards Section 8.3 – Emergency Response Training for South Bow Section 8.4 – Emergency Response Training for Casual and Volunteer Labourers Section 8.5 – Educating the Public on South Bow Emergency Response Section 8.7 – Training, Drills and Exercise Record Keeping
7.2	**Exercises**	☒ Applicable ☐ Not Applicable
	70) To promote emergency response preparedness, the duty holder must conduct the following planned exercises to test all ERPs: a) Conduct an annual tabletop or communications exercise for a corporate ERP. b) Conduct an annual tabletop or communications exercise for each AER-approved ERP except in the year when holding a major exercise. c) Conduct a major exercise once every three years for each AER-approved ERP. Where duty holders have multiple AER-approved ERPs with the same field supervisory response personnel and infrastructure, the ERPs may be tested simultaneously through one exercise.	☒ Applicable ☐ Not Applicable Section 8.6 – Response Drills and Exercises Section 8.7 – Training, Drills and Exercise Record Keeping

Sec #	Requirement	Reference in the ERP
	71) The duty holder must a) notify the appropriate AER field centre 30 days in advance of a scheduled exercise via the DDS system and b) invite appropriate authorities to participate in or observe a major exercise.	Section 8.6 – Response Drills and Exercises
7.3	**Review Meetings**	☐ Applicable ☒ Not Applicable
	72) For all critical sour well drilling and completion, workover, and well servicing operations, the duty holder must conduct a meeting within 96 hours before entering the first sour zone to identify hazards associated with the operation, review roles and responsibilities, and assess on-site personnel capabilities required to implement the ERP. Required personnel include a) field response personnel with assigned roles and responsibilities in the ERP and b) key personnel involved in the supervision and management of the incident response.	☐ Applicable ☒ Not Applicable
	73) If drilling, completion, workover, or well servicing operations include a critical sour zone or a combination of zones that makes the well a critical sour well, the duty holder must conduct a meeting concerning the critical sour zone work before entering the sour zone.	☐ Applicable ☒ Not Applicable
	74) The duty holder must notify the AER through the DDS system at least four business days before the meeting for critical sour zone work so that schedules may be adjusted to facilitate the AER's attendance.	☐ Applicable ☒ Not Applicable
	75) The duty holder must provide at least four business days' notice of the meeting for critical sour zone work to the appropriate authority so that they may participate.	☐ Applicable ☒ Not Applicable
7.4	**Signage**	
	76) The duty holder must post signage with its 24-hour emergency telephone number at the primary entrance to all wells and facilities.	☐ Applicable ☒ Not Applicable
8	**Spill Preparedness and Response**	

Sec #	Requirement	Reference in the ERP
	Spill preparedness requirements apply to • all wells (except those suspended in accordance with AER requirements and gas wells that produce less than two cubic metres per month [m3/month] of hydrocarbon liquids), facilities, and pipelines transporting liquids licensed by the AER; and • hazardous product transport, other than by pipeline, from a well, pipeline, or facility over which the AER has jurisdiction to any other like facility.	☒ Applicable ☐ Not Applicable
8.1	**Spill Contingency Planning**	☒ Applicable ☐ Not Applicable
	A spill response contingency plan can be a manual provided by a spill cooperative, a standalone manual created by the duty holder, a section within the duty holder's ERP, or any combination thereof.	☒ Applicable ☐ Not Applicable Section 1.1 Purpose Section 5.6 – Release of Product
	77) The duty holder must have a spill response contingency plan to address the release of hazardous products onto land or water from any well, facility, pipeline, or mode of transport other than a pipeline.	Section 5.6 – Release of Product GRP Annex 1004298468 – Section 4.3.1 – Spill Clean up and Remediation MEP Annex 1012946593 – Section 4.3.1 – Spill Clean up and Remediation WSP Annex 1012947110 - Section 4.3.1 – Spill Clean up and Remediation
	78) The spill response contingency plan must include the following:	☒ Applicable ☐ Not Applicable
	a) a description of initial emergency response procedures and actions and information on all contacts and services	☒ Applicable ☐ Not Applicable Section 5.6 – Release of Product GRP Annex 1004298468 – Section 4.3 - Support MEP Annex 1012946593 – Section 4.3 - Support WSP Annex 1012947110 - Section 4.3 - Support
	b) an inventory of wells, pipelines carrying liquids, and associated facilities	☒ Applicable ☐ Not Applicable GRP Annex 1004298468 –

Sec #	Requirement	Reference in the ERP
		Section 3.1.3 – Description of Operations Section 3.4.1 – Technical Data MEP Annex 1012946593 – Section 4.3 - Support Section 3.1.3 – Description of Operations Section 3.4.1 – Technical Data WSP Annex 1012947110 - Section 4.3 - Support Section 3.1.3 – Description of Operations Section 3.4.1 – Technical Data
	c) topographical maps showing designated spill control points (if applicable), access roads, urban centres, bodies of water (i.e., streams, rivers, lakes), and water supply intakes for municipal and industrial operations, pipelines, wells, and facilities within the operating area	☒ Applicable ☐ Not Applicable GRP Annex 1004298468 – Section 3.7 Maps MEP Annex 1012946593 – Section 3.6 Maps WSP Annex 1012947110 – Section 3.5 Maps
	d) roles, responsibilities, and resources to manage the environmental protection response	☒ Applicable ☐ Not Applicable Appendix C – Roles and Responsibilities Action Checklists - Environmental Unit Leader Environmental Monitoring Team
	e) inventory and location of response equipment	☒ Applicable ☐ Not Applicable Section 4.3.1 of Annexes Section 6.3.1 – Spill Response Equipment
	f) containment and recovery procedures; and applicable to the type, volume, and nature of the production and time of year	☒ Applicable ☐ Not Applicable Section 5.6 – Release of Product GRP Annex 1004298468 – Section 4.3.1 – Spill Clean up and Remediation MEP Annex 1012946593 – Section 4.3.1 – Spill Clean up and Remediation WSP Annex 1012947110 - Section 4.3.1 – Spill Clean up and Remediation

Sec #	Requirement	Reference in the ERP
	A duty holder is exempt from purchasing spill cleanup equipment and developing its own spill response contingency plan and exercise if it is a member in good standing of a spill cooperative in Alberta for the area where its operations are located.	☒ Applicable ☐ Not Applicable White Spruce Pipeline is listed as a WCSS member Grand Rapids s listed as a WCSS member
	79) A duty holder that is not a member of a spill cooperative must a) purchase appropriate spill cleanup equipment, considering the type of operations and terrain in which the duty holder operates, b) maintain the equipment in good working order, and c) store the equipment where it may be required for immediate access.	☐ Applicable ☒ Not Applicable White Spruce Pipeline is listed as a WCSS member Grand Rapids s listed as a WCSS member Section 6.3 – Company Owned Equipment Section 6.3.1 – Spill Response Equipment
8.2	**Spill Response Exercise**	☐ Applicable ☒ Not Applicable
8.2.1	**Spill Cooperative Member**	☒ Applicable ☐ Not Applicable
	80) A duty holder that is a member of a spill cooperative must be a member in good standing, which means membership fees are fully paid, and the duty holder has met the obligations of the cooperative.	☒ Applicable ☐ Not Applicable White Spruce Pipeline is listed as a WCSS member Grand Rapids s listed as a WCSS member
	81) As part of its spill response training, a duty holder that is a member of a spill cooperative must either a) attend (and be appropriately represented by spill response personnel) at least one of the cooperative's annual deployment exercises in the area where its operations are located (attendance at an exercise outside the area in which the duty holder operates is acceptable) or b) have an area representative complete a spill response course, self-study spill responder course, or on-scene spill commander course from a recognized training institution (this option cannot be used in consecutive years by	☒ Applicable ☐ Not Applicable White Spruce Pipeline is listed as a WCSS member Grand Rapids s listed as a WCSS member Section 8.7 Training, Drills and Recordkeeping

Sec #	Requirement	Reference in the ERP
	the duty holder).	
8.2.2	**Not a Spill Cooperative Member**	
	82) A duty holder not affiliated with a spill cooperative must conduct an exercise in the area in which it operates. The duty holder may choose between conducting an annual deployment exercise or a tabletop exercise, depending on the training needs of each area, but may not use a tabletop exercise in consecutive years.	☐ Applicable ☒ Not Applicable White Spruce Pipeline is listed as a WCSS member Grand Rapids s listed as a WCSS member Section 8.7 Training, Drills and Recordkeeping
	83) The duty holder must notify the appropriate AER field centre in writing at least 30 days in advance of the spill deployment exercise or tabletop exercise and provide the following information: a) The nature of the training exercise, the exercise date, and the legal land description of the land on which it will be conducted. b) A map showing the general topography, location of and access routes to the deployment area, and the location of any municipal water intakes within three kilometres of the deployment area. c) The proposed spill material and planned volume. The permitted spill medium is either edible canola oil or mineral oil, dyed with an innocuous dye that neither harms water quality nor flora and fauna. d) Comments on the public use of the area, the collection and disposal of garbage, and a statement indicating the extent, if any, of anticipated surface disturbance to stream banks or shorelines at the test site. e) The name of the landowner on whose land the training exercise will occur and confirmation that the landowner agrees to the exercise proceeding at the proposed test site.	☐ Applicable ☒ Not Applicable White Spruce Pipeline is listed as a WCSS member Grand Rapids s listed as a WCSS member Section 8.7 Training, Drills and Recordkeeping
8.2.3	**Training Exercise Report Summaries**	☒ Applicable ☐ Not Applicable
	84) The duty holder must complete a summary	☒ Applicable ☐ Not Applicable

Sec #	Requirement	Reference in the ERP
	report on the spill deployment exercise within 30 days of the exercise completion and keep it for two years should the AER require it for review.	Sections 8 to 8.8.3
9	**Incident Response Requirements**	
	85) The duty holder must have up-to-date copies of the applicable corporate ERP and any AER-approved ERPs (hard copy or electronic) available at a response location.	☒ Applicable ☐ Not Applicable Page 44 Controlled Copy Distribution List All Annexes – Section 2 Distribution List
	86) The duty holder must review the ERP with the personnel who are assigned roles and responsibilities under the ERP to ensure its proper implementation.	☒ Applicable ☐ Not Applicable ERP Orientation Section 8.1 Emergency Preparedness Standards Section 8.7 Training, Drills and Recordkeeping Appendix C – Role and Responsibilities Checklists
	87) The duty holder must follow and implement the procedures and response actions outlined in its corporate ERPs and any AER-approved ERPs.	☒ Applicable ☐ Not Applicable Section 5.15 – Post Emergency Response Actions Section 8.8.2 – Review Following an Incident
9.1	**Initial Response**	☒ Applicable ☐ Not Applicable
	88) The duty holder must ensure that a call to its 24-hour emergency telephone number initiates immediate action.	☒ Applicable ☐ Not Applicable Section 5.2.1 24-Hour Emergency Line
	89) The duty holder must respond immediately if notified of an incident by an alarm or other type of incident notification.	☒ Applicable ☐ Not Applicable Section 5.2.1 24-Hour Emergency Line Section 4.2.1 Initial Response All Annexes – Section 4 Directory **Program Element – Communications Testing** Ensure all system alarms and the 24-hour Emergency Line are tested regularly to confirm they are active and being answered. Ensure response teams are identified, understand the activation process, and are able to respond in a timely manner.
	90) Where sour operations are conducted at two or more sour wells with overlapping EPZs,	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	and there are surface developments within any of the EPZs, if a duty holder declares an emergency, the other duty holders must also suspend operations until it is over.	
9.2	**Classifying an Actual Incident**	☒ Applicable ☐ Not Applicable
	91) The duty holder must use the assessment matrix in appendix 4 to classify the incident. The duty holder will determine the initial level of the incident to communicate and immediately activate internal response resources.	☒ Applicable ☐ Not Applicable Section 5.3.1 - AER Assessment Matrix Section 5.2.1 24-Hour Emergency Line All Annexes – Section 4 Directory
	92) The duty holder must take appropriate actions as described in appendix 4, including public protection measures, for each level of emergency	☒ Applicable ☐ Not Applicable Section 5.5 – 5.10 Incident Specific Response Actions Section 5.1 Public Protection All Annexes – Section 4 Directory
	93) The duty holder must contact the AER immediately after it has communicated with and activated internal response resources to confirm the incident level and convey the specifics of the incident.	☒ Applicable ☐ Not Applicable All Annexes – Section 4 Directory
9.3	**Communication During an Incident**	☒ Applicable ☐ Not Applicable
	94) After contacting the AER, the duty holder must notify the appropriate authorities, stakeholders, and support services required to assist with the initial response if a hazardous release goes off site and has the potential to affect the public or environment or if the duty holder has contacted the public or the media.	☒ Applicable ☐ Not Applicable All Annexes – Section 4 - Directory Appendix B – Forms
	95) The duty holder must make the information in appendix 5 available to the public as soon as possible during an incident. AER Appendix 5 Information Distributed to the Public at the Onset and During an Incident	☒ Applicable ☐ Not Applicable Section 5.10 Public Protection Section 5.14 – Social Impact Considerations
9.4	**Hazard Monitoring**	☒ Applicable ☐ Not Applicable

Sec #	Requirement	Reference in the ERP
	96) The duty holder must ensure hazard monitoring is in place in accordance with the ERP (see section 6.2.5) and meet the additional requirements in this section.	☒ Applicable ☐ Not Applicable Section 3.2.7 Detection and Shut Down Procedures Section 3.3 Equipment in Roadblock Kits
	97) The duty holder must provide at least two mobile air quality monitors to monitor the EPZ for a critical sour well that includes a portion of an urban density development or urban centre. One mobile unit will monitor the boundary of the urban density development or urban centre, and the other will track the plume.	☐ Applicable ☒ Not Applicable
	98) The duty holder must also a) ensure one mobile air quality monitoring unit is nearby during drilling, completion, testing, and workover operations in potentially critical sour zones, b) ensure one monitoring unit is dispatched when loss of well control is evident and sour gas release likely, and c) before conducting operations in a sour zone, determine the estimated travel time to the well site from the current location of the monitoring equipment.	☐ Applicable ☒ Not Applicable
	99) Where the EPZ for a critical sour well does not include a portion of an urban density development or urban centre, and for all noncritical sour wells, the duty holder must a) dispatch a mobile air quality monitoring unit when loss of well control is evident and sour gas release likely, and b) before conducting operations in a sour zone, determine the estimated travel time to the well site from the current location of the monitoring equipment.	☐ Applicable ☒ Not Applicable
9.5	**Access Control**	☒ Applicable ☐ Not Applicable
	100) The duty holder must ensure that manned access control points are in place to restrict unauthorized entry into the response zones during an incident. The duty holder should be	☒ Applicable ☐ Not Applicable **No EPZs in this plan.**

Sec #	Requirement	Reference in the ERP
	prepared to manage access to major highways and railways passing through the EPZ that could be affected by the hazard. It may be necessary for the duty holder to obtain a fire hazard order from the AER or a local authority to declare a state of local emergency to restrict access to a designated area. The local authority may declare a state of local emergency if deemed prudent. It may also be necessary for NAV CANADA to issue a Notice to Airmen (NOTAM) to advise pilots of restrictions in the airspace above the EPZ or to close the airspace for a certain radius from the release (a no-fly zone). The AER may request NOTAMs or airspace closure for a level 2 or 3 incident.	Section 5.10.7 Roadblocks All Annexes – Section 3.7 Maps Appendix C – Roles and Responsibilities Checklists - Operations Section - Roadblock Team Operations Section - Rover Team Fire Hazard – AB Wildfire Emergency and Environment and Parks is listed in the Plan SOLE – Local Authorities / AEMA is listed in Section 4 Directory of all Annexes NOTAM – Listed in Section 4 Directory of all Annexes
9.6	**Public Protection Measures**	☒ Applicable ☐ Not Applicable
	101) The duty holder must initiate the public protection measures shown in figure 2 for incidents originating from its operations that may affect the public. The type of public protection measures used depends on the severity of the incident and the monitored results in unevacuated areas.	☒ Applicable ☐ Not Applicable Section 5.3.1 – AER Assessment Matrix Section 5.10 Public Protection Measures Appendix C – Roles and Responsibilities Checklists
9.6.1	**Notification During an Accidental Release**	☐ Applicable ☒ Not Applicable **No sour gas or HVP is identified**
	102) If a sour gas or HVP product release has the potential to affect an area beyond the lease, facility boundary, or pipeline right-of-way, the duty holder must notify a) the public in the response zones that are within the EPZ, b) the director of emergency management, if an urban centre is within the EPZ, c) individuals within the EPZ that have requested early notification and wish to evacuate voluntarily, and d) the appropriate authorities. The duty holder's personnel or designated responders may be required to provide	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	evacuation assistance to individuals identified as special needs.	
	103) The duty holder must notify the public in the EPZ once notification attempts are completed in the response zones.	☐ Applicable ☒ Not Applicable
	104) The duty holder must advise the public within the EPZ of the public protection measures required.	☐ Applicable ☒ Not Applicable
	The duty holder may use the notification mechanisms in the appropriate authority's emergency plan and program if agreed to by the appropriate authority.	☐ Applicable ☒ Not Applicable
9.6.2	**Evacuation or Shelter in Place**	☒ Applicable ☐ Not Applicable
	105) The duty holder must assess the following before advising a resident to evacuate or shelter in place: a) the size and expected duration of the release b) egress routes c) current and expected meteorological conditions d) the potential for unexpected ignition Figure 2 (shown previously) is a decision tree of the public protection measures.	Section 5.3.1 – AER Assessment Matrix Section 5.10 Public Protection Measures
	106) The duty holder must continuously assess and act on the need to expand the evacuation area based on the monitored levels of H2S and SO2 and take the actions noted in table 4.	☐ Applicable ☒ Not Applicable
	107) In the absence of monitored readings, responders must advise residents to shelter in place.	☒ Applicable ☐ Not Applicable Section 5.10 Public Protection Measures Section 5.10.5 – Shelter in Place
	108) Depending on the volume, size, duration, or meteorological conditions, sheltering in place may not be a viable public protection measure within the IIZ during an H2S release. In such a situation, the public safety aspects of sheltering in place must be continuously evaluated during the incident and assisted evacuation may be necessary to protect public safety.	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	109) The duty holder must advise residents to evacuate if required. A duty holder can advise residents to evacuate; however, the local authority must declare a state of local emergency before mandatory evacuation can occur.	☒ Applicable ☐ Not Applicable Section 5.10 Public Protection Measures Fire Hazard – AB Wildfire Emergency and Environment and Parks is listed in the Plan SOLE – Local Authorities / AEMA is listed in Section 4 Directory of all Annexes NOTAM – Listed in Section 4 Directory of all Annexes
9.6.2.2	**HVP Product Releases**	☐ Applicable ☒ Not Applicable
	Sheltering in place is the primary public protection measure for an HVP product release. Evacuation of the public should only proceed when it is safe to do so and after an assessment in accordance with requirement 105.	☐ Applicable ☒ Not Applicable
9.6.3	**Notification and Evacuation Outside the EPZ**	☐ Applicable ☒ Not Applicable
	110) If public protection measures are required beyond the EPZ, the duty holder must conduct them in accordance with the arrangement with the local authority.	☐ Applicable ☒ Not Applicable
	The Government of Alberta will activate the Energy Resources Industry Emergency Support Plan for level 2 and level 3 incidents (emergencies) to support the incident response. The notification mechanisms will be based on monitored air quality and other situations that might arise during the incident. Evacuation of the area outside the EPZ is coordinated through the duty holder's ERP and the response framework in the local authority's emergency plans and programs. The health authorities also have a role in evacuation in accordance with section 52.2 of the Public Health Act	☐ Applicable ☒ Not Applicable
9.6.4	**Activating the Reception Centre**	☒ Applicable ☐ Not Applicable
	111) When the evacuation of residents is required, the duty holder must a) activate a reception centre situated a safe distance from the release source and	☒ Applicable ☐ Not Applicable Section 5.10 Public Protection Measures Section 4.3.4 – Reception Centre

Sec #	Requirement	Reference in the ERP
	b) meet and register evacuees at the reception centre.	Appendix C – Roles and Responsibilities Checklist Reception Centre Contacts Reception Centre Team
9.6.5	**Ignition**	☐ Applicable ☒ Not Applicable
	112) The duty holder must ensure the ignition team is trained and competent in sour gas or HVP product ignition and has the proper equipment to ignite the release within the time limits for which the EPZ was designed.	☐ Applicable ☒ Not Applicable
9.6.5.1	**Sour Well Release Ignition**	☐ Applicable ☒ Not Applicable
	113) The duty holder must ensure a) all sour wells have an ignition system, such as a flare gun, on site during drilling, completion, well testing, or workover operations in sour zones and b) all critical sour wells have a dual-ignition system on site during drilling operations in critical sour zones and during completion, well testing, or workover operations when the wellhead is removed.	☐ Applicable ☒ Not Applicable
	114) The duty holder must a) keep the local AER field centre informed about the ignition situation and ignite a sour gas flow to the atmosphere in accordance with the ignition assessment criteria in appendix 6 unless the AER determines that ignition may be delayed, and b) assign the decision-making authority to an on-site representative to ignite the release. The primary ignition system at a critical sour well should be installed to enable remote activation from a safe location through a triggering device. The secondary system may be a manual system, such as a flare gun. Ignition does not negate the need for continuing with evacuation, as there may be residual pockets of H2S or SO2 in the area.	☐ Applicable ☒ Not Applicable
9.6.5.2	**Pipeline or Cavern Storage Facility HVP Product Releases and Ignition**	☐ Applicable ☒ Not Applicable
	115) When deciding to ignite HVP releases, the	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	duty holder must consider the following: a) the increased risks of a delayed ignition b) whether the perimeter of the hazard area has been established c) whether the public has been evacuated from the area d) whether ignition will worsen the situation by endangering the public or the environment or damage the equipment used to control the product e) whether wind direction has been established and continuously monitored f) whether the possibility of an explosion has been assessed (i.e., obstructions or regions of congestion within the perimeter of the dispersing vapour cloud)	
	116) The duty holder must assign the decision-making authority to an on-site representative to ignite an HVP product release.	☐ Applicable ☒ Not Applicable
9.7	**Equipment Requirements**	☐ Applicable ☒ Not Applicable
	117) The duty holder must ensure that the equipment identified in the ERP is available and at the location specified in the ERP before conducting the operation. Except for drilling and completion operations for critical sour wells, this equipment must be available at the location specified in the ERP before entering the critical sour zone.	☐ Applicable ☒ Not Applicable
	118) The duty holder must ensure that equipment is operational and the necessary documentation is available to verify testing and calibration requirements. The duty holder's approved vendor program should ensure that contracted equipment meets industry standards for calibration. If the equipment is from a third party, information regarding its location and estimated time to the site is required.	☐ Applicable ☒ Not Applicable
	For critical sour wells, the equipment identified in the ERP may be released from a location when • the rig has been released, • the wellbore is isolated with casing and cement and	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	is not perforated, or • the wellhead is installed.	
9.8	**Downgrading an Incident Level or Standing Down an Incident**	☒ Applicable ☐ Not Applicable
	119) Once the incident improves, the duty holder must decide in consultation with the AER to downgrade the incident level or stand down the incident. The AER will consult with other applicable agencies and confirm with the duty holder that the incident downgrade or stand down is appropriate.	☒ Applicable ☐ Not Applicable Section 5.3.1 AER Notification Matrix Section 5.15 Post Emergency Response Actions Appendix C - Incident Commander Responsibilities & Actions Checklist
	120) The duty holder must keep all notified persons, evacuated persons, and the media informed of the incident status.	☒ Applicable ☐ Not Applicable Section 5.10 – Public Protection Measures Section 5.14.2 – Community Information Sharing Appendix C - Public Protection Group Supervisor Checklist
10	**Record Keeping**	
	121) As part of public and local authority notification and consultation (see section 4.1), the duty holder must have a process for recording the following: **a) local authority and other government discussions** b) type of notification provided to the residents in an urban centre c) the number of attempts and the method made to contact an individual if the duty holder was unable to make contact d) record of consultation with the public, including unsuccessful attempts to consult or obtain the cooperation of any required persons and any outstanding issues yet to be resolved	☒ Applicable ☐ Not Applicable
	122) The duty holder must have a **process for recording the following activities**: a) incident records: information gathered during and following an incident. These records provide documentation to be used for assessment, historical, and analytical purposes. b) keeping ERPs current: efforts to keep the ERP current, including attempts to contact or obtain	☒ Applicable ☐ Not Applicable Appendix B - Forms Record of Changes (Pg 44) Section 5.11 – Documentation of Initial Response Section 5.15 – Post Emergency Response Actions Section 8.7 – Training, Drills and Exercise Recordkeeping Section 8.8 Review and Revision of this Plan /

Sec #	Requirement	Reference in the ERP
	the cooperation of any required persons and any outstanding issues yet to be resolved c) training, meeting, and exercise records: i) records of staff training ii) within 60 days of an exercise, a report of exercise results is to be retained for assessment purposes that includes • the type of exercise held • the exercise scope and objectives • the persons involved • the outcome of the exercise (i.e., whether objectives were achieved) • lessons learned • an action plan with timelines • documentation of all critical sour meetings, such as meeting sign-in sheets, invitations, and minutes for possible review by the AER The duty holder is expected to keep all records for three years.	Manual
11	**License Transfer**	
	123) If a well, facility, or pipeline with an AER-approved ERP is sold, the new duty holder must contact the AER within 30 days of the transfer of license to discuss a timeframe for submitting a new ERP.	☐ Applicable ☒ Not Applicable
	124) The new duty holder must provide notification to the AER at EPAHelpline@aer.ca within seven business days from the date of transfer of license and include an itemized summary of changes, including a) corporate structure change, b) contact numbers, c) internal communication changes, and d) signing authority changes.	☐ Applicable ☒ Not Applicable
	125) The new duty holder must ensure that the emergency response procedures in place will not be compromised before approval of the new ERP. Residents within the EPZ and the appropriate authorities should be notified of the change in ownership and advised that the new duty holder will be conducting a public involvement program and developing a new	☐ Applicable ☒ Not Applicable

Sec #	Requirement	Reference in the ERP
	ERP.	

CSA Z 246 ERP AUDIT PROTOCOL

CSA Z246.2-14: Emergency preparedness and response for petroleum and natural gas industry systems

ERP Audit Information	
Full ERP Name	South Bow AER Regulated Liquid Pipelines **Annexes:** Grand Rapids Pipelines (GRP) MacKay East Pipeline (MEP) White Spruce Pipeline (WSP)
Version	
Revision	
ERP Date	December 12, 2022
Audit Date	November 15, 2023
Auditor Name(s)	Carianne Loach
Auditor Company	Behr Integrated Solutions Inc.
Auditor Email	
Comments	

CAN/CSA Z246.2-14 Emergency preparedness and response for petroleum and natural gas industry systems

This standard provides requirements for a continual improvement process to develop, implement, maintain, and evaluate an emergency preparedness and response program that helps operators in the industry to be prepared to respond to an emergency that affects people, the environment, and property.

In this standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the Standard.

The checklist contained in the following pages has been provided along with an additional column indicating specific comments and location of the requested items within the Emergency Response Plan.

South Bow has a responsibility to ensure all CAN/CSA Z246.2-14 "*shall*" requirements are met

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
4 Emergency preparedness and response program		
4.1	The operator **shall** develop, implement, and maintain an emergency preparedness and response program (EPRP) that provides for the protection of people, the environment, and property.	• Intro 1.1
4.2 Management commitment		
4.2.1	**Accountability and Authority** The operator's senior management **shall** have overall accountability and authority for the EPRP.	• Corporate governance/policy
4.2.2	**Policy** The operator's senior management **shall** have approved policies intended to ensure the EPRP activities are conducted in a manner that protects people, the environment, and property.	• South Bow Program Manual is Governance • Section 1.4
4.3 Laws and authorities		
4.3	**Laws and authorities** The operator **shall** ensure the EPRP complies with applicable legislation, regulatory requirements, orders, directives, and policies.	• 1.4
4.4 Goals and objectives		
4.4	**Goals and objectives** The operator **shall** establish goals and objectives to support Clause 4.2.2.	• Corporate Program Governance • Section 8
4.5 Organizational structure		
4.5	The operator **shall** have an organizational structure that defines and communicates roles and responsibilities for the development, approval, implementation, evaluation, and improvements of the EPRP.	• 4.2
4.6 Program coordinator		
4.6	The operator **shall** appoint a coordinator to develop, implement, evaluate, revise, and maintain the ERP.	• Corporate governance/policy • Emergency Preparedness Team • 8.2

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
4.7 Documentation and document control		
4.7.1	The operator **shall** have	
	a) documents to support the EPRP; and	• 8.9
	b) a process for reviewing, revising, approving, controlling, and reissuing the documents; and	• Record of change p41 • 8.9.1
	c) schedules for reviews and revisions of the documents.	• 8.9.3
4.7.2	Documentation **should** be reviewed and revised at regular intervals and immediately where changes are required as a result of legal requirements or where failure to make immediate changes could result in negative consequences.	
	Documentation **should** include	
	a) organizational structure;	• Section 4
	b) roles and responsibilities	• 4.3
	c) policies, processes, and procedures;	• Corporate governance
	d) emergency response plans;	• Corporate governance
	e) exercise plan; and	• Section 8
	f) training plan.	• 8.1-8.8
4.8 Records management		
4.8.1	The operator **shall**	
	a) maintain records of activities and decisions related to the EPRP; and	• 8.9.2
	b) have a records management process for the identification, storage, protection, retrieval, retention and disposition of records.	• Corporate governance/policy .
4.8.2	Records **should** include	
	a) actions taken to prepare for emergencies;	• 3
	b) actions taken to respond to emergencies;	• 5.9
	c) debrief reports;	• 8.9.2
	d) training records;	• 8.8
	e) response equipment records;	• 6.3.1 Annex 1.3

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
	f) changes or improvements made to the EPRP; and	• 8.9 – Record of exchanges p41
	g) reports of exercises conducted by the operator.	• 8.8
4.9 Training and competence		
4.9.1	**Training** The operator **shall** establish training to create awareness and enhance the knowledge, skills, and abilities required to develop, implement, support, and maintain the EPRP.	Section 8: Maintaining Preparedness
	The operator **should**	
	a) provide employees who have a role in an emergency with appropriate training prior to assigning	• 8.1-8.2
	b) conduct an analysis of training needs, based on the results of the hazard identification;	• Corporate governance
	c) identify competency requirements for emergency response and program roles;	• 8.1 & Corporate governance
	d) develop training plans for individual employees with a role in the EPRP;	• Section 8
	e) establish training schedules;	• 8.7.1 & Outside of ERP
	f) have training records to support Clause 4.8.2; and	• 8.8
	g) review and update the training content and delivery.	• 8.2 Emergency Preparedness Teams
4.9.2	**Incident management system training** Employees with a role in the emergency response plan shall be trained in the operator's incident management system to the level of their involvement.	• Section 8
4.9.3	**Competence** The operator shall ensure that employees are competent to perform their roles in the EPRP on the basis of education, training, and experience.	• Governance document?

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
4.10 Exercises		
4.10	The operator **shall** develop and implement an exercise plan.	
	Exercises **should** be	
	a) conducted at all levels of the organization, including senior management;	• 8.7.1
	b) held with sufficient frequency to evaluate emergency response capability; and	• 8.7.3
	c) varied to test potential emergencies identified in the hazard identification process in Clause 8 (e.g., exercises conducted under a wide range of weather conditions).	• 8.7
	Notes: **1)** *It is recommended that at least one simulated emergency response exercise be held annually and that a fullscale emergency response exercise involving the agencies identified in the operator's emergency response plan be held at least every 3 years.*	
	2) *Further information is provided in Annex A (see regulation).* (8.7)	
5 Program evaluation and continual improvement		
5.1	The operator **shall** have a process for program evaluation and continual improvement.	8.9 & Program Governance
5.2	**Performance measurement** The operator **shall** gather information at appropriate intervals to monitor the performance of the EPRP.	Governance
	Note: *This information may include incident statistics and performance indicators related to the EPRP goals and objectives.*	
5.3 Program Evaluation		
5.3.1	The operator **shall** have a process to evaluate the EPRP that includes	
	a) a defined scope; and	• Program/ Corporate Governance
	b) a methodology to monitor and measure program performance at planned intervals. The data and results of monitoring and measurement **shall** be sufficient to facilitate corrective and preventive action analysis and be documented.	

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
5.3.2	Date sources **should** include	
	a) policies, goals, and objectives;	
	b) hazard identification and consequence analysis results;	• Section 3
	c) legislation requirements and best practices;	• 1.4
	d) training records;	• 8.8
	e) post-emergency analyses and reports;	• 8.9
	f) lessons learned as a result of post-exercise debriefs; and	• 8.7
	g) previous program reviews.	• Governance
	Note: *Checklists can be used to assist in performing systematic inspections and/or spot checks.*	
5.4 Audit		
5.4	The operator **shall** conduct audits to determine whether the EPRP meets the requirements of this standard and to other requirements established by the organization.	• Governance & audit in ERPs
	Note: *CAN/CSA-ISO 19011 provides guidance on conducting audits.*	
5.5 Corrective action		
5.5	The operator **shall** correct deficiencies, gaps, and limitations identified during the EPRP evaluation, audit, and management review within specified time frames.	Governance
6 Management of change		
6.1	The operator **shall** have a management of change process to identify and manage changes that could affect:	
	a) people, the environment, or property;	Management of Change Corporate Governance/ Policies
	b) hazard identification or consequence-analysis results;	
	c) a design, specification, standard, or procedure;	
	d) the operator's organizational structure; or	
	e) the legal requirements applicable to the operator.	
6.2	The management of change process **should** include	
	a) accountability;	
	b) identification and analysis of changes that could impact the EPRP;	Management of Change Corporate Governance/ Policies
	c) documentation of the changes;	

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
	d) approval of changes;	
	e) implementation, including communication, of changes; and	
	f) a review of the effectiveness of the changes made.	
7 Management review		
7.1	The operator's senior management **shall** have a process to review the EPRP at planned intervals to ensure its suitability, adequacy, and effectiveness.	
	The review **should** confirm	Management of Change Corporate Governance/ Policies
	a) that the EPRP is fully implemented;	
	b) that the EPRP meets the operator's policy and objectives;	
	c) whether the EPRP is adequate for its intended purpose; and	
	d) where improvements are required.	
7.2	The review **should** address the following subjects:	
	a) suitability of the current policy, goals, and objectives;	Management of Change Corporate Governance/ Policies
	b) setting objectives in the forthcoming period;	
	c) adequacy of the hazard identification and consequence-analysis processes;	Management of Change Corporate Governance/ Policies
	d) adequacy of resources (e.g., financial, personnel, material, mutual aid);	
	e) effectiveness of the EPRP evaluation process;	
	f) results of audits;	
	g) the state of preparedness for emergencies (e.g., emergency response plan, training, and	
	h) the output of any investigations into accidents, incidents, or emergencies;	
	i) the assessment of the effects of foreseeable changes to legislation or technology;	
	j) emergency response arrangements and information sharing with municipal emergency service providers; and	

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
	k) emergency communication plans (internal and external for surrounding communities).	
7.3	Data sources to review **should** include	
	a) results of audits;	Management of Change Corporate Governance/ Policies
	b) corrective and preventive actions carried out since the previous year;	
	c) reports of emergencies and incidents (whether actual or staged for exercises);	
	d) reports from individual line managers on the effectiveness of the EPRP locally; and	
	e) reports on hazard identification, risk assessment, and consequence analysis.	
8 Hazard identification and consequence analysis		
8	The operator **shall**	
	a) have a process for identifying and analyzing all hazards;	• Section 3 & any other Standards/ Policies on Hazard ID's
	b) establish and maintain an inventory of the identified hazards ;	
	c) establish and implement a process for evaluating and managing the consequences associated with	
	d) establish and implement a process to manage the identified hazards and mitigate the	
	e) have a person or company, knowledgeable in the industry and discipline, conduct the hazard identification and consequence analysis.	
	Note: *Further information is provided in Annex A (see regulation).*	
9 Emergency planning zones (EPZs)		
9	The operator **shall** have a process to determine EPZs.	• n/a
	Note: *Further information is provided in Annex A (see regulation).*	
10 Incident management system		
10.1	**Incident management** The operator **shall** have an incident-management system to direct, control, and coordinate response operations.	• Section 4

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
10.2	**Command and coordination centres** The operator **shall** have pre-designated primary and alternate command and coordination centres capable of supporting response operations as defined by the operator's incident-management system.	• Section 4.4
	Note: *Further information is provided in Annex A (see regulation).*	
11 Emergency response plan (ERP)		
11.1	The operator **shall** have a single ERP or multiple coordinated plans which consider hazard identification, consequence analysis, and regulatory requirements.	Program
11.2	**Components of an ERP** The ERP **shall** contain	
	a) a statement of purpose, scope, and objectives;	• Section 1
	b) a description of assets and operational activities covered by the ERP;	• Section 2
	c) mapping, with an appropriate level of detail to allow for effective planning and response;	• Annex 1.5
	d) roles and responsibilities for each internal and external position in accordance with the incident management system;	• 4.4.2 & Annex 1.2.5
	e) emergency contact information for an individual, group, or organization that has a role in the management of an emergency;	• Appendix A
	f) emergency contact process for directly impacted public;	• 5.1.4
	g) response procedures and guidelines to manage specific emergencies;	• 5.3-5.8
	h) command and coordination centres, and other facilities as appropriate;	• 4.4
	i) procedures for communication with stakeholders within the operation;	• Appendix D • Public Information Officer Checklist
	j) procedures for communication with external stakeholders;	• Liaison Officer Checklist • Annex 1.1, 1.2, 1.3
	k) critical resources and a means of activation;	• 6.2-6.3
	l) references to copies of mutual aid agreements;	·
	m) detailed hazardous product information;	• Appendix C
	n) internal and external reporting requirements;	• 5.10 Notifications

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
	o) documentation processes;	• 5.9
	p) processes and criteria for the activation and deactivation of the ERP;	• 5.1.2
	q) processes for the preservation of evidence; and	• 5.15.3
	r) debrief procedures.	• 5.15
	Note: *Mutual aid agreements may include equipment availability.*	
11.3	**Equipment** The operator **shall**	Annex 1.3
	a) assess the need for response equipment and, where considered necessary, ensure that it is available; and	• 5.12.1 • 5.11
	Note: *Mutual aid agreements may include equipment availability.*	
	b) maintain their own response equipment.	
11.4	**Hazard monitoring** The operator **shall** have procedures for continual monitoring of hazards throughout the emergency.	
	The type and number of monitoring devices specified in the ERP should be appropriate for addressing site-specific considerations, including:	
	a) hazard type;	• 5.8.4
	b) access and egress points;	• 5.8.7&5.8.8
	c) population density (distance to urban centres and/or rural subdivisions);	• Annex 1.5
	d) local weather conditions;	.
	e) topographical features;	• Annex 1.5 • Appendix D
	f) traffic patterns; and	• Situation Unit Checklist
	g) additional hazards (wildfire, flooding, and other natural occurrences).	• Section 3
12 Mutual Aid		
12	The operator **shall** assess the need for mutual aid and, where considered necessary, ensure that agreements are established.	
	Notes: 1) *Mutual aid/mutual assistance, reciprocal, or service-level agreements **should** be entered into between organizations when necessary.*	6.2 Annex 1.2

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
	2) *Mutual aid/mutual assistance, reciprocal, or service-level agreements **should*** *a) be in writing;* *b) be reviewed by legal counsel;* *c) define liability;* *d) detail funding and cost arrangements; and* *e) be signed by individuals with requisite authorities.*	
	3) *Further information is provided in Annex A (see regulation).*	
13 Communication		
13.1	**Stakeholders within an EPZ** The operator **shall** have a process to engage stakeholders within an EPZ that includes	If EPZ
	a) providing stakeholders with a description of i) specific hazards and consequences associated with the operations; ii) what actions they **should** take during an emergency, including sheltering and evacuation instructions; iii) how they could be notified; iv) how they can contact the operator; and v) how the operator will respond; and	
	b) defining how and what information will be collected for the purpose of emergency notification. **Notes:** 1) *The operator may consider conducting this process in conjunction with other operators or mutual aid groups.*	• Appendix D, • 5.14.1 • 5.14.2 • 6.1.2
	2) For gas distribution systems not requiring an EPZ, stakeholder engagement is by awareness programs offered by the operator, which inform the public of potential emergency situations and the safety procedures to be followed in the case of an emergency. The operator should consult with local authorities on public safety measures to confirm roles and responsibilities.	• 6.2
13.2	**Internal communication** The operator shall have a process for communicating internally during an emergency. The process should include	5.10 Notifications

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
	a) procedures outlining i) who will receive communications; ii) what will be communicated; iii) when will it be communicated; and iv) how will the communications be delivered;	• 5.1.2
	b) message approval;	
	c) means to ensure equipment and system interoperability; and	• Governance
	d) periodic testing.	
13.3.3.1	**Responders** The operator shall have a process for communicating with external responders during an emergency.	6.2 6.1.2
	The process should ensure associated with the emergency; and	Appendix D
	a) working lines of communication;	
	b) notification of specific hazards and consequences	
	c) notification of resources and response actions.	
13.3.3.2	**Media** The operator shall have a process for communicating with the media during an emergency.	Appendix D Public Information Officer Checklists
13.3.3	**Emergency communication and notification capability** The operator shall have a process of emergency communication with stakeholders within an emergency response area during an emergency.	5.8-5.8.8 5.14.1 5.14.2 Appendix D 6.1.2, 6.2
	Note: *Further information is provided in Annex A (see regulation).*	
14 Emergency Response		
14.1	The operator **shall** respond to emergencies to prevent or minimize consequences that could affect people, the environment, and property in accordance with the EPRP.	1.1 Purpose
14.2	**Response management** The operator **shall** implement a coordinated response based on the emergency.	5.1 Response Scope 5.3 Response Process
14.3	**Emergency assessment** The operator shall continually assess conditions associated with the emergency and the effectiveness of the response throughout the emergency.	Section 5 Plan Implementation 5.3 Response Process

SECTION #	REQUIREMENT	COMPANY / COMMENT/PAGE #
14.4	**Command and coordination centre activation** The operator shall activate command and coordination centres and appropriate staff based on the specific emergency. Communications and coordination shall be established between the centres.	Section 4
14.5	**Incident action plan** The operator shall create an incident action plan specific to the emergency.	Appendix D Incident Commander Checklist
14.6 Safety		
14.6.1	The operator **shall** have a process for the safety of response personnel and the public involved in, and affected by, the emergency.	4.2 5.8 Public Protection
14.6.2	**Site safety** The operator **shall** establish site safety to protect responders.	Appendix D Safety Officer Checklist
14.6.3	**Public safety** The operator **shall** coordinate public safety actions with local authorities.	Section 5.8, 5.14
14.7	**Response mobilization** The operator **shall** alert designated personnel and initiate an assessment of the need for mobilizing additional resources, which the operator **shall** deploy as required by the emergency.	Section 6, Response Resources
14.8	**Notifications and reporting** The operator **shall**	Appendix D Liaison Officer Checklist
	a) notify applicable stakeholders; and	6.1.2; Annex 1.1 – 1.4
	b) report to authorities having jurisdiction.	6.2
14.9	**Internal and external communications** The operator **shall** communicate with stakeholders, both internally and externally, who are affected by the emergency.	5.14.1, 5.8 5.14.2, 5.8.8
14.10	**Deactivation and debriefing of the response** The operator **shall** deactivate the response and debrief in accordance with the ERP.	5.15

THIS PAGE INTENTIONALLY LEFT BLANK

FACILITY INFORMATION AND MODIFICATIONS

South Bow operates AER Regulated Liquid Pipelines in the Heartland Operational Area with Field Operations. For Site Specific information refer to the Pipeline-Specific Response Zone Annexes.

DOCUMENT CHANGE AND CONTROL

This table captures a summary of the five most recent versions (Rev. No.) of this document and the signoffs obtained for each revision.

Version No.	Brief Description of Change	Date of Release	Updated By	Approved By
1	Transition to new South Bow Document Formatting	2025/03/10	Information has been redacted from this section to protect the safety and security of South Bow. Information redacted includes Company employees' names.	
7 (TCE)	Minor addition of exercise notice information to Section 8.6 Approval not needed, no material changes	11/2024		
6 (TCE)	AER Directive 071 ERP Audit Protocol Update of section 5.4.1.1 Air Monitoring Removal of Tertiary document review Change of Corporate Communication phone number/email Update of graphics	10/2024		
5 (TCE)	TC Energy changed to South Bow and removed corporate information	07/2024		
4 (TCE)	AER Directive 071 AER ERP Audit Protocol	11/2023		

CONTROLLED COPY DISTRIBUTION LIST

Refer to ERP Annex Section 2.5

Distribution List		
Copy No.	**Title**	**Address**
01	Field Operations Emergency Operations Center	
02	Liquids Pipelines Control Center	Information has been redacted from this section to protect the safety and security of South Bow. Information redacted includes confidential Company locations.
03	Mackay East Terminal	
04	Heartland Terminal	
05	Fort McMurray Office	
06	Sherwood Park Office	
07	Liquids Pipelines Control Center-Alternate site	

1.0 INTRODUCTION

1.1 Purpose

Personnel at South Bow take precautions to prevent oil spills and other emergencies from occurring. Well-engineered pipelines, inspections and surveillance, good housekeeping practices, equipment maintenance, and adequate training are employed to reduce the likelihood of an emergency. Despite these precautions, emergencies can and do occur. When they do, response actions must be initiated as quickly as possible.

The purpose of this Emergency Response Plan (ERP) is to describe the actions to be taken by response personnel to control and contain an oil spill and other specific emergencies, thereby minimizing damage to people and the environment. This ERP prepares South Bow personnel to respond to incidents that have been postulated for these pipeline systems. The ERP also provides important information regarding available support personnel, equipment, and necessary protective and corrective measures. The goal in all instances is to minimize risk to response personnel, the public, the environment and company property. The early identification of an emergency and assignment of responsibility to proper personnel will ensure all phases of response, including notification, containment, and cleanup proceed simultaneously and efficiently.

1.2 Overview of the Response Plan

These pipeline systems start and end in Alberta and do not cross a provincial or federal border; therefore, the Alberta Energy Regulator (AER) has jurisdiction.

This plan also forms part of the Emergency Response Plan requirements set out by the Environment and Climate Change Canada (ECCC) – Environmental Emergency Regulations.

This ERP is intended to aid personnel in taking appropriate, timely, and effective actions to respond to oil spills and other emergencies.

The ERP is a planning document that is divided into the following nine sections and associated appendices:

- The Administrative Section contains the following: Table of Contents, Pipeline Information and Modifications, Record of Changes, Distribution List, Lists of Acronyms and Definitions used in this ERP.
- The Introduction describes the purpose, provides an overview, and defines the scope of the ERP. Additionally, this section addresses how regulatory requirements for response planning have been met for the AER Regulated Liquid Pipelines.
- The Pipeline Description section provides a general overview of the pipelines and their immediate surroundings, as well as site Alarms and Equipment.

- The Hazard Identification and Risk Assessment section provides details of the Emergency Planning Zone (EPZ) for the pipeline and an inventory of the Emergency Planning Zone (EPZ) for the pipeline.
- The Organizational Control of Emergencies section describes the standard organizational structure for operations of the AER Regulated Liquid Pipelines and the unique organizational structure implemented for emergency response. This unique organizational structure is called the Incident Command System (ICS), and this section of the ERP describes ICS, the roles of each element of ICS, and key Incident Facilities.
- The Plan Implementation section describes the overall response approach to oil spills and other emergency situations. This section includes specific checklists for response to several identified potential emergencies.
- The Response Resources section describes South Bow-owned response resources, how contract and public resources integrate into the response and who those contract and public resources are for emergency response at the South Bow AER Regulated Liquid Pipelines.
- The Discharge Detection section identifies and describes the means by which South Bow may detect a release at the South Bow AER Regulated Liquid Pipelines to include the Leak Detection System and addressing public complaints and inquiries.
- The Maintaining Preparedness section describes South Bow's emergency response training and exercise program for personnel, the Liquids Pipeline Control Center (LPCC), and contracted responders. This section also discusses the process and requirements for updating the ERP.
- Supporting items include several Appendices which house pertinent Contact Information, Forms, Safety Data Sheets and Maps.

1.3 Scope

This ERP applies to all emergencies (including discharges of oil) occurring from AER Regulated Liquids Pipelines that are operated by South Bow. This plan provides for coordination of preparedness and response actions, specifies the roles and responsibilities among the site and corporate levels of South Bow, and describes resources available to the response team including both Company assets and those available under contract. The ultimate responsibility for spill management rests with the Incident Commander and Field Operations, but corporate, contract, and mutual aid resources may also be leveraged to respond to an emergency.

2.0 FACILITY DESCRIPTION

South Bow operates three AER Regulated Liquid Pipelines in Canadian Liquids Field Operations (LFO). For Site Specific information refer to the Pipeline-Specific ERP Annex Documents:

Grand Rapids Response Zone Annex
Mackay East Response Zone Annex
White Spruce Response Zone Annex

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 HAZARD IDENTIFICATION AND RISK ASSESSMENTS

3.1 Risk Assessment Information

Risk management is a key element in ensuring the ongoing safety, integrity, and reliability of South Bow assets. Understanding risks through the execution of established risk management processes and incorporating these risks into this ERP supports ongoing safe, reliable, and efficient operations in emergency situations.

South Bow's Risk Management Process defines the purpose of operational risk management in the Company and outlines the high-level requirements for risk management in operations. Liquids Field Operations abides by the Risk Management Standard and South Bow's South Bow Management System Framework which further defines the mandatory activities and roles and responsibilities that LFO implements to ensure proper risk management.

Field Operations uses a Risk Register to communicate risk information in a comprehensive, prioritized, consistent manner so the Company can ensure identified risks are documented and addressed. The Risk Register is designed to collect potential risk event information that has been identified and assessed as risk in a consistent manner, and then communicate the risk information to promote sound decision making and development of barriers (i.e. emergency response plans, training, equipment) to address the specifically identified risks. A common hierarchical classification system and review process is used in the Risk Register tool to promote fair comparison and clarity of risk information communication to enable decisions on direction of resources to manage risk.

3.2 On-site Hazard Evaluation

Refer to the Pipeline-Specific Response Zone Annex for detail Site Specific EPZ calculation information.

3.3 Worst Case Scenarios

Scenarios for most probable scenarios, incidents of highest impact, and worst-case discharge volumes for Oil Pipelines are included in the Pipeline-Specific Response Zone Annexes.

3.4 Vulnerability Analysis

Vulnerability Analysis, including Water Intakes, Threatened and Endangered Species, Historic Sites, Rightsholder Sites, Lakes, Streams and Wetlands, Highly Populated Areas, and Drinking Wells, are included in the Pipeline-Specific Response Zone Annexes.

3.5 Hazard Identification Matrix

In the table below, asset-based and natural hazards identified in the Emergency Management Program Manual (Section 2) are evaluated for likelihood to produce significant consequence or impact to South Bow assets. Where the potential exists for a hazard to significantly impact South Bow, there shall be a procedure to respond to each hazard in Section 5 of this Plan.

Hazard	Potential for Significant Impact South Bow Assets	Procedure Included in Section 5
Asset-Based Hazards		
Liquids Pipeline Emergencies	Yes	Yes
Natural Hazards		
Floods	Yes	Yes
Earthquakes	Yes	Yes
Landslides/Rockslides	No	
Hurricanes	No	
Wildfires	Yes	Yes
Severe Thunderstorms	Yes	Yes
Tornadoes	Yes	Yes
Winter Storms/Ice Storms/Blizzards	Yes	Yes
Volcano	No	
Technological or Man-Made Hazards		
Security Incidents	Yes	Yes

4.0 ORGANIZATIONAL CONTROL OF EMERGENCY

4.1 Standard

South Bow's AER Regulated Liquid Pipelines are under the purview of South Bow's Vice President of Liquids Operations, the Director of Canadian Liquids Field Operation. Site personnel, responsible for Initial Response to any emergency, report through this Chain of Command for routine work.

Staff respond to any operating and emergency requirements, with the greatest number of personnel on-duty from 0700 to 1630 local time, Monday through Friday except on holidays. On evenings, overnights, and holidays, one person is on-call to support activities at the site during these hours.

All personnel who are assigned to be an on-call representative to the site are trained as South Bow Company First Responders for emergencies. Small scale emergencies may be managed through this regular scheduling and Chain of Command; however, the next sections of

4.2 Emergency Organization

4.1.1 Initial Response/Site Managed Emergencies

Site procedures provide for one individual to assume command and control from the beginning of emergency operations. Normally, this would be the Company First Responder to the scene. The Company First Responder will take whatever actions are possible to mitigate the consequences of the emergency and will communicate the details of the emergency to the Liquids Pipelines Control Center (LPCC) and appropriate leaders. Upon notification, the LPCC will take actions to mitigate an emergency remotely, including operating remote valves and following other prescribed procedures. Notifications will be initiated to bring the Manager On-Call or other appropriate levels of leadership to assume the command of the event.

The initial response team will be composed of qualified personnel from local Field Operations. The Company First Responder will coordinate the emergency response until an Incident Commander (IC) arrives on the site and the two participate in a Transfer of Command.

At no time shall any employee endanger his/her own safety while responding to an emergency.

In hazardous spill situations, the initial response team, under the direction of the IC, will take immediate, defensive actions to stop the leak, contain the spilled substance, and initiate cleanup procedures within practicalities of the situation and within the limits of the team member's emergency response training. If necessary, outside contractors may be mobilized to help with the spill cleanup; such resources are described in Section 6 of this Plan.

4.1.2 On-Scene Management: ICS

Incident Command System (ICS)

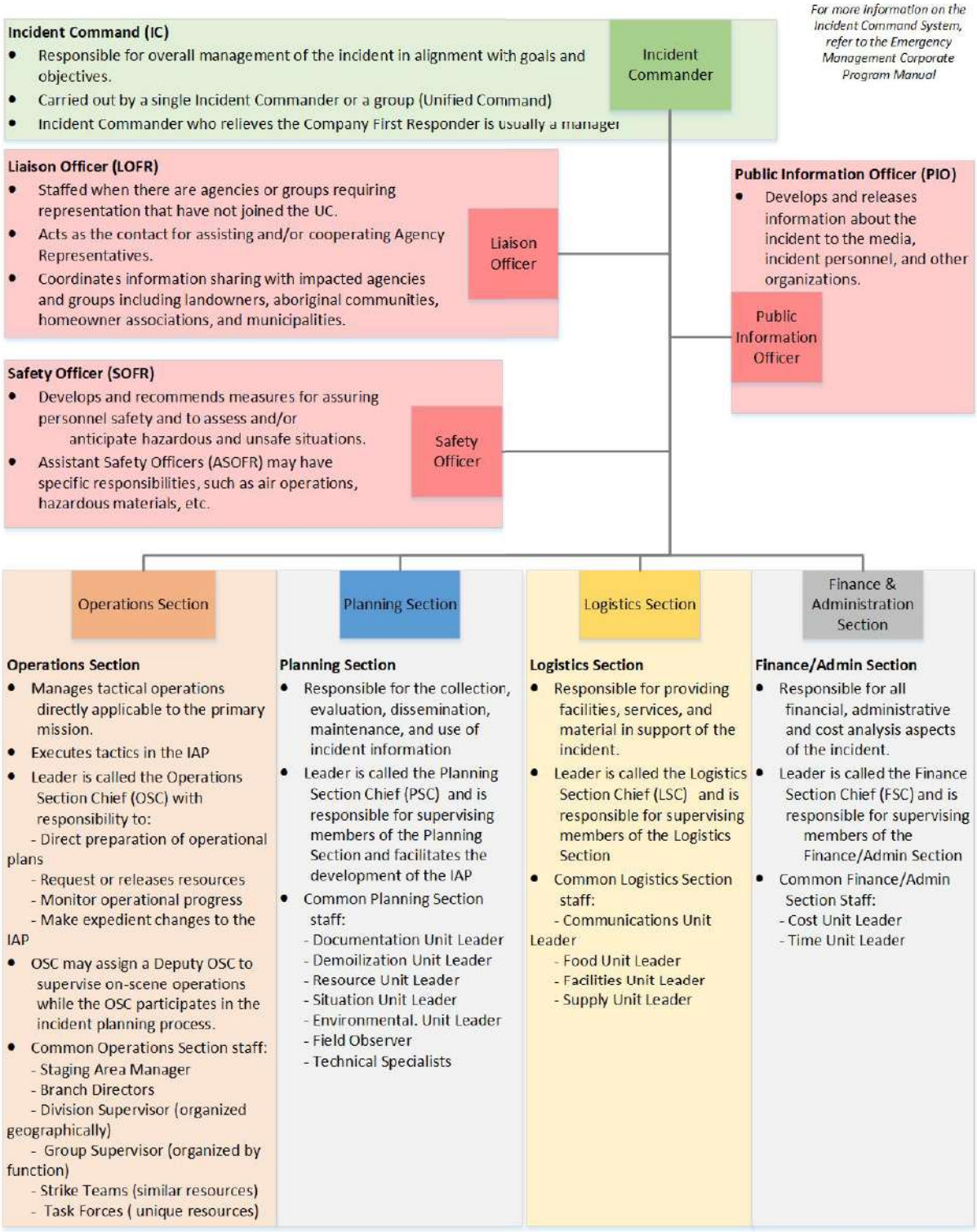
South Bow has adopted the Incident Command System (ICS) for managing emergencies across their assets. ICS is a standardized on-scene emergency management tool that is scalable and is a comprehensive incident management system that has been adopted by regulators, municipalities, and contractors.

ICS is based on the knowledge that every incident or event has certain major management activities that must be performed. Even if the event is very small and only one or two people are involved, these activities will always apply to some degree. The five major management activities in ICS are:

- Command
- Operations
- Planning
- Logistics
- Finance/Administration

The ICS organization as presented here has been developed from these five management activities. The ICS organization is "set" in that the job titles and responsibilities may not be changed, thus ensuring that any individual properly trained can come into an emergency and know exactly what he/she has to do. However, ICS provides the flexibility to allow each event to have its own unique organizational structure based on the size and type of event. It is the responsibility of the Incident Commander to determine the appropriate ICS organization based on the event.

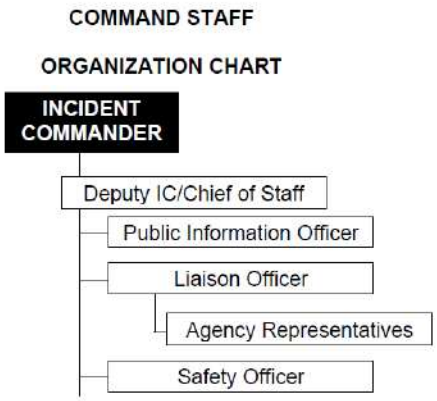
For more information on the Incident Command System, refer to the Emergency Management Corporate Program Manual



4.1.3 Incident Management Team

4.1.3.1 Command Staff

Incident Commander



The IC's responsibility is the overall management of the incident. On many incidents, the command activity is carried out by a single IC. The IC is selected based on qualifications and experience. The IC may have Deputy IC's, who may be from the same agency or from an assisting agency. The Deputy IC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time. When span of control becomes an issue for the IC, a Deputy IC/Chief of Staff may be assigned to manage the Command Staff.

General Accountability

The Incident Commander is responsible for overall management and command & control of all aspects of the response related to the protection of life, the environment, and property. The IC has final decision-making authority over response priorities, incident objectives, strategies and countermeasures and major expenditures. The IC is the Incident Management Team's (IMT) primary link with the Incident Support Team (IST), senior government officials and key outside stakeholders.

Deputy Incident Commander

General Accountability: Overall Management

The Deputy Incident Commander reports to the Incident Commander and is responsible for the overall coordination and facilitation to ensure accurate assessment, planning and effective implementation of physical response operations. Ensure the Section Chiefs are working in accordance with prioritized objectives established by the Incident Commander.

Scribe

General Accountability: Overall Management

The Scribe may report to the Incident Commander, Deputy Incident Commander and more than one Scribe position may be assigned. The role of the Scribe is to record actions taken, actions pending, and to provide updates and reminders to the members of the response team. The key role is to provide administrative support to the Incident Command Organization.

Unified Command

Unified Command (UC) is an expansion of the ICS organization. To be a member of the UC, response personnel must have authority and jurisdiction. UC members may also include agencies, organizations or private industries bringing large amounts of tactical and support resources to the table. The need for UC is brought about when an incident impacts the jurisdictional or functional responsibility of more than one agency. As a component of ICS, the UC is a structure that brings together the "Incident Commanders" of all major organizations that have jurisdictional responsibility for the incident to coordinate an effective response while carrying out their own agency's jurisdictional responsibilities. UC links the responding organizations to the incident and provides a forum for these agencies to make consensus decisions. Under UC, the various jurisdictions and/or agencies and non-government responders may blend together throughout the organization to create an integrated response team. The need for UC arises when incidents:

- Cross geographic boundaries (e.g., two provinces, international boundaries);
- Involve various governmental levels (e.g., provincial, local,);
- Impact functional responsibilities (e.g., Search and Rescue, fire, oil spill, EMS); or
- Some combination of the above.

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

- The specific details and characteristics of the incident.
- Determinations outlined in existing response plans.
- Decisions reached during the initial meeting of the UC.

The makeup of the UC may change as an incident progresses to account for changes in the situation.

UC is a team effort, but to be effective the number of personnel should be kept as small as possible. A well-defined process requires the UC to set clear objectives to guide the on-scene response resources.

UC is responsible for overall management of the incident. UC directs incident activities, including development and implementation of overall objectives and strategies, and approves ordering and releasing of resources. UC is not a "decision by committee". The principals are there to command the response to an incident. Time is of the
essence. UC should develop synergy based on the significant capabilities that are brought by the various representatives. There should be personal acknowledgement of each representative's unique capabilities, a shared understanding of the situation, and agreement on the common objectives. With the different perspectives on UC comes the risk of disagreements, most of which can be resolved through the understanding of the underlying issues. Contentious issues may arise, but the UC framework provides a forum and a process to resolve problems and find solutions.

Public Information Officer (PIO)

The PIO is responsible for developing and releasing information about the incident to the news media, to incident personnel, and to other appropriate agencies and organizations. Only one primary PIO will be assigned for each incident, including incidents operating under UC and multi-jurisdiction incidents. The PIO may have assistants as necessary, and the assistants may also represent assisting agencies or jurisdictions.

Liaison Officer (LOFR)

Incidents that are multijurisdictional, or have several agencies involved, may require the establishment of the LOFR position on the Command Staff. Only one primary LOFR will be assigned for each incident, including incidents operating under UC and multi-jurisdiction incidents. The LOFR may have assistants as necessary, and the assistants may also represent assisting agencies or jurisdictions. The LOFR is assigned to the incident to be the contact for assisting and/or cooperating Agency Representatives.

Safety Officer (SOFR)

The SOFR function is to develop and recommend measures for assuring personnel safety and to assess and/or anticipate hazardous and unsafe situations. Only one primary SOFR will be assigned for each incident. The SOFR 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.

4.1.3.2 Operations Section

Operations Section Chief (OSC)

The OSC, a member of the General Staff, is responsible for the management of all tactical operations directly applicable to the primary mission. The OSC will normally be selected from the organization/agency with the most jurisdictional responsibility for the incident. The OSC activates and supervises organization elements in accordance with the IAP and directs its execution. The OSC also directs the preparation of operational plans; requests or releases resources, monitors operational progress and makes expedient changes to the IAP, as necessary; and reports such to the IC. The OSC may have Deputy OSC's, who may be from the same agency or from an assisting agency. The Deputy OSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time. In complex incidents, the OSC may assign a Deputy OSC to supervise on-scene operations while the OSC participates in the incident planning process.

Branch Director (OPBD)

OPBDs, when activated, are under the direction of the OSC and are responsible for the implementation of the portion of the IAP appropriate to the Branches.

Division/Group Supervisor (DIVS)

The DIVS reports to the OSC (or OPBD when activated). The DIVS is responsible for the implementation of the assigned portion of the IAP, assignment of resources within the Division/Group, and reporting on the progress of control operations and status of resources within the Division/Group.

Strike Team/Task Force Leader (STCR/TFLD)

The STCR/TFLD reports to an OPBD or DIVS and is responsible for performing tactical assignments assigned. The Leader reports work progress, resources status, and other important information and maintains work records on assigned personnel.

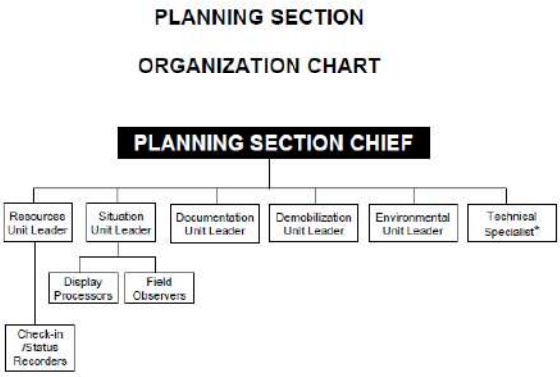
Staging Area Manager (STAM)

The STAM is under the direction of the OSC and is responsible for managing all activities within a Staging Area.

4.1.3.3 Planning Section

Planning Section Chief (PSC)

The PSC, a member of the General Staff, is responsible for the collection, evaluation, dissemination and use of incident information and maintaining status of assigned resources. Information is needed to:



- Understand the current situation.
- Predict the probable course of incident events.
- Prepare strategies, plans and alternative strategies and plans for the incident.
- Submit required incident status reports.

The PSC may have Deputy PSCs, who may be from the same agency or from an assisting agency. The Deputy PSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

Resource Unit Leader (RESL)

The RESL is responsible for maintaining the status of all assigned tactical resources and personnel at an incident. This is achieved by overseeing the check-in of all tactical resources and personnel, maintaining a status-keeping system indicating current location and status of all these resources.

Situation Unit Leader (SITL)

The Situation Unit Leader is responsible for collecting, processing and organizing incident information relating to the growth, mitigation or intelligence activities taking place on the incident. The SITL may prepare future projections of incident growth, maps and intelligence information.

Field Observer (FOBS)

The FOBS is responsible for collecting situation information from personal observations at the incident and provides this information to the SITL.

Documentation Unit Leader (DOCL)

The DOCL is responsible for the maintenance of accurate, up-to-date incident files. Examples of incident documentation include: Incident Action Plan(s), incident reports, communication logs, injury claims, situation status reports, etc. Thorough documentation is critical to post-incident analysis. Some of the

documents may originate in other sections. The DOCL shall ensure each section is maintaining and providing appropriate documents.

The DOCL will provide duplication and copying services for all other sections. The Documentation Unit will store incident files for legal, analytical, and historical purposes.

Demobilization Unit Leader (DMOB)

The DMOB is responsible for developing the Incident Demobilization Plan. On large incidents, demobilization can be quite complex, requiring a separate planning activity. Note that not all agencies require specific demobilization instructions.

Environmental Unit Leader (ENVL)

The ENVL is responsible for environmental matters associated with the response, including strategic assessment, modeling, surveillance, and environmental monitoring and permitting. The ENVL prepares environmental data for the Situation Unit. Technical Specialists frequently assigned to the Environmental Unit may include the Scientific Support Coordinator and Sampling, Response Technologies, Trajectory Analysis, Weather Forecast, Resources at Risk, Shoreline Cleanup Assessment, Historical/ Cultural Resources, and Disposal Technical Specialists.

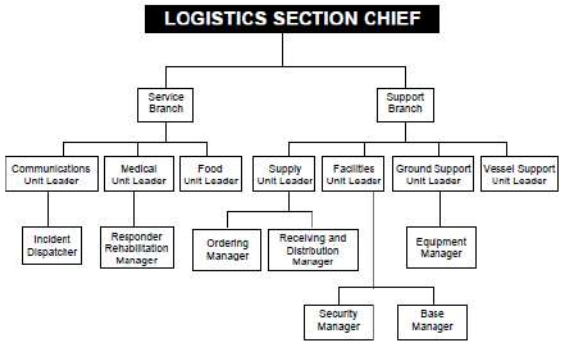
Technical Specialist (THSP)

Certain incidents or events may require the use of THSPs who have specialized knowledge and expertise. THSP's may function within the Planning Section or be assigned wherever their services are required. Technical Specialists report to the Planning Section Chief and are responsible for providing specialized technical support to emergency response personnel. These specialists may be company personnel or contractors hired specifically for emergency response operations. Technical Specialists may also report to the Operations Section Chief, Finance Section Chief or the Logistics Section Chief depending on the situation. Specialists may include accountants, engineering & environmental consultants, industrial hygienists, lawyers, meteorologists, purchasing agents, information technology support, GIS specialists etc. These roles are to be filled on an "as required" basis on site.

4.1.3.4 Logistics Section

LOGISTICS SECTION

ORGANIZATION CHART



Logistics Section Chief (LSC)

The LSC, a member of the General Staff, is responsible for providing facilities, services, and material in support of the incident. The LSC participates in the development and implementation of the IAP and activates and supervises the Branches and Units within the Logistics Section. The LSC may have Deputy LSCs, who may be from the same agency or from an assisting agency. The Deputy LSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

Service Branch Director (SVBD)

The SVBD, when activated, is under the supervision of the LSC and is responsible for the management of all service activities at the incident. The Branch Director supervises the operations of the Communications, Medical and Food Units.

Communications Unit Leader (COML)

The COML is responsible for developing plans for the effective use of incident communications equipment and facilities; installing and testing of communications equipment; supervision of the Incident Communications Center; distribution of communications equipment to incident personnel; and the maintenance and repair of communications equipment.

Food Unit Leader (FDUL)

The FDUL is responsible for supplying the food needs for the entire incident, including all remote locations, e.g., Staging Areas, as well as providing food for personnel unable to leave tactical field assignments.

Support Branch Director (SUBD)

The SUBD, when activated, is under the direction of the LSC, and is responsible for the development and implementation of logistics plans in support of the Incident Action Plan. The SUBD supervises the operations of the Supply, Facilities, Ground Support and Vessel Support Units.

Supply Unit Leader (SPUL)

The SPUL is primarily responsible for receiving, storing, and distributing all supplies for the incident; maintaining an inventory of supplies; and storing, disbursing, and servicing non-expendable supplies and equipment.

Facilities Unit Leader (FACL)

The FACL is primarily responsible for the setup, maintenance, and demobilization of incident facilities, e.g., Base, ICP and Staging Areas, as well as security services required to support incident operations. The FACL provides sleeping and sanitation facilities for incident personnel and manages Base operations. Each facility is assigned a manager who reports to the FACL and is responsible for managing the operation of the facility. The FACL reports to the SUBD.

Security Manager (SECM)

The SECM is responsible for providing safeguards needed to protect personnel and property from loss or damage.

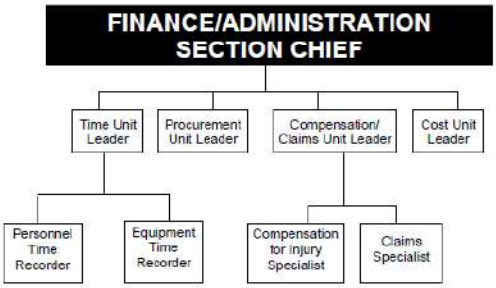
4.1.3.5 Finance and Administration Section

Finance/Administration Section Chief (FSC)

The FSC, a member of the General Staff, is responsible for all financial, administrative, and cost analysis aspects of the incident and for supervising members of the Finance/Admin Section. The FSC may have Deputy FSC's, who may be from the same agency or from an assisting agency. The Deputy FSC must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

FINANCE/ADMINISTRATION SECTION

ORGANIZATION CHART



Time Unit Leader (TIME)

The TIME is responsible for equipment and personnel time recording and for managing the commissary operations.

Procurement Unit Leader (PROC)

The PROC is responsible for administering all financial matters pertaining to vendor contracts, leases and fiscal agreements.

Compensation/Claims Unit Leader (COMP)

The COMP is responsible for the overall management and direction of all administrative matters pertaining to compensation for injury and claims related activities (other than injury) for an incident.

4.1.4 Incident Management Team (IMT)

Incident Management Team (IMT) is the term used for the collective of personnel staffing an Incident Command System (ICS) structure at an Incident Command Post. Led by an Incident Commander, the team is responsible for the direct control of all facets of the response to the emergency. This is achieved using 'management by objective' and the other attributes and features of ICS. Where Unified Command has been enacted, there is only one, composite IMT for the incident.

Any element of a response to an emergency not managed by the IMT is deliberately left un-done, or is delegated to and managed autonomously by a South Bow supporting function such as the Emergency Operations Center, or an Incident Support Team.

Refer to Appendix C Roles and Responsibilities Checklists.

4.1.5 Augmentation of the Site Managed Response/Large Scale Emergencies

If the event is of a significant size, the initial response organization will be expanded. The degree to which the organization expands will depend on the size and severity of the incident. The decision to augment the initial response team with an Incident Management Team (IMT), in full or in part is the responsibility of the IC.

All attempts will be made to fill needed positions within the incident management organization with qualified LFO personnel. If additional resources are required, the IC, in coordination with the Emergency Operations Center (EOC) Manager, will direct the activation of resources. Special expertise such as media, communications, legal and finance specialists will assist in the response from the Incident Support Team (IST) or will be sent to the incident site from other areas of the Company as needed. Additional response help may be drafted from other trained South Bow staff and outside contractors who are under contract with South Bow.

Representatives from the provincial environmental agencies may report to the incident site for major spill events, especially those where the spilled material has reached surface waters. Upon their arrival, South Bow Liaison Officer or support staff will meet with these representatives; the Lead Agency may be a representative from the Alberta Energy Regulator (AER) and Provincial Environmental Agency. In most instances, the Lead Agency will be available for direction and consultation on the spill response. However, if conditions warrant, a Unified Command (UC) will be established between the South Bow IC and the Lead Agency. Once established, the UC will jointly decide on response actions.

Provincial and/or municipal emergency services agencies may respond to the incident for non-spill related emergencies such as fire/explosion events, security related issues, etc. Upon their arrival at the ICP, the IC will meet with the lead representatives from the various response agencies. In certain instances, (e.g. a fire, or explosion or security event), the chief of the fire department or police department may assume command of the incident from the South Bow IC. If this occurs, the Company

First Responder or Company IC will assist the Emergency Services IC while serving to oversee South Bow's interests. When the emergency is declared over, the Emergency Services IC will turn Command and Control back to the Company IC. In other event scenarios, a UC will be established between the South Bow IC and the lead representative from the responding agencies.

4.1.6 Incident Facilities

The Incident Commander is typically stationed at the **Incident Command Post (ICP)** where the primary Command functions are performed. All incidents have only one designated ICP. It may also be co-located with other Incident Facilities as required. The location of the ICP should take into account the nature of the incident, whether the incident has potential to grow or move, and whether the location is suitable in size and is safe for the expected duration of the incident. It may be located in a vehicle, trailer, or tent; however, if the incident duration is expected to be more than a few hours, a building (i.e. South Bow office, hotel conference room) is recommended for use as the ICP.

A **staging area** is a location where resources can be placed while awaiting a tactical assignment. The Operations Section manages Staging Areas.

A **base** is a location at which primary Logistics functions for an incident are coordinated and administered.

A **camp** is a geographical site, within the general incident area, but separate from the Incident Base, that is equipped and staffed to provide sleeping, food, water, and sanitary services to incident personnel.

A **Joint Information Center (JIC)** is a facility established to coordinate all incident-related public information activities. It is the central point of contact for all news media at the scene of the incident. Public information officials from all participating agencies should collocate at the JIC.

In emergencies impacting the public, South Bow's Land, Community, and Indigenous Relation team may establish **Community Information Centers** to meet the following purposes:

- Share information about the emergency with the public
- Collect information regarding public impacts of the emergency
- Receive requests for assistance for recovering from the emergency
- Serve as a Reception Center for receiving and organizing evacuees

An Emergency Operations Center (EOC) is a coordination venue through which leadership and company departments can collect information and offer assistance to the Incident Management Team.

South Bow's Emergency Operations Center has been established as a virtual environment, through telephone and video conferencing. A Virtual EOC is a non-physical gathering of personnel via conference line in order to collectively gather and share information about the emergency. The EOC provides logistical support to the Incident Management Team, ensuring the Incident Management Team has all of the resources they need to effectively contain and control the emergency event. The EOC may also assist with internal and external notifications, advice on containment and control of the emergency, and serve as a communication point for all company resources. The EOC's role is to directly support all activities at the scene through communications, resource deployment and technical expertise.

4.1.7 Incident Command Post

The Incident Command Post (ICP) is the field location at which the primary tactical-level, on-scene incident command functions are performed. The ICP may be collocated with the incident base or other incident facilities and may be identified by a green flag.

The ICP will be determined by the actual location of the event, taking into consideration which Field Offices and Facilities are available to support a temporary ICP while a full deployment is coordinated

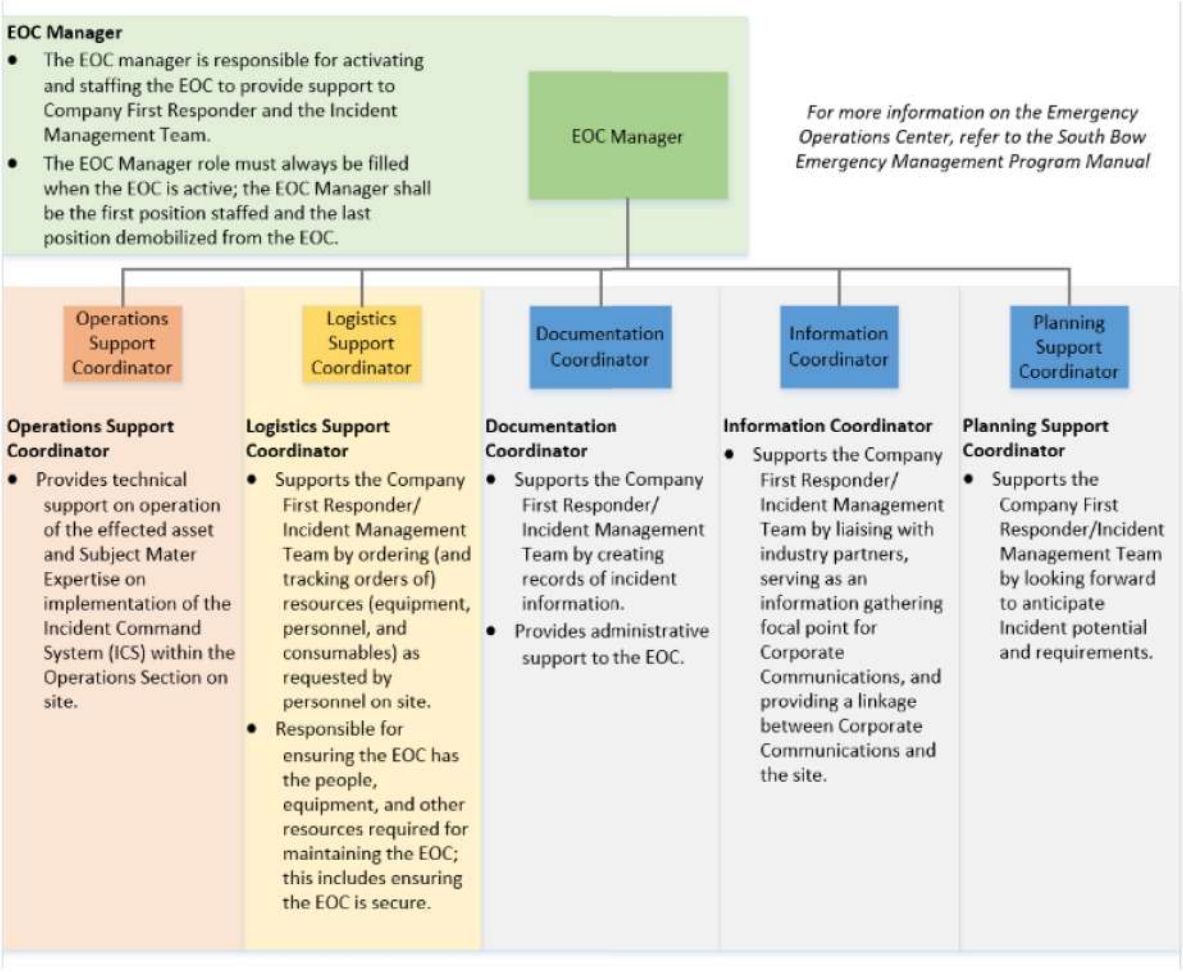
with the IMT and a more suitable option is evaluated and selected if required (trailers, hotel rooms, others).

4.1.8 Emergency Operations Center

An Emergency Operation Center (EOC) virtual platform pre-established to co- ordinate the overall response and support for the Incident Command Post at the site of the emergency. The EOC contains information to assist with internal and external notifications, containment and control of the emergency as well as act as a communication point for all company resources. The EOC's role is to directly support all activities at the scene through communications, resource deployment and technical expertise.

4.1.8.1 EOC

A EOC is established for all emergencies within field operations. This EOC has dedicated conference lines, and other communications equipment to support on-scene response to an emergency. Additionally, the EOC may provide technical expertise, remote logistical support, or any number of other services to support incident response. South Bow will establish a virtual EOC for emergencies on the AER regulated liquids pipelines.


EOC Manager
The EOC manager is responsible for activating and staffing the EOC to provide support to Company First Responder and the Incident Management Team.
The EOC Manager role must always be filled when the EOC is active; the EOC Manager shall be the first position staffed and the last position demobilized from the EOC.
EOC Manager
For more information on the Emergency Operations Center, refer to the South Bow Emergency Management Program Manual
Operations Support Coordinator
Logistics Support Coordinator
Documentation Coordinator
Information Coordinator
Planning Support Coordinator
Operations Support Coordinator
Provides technical support on operation of the effected asset and Subject Mater Expertise on implementation of the Incident Command System (ICS) within the Operations Section on site.
Logistics Support Coordinator
Supports the Company First Responder/ Incident Management Team by ordering (and tracking orders of) resources (equipment, personnel, and consumables) as requested by personnel on site.
Responsible for ensuring the EOC has the people, equipment, and other resources required for maintaining the EOC; this includes ensuring the EOC is secure.
Documentation Coordinator
Supports the Company First Responder/ Incident Management Team by creating records of incident information.
Provides administrative support to the EOC.
Information Coordinator
Supports the Company First Responder/ Incident Management Team by liaising with industry partners, serving as an information gathering focal point for Corporate Communications, and providing a linkage between Corporate Communications and the site.
Planning Support Coordinator
Supports the Company First Responder/Incident Management Team by looking forward to anticipate Incident potential and requirements.

4.1.9 Incident Support Team

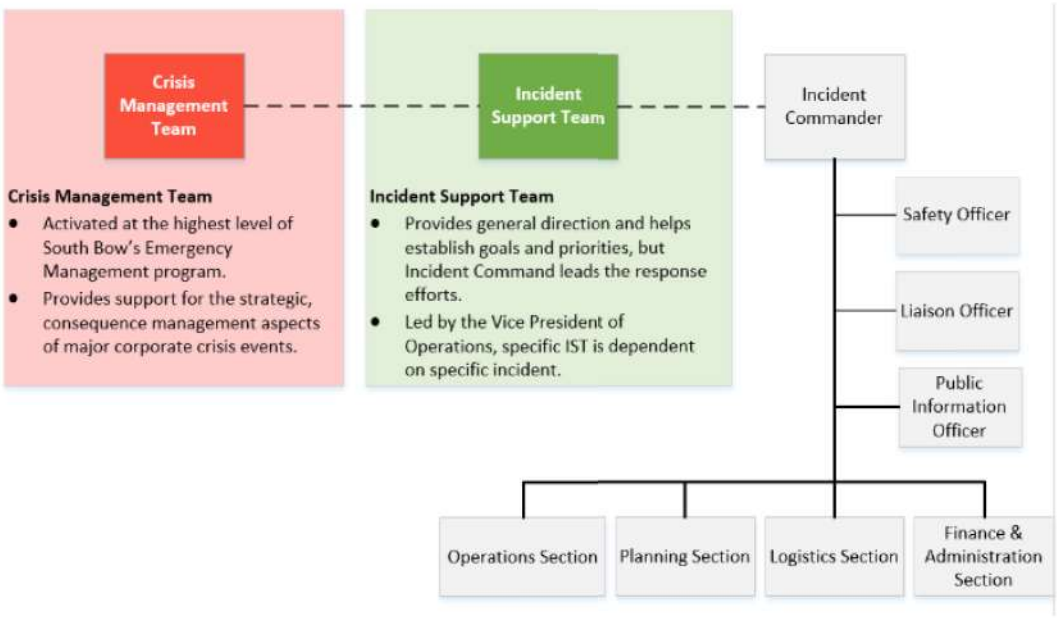
Senior management should be engaged during all significant events and emergencies that occur in South Bow to support the response. This may take place simultaneously with the activation of the EOC, but may also take place in events which do not activate the EOCs. In all emergency events the Incident Commander will be making all decisions related to the event. Senior Management can help provide direction and help establish priorities as necessary, but the Incident Commander (or Unified Command) is leading the response efforts.

South Bow personnel who may provide direction and establish priorities as described above is known as the Incident Support Team (IST). The establishment of the IST is at the discretion of the Vice President of Liquid Operations. The IST is predominantly activated for significant events (non- emergencies), emergencies and active through repair and restoration phase.

The responsibilities of the IST will include the following:

- Providing guidance/support for the Incident Commander.
- Helping the Incident Commander transition command when necessary.
- Providing input into determining if the EOC is required and when deactivated.
- Working with the EOC, providing necessary resources for the Incident Commander.
- Help establish increased spending authority for the Incident Commander and Incident Management team.
- Providing input in deciding when the emergency event is over.
- Communicating status updates to Executive Management not participating on the IST.

For pipeline related incidents, the IST may help provide direction and help establish priorities as necessary, but the on-site Incident Commander (using ICS) is leading response activities.



4.1.10 Staging Area

Staging Areas are any location established where resources can be placed while awaiting a tactical assignment. The Operations Section manages Staging Areas.

4.1.11 Reception Center

Reception Centre personnel establish a specialized facility called the Reception Centre outside the Emergency Planning Zone (EPZ) at a suitable, safe location near the incident. Reception Centre personnel address the concerns and immediate needs of the evacuated public. Arrangements for alternative accommodation, reimbursement of daily expenses and temporary care of evacuated property are managed through the Reception Centre. Evacuees will not be housed at the Reception Centre.

5.0 PLAN IMPLEMENTATION

5.1 Response Process & Scope

An emergency is defined as an unforeseen or imminent event which requires one of the following to protect the health, safety, and welfare of people first; and then to limit damage to property, the environment or company operations:

- Prompt coordination of resources,
- Special communications,
- and/or heightened authority for employees,

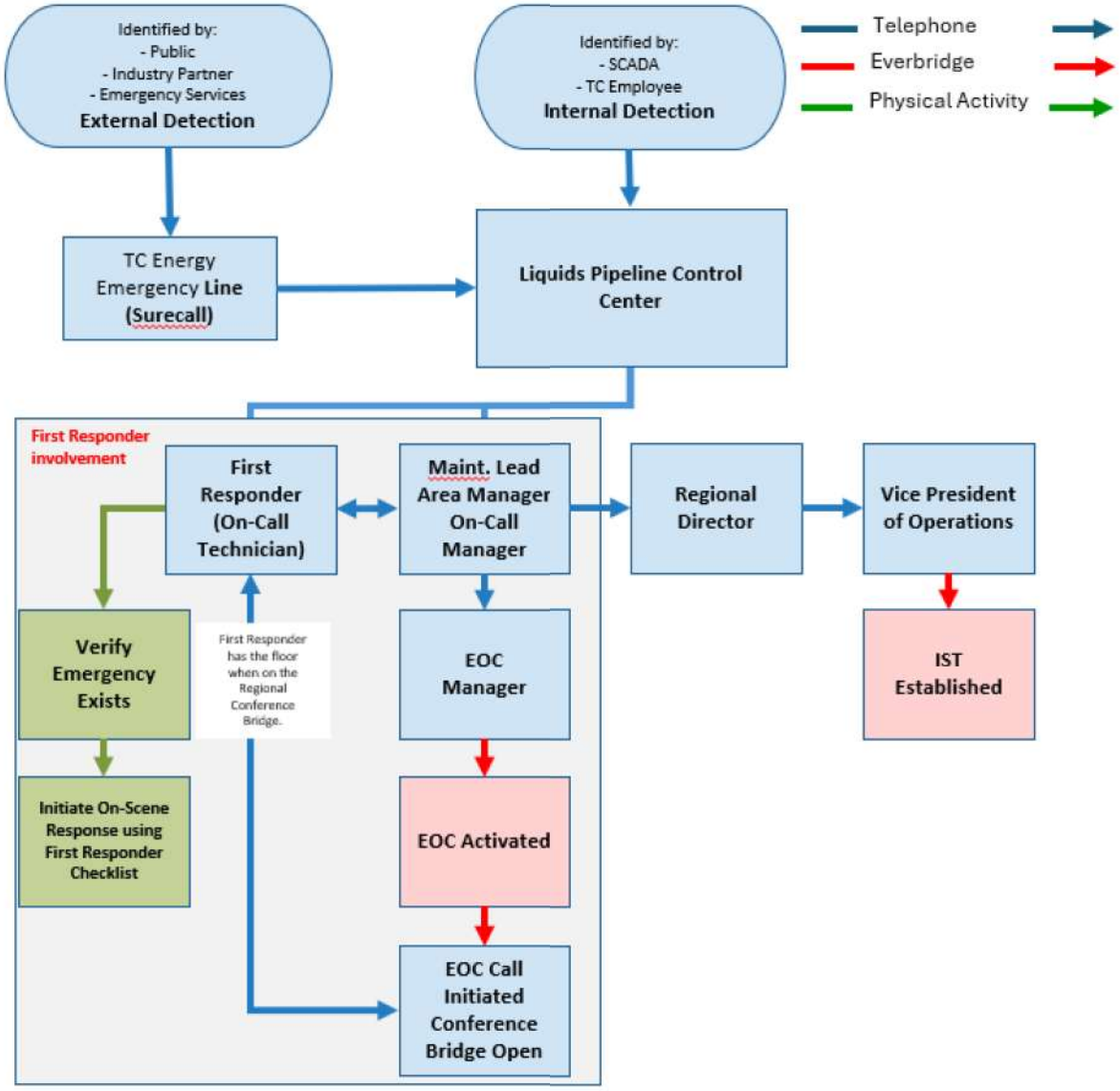
This section describes how the factors above will be assessed to determine the scope of an emergency, and ultimately the resources required to efficiently manage response operations.

5.1.1 Scope Based Response

There are two major tiers of response:

1) Initial Response/Site Managed Emergencies.
2) Augmentation of Site Managed Emergencies.

The process for initial response to these two tiers of emergencies are identical, preparing South Bow First Responders to prepare for developing and cascading emergencies, when the scope may not initially be apparent. Following the Response Actions Checklists in this Section of this Plan prepares South Bow to manage an emergency from the onset of the incident to termination.



5.1.2 Company First Responder

The South Bow First Responder (or initial Incident Commander) will inherently be tasked with evaluating the scope of the emergency to determine the resource needs for the response First Response Checklist - Oil . At any point during this initial scene size-up, the South Bow First Responder is empowered to request a response team to support response efforts. This response team may come in one of two forms:

- Activation of local company resources to support Site Managed Emergencies.
- Deployment of an Incident Management Team to support either tier of emergency.

The decision to activate either form of response team must be made by a request from the on-scene Incident Commander (IC). The LFO EOC, IST may make a recommendation to the IC if they feel an IMT would provide valuable support to the response efforts. The following criteria should be used by the IC in determining whether to augment the site IMT:

- The incident is beyond the capabilities of the current response resources.
- The potential duration of the incident will exceed current resource endurance.
- The incident poses significant human resource, political, economic and/or environmental implications.
- It is decided that augmentation of the site team is in the best interests of the Company.

5.1.3 Incident Management Team

As mentioned above, an IMT is a person or group of people who respond to emergencies to set objectives, manage resources and logistics, and otherwise support personnel executing the specific tactics to stabilize and resolve the emergency.

Where needed, additional resources can be deployed to support the Company First Responders. BU sources Incident Management Team (IMT) personnel may be mobilized to support the incident.

IMT roles should reference the ICS Role Checklists which are available through the Emergency Management SharePoint.

5.1.4 On-Call Manager

The On-call Manager is responsible to ensure the Response Process described in this Plan is followed. Specifically, they shall take the actions summarized in the table below.

On-Call Manager
• Provide support to the Company First Responder and IMT. • Use Everbridge to activate the EOC, along with additional virtual platforms as needed. • Ensure the conference bridge is opened, maintained, and monitored to allow conferencing with the site. • Ensure local emergency response agencies and public officials are contacted.

5.1.5 EOC

The EOC provides support to the Company First Responder and IMT. Staff in the EOC are guided by EOC Role Kits maintained on the Emergency Management SharePoint and in the EOC Team Site itself. However, during response to an emergency, the EOC will, at minimum, take the actions summarized in the table below.

EOC Refer to EOC Role Kits for more detailed guidance

- Provide support to the Company First Responder and IMT.
- Ensure that the Emergency Conference bridge has been established to allow communication between the site and the EOC.
- Make sure local emergency response agencies and public officials are contacted

5.2 Notifications

5.2.1 24 Hour Emergency Line

South Bow has contracted a 24-hour seven-day a week trilingual answering service. The following is a description of the services provided:

- Answers "South Bow's Emergency Line" incoming calls.
- Provide 24-hr trilingual (English, French & Spanish) call service.
- Prompt response to all calls.
- Record all calls.
- Complete the Initial Call Information Form (ICIF) for all emergency calls.
- Send the completed ICIF and audio file of the emergency call to the respective Control Centre.
- Contact the Control Centre and inform them of the emergency call.
- Re-direct calls appropriately to other provided numbers if the call is not an emergency.
- Ability to retrieve previous emergency archived files.
- One-point contact for inquiries.

Contact information for this 24-Hour Emergency Line is included in Appendix A.

5.3 Matrix for Classifying Incidents

5.3.1 Alberta Energy Regulator (AER) Assessment Matrix for Classifying Incidents

Table 1. Consequence of incident

Rank	Category	Example of consequence in category
1	Minor	• No worker injuries. • Nil or low media interest. • Liquid release contained on lease. • Gas release impact on lease only.
2	Moderate	• First aid treatment required for on-lease worker(s). • Local and possible regional media interest. • Liquid release not contained on lease. • Gas release impact has potential to extend beyond lease.
3	Major	• Worker(s) requires hospitalization. • Regional and national media interest. • Liquid release extends beyond lease—not contained. • Gas release impact extends beyond lease—public health/safety could be jeopardized.
4	Catastrophic	• Fatality. • National and international media interest. • Liquid release off lease not contained - potential for, or is, impacting water or sensitive terrain. • Gas release impact extends beyond lease - public health/safety jeopardized.

Table 2. Likelihood of incident escalating*

Rank	Descriptor	Description
1	Unlikely	The incident is contained or controlled, and it is unlikely that the incident will escalate. There is no chance of additional hazards. Ongoing monitoring required.
2	Moderate	Control of the incident may have deteriorated but imminent control of the hazard by the licensee is probable. It is unlikely that the incident will further escalate.
3	Likely	Imminent and/or intermittent control of the incident is possible. The licensee has the capability of using internal and/or external resources to manage and bring the hazard under control in the near term.
4	Almost certain or currently occurring	The incident is uncontrolled and there is little chance that the licensee will be able to bring the hazard under control in the near term. The licensee will require assistance from outside parties to remedy the situation.

* What is the likelihood that the incident will escalate, resulting in an increased exposure to public health, safety, or the environment?

Sum the rank from both of these columns to obtain the risk level and the incident classification

Table 3. Incident classification

Risk level	Assessment results
Very low 2–3	Alert
Low 4-5	Level-1 emergency
Medium 6	Level-2 emergency
High 7–8	Level-3 emergency

Incident Classification				
Responses	**Alert**	**Level-1 Emergency**	**Level-2 Emergency**	**Level-3 Emergency**

Communications				
Internal	Discretionary, depending on duty holder policy.	Notification of off-site management.	Notification of off-site management.	Notification of off-site management.
External public	Courtesy, at duty holder discretion.	Mandatory for individuals who have requested notification inside the Emergency Planning Zone (EPZ).	Planned and instructive in accordance with the specific emergency response plan.	Planned and instructive in accordance with the specific emergency response plan.
Media	Reactive, as required.	Reactive, as required.	Proactive media management to local or regional interest.	Proactive media management to national interest.
Government	Reactive, as required. Notify AER if public or media is contacted.	Notify Local AER Field Centre. Call local authority and regional health authority if public or media is contacted.	Notify Local AER Field Centre, local authority, and regional health authority.	Notify Local AER Field Centre, local authority, and regional health authority.
Actions				
Internal	On-site, as required by duty holder.	On-site, as required by duty holder. Initial response undertaken in accordance with the site- specific or corporate- level emergency response plan.	Predetermined public safety actions are under way. Corporate management team alerted and may be appropriately engaged to support on-scene responders.	Full implementation of incident management system.

External	On-site, as required by duty holder.	On-site, as required by duty holder.	Potential for multi-agency (operator, municipal, provincial, or federal) response.	Immediate multi-agency (operator, municipal, provincial, or federal) response.
Resources (Manpower and Equipment)				
Internal	Immediate and local. No additional personnel required.	Establish what resources (manpower and equipment) would be required.	Limited supplemental resources (manpower and equipment) required.	Significant incremental resources (manpower and equipment) required.
External	None.	Begin to establish resources (manpower and equipment) that may be required.	Possible assistance from government agencies and external support services, as required.	Assistance from government agencies and external support services, as required.

5.4 Response Process

Emergency Response is defined as an aggregate of decisions and measures taken to achieve the following:

- Contain or mitigate the effects of an emergency to prevent any further loss of life and/or property.
- Restore order in the immediate aftermath of an emergency.
- Re-establish normalcy through reconstruction and rehabilitation shortly thereafter.

In the unlikely event of a leak, South Bow will respond immediately by shutting down the pump stations, closing valves and dispatching emergency response personnel. The principal focus of the initial response is to stop operating pumping units to isolate the impacted segment(s) of the pipeline and then close shut-off valves in the vicinity of the leak to limit its impact. Actual response times will vary depending on the location of the leak. However, South Bow is prepared to transport and mobilize any required personnel and equipment via ground, air and water. Personnel and equipment are strategically placed along the AER Regulated Liquids Pipelines for a quick and safe response.

5.4.1 Health and Safety

It is the corporate policy of the Company to provide a safe workplace for all workers. All employees and contractors are responsible for maintaining the safety and health of all workers on the pipeline and the response operations.

Prior to engaging in any spill response activity:

- All employees/contractors must receive orientation from the HSE Company Safety Orientation and the Site-Specific Safety Orientation.
- All other personnel will have completed appropriate training for their position as outlined in Section 8.3.
- No employee/contractor shall engage in activities without the appropriate protective equipment and training.

5.4.1.1 Air Monitoring

A Safety Officer shall be designated who is trained in the operation of air monitoring equipment can oversee air monitoring personnel. The Incident Commander must ensure that Safety Officers are trained and that their equipment is maintained and ready for use.

- The air monitoring equipment shall be activated and checked at the location in which it is stored.
- Calibration of instruments should be performed before use.
- Air monitoring measurements which are to be made prior to entry into the spill area include:
- Oxygen content
- Lower Explosive Limit (LEL) with a pentane calibrated instrument
- Benzene level
- H2S
- Lower Explosive Limit readings above 10% require immediate evacuation of the area and elimination of ignition sources.
- Oxygen readings below 19.5% require the use of air supplied respiratory protection.
- After assuring that there are no hazards relating to explosion or oxygen depletion, sampling for benzene or total petroleum hydrocarbons shall dictate the appropriate respiratory devices to be used by persons entering the area.
- A positive benzene level less than or equal to 0.2 ppm requires a half face respirator equipped with Organic Vapour/Acid Gas/P100 cartridges be used. When the level is between >0.2 and 1 ppm a full face respirator equipped with Organic Vapour/Acid Gas/P100 cartridges must be used. A benzene level greater than 1 ppm, a supplied air respirator or SCBA must be used. An exception to the requirements is that a full face respirator equipped with Organic Vapour/Acid Gas/P100 cartridges may be used between benzene levels >1 and 3 ppm if an individual is in the benzene environment for less than 15 minutes.

If H2S is present below 10 ppm, a full face respirator equipped with acid gas cartridges may be used. H2S levels above 10 ppm require a supplied air respirator or SCBA be used.

- Hydrogen Sulfide is an extremely hazardous toxic compound that is present in most crude oils that are transported through the pipeline.
- Air monitoring for Hydrogen Sulfide will be done by all personnel working on or near the pipeline and during any cleanup operation.
- Hydrogen Sulfide is characterized by a rotten egg smell at low level concentrations.
- The gas causes rapid temporary paralysis of the olfactory system leading to the loss of the sense of smell.
- Permissible exposure limits in many countries is 10 ppm. In Canada the occupational exposure level is 1 ppm.

Symptoms of exposure to Hydrogen Sulfide are:

- 0-10 ppm no known health effects for most people
- 10-100 ppm can cause headache, dizziness, nausea (100 ppm is the immediately dangerous to life and health level)
- 100-500 ppm above mentioned effects within a short time and more severe. Loss of breathing and death is possible within minutes.
- 500-700 ppm affects the central nervous system. Symptoms could include a loss of balance and a loss of reasoning. You could become unconscious and stop breathing within seconds
- 700 and greater would result in immediate loss of consciousness and permanent brain damage due to hypoxia or death if not rescued immediately
- The Incident Commander is responsible for arranging industrial hygiene monitoring in the post discovery period.

5.4.2 Personal Protective Equipment

As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

Selection of the appropriate PPE is a complex process which should take into consideration a variety of factors. Key factors involved in this process are identification of the hazards, or suspected hazards; their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact); and the performance of the PPE materials (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases, the breakthrough time of the protective material should exceed the work durations.

Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, should be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

The following are guidelines that can be used to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and re-selection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

Personal protective equipment is divided into four categories based on the degree of protection afforded.

PPE Level	Level of Hazard by Characteristic	PPE Required
Level A To be selected when the greatest level of skin, respiratory, and eye protection is required.	The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the skin, Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or	• Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH). • Totally encapsulating chemical-protective suit. • Coveralls. • Long underwear. • Gloves, outer, chemical resistant. • Gloves, inner, chemical resistant. • Boots, chemical-resistant, steel toe and shank. • Hard hat (under suit).

PPE Level	Level of Hazard by Characteristic	PPE Required
	Operations must be conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.	• Disposable protective suit, gloves and boots (depending on suit construction, may be worn over totally encapsulating suit).
PPE Level	**Level of Hazard by Characteristic**	**PPE Required**
Level B The highest level of respiratory protection is necessary, but a lesser level of skin protection is needed.	The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection. The atmosphere contains less than 19.5 percent oxygen; or The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin. Note: This involves atmospheres with IDLH concentrations of specific substances that present severe inhalation hazards and that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.	• Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved). • Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical- resistant overalls). • Coveralls. • Gloves, outer, chemical resistant. • Gloves, inner, chemical resistant. • Boots, outer, chemical-resistant, steel toe and shank. • Boot-covers, outer, chemical-resistant • (disposable). • Hard hat.) • Face shield.
Level C The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air	The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin; The types of air contaminants have been identified, concentrations measured, and an air- purifying respirator is available that can remove the contaminants; and	• Full-face or half-mask, air purifying respirators (NIOSH approved). • Hooded chemical-resistant clothing (overalls; two- piece chemical-splash suit; disposable chemical- resistant overalls). • Coveralls. • Gloves, outer, chemical resistant.

PPE Level	Level of Hazard by Characteristic	PPE Required
purifying respirators are met.	All criteria for the use of air-purifying respirators are met.	• Gloves, inner, chemical resistant. • Boots (outer), chemical resistant steel toe and shank. • Boot-covers, outer, chemical-resistant • (disposable). • Hard hat. • Escape mask. • Face shield.
Level D A work uniform affording minimal protection: used for nuisance contamination only.	The atmosphere contains no known hazard; and Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals. Note: As stated before, combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.	• Coveralls. • Gloves. • Boots/shoes, chemical-resistant steel toe and shank. • Boots, outer, chemical-resistant (disposable). • Safety glasses or chemical splash goggles. • Hard hat. • Escape mask. • Face shield.

5.4.3 Search and Rescue

South Bow personnel are not trained to conduct search and rescue operations. South Bow personnel will work to identify personnel on site during an emergency and will use this information to support Local First Responders to conduct Search and Rescue Operations.

5.4.4 Serious Injuries and Fatalities

A Critical Injury and Fatality Response Procedures has been developed to help staff and leaders deal with issues related to a Critical Injury or Fatality of an employee or the fatality of a contractor who is actively engaged in work activities at a South Bow site.

Notification of Next of Kin

Due to privacy issues, South Bow takes extreme precautions not to access the next of kin files unless we have a defined emergency event involving the health and safety of our employees.

5.5 Incident Specific Response Actions – Common to All Responses

First Responder

- Verify emergency exists.
- Follow the appropriate steps outlined in the "Specific Incident Response Checklist" and the "Product Specific Response Considerations".
- Notify the LPCC of the incident.
- Contact/Utilize local emergency services, as necessary (police, fire, medical).

EOC

- Ensure local emergency agencies have been contacted (police, fire, medical).
- Assign personnel immediately to the discharge site to assist with emergency response and spill containment.
- Activate additional company and response contractors to site as situation demands.
- Confirm safety aspects at site, including need for Personal Protective Equipment (PPE), removal of sources of ignition, and potential need for evacuation.
- Evaluate the severity, potential impact, safety concerns and response requirements based on the initial data provided by the First Person On-scene. Refer to the spill response evaluation flowchart in this section.
- Perform notifications, as appropriate.

Area Management

- As appropriate, proceed to spill site and coordinate response and clean-up operations.
- Coordinate/perform activation of additional spill response contractors, as the situation demands.
- Direct containment, dispersion, and/or clean-up operations in accordance with the Emergency Response Guidebook (ERG).

Local Company Personnel

- Assigned personnel will immediately respond to a discharge from the Pipeline or Facility, as the situation demands.
- Assist as directed at the spill site.
- Assume Incident Management Team roles as deemed by Incident Commander

5.6 Release of Product

5.6.1 Containment and Recovery of Spilled Product

General descriptions of various specific response techniques that may be applied during a response effort are discussed below. Company responders are free to use all, or any combination of these methods as incident conditions require, provided they meet the appropriate safety standards and other requirements relative to the situation encountered. Data was obtained from reports, manuals and pamphlets prepared by the various industry and government sources. The most effective cleanup of a product spill will result from an integrated combination of clean-up methods. Each operation should

complement and assist related operations and not merely transfer spillage problems to areas where they could be more difficult to handle.

The spill should be assessed as soon as possible to determine the source, extent, and location of travel. Terrain and other physical conditions downgradient of the spill site will determine the methods of control at a point in advance of the moving product. Often, the bulk of a spill can be contained at a single location or a few key locations in the immediate vicinity of the source point. When possible, the execution of this type of initial containment strategy helps confine a spill to a relatively limited area.

Spill on Land / Source Control

Containment Methods

After safety, the highest priority for South Bow during a spill response is to prevent product from reaching water and mitigate migration of oil out of the source area. To accomplish this there are many different ways to contain or deflect product. Product can be trapped in ditches and gullies by earth dams. Where excavating machinery is available, dams can be bulldozed to contain lakes of product. Dams, small and large, should be effectively employed to protect priority areas such as inlets to drains, sewers, ducts and watercourses. These can be constructed of earth, sandbags, absorbents, planks, pillow (inflatable with air/water) dams or any other effective method. If time does not permit a large dam, many small ones can be made, each one holding a portion of the spill as it advances. The terrain will dictate the placement of the dams. If the spill is minor, natural dams or earth absorption will usually stop the product before it advances a significant distance. Cleanup is the main concern in such situations.

Whenever possible, potential routes of migration should be closed off by the use of sandbags, planks, earth or other dams. This is used as a preventative measure in case precipitation begins and the product starts to migrate.

In urban locations such as city streets or concrete drainage ditches, a combination of sorbent booms in front with a layer sandbags behind holding the boom in place can be used as a very effective means to create containment along with some collection. Instead of building up dikes and dams, another method of containment is to dig collection pits. By creating a new low point for the oil to run it provides an excellent recovery point for removal.

Removal Methods

The best approaches to remove oil from urban infrastructure include:

- Removal with suction equipment to tank truck if concentrated in volumes large enough to be picked up. Channels can be formed to drain pools of product into storage pits. The suction equipment can then be used.
- Small areas can be cleaned by hand. Use of sorbent pads to soak up the oil is the preferred method.
- If safe, controlled burning presents the possibility of a fast, simple, and inexpensive method of destruction of the remainder of the product. If all other options have been executed and the site is still unsafe for further activity because explosive vapors persist, the vapors may need to be intentionally ignited to prevent an accumulation sufficient to become an explosive mixture, provided the other requirements of these guidelines for controlled burning are met.
- Intentional ignition to remove released product should be utilized only if all of the following conditions are met:
    - Other steps and procedures have been executed and a determination has been made that this is the safest remaining method of control.
    - Intentional burning will not unduly damage pipelines, adjacent property, or the environment.
    - Controlled burning is permitted by Federal and State/Provincial government authorities. Local government authorities to be contacted may include city council, county board of commissioners, city or county fire chiefs, the county forestry commission or fire tower, and the local environmental protection agency. In seeking permission from these authorities, be prepared to convince them that adequate safety precautions have been and will be taken during the operation. Also be ready to conduct water or soil sampling upon completion as may be required.
    - Controlled burning is conducted with the consent of local landowners.
    - Safety must always be a prime consideration when considering controlled burning of product. Sparks and heat radiation from large fires can start secondary fires and strong winds make fire control difficult. There must be no danger of the fire spreading beyond control limits. All persons must be at a safe distance from the edge of the inflammable area. Remember that all burning must be controlled burning.

Spill on Lake or Pond (Calm or Slow-Moving Water)

Containment Methods

A lake or pond offers the best conditions for removal of product from water. Although the removal is no easy task, the lake or pond presents the favorable conditions of low or no current and low or no waves.

The movement of product on a lake or pond is influenced mainly by wind. The product will tend to concentrate on one shore, bank or inlet. Booms should be set up immediately to hold the product in the confined area in the event of a change in wind direction.

If the spill does not concentrate itself on or near a shore (no wind effect), then a sweeping action using boats and floating booms will be necessary.

The essential requirement for this operation is that it be done very slowly. The booms should be moved at not more than 40 feet per minute. Once the slick is moved to a more convenient location (near shore), the normal operations of removal should begin.

If the slick is small and thin (rainbow effect) and not near the shoreline, an absorbent boom instead of a regular boom should be used to sweep the area very slowly and absorb the slick. The product may not have to be moved to the shoreline.

Removal Methods

If the Containment slick is thick enough, regular suction equipment may be used first; however, in most instances, a floating skimmer should be used.

If the floating skimmer starts picking up excess water (slick becomes thin), drawing the boom closer to the bank as product is removed will also keep film of product thicker.

However, when the slick becomes too thin, the skimmer should be stopped, and an absorbent applied (with a boat if necessary) to remove the final amounts. The floating skimmer (if speed is a must) or hand skimmers (if water is shallow enough) or both can be used to pick up the product-soaked absorbent. Before pumping the product-soaked absorbent with a floating skimmer, ensure that the absorbent in question can be pumped and will not harm the pump. Several types are nonabrasive to pump internals. If the floating skimmer is used first, the product-soaked absorbent/water mixture should be pumped into a tank truck.

A better method of retrieving the product-soaked absorbent is to draw it in as close to the shore as possible with the booms used to confine the product initially. The absorbent can then be hand skimmed from the water surface and placed in drums, on plastic sheets or in lined roll-off boxes. It should then be disposed of by acceptable means.

The final rainbow on the surface can be removed with additions of more absorbent.

Spill on Small to Medium Size Streams (Fast-Flowing Creeks)

Containment Methods

The techniques used for product containment on fast-flowing shallow streams are quite different from the ones used on lakes, ponds, or other still bodies of water. The containment and removal processes require a calm stretch of water to allow the product to separate onto the surface of the water. If a calm stretch of water does not exist naturally, a deep slow-moving area should be created by damming. The dam can be constructed by using sandbags, planks or earth. If a dam is required, it should be situated at an accessible point where the stream has high enough banks. The dam should be constructed soundly and reinforced to support the product and water pressure.

- Underflow dam - The underflow dam is one method that can be used, especially on small creeks. The water is released at the bottom, of the dam using a pipe or pipes which are laid during construction of the dam. The flow rate through the pipe must be sufficient to keep the dam from overflowing. One method is to lay the pipe at an angle through the dam (while dam is being constructed) so that the height of the downstream end of the pipe will determine the height the water will rise behind the dam. Another method used with the underflow dam is having the pipe or pipes sized to carry only a portion of the flow needed. The pipe would be placed at the bottom of the dam and level with the creek bed. The remaining flow of the creek could be siphoned or preferably pumped around the dam from a point away from the dam and from the deepest portion of the pool. The pumping or siphoning can be controlled to maintain the desired water level at the dam. The key is the removal of water through or around the dam at the lowest point in the basin. This prevents the oil from escaping with the released water.
- Overflow dam - Another method of containment is the overflow type dam. The dam is constructed so that water flows over the dam, but a deep pool is created which slows the surface velocity of the water. Therefore, the condition of a calm stretch of water is met. The overflow dam may be used where larger flow rates (medium size creeks) of water are involved. With this type dam, a separate barrier (floating or stationary boom) must be placed across the pool created by the dam. The separate barrier arrests the surface layer of product. At the same time, the water is flowing under the barrier and over the top of the dam. The barrier should be placed at an angle of 45 % across the pool to decrease the effective water velocity beneath it. Also, it helps to concentrate the product at the bank and not all along the barrier. A second barrier should be placed approximately 10 to 15 feet downstream of the first one as a secondary back-up. The stationary boom type barrier should be made of wood planks or other suitable material. The stationary boom should be soundly constructed and sealed against the bank. The ends of the planks can be buried in the banks of the stream and timber stakes driven into the stream bed for support as needed. The necessary length of the boom will be approximately 1-1/2 times the width of the waterway. The plank boom should extend six to eight inches deep into the water and about two inches or higher above the water level. If the increase in velocity under the stationary boom is causing release of trapped product, it should be moved upward slightly. At no time should barrier be immersed more than 20% of the depth of the pool at the barrier location; that is, if the pool created by damming is three feet deep, do not exceed an immersion depth of seven inches with the barrier at the position the barrier is installed. A floating boom can be used in place of the stationary type if the created pool's size (bank to bank) and depth will permit. Since changing the depth and/or length of a standard floating boom in a small stream is difficult, the use of the separation of product and water. The advantages of using a floating boom are the speed of deployment and the fact that there is not need for additional support as with the stationary boom.
- Multiple Impoundments - Since emergency-built dams (either underflow or overflow) are seldom perfect, a series of dams is usually required. The first one or two will trap the bulk and the ones that are downstream will trap the last traces of product. Precautions should be taken to ensure that the foundations of emergency dams are not washed away by the released water. If earth is used to construct an overflow dam, a layer of earth-filled bags should be placed on top of the dam so erosion will not take place.

Removal Methods

Once the containment dams are constructed, the problem or removal of the product from the water surface should be the prime consideration. The removal must be continuous or else build-up of product behind the dams or booms might lead to product escaping the traps.

The type of removal procedures used depends largely on the amount of product being trapped in a given span of time, if the amount of product moving down the stream is of sufficient quantity, the first dam or fixed boom would quite possibly trap enough for the floating skimmer to work efficiently. The skimmer will pump the product and possibly some water to a tank truck or other holding tank. Separated water may be released from the bottom of the tank truck if it becomes necessary. The absorbents could then be used at downstream dams or booms. It is inadvisable to place an absorbent in the stream prior to or at the first dam in anticipation of the arriving product. Let the product accumulate at the first dam and use the floating skimmer to recover the product.

Disposal of gross amount of product-soaked absorbent would not then be a problem.

Follow directions on use of each absorbent. Some are designed to be placed on water before product arrives; others are intended only to be placed on the product after it accumulates on the water.

Plastic sheets should be used to place the product- soaked absorbent on as it is hand skimmed from the water. Alternatively, the material may be placed in drums or lined rolloff boxes.

The containment and removal of spilled product on small to medium fast-flowing streams might require a combination of underflow or overflow dams, fixed booms, skimmers, and absorbents, to ensure a complete cleanup.

Spill on Large Streams and Rivers

Containment Methods

The containment techniques differ considerably on large streams and rivers versus small streams. First, the smooth calm area of water necessary for product-water separation must be found along the stream or river rather than making one as with small streams. Floating booms (rather than fixed booms or dams) must be used to trap the surfaced product.

Local conditions of current and wind must be considered when selecting the site for the boom. A point with a low water velocity near the bank, sufficient depth to operate the product removal equipment, and good access are required. The fact that wind may tend to concentrate the product against one bank must be considered. A smooth, undisturbed area of water is required immediately upstream of the boom to ensure that the product has opportunity to separate out onto the surface. The boom should be positioned where the current is at a minimum. It is more effective to boom at a wide, slow position than on a narrow, fast stretch of water.

If the booms are positioned straight across a river or stream, at right angles to the flow, surface water tends to dive beneath the barrier (boom) when current velocities exceed about ½ knot (0.8 ft./sec.). However, if the current of the entire river is ½ knot or less, then a boom can be positioned straight across the river or large stream but angled slightly in relation of the banks. By placing the boom at an angle to the banks, product on the surface is diverted along the boom to the side of the river.

The current velocity is usually much slower near the riverbank than in the center and the product will move along the boom toward the bank for removal. A water-tight seal between the bank and the boom is essential. A secondary boom should be set up immediately downstream of the first one to capture the amounts that escape the upstream boom. A boom can be employed parallel to the river flow at the bank to form the seal with the booms used to trap the product.

Where the current velocity of the chosen site exceeds ½ knot, the boom should be positioned in two smooth curves from a point of maximum velocity (usually the center of the river) to both banks. However, this double boom required product to be removed from both sides of the river. To determine the appropriate angle of boom placement and support (mooring) needed to hold the booms in position, the current velocity should be measured by timing a floating object which is 80% submerged over a distance of 100 feet. A time of 60 seconds over this distance indicates a water current of approximately 1 knot. For currents from 1 to 2.5 knots (1.7 to 4.2 ft./sec.), the more the boom will have to be angled acute to the bank because of oil entrainment. The length of the boom will have to be such to reach the center of the river. For currents between ½ and 1 knot (0.8 and 1.7 ft./sec.), the angle of employment can be enlarged. The major load on the boom is taken by the terminal moorings, particularly the one in the center of the river. However, intermediate moorings are also required both to maintain the smooth curve of the boom to prevent breaking of the boom and to assist with preventing skirt deflection. The intermediate moorings are preferably positioned every 25 feet and must be adjusted to avoid the formation of indentations in the boom profile.

These trap product in pockets, prevent its deflection to the bank, and also encourage diving currents. The moorings should be five times the water depth.

In certain situations, it might be advantageous to position booms to deflect the approaching spilled product to a slower moving area. Naturally, additional booms would have to be positioned around this slower moving area prior to deflecting the product to the area. This approach has been used along river which has lagoons, etc., with a very low current action. The recovery would take place in the lagoons and not along the riverbank.

Removal Methods

The product collected upstream of the floating booms in a large stream or river should be removed from the water surface as it accumulates. Regular suction equipment, a floating skimmer, and/or absorbents

(including absorbent booms) should be used to remove the product as appropriate to the quantity being trapped in a given span of time. If the amount moving down the stream is of sufficient quantity, the primary floating boom would possibly trap enough for the floating skimmer to work efficiently. The skimmer will pump the product and some water to a tank truck or other holding tank.

The absorbents would then be used upstream of the secondary boom to absorb the underflow from the primary boom. An absorbent boom can also be placed between the primary and secondary booms to help the other absorbents control the underflow from the primary boom.

It is best to hand skim the saturated absorbents and place on plastic sheets. However, if the absorbent used can be pumped after product absorption and speed of removal is a necessity, the floating skimmer can be used to remove the product-soaked absorbent. The disadvantage of pumping the product-soaked absorbent to a truck is the volume that will accumulate (skimmer will pump excess water) and the disposal problems associated with the large water/product-soaked absorbent mixture.

Spill on Stream which Flows into Lake or Pond

In certain locations where streams (small and large ones) flow into lakes or ponds at relatively short distances, it is conceivable that a spill could reach the lake before containment and recovery operations are set up. If time permits for containment operations to be set up on the stream in question, it then would be handled as described above depending upon the stream size involved.

However, if product in the stream is near the lake site or if product is flowing into the lake with a significant amount yet to arrive, a different containment should be employed.

Containment Methods

Product on a stream flowing into a lake should be boomed as close to the entrance as possible. The boom should be positioned on the lake at an angle to the residential stream current so as to direct the surface water to a slower moving area. The area where the product is being deflected should be enclosed by booms to contain it. An additional boom for sweeping the product to the bank will be required. This area of containment should not have a current velocity of more than 1/2 knot (0.8 ft./sec.), preferably less.

Removal Methods

The removal of product from the lake or pond's surface would be handled as described earlier.

For sizable releases, collected product will usually be pumped into tank trucks and transported to a storage facility. Tank trucks are available at several locations throughout.

Sinking or Submerged Oil

Containment Methods

Sinking and submerged oil can be contained. Oil that is heavier than water will become submerged in the water column or sink to the bottom. Oil that sinks to the bottom may act much like oil on dry land, collecting in low lying areas and thus containing itself on the bottom.

Sinking or submerged oil is simply oil that has not reached the bottom yet or has been disturbed and is currently suspended in the water column by tide or current. In water with a current of less than 0.7 knots oil that is heavier than water will tend to sink to the bottom. Any current above 0.7 knots has the potential to remove oil from its resting place on the bottom and carry the oil downstream. Types of equipment used to contain oil that is sunken or submerged include net booms, bottom hugging weighted boom and Watergate dams, silt curtains, gabion baskets lined with impermeable membranes, filter fences such as Turner Valley Gates which can also be lined with impermeable membranes, and boom with deep skirts to help resurface submerged oil.

Methods to detect submerged oil include the use of Sonar which has been used in an attempt to locate submerged oil with some success. Remote and diver operated underwater video detection systems have proved to be useful but is dependent on visibility. Visual observation can be used in shallow water although expert analysis is essential for this technique as aquatic biota (vegetation) in the water may be mistaken for oil. Currently the best method for sampling for submerged oil is to drop weighted sorbent materials such as “pom-pom” snare boom or sorbent chain drags into low areas for short distances and then visually inspected for oil to map oil distribution. This provides a bottom sample indicating whether or not oil is present. Gabion baskets filled with sorbent materials are also used for detection of sunken and mobile oil. These sorbent filters allow water to flow through them thus capturing any suspended or sunken oil. By examining the filter, it can be determined if submerged or sunken oil is present. Collection of core samples can also be a method to detect sunken oil. The sampling area of the core may be too small to be effective but has been historically used for subsurface contamination assessments.

Removal Methods

The most effective method to recover oil is the use of drivers with vacuum system to collect concentrations of submerged oil on the bottom. The diver can direct the pumping of oil and can detect when the oil has been recovered. Another common method is to dredge the bottom and remove the oil along with some of the bottom substrate. Dredging is a common method currently used to remediate contaminated sites but may generate a large amount of waste material that must be properly managed and disposed of.

Both diver-directed pumping and dredging only work for completely sunken oil. To capture suspended oil an underwater filter can be constructed. This filter is created using some form of porous container such as a Gabion Basket, prawn or crab traps, silt fences and even chicken wire. The container is filled with sorbent material such as oil snares, weighted down, and submerged into the water column. The sorbent materials are monitored and replaced as needed to continue recovery of oil.

Trawl nets have also been specifically designed for spill recovery in response to the increased transport of heavy crude oils by cargo ship.

In shallow water, where oil can be seen from the surface, dip nets or pool nets have been successfully used as the most effective way to collect oil. This method is useful if the oil has emulsified or is thick enough to scoop up with nets.

Spill in Urban Areas

Oil spills in urban areas can greatly impact recreational use, human health, wildlife habitat(s), and potential beach or park closures. Manmade structures along waterways require unique protection strategies. Manmade structures could include vertical shore protection structures such as seawalls, piers, and bulkheads, as well as riprap revetments and groins, breakwaters, and jetties. Vertical structures can be constructed of concrete, wood, and corrugated metal. They usually extend below the water surface, although seawalls can have beaches or riprap in front of them. These structures are very common along developed shores, particularly in harbors, marinas, and residential areas. The range in degree of exposure to waves and currents varies widely, from very low in dead-end canals, to very high on offshore breakwaters. Boat wakes can generate wave energy in otherwise sheltered areas.

Maintaining shipping or other kinds of vessel traffic through navigation channels or waterways during a spill response is a difficult consideration because there is usually economic and political pressure to re-establish normal operations as soon as possible. This consideration extends to vehicular traffic through urban areas. Deploying booms and skimmers or constructing recovery sites can conflict with such traffic for several days. Also, passage of deep-draft vessels through the waterway can suddenly change water level and flow or create wakes, causing booms to fail. For these reasons, recovery efforts must be coordinated through the Unified Command to ensure the cooperation of all parties involved.

Containment Methods

Containment techniques in an urban area depend greatly on the ability to deploy equipment due to obstacles presented by the urban area. Most booming and containment techniques will work with slight modifications such as direct anchoring instead of the use of booming buoys. Often, debris and other obstacles cause gaps in containment or clog up the flow of oil in diversion booming. Vessel traffic can also cause containment to fail, due to splash over from vessel wakes.

Removal Methods

Normal recovery techniques work when recovering oil in an urban area. However, recovery can be hampered by several situations. Floating debris clogging skimming equipment is the main cause for low recovery rates. Another problem for recovery in an urban area is lack of storage space. Often traffic problems or lack of access prevent storage equipment such as frac tanks and vacuum trucks from approaching the recovery zone.

Spill Under Ice

Containment Methods

The traditional strategy for dealing with oil under the ice in a river or lake is to cut a slot to aid in recovery. Ice slots can be cut using chain saws, handsaws, ice augers or some form of trencher. Another effective variation of this technique is the diversionary plywood barrier method which is also discussed below.

Removal Methods

Ice slotting is a very basic technique used to gain access to oil trapped beneath the ice. In ice slotting, a J shaped outline is sketched into the ice at a 30-degree angle to the current. The slight J hook or curve is necessary at the upstream side to provide flow towards the recovery area. In general, the slot width should be 1.5 times the thickness of the ice. Remember, a block of ice is heavy, and the width of the slot must be taken into consideration so it can be safely removed or pushed under if the water beneath the ice is sufficiently deep. The length of the slot will be determined by the width of the river and strategy.

This technique is a successful strategy to implement. However, there are a few pitfalls to be aware off. First, responders will fatigue rapidly if required to cut the slot or slots by hand using a chain saw or handheld saw. This can present a problem if there are not a sufficient number of Hazmat technicians available. Secondly, when cutting with chain saws, large volumes of water are kicked up by the moving chain onto the responder. This is a safety problem when the responders get wet in extreme cold weather conditions.

Wearing rain gear, however, can reduce this problem.

A second technique is to slot the ice and use plywood to help divert oil beneath the ice to a recovery area. This technique is called the diversionary plywood barrier method. In this technique, a narrow slot is made through the ice and 4' x 8' sheets of plywood or equivalent are dropped into the slot to create a barrier and force the oil to follow along it to the collection area. This is the same principal employed when using floating boom. The slot can be cut or drilled depending on the equipment available at the time of the response. If drilling is required, a gas-powered ice auger can be used. In this scenario a series of 8" or 10" holes are drilled next to each other in the J pattern. A chain saw can be used to connect the holes if an ice bridge exists between two auger holes. After the ice auguring is complete, plywood can be dropped into the augured slot. Again, river ice is dirty and chipper blades on the augers may only last long enough to complete a single auger hole. This technique requires a large inventory of chipper blades. Extra auger flights can be used, which reduces down time to change blades. A real plus to slotting the ice with an ice auger is the limited exposure of responders to water. The water is generally restricted to the area around the responder's feet.

If an ice auger is not available, a chain saw can be used to cut a narrow slot. After the slot has been cut and ice removed, plywood can be inserted. When using a chainsaw that makes a 3/8" cut, a 1/8"-1/4" plywood or outdoor siding can be inserted into the slot and effectively be used to create the barrier. Again, the downside when using a large chain saws is fatigue and splash from water being kicked up by the chain. However, this problem is not as bad as cutting large slots as described above. Since only a single slot is made, the number of responders can be reduced and extra personal protective equipment in the form of rain gear can be used to minimize the water splash.

Spill on Ice

When managing an oil spill on ice special consideration must be given to several safety factors. Thickness of the ice and general accessibility of equipment must be considered when planning for on-ice recovery. Ice that is too thin to safely traverse or broken ice may prevent active recovery.

Containment Methods

For ice-covered on-land or on- water spills, snow or earthen berms may be constructed to contain oil around the leak, if terrain permits. Dikes filled with sorbent materials may be used on spills in smaller streams to create a manmade dam to prevent the further migration of the oil.

Oil may become encapsulated due to melting and refreezing of the ice. Oil may then be more difficult to access and remove. See Figure 6.1 for on-water recovery decision tree.

Removal Methods

Generally, on-ice recovery consists of the manual removal of the product from the spill site. If conditions permit, vacuum trucks or suction pumps may be used to remove pools of oil that may have collected. Often, product removal will be done by hand using brooms, shovels and rakes. Manually moving the oil/snow mixture into piles for collection where it is either vacuum or manually collected into storage containers.

Spill in Wetland Areas

Wetlands, which include upland and inland marshes, swamps and bogs, are highly sensitive to spills because they collect run-off from surrounding environments, and because they are home to many commercially and ecologically important species. Wetlands are very susceptible to damage and are a high priority to protect. Precautions should be taken so that the recovery effort does not cause more damage than that cause by the release.

Containment Methods

Containment booms can be strategically deployed to contain or divert the product into recovery areas where skimmers and vacuums can be used to remove the product. Berms can also be built to contain or divert the product. Consideration must be given to the damage that can be caused by holding the

product in the wetland areas. Often, allowing the product to flow to natural collection areas and possibly assisting the flow by the use of high-volume low-pressure water pumps may be the best course of action.

Removal Methods

Skimmers and vacuums can be deployed to recover contained oil. Other acceptable response techniques might include bioremediation, sorbents and in-situ burning. The use of heavy equipment is often not practical because of the damage it can cause to plant and animal life. During recovery, specially designed flat bottom shallow draft vessels and the use of plywood or boards may be used to reduce the damage caused by recovery personnel. If the water table is high and the oil will not permeate the soil, shallow

trenches may be dug to collect oil for removal. The Unified Command must balance the need to remove the product with the damage caused by active removal. Considerations for long term passive recovery should be considered.

Release to Groundwater

Contaminant Fate and Transport

In the unlikely event of a release from the pipeline, crude oil will migrate downward under the force of gravity. In shallow unconfined aquifer areas, downward movement of crude oil to the surface of the water table may occur, though immediate emergency response tactics may contain and clean up a release prior to the release reaching groundwater. The rate of penetration depends on the type and amount of released oil (its viscosity), the type of soil (its porosity) and the soil's water saturation. If the release does reach groundwater, dissolved constituents from the crude oil source can dissolve into the groundwater over time (weeks to months), forming a planar plume that may move in the groundwater flow direction, and to a limited degree, some migration may occur initially in other directions because the crude oil may hydrostatically depress the capillary fringe and water table. Removal of the crude oil source eliminates the source of dissolved constituents.

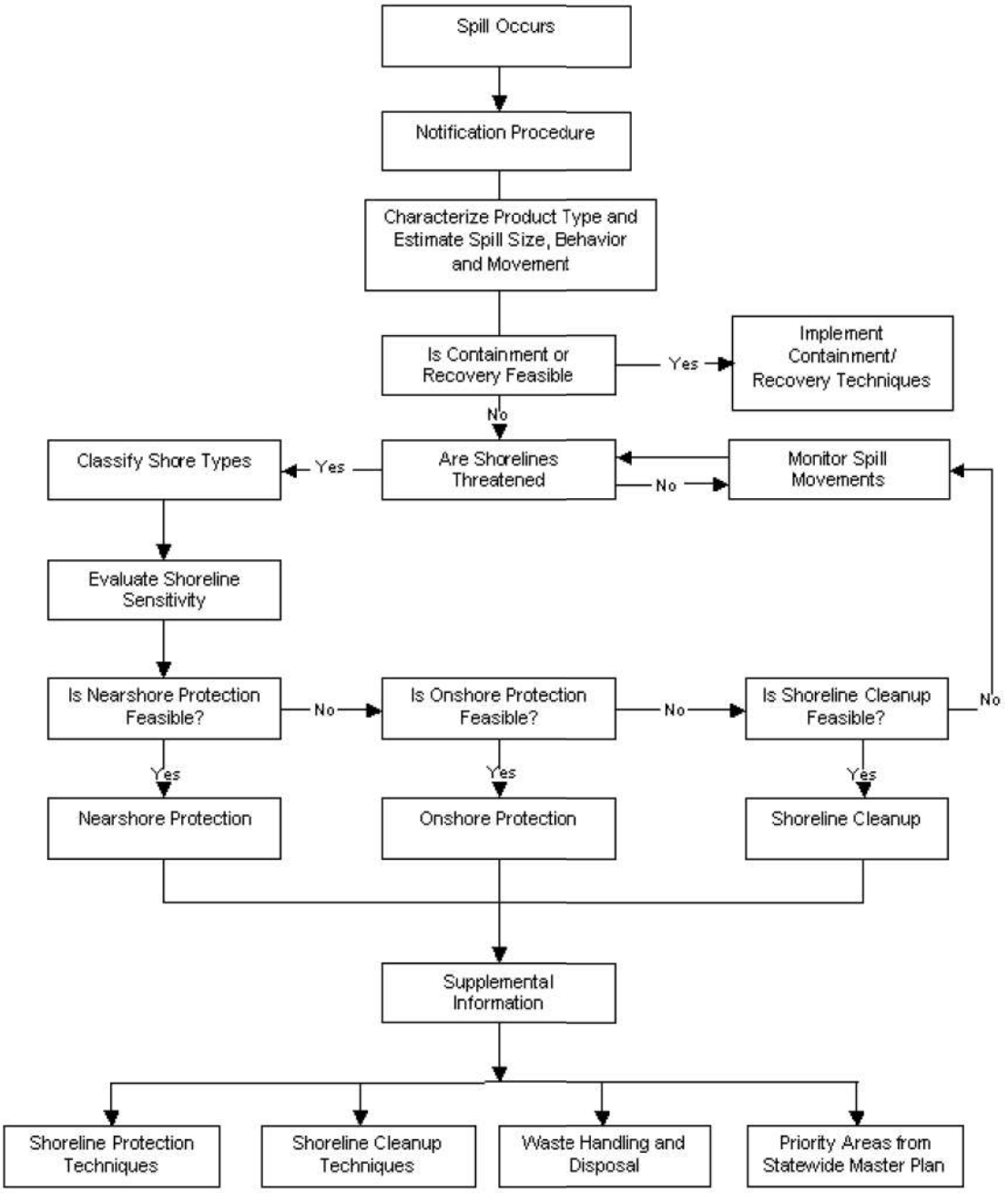
In a confined aquifer, crude oil would need to move through the surficial low permeable layer, significantly reducing or preventing the release from reaching underlying groundwater. If a small volume of crude oil is released to the subsurface, much of the crude oil will be retained by capillary forces as residual oil in the soil pores, often partially or completely confining the spill to the less consolidated trench material surrounding the pipeline and thereby minimizing the extent of impact in the surrounding/underlying low permeable deposits above the confined aquifer.

Fate and transport processes of petroleum hydrocarbon constituents of crude oil (PHC) dissolved in the aquifer groundwater usually includes advection; dispersion; diffusion; sorption; volatilization; and, biodegradation reactions. These processes influence the movement of PHCs from the pipeline toward

potential receptors. Advective-dispersive processes involve the movement of PHC chemicals along a hydraulic gradient from an area of higher hydraulic head to an area of lower hydraulic head. Diffusion process involves the movement of PHC chemicals along a concentration gradient from an area of higher concentration to an area of lower concentration. Advection and dispersion have a significant influence on the transport of the dissolved-phase PHC constituents in relatively permeable soils, whereas the importance of diffusion increases for moderate and low permeable soils. Sorption processes result in lower PHC transport velocity than groundwater flow velocity. PHC volatilization and biodegradation results in lower-than-expected contaminant concentrations.

PHC plumes have limited mobility in groundwater. Unlike chemicals with high environmental persistence (e.g., trichloroethylene, pesticides), the areal extent of the dissolved PHCs will stabilize over time due to natural attenuation processes. Natural biodegradation through metabolism by naturally occurring microorganisms is often an effective mechanism for reducing the volume of crude oil and its constituents. Natural attenuation will reduce most toxic compounds into non-toxic metabolic by-products. Typically, carbon dioxide and water (Minnesota Pollution Control Agency 2005). Field investigations of more than 600 historical petroleum hydrocarbon release sites indicate the migration of dissolved constituents typically stabilizes within one hundred metres of the crude oil source area (Newell and Conner 1998; USGS 1998). Over a longer period, the area of the contaminant plume may begin to reduce due to natural biodegradation.

Most crude oil constituents are not water soluble. For those constituents that are water soluble (e.g., benzene) the dissolved concentration is not controlled by the amount of oil in contact with the water, but by the concentration of the specific constituent in the oil (Charbeneau et al. 2000; Charbeneau 2003; Freeze and Cherry 1979). Studies of 69 crude oils found that benzene was the only aromatic or PAH compound tested that is capable of exceeding groundwater protection values for drinking water (Kerr et al. 1999 as cited in O'Reilly et al. 2001).


Spill Occurs
Notification Procedure
Characterize Product Type and Estimate Spill Size, Behavior and Movement
Is Containment or Recovery Feasible
Yes
Implement Containment/ Recovery Techniques
No
Classify Shore Types
Yes
Are Shorelines Threatened
No
Monitor Spill Movements
Evaluate Shoreline Sensitivity
Is Nearshore Protection Feasible?
No
Is Onshore Protection Feasible?
No
Is Shoreline Cleanup Feasible?
No
Yes
Yes
Yes
Nearshore Protection
Onshore Protection
Shoreline Cleanup
Supplemental Information
Shoreline Protection Techniques
Shoreline Cleanup Techniques
Waste Handling and Disposal
Priority Areas from Statewide Master Plan

5.6.2 Wildlife Rescue

EOC and IMT staff should reference the South Bow Fish and Wildlife Protection Procedure.

During emergency events where fish and/or wildlife may be affected, provincial and federal regulators should be contacted as soon as possible for additional guidance. Contact for these agencies is located in the applicable Annex.

Every effort should be made to use trained Wildlife Response Professionals when handling wildlife in a response. Wildlife Response Contractors are identified in the applicable annex.

In the event of an oil spill resulting in wildlife (mainly waterfowl) contamination with hydrocarbons, it is imperative that preventing waterfowl from entering spill areas is a high priority. When oil sticks to a bird's feathers, it causes them to mat and separate, impairing waterproofing and exposing the animal's sensitive skin to extremes in temperature. This can result in hypothermia, meaning the bird becomes cold, or hyperthermia, which results in overheating. Instinctively, the bird tries to get the oil off its feathers by preening, which results in the animal ingesting the oil and causing severe damage to its internal organs.

Procedure:

Wildlife deterrent devices may be obtained through Company owned resource caches, Spill Cooperatives, or contract resources.

Environment Canada recommends the following methods of dispersal and deterrent to be practical and effective techniques:

- aircraft
- gas cannons, pyrotechnics and scarecrows
- boats

Aircraft

- hazing by fixed-wing aircraft and/or helicopters.
- fast and easy method to reach remote and non-remote areas.
- allow the herding of birds from large areas quickly and with minimal human resources.
- cannot be used for a long duration.

Gas cannons, pyrotechnics (discharging of loud banging sounds)

- can be deployed in wetland areas, along shorelines and on barrier islands adjacent to spills, from rafts or boats.
- gas cannons and scarecrows are easily deployed and have low maintenance.
- gas cannons are mechanical devices emitting loud banging sounds, and can be set to sound at different intervals, in specific directions, at different decibels, effective day and night. (Point cannon into an empty 45-gallon drum for additional effect).

- gas cannons have been noted to be effective over an area of 4 to 5 hectares depending on the variables (i.e. land geography, type of fowl, etc.)
- pyrotechnics such as flashes of light, loud sounds like that of a shotgun are useful means to scare birds away. However, like the gas cannon, birds tend to habituate back to the source, making it necessary to supplement this method with other recommended methods.

Scarecrows can be easily put together from old clothing, potato sacks, bought as a mechanical pop-up or an inflatable human-shaped effigy.

- the more a scarecrow looks like a human dressed in bright colours, has movement (i.e. wind or mechanical), the more effective a tool it becomes.
- after a period of time, birds once again tend to habituate to scarecrows; therefore, it should also be coupled with other deterrence methods (i.e. plastic owl).

Boats

- used for setting off cannons, pyrotechnics and deploying scarecrows.
- used to herd birds.

Handling oiled waterfowl must be done with utmost concern for the birds' survivability. Many oiled birds die because well-meaning people, anxious to remove the oil from feathers, wash them immediately, resulting in extreme stress. It is more important to provide oiled birds the nutrition, hydration and medical treatment they need to regain their strength before they are washed.

Procedure for Handling Wildlife:

- Handling, if possible, should always be left to the responsibility of wildlife specialists
- Extreme caution should be used when attempting to capture wild birds
- Bird handlers should wear protective clothing, including eye protection and gloves

On emergency basis only:

- Approach the bird from the water to avoid driving it back into the water
- Capture the bird by throwing a net, blanket, towel, etc. over the bird
- Captured birds should be held below the worker's waist level to minimize the risk of injury
- Hold birds in a roomy cardboard box in a quiet, warm area and contact a wildlife specialist for further direction

5.6.3 Spill Boat Operations

BOAT SAFETY

General

Before placing boats in the water, the Incident Commander or Safety Officer shall ensure that:

- A Boat Captain, who is experienced with boat operations and boating safety, is appointed for each boat in the water. All TC staff who operate watercraft should meet the South Bow Boat Operators training requirements.

- A safety boat with a crew of two is available downstream to assist work boats undertaking emergency operations
- A safety briefing is conducted for all passengers and crew prior to boat operations

Before leaving the shore, the boat captain shall ensure that:

- A hazard assessment has been conducted for water-based activities
- A journey management plan has been completed and filed with a responsible party
- The boat and motor are in good condition and sufficient fuel supply is on board
- All required boat safety equipment is stored onboard and is functional, including the following:

Quantity	Minimum Required Equipment		
2	Paddles	1	5#-ABC fire extinguisher
1	Anchor & line	1	Basic tool kit
4	Life jackets for each passenger	1	Whistle
4	PFD's	1	Boat hook
1	Manual bail pump	1	First aid kit
1	Marine flares	1	Emergency knife
1	100' HD floating rope	1	24" life ring
1	50' floating rope	1	Flashlight

- Portable fuel tanks are refueled onshore away from ignition sources, and any onboard fuel tanks are filled using proper fueling equipment designed for the purpose
- All cargo is stored securely onboard, toward the center of the boat
- The engine is started before loading passengers
- Approved life jackets or flotation suits are available for each person onboard, and that all passengers wear the equipment provided
- Wind, weather, and river conditions are monitored during the trip, and any potentially hazardous areas are avoided
- The right-of-way is given to the boat approaching on the right
- High speed turns are avoided during boat operation
- Secure all equipment stored or carried in the boat to prevent shifting or movement

Worker Protection

All personnel on board the boat shall ensure that:

- Approved life jackets or flotation suits are being worn in an appropriate manner before boarding the boat and leaving the shore
- They do not stand in the boat or hold firmly to handrails while the boat is in motion

Man Overboard

If a worker falls overboard, the Boat Captain shall ensure that:

- The stern of the boat is turned away from the worker
- A life ring or line is thrown to the person overboard
- An unconscious or injured person overboard receive assistance from a safety boat
- Retrieved personnel are kept warm and taken ashore for required treatment

Boat Towing

To ensure safe towing operations, the Boat Captain shall ensure that:

- Only towing equipment designed for the type of operation being undertaken is used
- Lines are not tied directly to the boat. A quick release mechanism should be used, to allow the line to be disconnected quickly if an emergency occurs
- Towing is undertaken from the rear, never from the side
- No tow is attempted where boat power is inadequate to allow safe boat handling under all anticipated conditions
- Caution is used during towing operations with prop-driven boats to ensure the towline is not caught in the propeller

5.6.4 Aircraft Operations

In regard to Aircraft Operation, Worker Protection, Fixed Wing Aircraft Safety, Helicopter Safety and Helicopter Slinging Safety Canada Liquids Field Operations personnel will rely on the expertise of the Corporate Aviation department to oversee the tactical operations safely per internal policies

5.6.5 Management (Storage, Containment and Disposal) of Contaminated Materials

Strict rules designed to ensure safe and secure handling of waste materials govern the Company waste disposal activities. To ensure proper disposal of recovered oil and associated debris, the following guidelines should be considered:

- In the event of a product spill, facilities have limited capacity to store recovered product and water. Separated product is pumped to frac tanks or to trucks to be carried to the Facility for processing.
- Oily debris will be segregated on site and containerized for temporary storage prior to disposal in accordance with hazardous waste regulations.
- Transportation of waste material will be performed in accordance with all applicable Federal and Provincial Regulations.
- Waste associated with the spill will be disposed at sites that have the necessary permits to accept the type of waste to be discharged.

5.6.6 Sampling and Waste Analysis

South Bow's sampling and waste analysis practices are governed by the regulations for the applicable agency. These regulations outline methods and procedures for determining the chemical and physical characteristics of wastes generated by the Facility, including waste associated with spills, so that they may be properly stored, treated, or disposed.

5.6.7 Decontamination

Depending on the size of the release, the act of oil spill clean-up and containment operations will involve several to hundreds of workers to assist. These workers will require specialized clothing and PPE to ensure they are protected from the spill materials. The goal in any clean-up operations is to limit the spread of contaminates. To this end establishing an area where response personnel can remove soiled clothing, wash up, return / clean equipment and change into street clothes is suggested early on in response actions. See suggested layout Diagram #1.

Response Procedure for Decontamination:

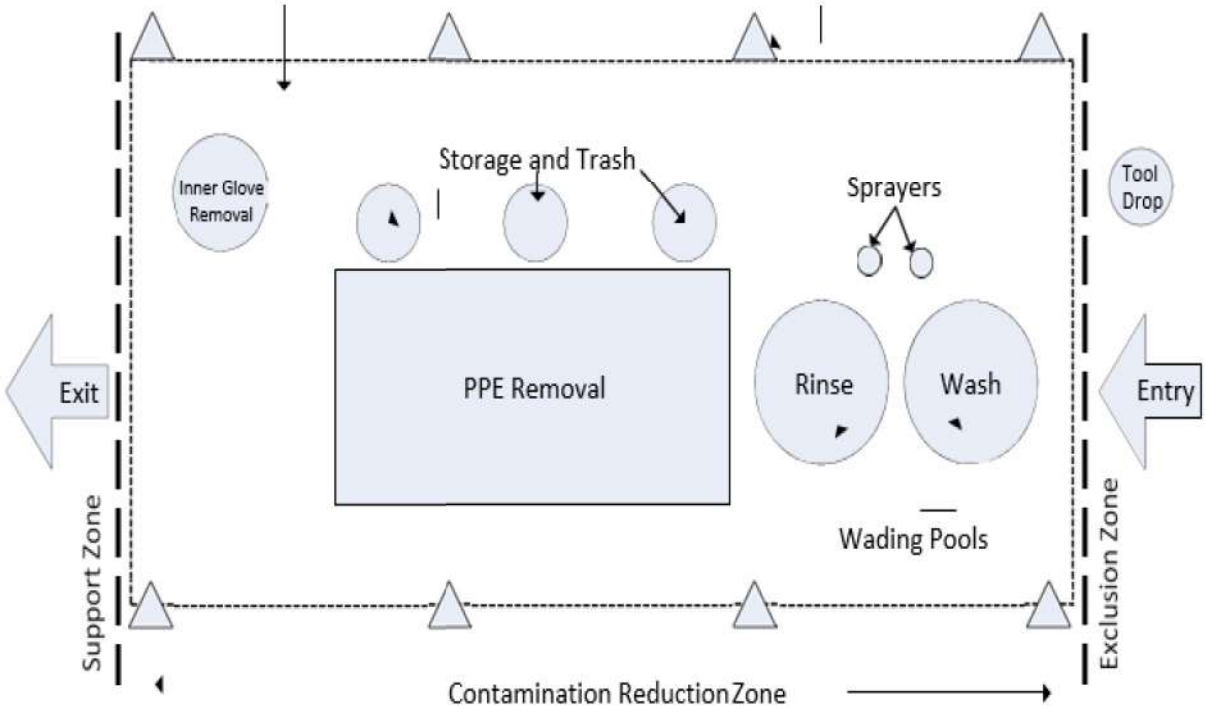
The need for and type of decontamination process varies and can be altered according to the type of spill. The nature of the incident, type of oil, weather, temperature, number of workers to be contaminated and number of trained personnel available are a few factors which dictate the method, size and type of decontamination required. All response personnel should be briefed on the following procedures before entering the hot zone. The decontamination zone should be kept as clean and organized as possible. This will ensure efficient decontamination operations and safety of personnel. Third party suppliers of on-site decontamination equipment should be sourced as soon as possible.

- Ensure that the decontamination area is in a safe, convenient location.
- Select an area where contaminated wash water can be collected for disposal.
- Have the area identified with ribbon, pylons and appropriate signage (i.e. no smoking).
- Establish and clearly identify the point of entry from the hot zone (exclusion zone) into the exit corridor into the cold zone (support zone).
- Berm the area and cover area with plastic sheet or tarp. Absorbent rolls should be used to line the decontamination corridor and area to reduce slippage and absorb oil.
- Water used during the process must be carefully controlled and kept to a minimum. Water generated from decontamination procedures must be treated as contaminated waste.
- Establish an equipment drop zone at the edge of the hot zone for contaminated tools and equipment. Small equipment such as pumps and hand tools should be placed into wading pools in this zone.
- Disposable PPE that becomes heavily contaminated will be disposed of without decontaminating. Contaminated raingear, Tyvek suits, gloves etc. should be placed in containers lined with 6 mil debris bags.
- Establish a primary decontamination wash (wading pool) and rinse (wading pool) as the first step near the Hot Zone to remove the most significant contamination from the PPE.

- Establish a secondary decontamination wash (wading pool) and rinse (wading pool) approximately 3 m from the primary rinse to assure thorough decontamination of the PPE.
- Decontamination solution may be any dishwashing liquid designed for grease cutting. Combine the detergent solution with use of an appropriate brush to remove contaminates.
- Decontaminating personal with brush strokes should always be done in a downward motion. This will reduce the risk of any detergent or contaminate from splashing into the facial area. Ensure splash googles are left on during the process. Absorbents may be used for wiping off contaminated areas of clothing or equipment.
- Consider having the following equipment at the site: Mobile decontamination unit complete with:
    - Warm water supply and detergents
    - Washing supplies including hand soap, scrub brushes and wash basins
    - Long-handled, soft-bristled scrub brushes
    - Small tables, chairs or benches
    - Hand and facial wipes
    - Racks for drying and storing clothing and boots, and for equipment storage
    - Disinfectant for boots and breathing apparatus
    - Portable shower units
    - Dressing area (i.e. tent, trailer) for inclement weather
    - Lined bins for waste materials (6 mil plastic minimum)

Diagram 1: Example Decontamination Layout Plan

Tarp or Liner Material Marking Pylons with Barrier Tape


Inner Glove Removal
Storage and Trash
Sprayers
Tool Drop
Exit
PPE Removal
Rinse
Wash
Entry
Wading Pools
Support Zone
Exclusion Zone
Contamination Reduction Zone

5.6.8 Dikes / Underflow Dam

Using dikes/ underflow dam to contain and recover fluids is another method that works well when spring run-off may be encountered, and subsurface oils are brought to the surface by hydraulic action.

Response Procedure for use of Dikes/Underflow Dams:

Ensure safety aspects are considered, including:

- Monitor to ensure no toxic or combustible vapours are present prior to, and during, construction
- Pre-job safety meeting should be held to discuss:
  - Method to be used to install dikes / underflow dam
  - Potential hazards and method to be used to eliminate or mitigate the hazards
  - Monitoring requirements, frequency, levels
  - Personal protective equipment requirements
  - Emergency response and egress plan
- Adequate fire-fighting equipment must be on site.

When using dikes, consider the following:

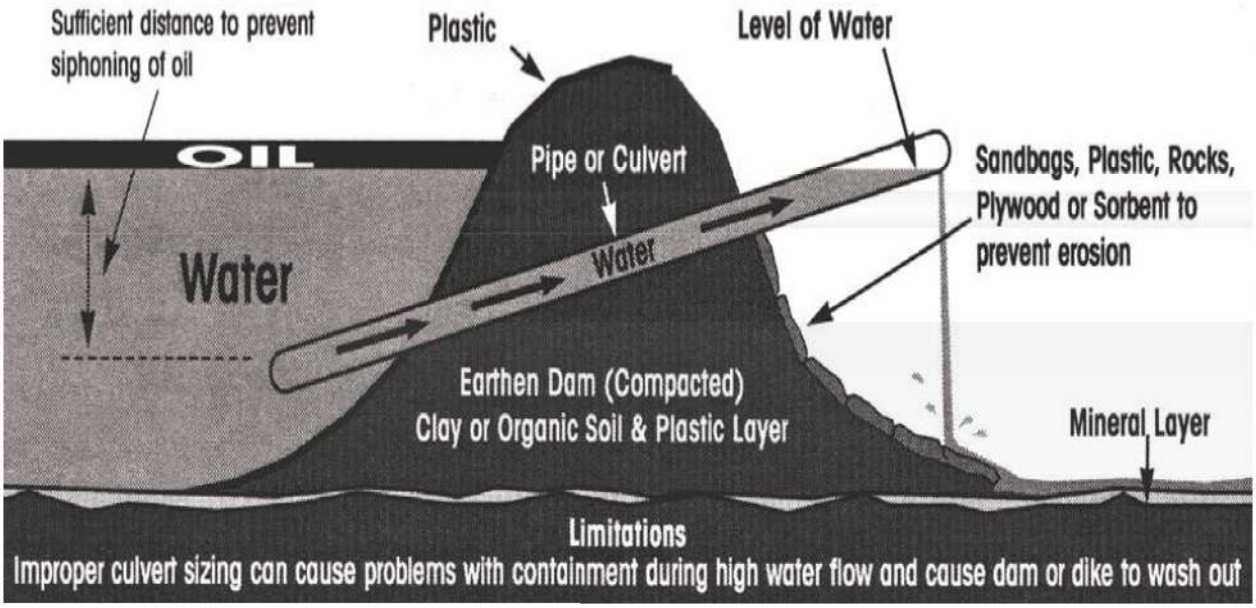
- Use natural low areas and seams to minimize construction and disturbance
- Keep height and width to minimum to reduce construction time and disturbance
- Existing roads may be used by blocking culvert, but flow must be monitored to prevent wash out and losses of contaminants
- Straw bales may be used in certain areas requiring oil retention oil (filter fence):
  - Constructed of double bales, with overlap, set evenly on level ground
  - Some site preparation to ensure level ground for good seal with bales may be required
  - Bales may have to be staked or re-enforced to prevent failure if significant flow expected
- A snow and ice dike can be used to contain a spill during winter months

When using an underflow dam, consider the following:

- Used to contain oil and permit water to flow on through culvert
- Use natural seams or low areas to minimize construction and disturbance
- If inadvertent failure could contaminate sensitive areas, construct 2 underflow dam in succession to lessen risk
- Use properly-sized culvert at appropriate angle to control water/oil level in the dike/ underflow dam:
  - If expected flow/culvert size not known, use bigger size culvert
  - If large flows expected, use two culverts - one set slightly higher to act as overflow if required

- Bottom edge of culvert discharge will determine level of oil/water in dike/ underflow dam
- Bottom of culvert inlet (within dike/ underflow dam) should be approximately two feet below expected water surface to
- Prevent siphoning of oil and off bottom far enough to prevent plugging by siltation

- Dike/ underflow dam should be constructed of material with sufficient clay content to permit sealing around culvert and provide a strong dike
- Consider reinforcing the dike walls with sandbags and plastic when it is in loose material
- Straw or other absorbent material should be placed at discharge to catch small amounts of oil
- Prepare for the release of a small slug of oil when underflow dam is first put into operation
- Install culverts with gates or pipes with valves, if there is need to control high fluid levels. Gates/valves should be locked to prevent tampering and possible loss of contaminants.



5.6.9 Emergency Response Equipment

Following the site assessment and the development of an action plan that identifies techniques for containment and recovery, select the appropriate equipment. Refer to the following Table 1 for information on typical equipment used for containment and recovery operations.

Table 1: Emergency Response Equipment

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
BACKHOES	Wheeled	• More mobile, easier / faster to move without trailers. • Limited use in softer ground conditions. • Newer 4-wheel and/or extend-a-hoe's have increased versatility.	• Safe positioning required within spill site. • Potential ignition source from equipment components (exhaust, alternator, etc.) as well as steel striking steel / rock, etc. • On-site hazards must be identified (i.e. power lines, underground lines, etc.). • Continuous monitoring for combustible / toxic vapours is required.	• Do not dig deeper than minimum depth required. • Can be used to install bell holes, trenches, ditches, dikes, underflow dam. • Can clear debris for other equipment workers. • Can position equipment, matting for other equipment, towing build ramps to open tankage, etc.
	Tracked	• Less mobile, requires trailer to move longer distances. • More versatile in soft ground conditions. • Consider a unit with a thumb for moving debris. • Usually larger, more powerful, longer reach.		
DOZERS	Standard	• Suitable for average to soft ground.	• Potential ignition sources:	• Dozers with winches are preferred:

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
	Wide Pad / Extended Track	• More versatile in soft ground conditions.	• engine and components; • steel striking steel / rock. • Monitoring is required for combustible/toxic gases.	• winching out if stuck; • winching / towing other equipment • Performance enhanced by tilt / angle blade. • Maintaining/preparing access. • Removing obstacles/ debris for equipment / workers. • Towing equipment. • Making ditches, dikes, underflow dam. • Piling debris for disposal.

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
PUMPS	Various	• Skimming operations. • Transporting fluids. • Flushing and cleaning operations. • Fire suppression.	• Continuous monitoring of the area for toxic / flammable vapours. • Follow manufacturer's recommendations for operation. • Ensure that gasoline and diesel engines are equipped with flame and spark arrestors. • Electric motors must be explosion-proof and grounded when necessary. • Cool engines and ensure they are in a safe area (no ignition sources) prior to refuelling. • Ensure operators wear appropriate personal protective equipment, including hearing protection.	• Follow manufacturers operating guidelines.

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
SKIMMERS	Vacuum units Disc skimmer Drum skimmer Rope mop skimmer Acme skimmer Mantaray skimmer PEDCO skimmer Skim-pak	• Normally used in bell holes for land spills. • Disc skimmer, drum skimmer and rope mop will reduce the amount of water collected.	• Monitoring for combustible and toxic vapours is required. • Workers in or near water should wear life jackets.	• Position skimmers to be presented with maximum amount of oil. • Ensure that skimmer is adjusted to work efficiently. • Locate recovery / storage tank close to skimmer.
OILY DEBRIS SEPARATION TANK	1/2 Railway Tank with series of screens.	• Specialized tank used for separating debris from recovered hydrocarbons. • Position a minimum of 25 metres from ignition source. • Portable open tank with compartments and screens. • Separates debris from recovered fluid by screening fluid as it flows between compartments. • Equipped with heating coils for use in winter. • Available from WCSS in Alberta	• Ground tank to proper ground rod: • provide trucks with ability to ground to rod or tank. • Screens should be bonded to tank during insertion / removal. • Guard rolls should be in position. • Monitor the area for hydrocarbon gases.	• Tank should be positioned as close to spill site as safety allows. • Vacuum trucks can discharge into inlet and tank trucks can haul fluids back from discharge for processing. • Periodically, inlet baskets • / compartment should be cleaned by vacuum units and debris taken to approved disposal site.

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
TANK TRUCKS	Wheeled	• For removal of recovered hydrocarbons and also have some capability for recovering spilled materials. • Can recover fluids if sufficient volume of spilled material is present at point of suction to keep unit from breaking suction. • Most cost-effective type of truck unit to recover fluid. • Are not as efficient as vacuum trucks at removing oil from water since they cannot continually maintain suction. • Efficiency can be enhanced by skimmer heads.	• Should operate from outside spill perimeter and have gas monitoring to ensure they are not operating in potentially explosive / toxic atmospheres.	• Hoses can be swaged down to increase recovery distance. • Properly maintained pump on tank truck can greatly increase suction distance / efficiency. • Workers at hose suction end can increase efficiency through proper positioning (suction strainer reduces recovered debris). • Portable pump used as a booster near suction end can increase suction distance. • Can be used as short-term stationary pump to recover fluids and pump directly into tank.
TANKS	Closed	• Suitably sized valves / ports for unloading from large discharge hose. • If solids / debris expected, should have manways to facilitate periodic clean- out.	• Tankage should be located a safe distance from ignition source. • There should be adequate secondary containment around tankage.	• Adequate storage volume must be calculated and provided. • Sufficient retention time to facilitate separation decreases cost, especially in remote areas.

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
	Open	• Preferred if large amounts of solids / debris expected. • Overflow piping can be connected to prevent further spillage.	• Overflow piping can be connected to open tank with portable hose to eliminate overflow spills. • Should be accessible for trucking. • Adequate signage and grounding must be used. • If used for hot bitumen, valves must be temperature rated. • Monitor filling to ensure safe levels are maintained. • Apply warning flagging or rope around perimeter. • Consider fencing to keep out animals.	• Regulatory approval required to release water from tankage following oil / water separation at the site.

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
TANKS	Port-a-tanks	• Portable, transportable by air or all-terrain vehicles. • Best-suited for remote areas. • Usually a temporary solution until large tankage can be installed. • Usually very limited volumes.		
	Temporary lined pits	• Should be constructed as shallow as possible and larger in dimension. • Lined with impermeable synthetic liner of the proper type for product to be stored. • Provision must be made during construction to ensure integrity of the liner (i.e. sand bed). • Used only as temporary solution for remote areas.		

EMERGENCY RESPONSE EQUIPMENT				
EQUIPMENT	**TYPES**	**USAGE**	**SAFETY CONSIDERATIONS**	**OPERATING**
VACUUM TRUCKS	Standard	• Single axle or tandem. • Require good ground conditions to operate without towing assistance. • Tandems utilizing only partial loads can operate on semi-soft ground. • Are able to travel from spill site right onto road. • Heli-portable units capable of filling 205 litre drums are used for shoreline clean-up.	• Monitor area to ensure that trucks are not within zone of combustible / toxic gas. • Keep trucks outside of spill perimeter and use hoses to recover products. • Vacuum pump air discharge should be piped away from engine and downwind of workers. • Monitor product temperature as most trucks have maximum operating temperature of 90° c • Heli-portable units require an engine driven power supply.	• Position outside spill perimeter, recover product utilizing hoses. • Proper hose placement improves efficiency: • hoses can be swaged down to increase recovery distance; • Worker at hose suction end can increase efficiency through proper positioning.
	All-Terrain	• Caution required - avoid increasing safety risk by operating in unacceptable areas. • Large low-pressure tires provide capability to operate on soft ground unaided. • Consider specialized track style carrier for very rugged or soft terrain. • Limited, cost-effective travelling distances. • Must have on-site tankage to reduce costs.		

5.6.10 ROW Access

Following the site assessment and the development of an action plan that identifies techniques for containment and recovery, select the appropriate equipment.

In order to access the majority of Pipeline right of ways (ROW) and to protect the adjacent pipelines from the impact of heavy equipment crossings, it will be a requirement to lay rig and or swamp mats. The placement of the mats is the first step to performing any response activities on the ROW and as such must be acted upon in the early stages of the response plan.

Access to a variety and quantity of rig and swamp matting will be required to ensure safe and efficient access to the ROW is possible. Matting placement should allow safe and efficient movement of equipment such as track hoes, large picker trucks or cranes, welding trucks, vac trucks etc. Plan to have mats in place for several weeks during emergency operations.

Even winter conditions may require matting as the ROW will rarely freeze naturally to support heavy equipment unless a winter road is constructed.

Consideration should be given to order a grapple equipped excavator and loader to aid in the rapid deployment of the mats. Mat placement in standing water may require additional strategies such as timber placement, corduroy, floating, interlocking or multiple layers of mats to support heavy equipment. Consider including industry experts to assist in mat type and layout configuration in the early stages of the response.

5.6.11 Response to Fires / Explosions

5.6.11.1 Facility/Line Rupture, Fire or Explosion

Facility fires are not address in this Plan. Refer to the applicable Fire Incident Pre-Plan (FIPP).

5.6.11.2 Encroaching Grassland or Wildland Fires

Fires near the pipeline right-of-way and fires involving oil containing facilities, Company personnel should control the situation and coordinate activities with outside firefighting personnel, as needed. Any large fires that involve the services of external firefighting agencies, the Incident Command System will be established.

General procedures for responding to this type of emergency are as follows:

- Notify Alberta Agriculture, Forestry and Rural Development Emergency Line at 310-FIRE
- Stay at a safe distance. Protect people first and property second. Secure the area and restrict access to trained personnel only.
- Contact LPCC with the following information:

- A description of the situation.
- The location of the fire and your exact location.
- An assessment of whether Company personnel can handle the fire.
- A request for what assistance is needed.
- Possible activation of the Emergency Management System.

- LPCC/ EOC will:
  - Notify necessary emergency response agencies, including fire departments as necessary.
  - Dispatch Company personnel and equipment.
  - Log times of significant events.
  - Coordinate offsite activities and monitor communications.
- Site Personnel - Evacuate any adjacent facilities or buildings that may be endangered. Wait for assistance to arrive if assistance is necessary.
- If the fire is due to escaping flammable material, eliminate the flammable fuel source if possible.
- Proceed to extinguish the fire, if that is desirable. Use whatever firefighting equipment is available, remembering the proper firefighting techniques.
  - If the fire is to be contained by a fire department, and the fire involves Company facilities, establish Unified Command and inform the fire official in charge of what to do and what not to do regarding the Company facilities.
  - Allow the fire to burn out by itself, if that is desirable, because of escaping flammable material. Advise Fire Department to contain secondary fires.

Ensure responding agencies are made aware of the location of any buried pipelines. Encroachment over the pipelines should be closely monitored to ensure that proper procedures and appropriate equipment are selected to reduce any likelihood of buried pipeline damage.

5.6.12 Fire Control

South Bow personnel are not trained firefighters. If fires have grown beyond the incipient stage, South Bow will work with local and contract firefighting professionals for fire control and suppression.

5.6.13 Response to Natural Hazards

5.6.13.1 Severe Thunderstorm

Thunderstorms are a natural event with lightning as a major threat. The potential of flash flooding is also possible when one area is affected for an extended period.

- Be aware of changing weather conditions.
  - Severe Thunderstorm Watch - Conditions are favorable to the development of thunderstorms.
  - Severe Thunderstorm Warning - A severe thunderstorm has been observed or is imminent.
  - Flood Watch - Flash flooding is possible within 6 hours after heavy rains have ended.

  - Flood Warning - Flash flooding is occurring or imminent.
- Terminate outdoor work when lightning is occurring and move to shelter.
- Avoid areas subject to sudden flooding until the thunderstorm passes.
- Evaluate the situation after weather event.
  - Does standing water prevent visual inspection?
  - Have flood waters damaged the Pipeline?
  - Have flood waters exposed piping?
  - Has soil shifted that could lead to a landslide?
- Evaluate the accessibility of pipeline facilities that may be in jeopardy, such as valve settings, which are needed to isolate water crossings or other sections of a pipeline.
- Extend regulator vents and relief stacks above the level of anticipated flooding, as appropriate.
- Coordinate with emergency and spill responders on pipeline location and condition. Provide maps and other relevant information to such responders.
- Coordinate with other pipeline operators in the flood area and establish emergency response centers to act as a liaison for pipeline problems and solutions.
- Deploy personnel so that they will be in position to take emergency actions, such as shut down, isolation, or containment.
- Determine if facilities that are normally above ground (e.g., valves, regulators, relief sets, etc.) have become submerged and are in danger of being struck by debris.
- Perform frequent patrols, including appropriate overflights, to evaluate right-of-way conditions at water crossings during flooding and after waters subside. Determine if flooding has exposed or undermined pipelines as a result of new river channels cut by the flooding or by erosion or scouring.
- Perform surveys to determine the depth of cover over pipelines and the condition of any exposed pipelines, such as those crossing scour holes. Where appropriate, surveys of underwater pipe should include the use of visual inspection by divers or instrumented detection. Information gathered by these surveys should be shared with affected landowners. Agricultural agencies may help to inform farmers of the potential hazard from reduced cover over pipelines.
- Ensure that line markers are still in place or replaced in a timely manner. Notify contractors, highway departments, and others involved in post-flood restoration activities of the presence of pipelines and the risks posed by reduced cover. If a pipeline has suffered damage, is shut-in, or is being operated at a reduced pressure as a precautionary measure as a result of flooding.
- Advise the appropriate authority before returning the line to service, increasing its operating pressure, or otherwise changing its operating status. The appropriate authority will review all available information and advise the operator, on a case-by-case basis, whether and to what extent a line can safely be returned to full service.
- Make all necessary repairs.

5.6.13.2 Tornado/Straight Line Winds

Although many disasters cannot be prevented or predicted, preparation can significantly reduce losses. In the event of a severe weather condition or a natural disaster, the Area Manager or assigned designee will be the IC.

- Be Aware of Changing Weather Conditions
  - Tornado watch - Conditions are right for the formation of a tornado.
  - Tornado warning - A tornado has been sighted but is not in the area at this time.
  - Tornado alert - A tornado has been sighted in the immediate area, take cover immediately.
- If Severe Weather Conditions Threaten
  - Carry a battery-operated portable radio and monitor conditions.
  - If a tornado is observed and time permits, evacuate the area.
  - If the tornado is approaching a pump station, notify the Oil Central Center to remotely isolate the station.
  - In vehicle, drive away from tornado at right angle. Get out of car and seek shelter if tornado cannot be avoided.
  - If outdoors, shelter in ditch, excavation or other low spot and lie flat, face down.
  - Make certain that all personnel are aware of the condition.
  - Stay in shelter until conditions are safe.
- Immediately After the Storm
  - Account for all personnel.
  - Survey for damages.
  - Initiate team for any repairs.
  - Refer to this Plan for additional response guidance regarding fires, spills, etc., as needed.

5.6.13.3 Earthquake

The actual movement of the ground in an earthquake is rarely the direct cause of death or injury. Most casualties result from falling objects and debris because the shocks can shake, damage or demolish buildings and other structures.

- Stay calm. Don't panic.
- If you are indoors, stay there. Do not run outside.
  - If you are in a building, take cover under a heavy furniture or stand in an inside doorway away from windows. (A door frame or the inner core of a building is its strongest point and least likely to collapse.)
  - Exit building as situation determines.
  - If you are outside, stay there. Move away from buildings to avoid falling debris. Avoid damaged utility lines.
- If you are driving, stop quickly and stay in your car. If possible, do not stop on a bridge, overpass or where buildings can fall on you. Your car can provide protection from falling debris.

- Do not re-enter damaged buildings. Walls may collapse after the original shaking has ceased.
- Evaluate the situation and initiate appropriate pipeline patrol by the most expedient means possible to determine extent of damage.

- Make all necessary repairs as resources and conditions allow.

5.6.13.4 Severe Winter Storms

- Be aware of Changing Weather Conditions
  - Winter Storm Watch - Conditions are expected but not imminent.
  - Winter Storm Warning - A significant winter storm is occurring, imminent, or likely.
  - Blizzard Warning - Winds at least 56.3km/hr (35 mph), blowing snow frequently reducing visibility to 0.4 km (0.25 miles) or less, and dangerous wind chills are expected.
- Listen to local radio stations for weather advisory and road condition reports, carry a survival kit, and start the trip with a full tank of fuel.
- Inspect pump station, equipment, and controls after storm for damage.
- Make any repairs as necessary.

5.6.13.5 Flood

Preventative Measures

- Local operations may need to monitor local weather conditions to determine flood preparations requirements.
- Preventative measures may include, but are not limited to:
  - Raise vents on critical equipment, such as regulators, to an elevation higher than that expected of the flood water
  - Extinguish line heaters if operating conditions permits
  - Time permitting; evaluate liquid removal from atmospheric storage tanks
  - Evacuate or secure hazardous materials
  - Determine if normally aboveground facilities (valves, M&R and relief valve setting, etc) could become submerged and be struck by watercraft operating in flooded area. Mark such facilities with buoys as appropriate
  - Disable line breaks or other automatic safety devices if necessary
  - Take appropriate measures to protect critical equipment with fences or other temporary means
  - Take action such as removing valve handles or locking valves to ensure continued service and to prevent possible damage to Company facilities
  - Ensure regulatory required records are secure. These might include local operations equipment and manuals
- Follow site specific Evacuation and Business Contingency Plans, when applicable
- Contact the Liquids Pipeline Control Centre to inform them of the local actions taken

During Flooding

- Perform frequent patrols, as appropriate; to evaluate right-of-way conditions at water crossings during flooding and after flooding subsides

- Have personnel available for emergency response action such as shutdown, isolation, and contamination
- If gas is leaking at a facility due to physical damage or floodwater having extinguished a pilot light, gas should be shut off to that location (unless the location can be made safe without shutting off the gas supply, and there is a reason not to do so)
- Consider the effect on other consumers on the same pipeline
- Coordinate with other pipeline companies in the flood area and provide personnel, as appropriate, to emergency response centers to act as liaison for pipeline issues. Provide maps and information on location of pipeline facilities and conditions to emergency responders as required
- At facilities, use precaution in flooded areas due to the risk of electrocution, swift-moving water and debris, and submerged surface debris and damage. For additional information refer to your facilities Evacuation Plan

After Flooding Subsides

- Obtain any necessary entry permits from local authorities
- Inspect exposed facilities and evaluate for possible damage. Determine if flooding has exposed and/or undermined pipelines as a result of forming new channels or erosion of stream or riverbeds
- Assure that line markers and signage are still in place. Remind emergency responders, highway departments, contractors and other involved in flood cleanup and clearing activities of the presence and location of pipelines in the area and the electrical and control system before attempting to restart the facility
- Evaluate damage to electric motor and the electrical and control system before attempting to restart the facility
- If necessary, purge lines prior to returning equipment to service
- Inspect right-of-way of affected pipelines to determine if depth of cover has been reduced. Notify affected landowners of any reduced cover. Agricultural agencies may be helpful in reminding farmers of potential hazards resulting from reduced cover over pipelines
- Return line breaks or other automatic safety devices to service
- Notify Liquids Pipeline Control Center of return to service
- Document any patrols, inspections, repairs or notifications

5.6.14 Responding to Security Incidents

5.6.14.1 Bomb Threats

The following pages provide guidelines for actions to be taken in the event a bomb threat is received. A bomb threat to the pipeline system or personnel may present itself in any of several ways:

- Phone
- E-mail
- Fax

- Radio
- Mail
- Word-of-mouth
- Increase in the Homeland Defense Status
-

Other threats to pipeline system or personnel are often treated in the same manner as bomb threats. These may include:

- Terrorist threats
- Workplace violence threats
- General threat to an industry
- Civil disturbances

The following steps should be used as guidance when responding to the above situations. Actions during a real event will vary based on differences in circumstances, response activities, good judgment, etc.

Phone/Written (Fax, Letter, Telegram) Threats

Person Receiving the Call

- Immediately open the Bomb Threat form, (this should be kept next to the phone), so you can use it during the conversation with the individual making the bomb threat call. If possible, complete the form during the call.
- Remain calm and be engaging when talking to the caller.
- Keep the caller on the line as long as possible in order to obtain as much information as possible. Ask him/her to repeat the message. Try to write down every word spoken by the person. If you have a small hand-held tape recorder available, try to tape the conversation.
- If the caller does not indicate the location of the bomb or the time of detonation/attack, ask for this information.
- Inform the caller that the incident could result in death or serious injury to innocent people.
- Pay particular attention to background noises, such as motors, music, and any other noise that may give a clue as to the location of the caller.
- Listen closely to the voice (male, female), voice quality (calm, excited), accents, and speech impediments.

After the Caller Hangs Up and Written Threats: Immediately report the threat call to the Liquids Pipeline Central Center or the Company person designated by management to receive such information.

Pipelines and Pump Stations - Additional Guidance

- If the caller does not indicate the location of the bomb/substance or the time of possible detonation/attack, ask him/her for this information. Try to determine the Province, pipeline system, and specific location involved if possible.
- For offices and control center, inform the caller that the building/facility is occupied and the incident could result in death or serious injury to innocent people.
- For pipeline and pump stations, inform the caller that an incident could result in death of the innocent general public or significant environmental impact.
- Additional actions to consider taking upon credible threats against pipelines and pump stations:
  - Which if any system(s) should be shutdown
  - When any system(s) should be shutdown
- Survey from a distance with the aid of binoculars:
  - valves
  - station piping
- Due to the expanse of Pipeline facilities, aircraft should be considered to aid in the surveying pipeline ROW.
- Notify the appropriate local and/or government agencies, contact information, upon discovery of suspicious or out-of-place object(s).

On Call Manager

- Based upon discussion with Corporate Security, determine if the threat is credible. Then decide what actions to take, which can include:
  - Do Nothing
  - Attempt to determine which facility(s) are at risk
  - Stay and Search
  - Partial Evacuation or Internal Evacuation (offices or control center)
  - External Evacuation to an offsite Command Post (offices or control center)
- If a full or partial facility evacuation is necessary, activate Building Evacuation Plan immediately. When in doubt, evacuate. Encourage personnel to be vigilant for suspicious or out-of-place objects as they evacuate and leave their workstations.
- Initiate operations "shut down" procedures, as necessary.
- Secure the location and limit access to essential personnel only.
- Call the appropriate local and/or government agencies (fire, police, etc.) and inform them of the threat and your Command Post location
- Set up a Command Post at a pre-determined offsite location. Ensure you have:
  - ERP
  - Facility maps
  - Access keys
  - Cell Phones, Pagers & Radios
- Direct all members of the press to the designated spokesperson.

5.6.14.2 Suspicious Mail/Delivered Package

- Frequently seen explosive devices have been incorporated, hidden, or camouflaged in letters, soft cover pocketbooks, hard cover books, manila envelopes, and cardboard boxes. While many are delivered by Canadian mail, they may arrive by private courier or express service. Be alert to recognize suspicious-looking or unexpected items especially those that have:
  - Special handling marks (special delivery, air mail, registered, certified)
  - Restrictive markings (personal, confidential, addressee only)
  - Excessive postage
  - Handwritten or poorly typed address
  - Incorrect title, or title but no names
  - Misspelling of common words
  - Oily stains, discolorations, or odor
  - No return address
  - Excessive weight
  - Lopsided, uneven, or ridged envelope
  - Protruding wires or tin foil
  - Excessive securing material (tape, string, etc.)
  - Any evidence that the envelope has been opened and re-glued
  - Mail item from a new or strange source
- If you receive or find a suspicious-looking letter or package:
  - DO NOT TRY TO OPEN IT.
  - Isolate the area around the letter or package to the degree possible, and make emergency notifications as previously outlined, and evacuate personnel to a safe distance, as directed.
  - DO NOT MOVE NOR HANDLE unless absolutely necessary.
  - If opened, preserve, BUT DO NOT TOUCH FURTHER all original envelopes, twine, shipping documents, or packaging materials for evidence and release to the police as requested.
  - Report the call to the Area Manager or their designee.

5.6.14.3 Technological Issues

Emergencies related to the operation of the LPCC can have severe negative impacts on company operations. Fire, explosion, natural disaster, power outage may damage the back-up power supply or cause other emergency conditions. Such an emergency can cause a loss of information stored electronically on computer systems and physical damage to hardware integral to the operation of the pipeline system.

If the LPCC has only been partially damaged computer hardware and software shall be inspected and evaluated to determine whether operations can be resumed from the location. If the computers are operable but the software is damaged, back-up software shall be retrieved from off-site back-up facilities.

LPCC

Backup LPCCs has the capability to operate the AER Regulated Liquids Pipelines within 14 hours of relocation.

5.6.14.4 Terrorist Threats

Within the Province of Alberta ASSIST (Alberta Security & Strategic Intelligence Support Team) is responsible to identify threats early enough for the Government to provide warning and mitigate the threat. In this capacity the Team has an intelligence role in which it maintains liaison with various police and intelligence agencies to determine threats to the province and its critical infrastructure, including pipelines.

To maintain terrorism and security awareness, ASSIST produces and distributes bulletins, situation updates and conducts exercises. Incidents of interest include:

- Threat to Government of Alberta, elected officials and Alberta Infrastructure.
- Suspicious persons possibly of National/Provincial interest
- Criminal acts that may be politically or economically motivated including: bombs/bomb threats, suspicious packages/powders, sabotage
- Explosions of unknown cause
- Chemical, biological, radiological threats or events
- Nuclear explosive threats
- Radical extremism such as environmental/animal rights activism/extremism
- Illegal protests or deliberate blockades

In the event South Bow AER Regulated Liquids Pipelines are involved or targeted in any way the local law enforcement should be contacted first followed by notification to ASSIST via e-mail or duty phone. TC

Energy workers can also access the National Security Tip Line and report any suspicious activity that could be related to a security threat.

5.6.15 Public Protection

A public involvement program is not required for the AER Regulated as they are licensed for sweet operations. However, EPZ have been assigned & South Bow will provide information to stakeholders in the EPZ. Notification will be provided regarding modifications to the pipelines.

Three methods used to safeguard the public against exposure to potentially dangerous situations:

1. Shelter-in-Place
2. Evacuation
3. Isolation

For the purposes of this ERP, the term public means:

Residents, transients, other industrial operators and any other people that may be impacted by an event at a company operation including workers not presently on shift and non-essential personnel who are not dealing directly with a response to an incident.

5.6.16 Planning and Response Zones

North American – Emergency Response Guidebook

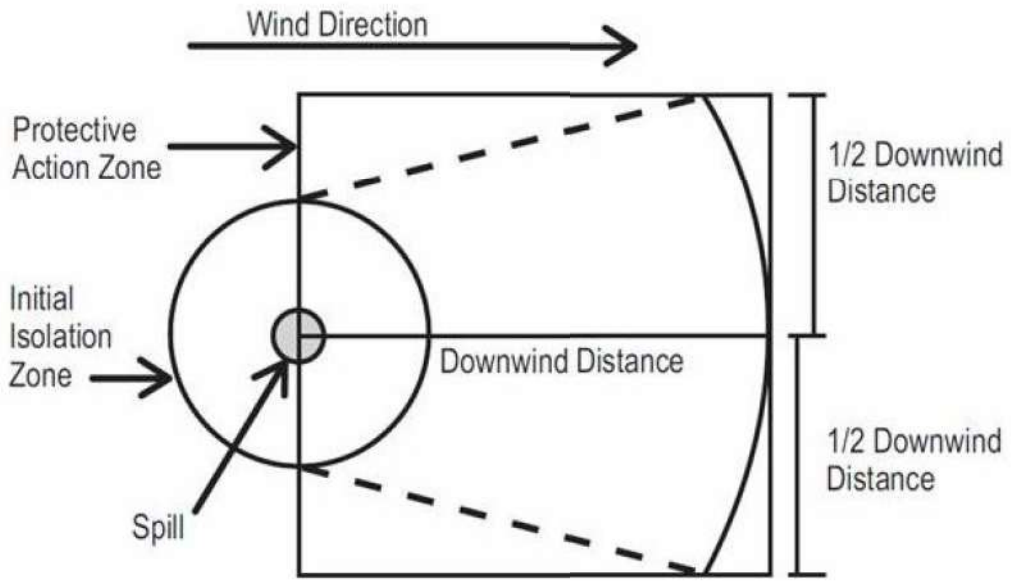
The Emergency Response Guidebook (ERG 2020) was developed jointly by Canada, the U.S., Mexico and Argentina for use by fire fighters, police and other emergency services personnel who may be the first to arrive at a dangerous goods incident. ERG 2020:

- Is primarily a guide to aid first responders in quickly identifying the specific or generic hazards of the material(s) involved in the incident
- Includes general information to protect themselves and the public during the initial response phase of the incident.
- Provides guidance about the initial isolation and protective action distances to protect those closest to the hazard first and then those who are downwind.
- Is a practical, proven response process that has been refined and adopted by provincial regulators.

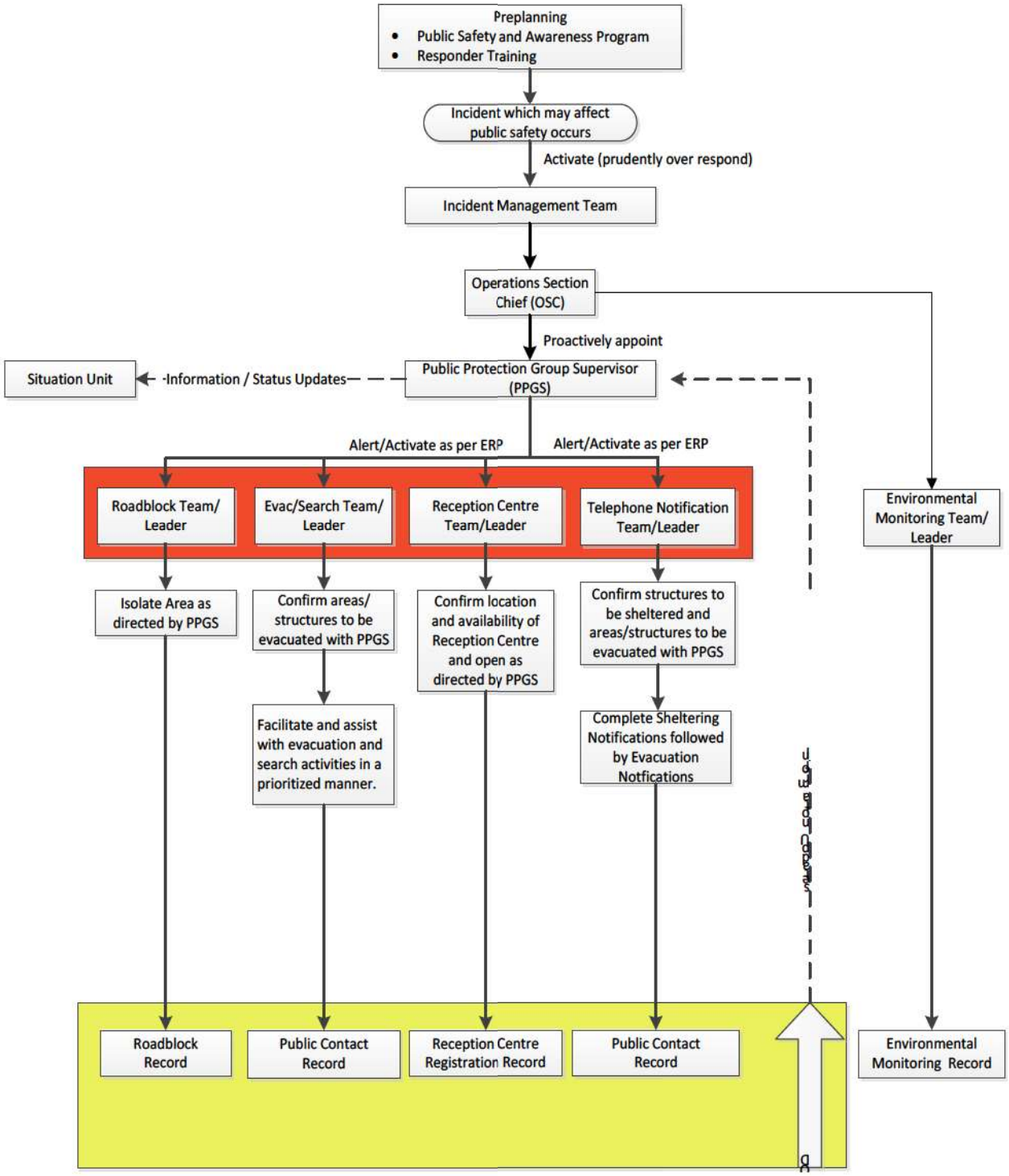
Within the Emergency Response Guidebook, first responders are told to:

- Direct all persons to move, in a crosswind direction, away from the spill or release to the distance specified for the Initial Isolation Zone.
- Look up the initial Protective Action Distance in the Emergency Response Guidebook for a given material, spill or release size; determine whether it is day or night; identify the downwind distance and determine the most appropriate protective actions to consider.

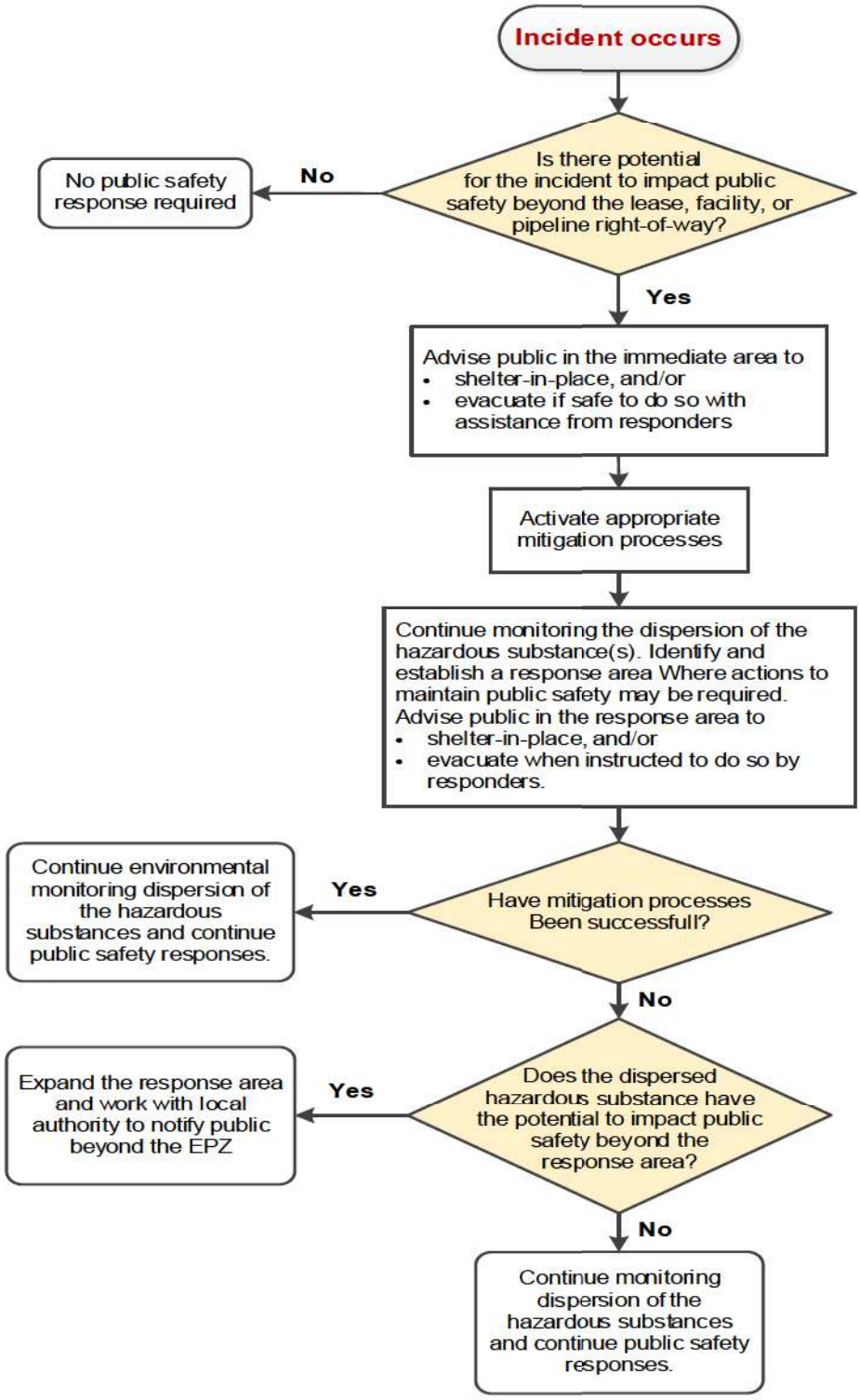
The Protective Action Zone (PAZ) is defined within the North American ERG as a square, whose length and width are the same as the downwind distance. The square shape of the area in which protective actions should be taken (the PAZ) is shown in the figure below, extracted from the North American ERG.


Wind Direction
Protective Action Zone
Initial Isolation Zone
Spill
Downwind Distance
1/2 Downwind Distance
1/2 Downwind Distance

5.6.17 Public Safety Process Overview Chart



5.6.18 Public Safety Decisions Process



5.6.19 Evacuations

For long-term releases, evacuation is preferred to sheltering if public safety can be assured during the evacuation process.

Evacuation is a viable public protection measure in circumstances when:

- The location of the plume is known, and safe egress routes can be assured
- The release will not likely be contained in the near future
- Visibility and road conditions are good
- The residents clearly understand their directions

Tactical Evacuation: A measure to immediately move people to a safe area as part of emergency response and operations. In consultation with AER, does not require approval from local authority but the local authority may enact an evacuation order, if required. The local authority must be advised if a tactical evacuation has occurred. Appropriate methods must be utilized to ensure transients (hunters, trappers, recreational users, non-resident landowners, etc.) within the EPZ are located and evacuated. Refer to Section 5: Forms for Evacuation Scripts for information that should be communicated as part of the evacuation process.

Planned Evacuation: An evacuation coordinated by local government authority that can authorize evacuation alerts and orders.

Residents should also be evacuated during ongoing emergency flaring or burning if their health and safety could be affected by the operation.

Special procedures may be required for evacuating large industrial operations and/or public facilities. If large numbers of people are involved, the duty holder must address assistance with transportation. Refer to the Area Specific Information Section for information regarding transportation (e.g., providing school buses) or other changes in the normal notification procedures.

The duty holder must continuously assess and act on the need to expand the evacuation area, based on the specifics of the incident, including harmful levels of hazardous substances.

The duty holder is expected to monitor the air quality along the edge of the EPZ to determine if sheltering or evacuation criteria have been met outside the EPZ. Evacuation outside of the EPZ must be coordinated with the Local Authority.

Appropriate methods must be utilized to ensure transients (hunters, trappers, recreational users, non-resident landowners, etc.) within the EPZ are located and evacuated. When a tactical evacuation has taken place, the appropriate local authority must be notified.

5.6.20 Shelter in Place

If evacuation is not possible, shelter-in-place can be used to protect members of the public under certain conditions. Shelter-in-place is the practice of going or remaining safely indoors during an outdoor release of a hazardous substance.

Examples of when Shelter-In-Place applies include the following:

Residents are waiting for evacuation assistance

- Extreme weather conditions compromise the ability of the public to safely evacuate
- Evacuation routes take individual through the hazard
- When evacuation carries an unacceptable level of risk

The public safety aspects of shelter-in-place are to be continuously re-evaluated during an incident.

All persons advised to shelter-in-place are to be notified if additional measures are required, and when it is "all clear".

5.6.21 Isolation

Isolation is used in conjunction with the other Public Protection Methods to restrict access to a hazardous area by establishing roadblocks.

It may be necessary for South Bow to obtain a Fire Hazard Order (issued by the Lead Regulatory Agency) or for the local authority to declare a State of Local Emergency to restrict access to a designated area such as the Emergency Planning Zone (EPZ) / Hazard Planning Zone (HPZ).

The Lead Regulatory Agency will be notified of the closure of any Petroleum Development Road (PDR).

Local authority will be contacted if any MD or county roads are to be blocked for public safety.

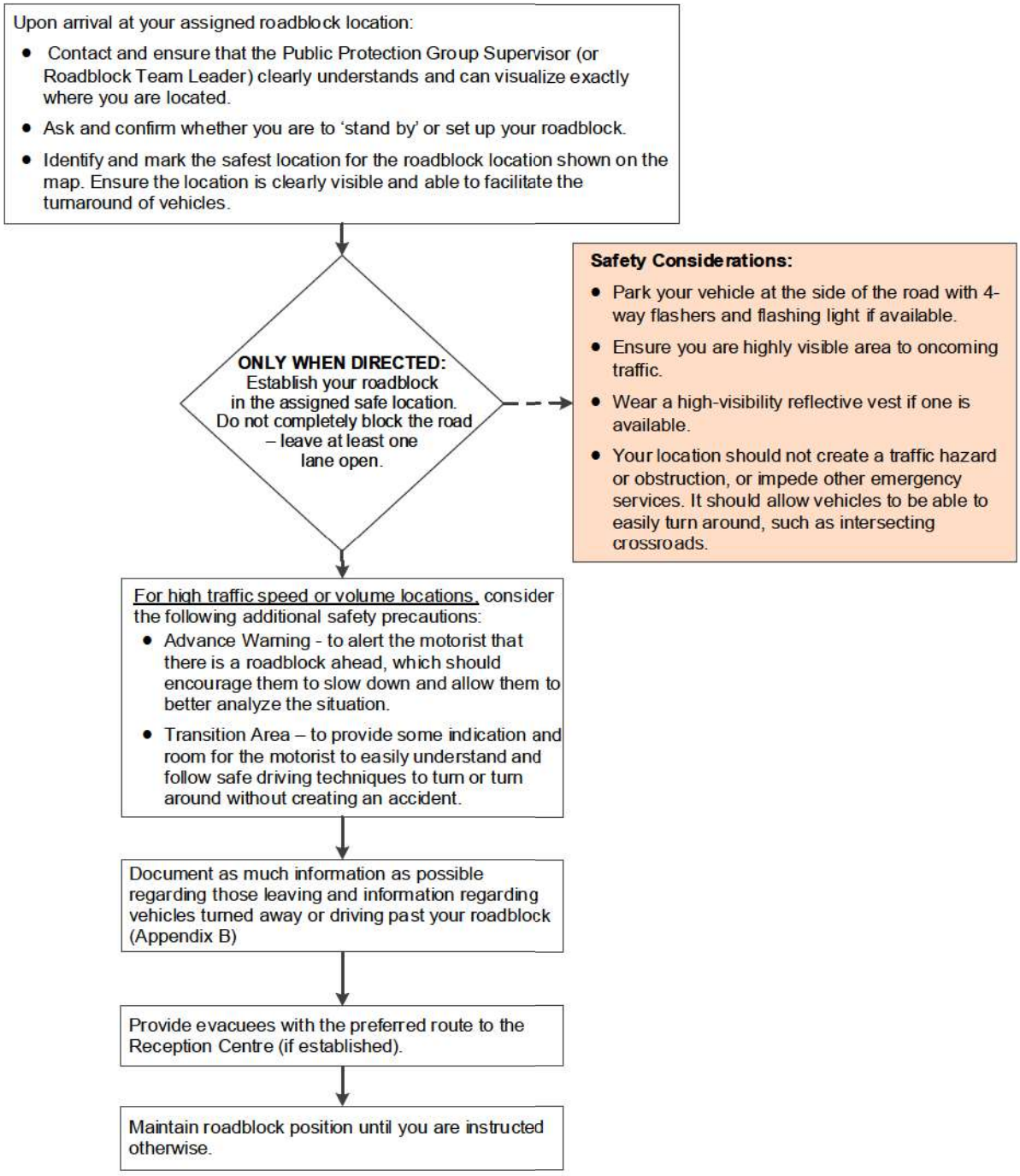
In the event a highway needs to be closed for public safety, contact the RCMP.

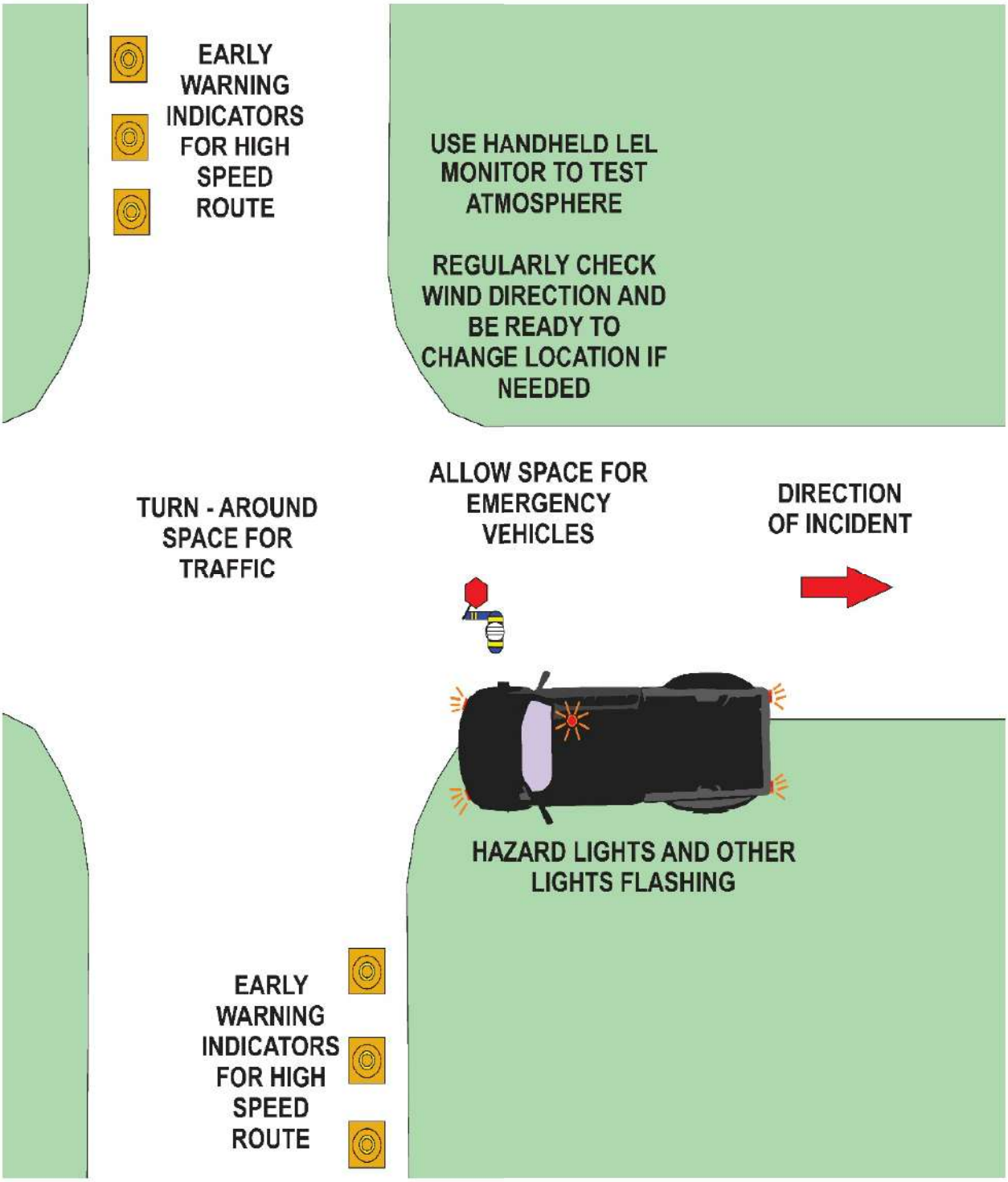
The applicable railway company will be contacted for any railway closures.

The applicable jurisdictional environmental agency and the Lead Regulatory Agency will be contacted if any navigable water course is required to be closed.

Where applicable, special procedures will be developed for addressing major highways, navigable water sources, cleared pipeline rights-of-way and railways that go through the EPZ and could be impacted by the hazard. These procedures are detailed in the pipeline specific annex.

5.6.22 Establishing Roadblocks


Upon arrival at your assigned roadblock location:
• Contact and ensure that the Public Protection Group Supervisor (or Roadblock Team Leader) clearly understands and can visualize exactly where you are located.
• Ask and confirm whether you are to 'stand by' or set up your roadblock.
• Identify and mark the safest location for the roadblock location shown on the map. Ensure the location is clearly visible and able to facilitate the turnaround of vehicles.
ONLY WHEN DIRECTED:
Establish your roadblock in the assigned safe location.
Do not completely block the road – leave at least one lane open.
Safety Considerations:
• Park your vehicle at the side of the road with 4-way flashers and flashing light if available.
• Ensure you are highly visible area to oncoming traffic.
• Wear a high-visibility reflective vest if one is available.
• Your location should not create a traffic hazard or obstruction, or impede other emergency services. It should allow vehicles to be able to easily turn around, such as intersecting crossroads.
For high traffic speed or volume locations, consider the following additional safety precautions:
• Advance Warning - to alert the motorist that there is a roadblock ahead, which should encourage them to slow down and allow them to better analyze the situation.
• Transition Area – to provide some indication and room for the motorist to easily understand and follow safe driving techniques to turn or turn around without creating an accident.
Document as much information as possible regarding those leaving and information regarding vehicles turned away or driving past your roadblock (Appendix B)
Provide evacuees with the preferred route to the Reception Centre (if established).
Maintain roadblock position until you are instructed otherwise.


EARLY WARNING INDICATORS FOR HIGH SPEED ROUTE
USE HANDHELD LEL MONITOR TO TEST ATMOSPHERE
REGULARLY CHECK WIND DIRECTION AND BE READY TO CHANGE LOCATION IF NEEDED
TURN - AROUND SPACE FOR TRAFFIC
ALLOW SPACE FOR EMERGENCY VEHICLES
DIRECTION OF INCIDENT
HAZARD LIGHTS AND OTHER LIGHTS FLASHING
EARLY WARNING INDICATORS FOR HIGH SPEED ROUTE

5.6.23 Documentation of Initial Response

It is difficult, particularly during the first few minutes of an initial response operation, to think about the importance of documentation. However, a log should be maintained which documents the history of the events and communications that occur during the response.

When recording information during Initial Response, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate.
- Do not criticize the efforts and/or methods of other people/operations.
- Do not speculate on the cause of the incident.
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change.
- Record the recommendations, instructions, and actions taken by government/regulatory officials.
- Document conversations (telephone or in person) with government/regulatory officials.
- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions).

An ICS 201 Form is the preferred form to be used for documentation for initial Incident Response. An ICS 201 Form is located in Appendix B of this Plan.

The TRG IR App has functionality consistent with what South Bow accepts as initial response information requirements. Where possible staff will use the TRG IR App to log initial response information.

5.6.24 Communications

Communication challenges occur in nearly every emergency response operation. It is important to exercise various communication avenues to ensure consistent, on-going, and effective communications between responders, governmental officials, and external stakeholders.

Communications systems include the following:

- Cellular Telephones
- Hand-held air horns
- Hand-held two-way radios
- Land-line telephone systems
- Satellite phones
- Email; however, not all company personnel have smart phones allowing remote access to email
- Blackline G7 Monitors

Responders will rely on cellular telephones and land-line telephones for communications between facilities, offices, etc. When possible, land-line telephones shall be used for all internal and external notifications and all highly confidential communications (i.e. employee injury or fatality). The satellite

phone and handheld radios will only be used when other forms of communications have failed or networks are overwhelmed.

In the case of an emergency, if there is any concern with telephone or radio communications at the site, the EOC should consider recommending request for a Communications Trailer with operators. No resources should be ordered without approval of on-site personnel; however, the EOC may suggest this resource request and provide logistical support to make this (and any other requested) equipment available when appropriate.

5.6.25 Facility Evacuation

Evacuation of Company personnel is often an effective and appropriate response action. When an evacuation occurs, the following actions must also be taken:

- Account for all personnel on site. This is accomplished through head counts, sign-in sheets, communication with supervisors and other means
- If the integrity of the facility is compromised, use the Emergency Shut-Down (ESD) or otherwise isolate the facility
- Notify the Liquids Pipeline Control Center of the evacuation
- Notify the Area Manager of the evacuation

5.6.26 Social Impact Considerations

South Bow recognizes that large scale emergencies at pipeline system facilities could have an impact on the community at large. This section explains how South Bow will work with local responders and will independently address the needs of affected members of the public, following an emergency.

5.6.26.1 Community Evacuation Plan

All evacuations of non-South Bow facilities (including private and public property) should be coordinated with local emergency responders. South Bow will actively support evacuations by providing appropriate, requested information and providing resources to local emergency responders as feasible.

5.6.26.2 Community Information Sharing

If the geographic location of the pipeline does not present a risk to the surrounding communities, South Bow still pledges to share information regarding emergencies with any impacted communities, businesses and members of the public. Fore Stakeholders Impacted by the Emergency Planning Zone (EPZ) refer to the applicable Annex which will include names and contact telephone numbers for potentially impacted individuals and industry business partners.

The following information will be made available to the public as soon as possible during an emergency.

- Type and status of the incident

- Location of the incident
- Areas impacted by the incident
- Public protection measures to follow, evacuation instructions, and any other emergency response measures to consider as applicable
- Description of the products involved
- Contacts for additional information
- Actions being taken to respond to the situation, including anticipated time period.

Any persons evacuated or sheltered, and the media will be kept appraised of the situation.

If the geographic location of the pipeline does not present a risk to the surrounding communities, South Bow still pledges to share information regarding emergencies with any impacted communities, businesses, and members of the public. Fore Stakeholders Impacted by the Emergency Planning Zone (EPZ) refer to the applicable Annex which will include names and contact telephone numbers for potentially impacted individuals and industry business partners.

5.6.27 Post Emergency Response Actions

The Incident Commander will authorize any stand down of the emergency in conjunction with the Lead Regulatory Agency. The regulator will consult with the other government agencies as applicable and confirm with South Bow that the emergency call-down is appropriate.

Emergency Management does not end when initial threats to health and safety are managed. Rather, there can be a lengthy process for investigation of the emergency's cause and to repair and restore the pipeline system. Through these processes, South Bow can identify solutions to mitigate future emergencies. This section explains the investigation and corrective actions which occur following an emergency.

5.6.27.1 Investigations

The investigation of incidents is a fundamental element of the South Bow Incident Management Process. When incidents do occur, it is management's role to assemble and lead an investigative team in the investigation of root cause(s) of the incident and in the determination of effective corrective action(s). It is also incumbent upon management to ensure that the corrective action(s) is/are implemented on an aggressive time schedule and to share lessons learned so that similar incidents can be avoided elsewhere. Consistent application of this methodology will help ensure that reliable and accurate root cause(s) information is identified, and effective corrective action(s) is chosen in order to:

- Prevent recurrence of incidents, or
- Reduce the consequences of an incident, should a similar incident occur again.

The Area Manager is accountable for initiating the post-incident investigation. The investigation of any incident requires a series of six steps to produce a reliable result. Those six steps are:

- Securing the scene to preserve as much evidence of the event as possible

- Collecting the information
- Defining the sequence of events
- Identifying the immediate cause(s)
- Identifying the root cause(s)
- Developing an action plan

The investigation shall be initiated as promptly as possible. The investigation shall be performed at a sufficient level of detail to determine immediate and long-term steps needed for corrective action and changes to emergency response procedures. Help in performing a post-incident investigation can be found by following the Incident Management Program.

5.6.27.2 Corrective Actions

Corrective actions may take place simultaneously with the containment/ isolation steps of the response and with any post-incident investigations. The actions to be taken depend on the type and extent of the incident and may include one or more of the following:

- Removal and proper disposal of contaminated soil, equipment, etc.
- Removal, recovery and proper disposal of free floating and dissolved hazardous substances in ground and surface water;
- Removal, venting dispersing or recovery of vapors from building, the soil or air;
- Repair, replacement or decontamination of equipment;
- The improvement of storage and handling practices, including improvement to secondary containment systems;
- Installation of engineering controls;
- Relocation of employees to other work locations; and
- Any other actions which the regulatory agencies may require to remediate the site in order to protect the public health, safety or environment.

Pipeline Operations shall report its progress on the implementation of its response and corrective action plan to the regulatory agencies in accordance with established schedules.

5.6.27.3 Securing the Affected Area and Inspecting/Restoring Emergency Equipment

After clean-up operations have been completed, all emergency equipment will be cleaned and inspected to ensure it is in proper working condition and that all supplies have been restocked.

The responsible manager will ensure that federal, provincial and local officials are notified that the area has been secured before the facilities are reactivated.

5.6.27.4 Analyzing the Incident and Modifications of the Plan, Procedures, and Facility

After the pipeline has been returned to operations, key personnel will meet to review the incident. The focus of the meeting will be to assess the effectiveness of the emergency response. The meeting may result in recommendations for physical changes to the facility, the purchase of new or different

equipment, and/or changes to the ERP and response procedures. Meeting notes will be kept on file for reference.

THIS PAGE INTENTIONALLY LEFT BLANK

6.0RESPONSE PROCEDURES

6.1 Public Response Resources

Emergency Response Resources from the public sectors (i.e. Provincial, and Local Governments) have authorities and resources which aid Industry Operators, including South Bow, in managing emergencies and protecting the public. This section of this Plan provides the contact information and roles of each level of government's response resources which could be involved in emergency response to an incident at the Pipeline.

6.1.1 Local Response

Local Emergency Response Resources may be the first non-South Bow response resources to arrive during an emergency. Like Provincial Responders, Local Emergency Response Agencies have authorities and resources which aid Industry Operators, including South Bow, in managing emergencies and protecting the public. For Local Emergency Responders that may respond to an incident, refer to the applicable Annex.

Law enforcement, Local Fire Department, Emergency Medical Services and Hospital. Refer to the applicable Annex for contact information.

6.1.2 Local Emergency Management

The safety of all residents within the Municipality is ensured through a Municipal Emergency Plan (MEP) should a disaster occur within the Regional Municipality. Emergency responders elected officials and municipal employees receive training to understand their roles should the MEP ever have to be activated.

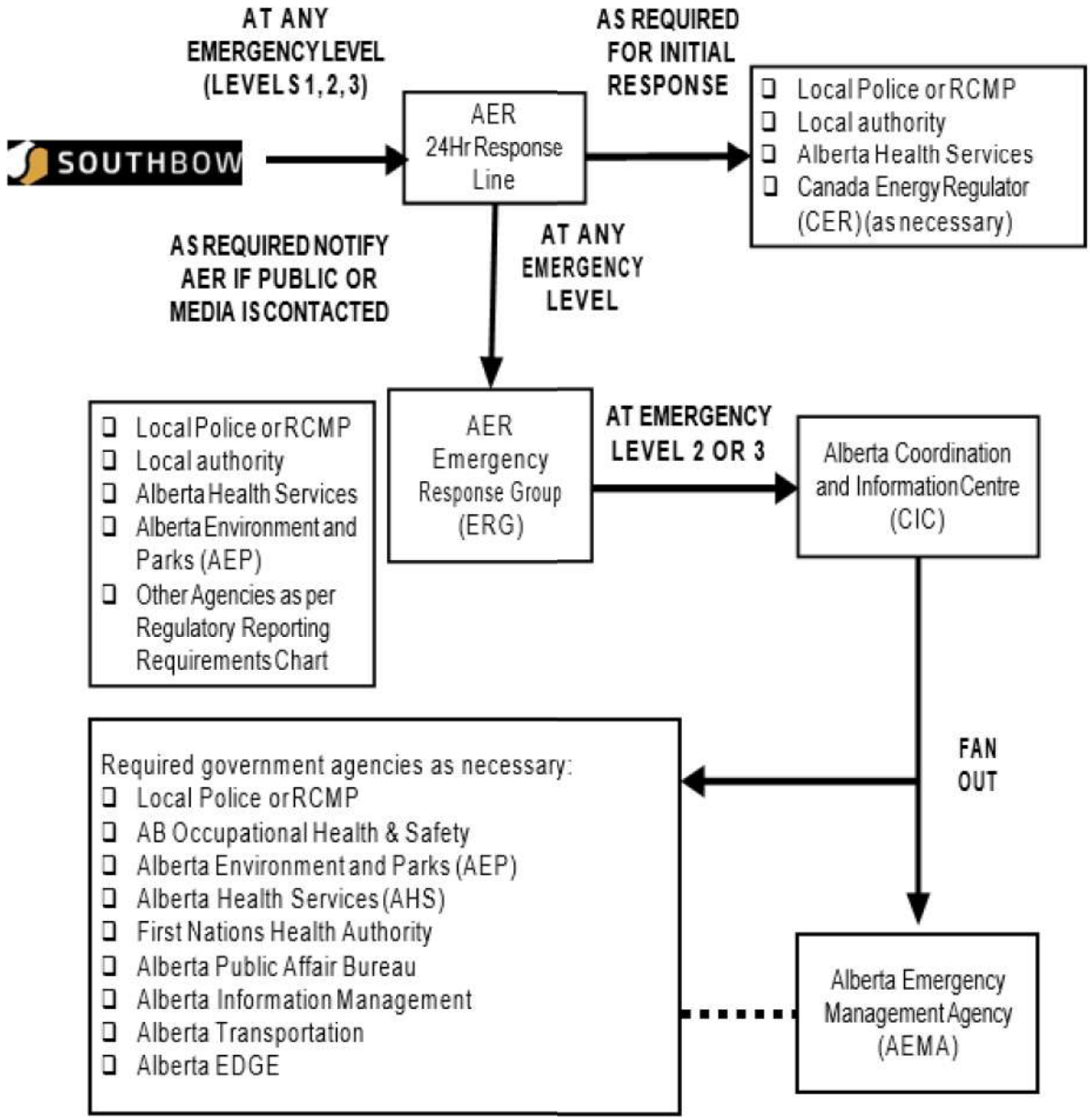
Refer to the applicable Annex for contact information.

6.1.3 Federal Response

Responding Federal Agencies will adhere to prescribed response processes and procedures as dictated by regulatory standards per their agency.

6.1.4 Provincial Response

Responding Provincial Agencies will adhere to prescribed response processes and procedures as dictated by regulatory standards per their agency.



For spills/releases an AER First Call Communication will be submitted. Refer to applicable Annex for contact information.

Regulatory Reporting Requirements

(Note: More than one incident may apply for a given emergency)

Type	Product/Incident Conditions	Volume / Severity	AB
Level 1, 2, or 3 Emergencies (Alert AB only)		Any	AER
Life Safety	Any situation or dangerous occurrence that has the potential for serious injury of workers (i.e., structural failure or collapse of a support system, excavation or contact with a pipeline).	Any	OH&S
	Actual injury/fatality of employee or contractor.	Any	OH&S, WCB
	Any situation that has or potentially may threaten the health and safety of the public.	Any	AER, EMA, Police, LA, AEMA
Spills	**Unrefined Product Release**		
	On-lease crude oil/saltwater spill OR product losses/vandalism.	AB: >2m3	AER, AEP
	On-lease spill that has potential to cause an adverse effect through cumulative releases (i.e.: number of small releases at the same location over a prolonged period of time with potential to cause adverse effects).		
	Off-lease crude oil/saltwater spill or any pipeline release or any pipeline release that may, has or could cause an adverse effect.	Any	AER, AEP
	Crude oil/saltwater spill into a watercourse.	Any	AER, AEP, ECCC
	Refined Product Release		
	Refined product or chemicals. Any significant spill, or a spill into water, or a spill that may cause, has or could cause an adverse effect.	Reportable volumes in TDG regulations	AEP, AEMA, ECCC
	Unrefined or Refined Product Release		

Type	Product/Incident Conditions	Volume / Severity	AB
	Transportation of Dangerous Goods (TDG) incident involving refined or unrefined products. This includes on- or off-lease truck loading/ unloading spills.	Volumes according to TDG regulations	AEMA, Local Police, CANUTEC, Alberta EDGE
	Refined or unrefined product or chemical spill into watercourse or body of water.	Any	ECCC
	Refined or unrefined spills involving PCBs or spills on aboriginal land, in National Parks or on railway right of ways.	Any	ECCC
Pipeline Contact/Failure/ Rupture	Any AER licensed pipeline is contacted, fails or ruptures. Note: OHS must also be notified if situation causes or has potential to cause serious injury.	Any	AER - as applicable OH&S
Fire/Explosion	ANY explosion and on- or off-lease fires. Note: as required, confirm with IC that local/forest/industrial fire fighters have been notified.	Any	AER, OH&S, LA
Crane/Derrick Hoist	The collapse or upset of a crane, derrick, or hoist.	Any	OH&S, LA
Pressure Vessel	Incident involving pressure vessel, boiler or pressure piping.	Any	ABSA
Electrical	Incident involving/possibly caused by electrical equipment.	Any	SSE
Vehicle Accident	Single or multiple vehicle accidents.	Any	Local Police
Security Incident	Threatening phone call or trespassers on company property.	Any	Local Police

Type	Product/Incident Conditions	Volume / Severity	AB

Note:

For an explanation of government agency acronyms, refer to Section 2.1, page 1.

When in doubt, notify ALL of the following key government agencies for the appropriate province:

- Oil and Gas regulators (AER, CER)
- Local Authority (LA)
- Environmental regulators (AEP, ECCC and FOC as appropriate)
- Workplace Health and Safety regulators (OH&S)
- Provincial Emergency Measures (AEMA)
- Highway Authorities, for emergencies that impact or require closure of 1- or 2- digit highways (AT)
  - An Adverse Effect is defined as impairment of or damage to the environment, human health, safety or property.

Refer to applicable annex for contact information.

6.2 Contracted Resources

South Bow has secured external emergency response resources to augment company owned emergency response resources. Contact information for these contract resources is included in Pipeline-Specific Response Zone Annexes.

6.2.1 Spill Cooperatives

Refer to the applicable Annex document for specific contact information.

6.3 Company Owned Equipment

6.3.1 Spill Response Equipment

South Bow owns a variety of Oil Spill Response Equipment staged strategically across the pipeline systems. Refer to applicable Geographic Response Plan for a list of equipment staged near the pipeline.

6.3.2 First Aid and Medical Equipment

All South Bow vehicles contain a basic first aid kit.

Refer to applicable Annex for a list of strategically equipment located at the pipeline.

6.4 Casual and Volunteer

Volunteers will not be utilized by South Bow for emergency response operations.

THIS PAGE INTENTIONALLY LEFT BLANK

7.0RELEASE DETECTION

7.1 Release/Rupture/Discharge Detection

South Bow's LPCC and field employees are responsible for ensuring the integrity of facilities and detecting releases.

There are four primary types of indications that a release may be occurring:

- An unexplained hydraulic upset condition observed in the pipeline system operating data.
- A consistent unexplainable pipeline system shortage occurring over several check time periods.
- An alarm from a Supervisory Control and Data Acquisition (SCADA)-based leak detection system.
- A report of a direct observation of a release or released product received from an employee or the public.

All indications, including supposedly direct observation, are subject to confirmation; however, the Company policy is to shut down if any doubt exists as to the integrity of the pipeline system. The simultaneous occurrence of two or more of the indicators above greatly increases the probability that the pipeline system has lost integrity.

Specific guidance for response to abnormal operating conditions and determining the location of a suspected pipeline release may be found in the Company's Operations and Maintenance Manual, maintained separately.

Routine actions to be taken by South Bow employees to ensure facility integrity and detect releases are listed as follows:

- LPCC Monitors pressures using SCADA
- Perform routine Station/ROW checks
- Conduct routine aerial surveillance

Monitor 24-hour emergency reporting phone number

7.2 Detection of an Incident: Release/Leak Detection

Leak detection systems utilized along the pipeline include:

- System-level indication is accomplished through usage of a SCADA system. This system is capable of monitoring flow rates, pressure, metering information (delivery/receipt volumes), temperature, and valve positions.
- SCADA system is monitored on a 24-hour per day basis by both the centralized Pipeline Control Center and Secondary Control points.

The location of a spill caused by a catastrophic break, which may be indicative of a Worst Case Discharge, can be inferred by SCADA personnel down to a pipeline section between operating pump stations. This inference is based upon rapid and abrupt changes in operating conditions.

7.3 Release/Rupture/Discharge Prevention

Pipeline pump stations are designed in a manner that maximizes the containment of leaks on-site and deters the migration of leaks off-site. Discharge prevention is accomplished through the following measures:

- Pipelines and related structures have grounding systems to reduce the possibility of accidental ignition due to lightning.
- Discharge prevention is also accomplished through the use of general housekeeping procedures and leak inspection system.
- Weekly aerial patrols by fixed or rotary wing aircraft to monitor for unauthorized activities on ROW, slope and river crossing anomalies and any other significant observances.
- Cathodic protection is applied to the pipeline to minimize the effects of external corrosion
- Placing conspicuous pipeline warning signs at road crossing and other high hazard areas.
- Maintaining an active pipeline damage prevention program.
- Maintaining the integrity of the pipelines by actively assessing pipeline integrity via smart In Line Inspection (ILI) tools and assessing anomalies and repairing areas of the pipeline, which do not meet specifications.

7.4 Investigation of Public Complaints or Inquiries

Reports of a pipeline system emergency from a third party will be responded to as if an emergency has occurred. A South Bow representative will be dispatched to the site of the reported emergency to verify accuracy of the report. Upon verification of the incident, appropriate South Bow entities will implement this Plan. In such case, emergency response operations will become South Bow's first priority.

When third party reports do not come from an emergency services organization, South Bow will contact the local Public Safety Answering Points (PSAPs) to determine whether other similar reports have been received. South Bow will rely on local emergency responder's reports of the incident. South Bow will always work cooperatively with local emergency services to verify and respond to an emergency event.

Since the South Bow's AER regulated liquids pipelines are close in proximity to other crude oil producers and pipeline operators, it may be challenging for Public First Responders or members of the general public to determine the source of a release.

8.0MANAGING PREPAREDNESS

South Bow recognizes Emergency Preparedness, including planning, training, and exercises, as critical elements of an Emergency Management Program. This section describes the Emergency Preparedness measures which are taken to prepare site personnel and the company to safely and efficiently manage an emergency, including oil spills.

8.1 Emergency Preparedness Standards

South Bow provides training related to discharge prevention, testing and response, including measures to repair pipeline ruptures and mitigate discharges. The training methods address pipeline system emergencies from several perspectives: human health and safety, rupture control and repair operations, pollution control, and overall (crisis) management of the emergency.

Through the various training methods described is this section, South Bow's training program is intended to ensure the following results:

- That all personnel know:
  - Their responsibilities under the plan.
  - The name, address and procedures for contacting the operator on a 24-hour basis.
- That all reporting personnel know:
  - The pipeline details for the affected area.
  - The telephone number of the Federal, Provincial and local agencies and other required notifications.
  - The notification process.
- That all response personnel know:
  - The characteristics and hazards of the oil discharged.
  - The conditions that is likely to worsen emergencies, including the consequences of pipeline malfunctions, and the appropriate corrective actions.
  - The steps necessary to control any accidental discharge of oil and to minimize the potential for fire, explosion, toxicity or environmental damage.
  - The proper firefighting procedures and use of equipment, fire suits, and breathing apparatus.
- Only trained persons will be utilized for response to fires. South Bow personnel are only trained on the use of handheld fire extinguisher units for small incipient fires.

All Response Team Members should review the ERP whenever their job position or responsibilities change under the plan. A copy of this Plan will be available at all times to South Bow personnel responsible for responding to or reporting an emergency.

8.2 Emergency Management Team

South Bow Emergency Management Team is the means through which the Emergency Preparedness Program is implemented at the field level. The emergency management team is responsible for ensuring compliance with the requirements of the Emergency Management System and takes the lead role in organizing emergency exercises and training for the Region/Facility.

In accordance with South Bow Emergency Management Program, the South Bow Emergency Management team is responsible for the following:

- Identifying local hazards and conducting risk assessment
- Identifying roles and responsibilities
- Identifying resources
- Establishing and maintaining the EOC
- Training employees
- Updating ERPs
- Ensure preparedness

8.3 Emergency Response Training for South Bow Personnel

South Bow recognizes that LPCC and Operations Personnel must both be adequately trained and prepared to work collaboratively to effectively manage initial response to an emergency. To this end, this section describes the training programs for Operations Personnel and LPCC; these training programs are designed to be complimentary of one another and to be executed in parallel with each other.

8.3.1 Liquids Pipelines Control Center (LPCC) Training and Procedures

Training and certification ensures Controllers recognize all manners of pipeline operation, including start-up and shutdown, steady state and transient operations and leak detection operations. Controllers are not permitted to operate the system on their own until they have successfully achieved the necessary competency and have been appropriately certified. Regular re-training and re-certification ensures skills and awareness of procedures are maintained.

Training takes place on a state-of-the-art simulator that fully represents the pipeline and includes a fully integrated leak detection system, enabling training on real world scenarios, including simulated leaks. Any significant changes to the actual pipeline system are first implemented in the simulator and Controllers are fully trained on the change prior to pipeline system implementation.

A dedicated leak detection controller maintains responsibility for monitoring the leak detection system and making decisions regarding response to leak indications, including line shutdown. Two other controllers are also in the control room at all times; one dedicated to pipeline operation and one dedicated to terminal and delivery facility operation. Controllers are adjacent to one another and are in constant communication. Team training and a team culture within the control room ensures a collaborative response to anomalous events.

The pipeline system is to be immediately shutdown within ten minutes when there is indication suggesting a leak event that cannot be definitively evaluated and explained as a non-leak event.

Controllers are empowered to shut down the pipeline at their discretion. All non-routine alerts or concerns are investigated immediately by pipeline controllers and field staff. Line start-up after an anomaly is identified cannot occur until the anomaly is explained and re-start is approved by the Control Center manager.

8.3.2 Operations Personnel

Operations Personnel and other Response Team Members will receive ICS training and supplemental training in other related topics.

Emergency response training records are maintained in the company Learning Management System. Training records for response personnel will be maintained for as long as personnel have duties in this ERP.

8.4 Emergency Response Training for Casual and Volunteer Laborers

South Bow will not utilize casual or volunteer laborers to assist in the response to hazardous incidents. If Casual or Volunteer Laborers are ever utilized for any aspect of emergency response, a specific training program will be developed to ensure these laborers are prepared to safely and efficiently conduct their assignments.

8.5 Educating the Public on South Bow Emergency Response

A public involvement program is not required for AER Regulated Liquids pipelines, as South Bow's pipelines are licensed for sweet hydrocarbons. However, South Bow defines emergency planning zones for their operations and provides information to stakeholders in the emergency planning zone.

8.6 Emergency Response Drills and Exercises

Emergency Response Drills and Exercises are conducted to ensure maximum effectiveness of the site's various plans and procedures and to keep personnel aware of their responsibilities in an emergency. To meet this objective, and to satisfy all requirements which impact the AER Regulated Liquids Pipelines South Bow's drill and exercise program has been designed to conform to National Preparedness for Response Exercise Program (NPREP) guidelines and to the drill/exercise requirements of the South Bow Emergency Management Program.

Furthermore, per the Alberta Energy Regulators Directive 071 - Emergency Preparedness and Response Audit Protocol, the appropriate AER field centre will be notified 30 days in advance of a scheduled exercise via the DDS system. Additionally, invitations to the appropriate authorities will be made to participate in or observe major exercises. South Bow Regulatory Compliance will receive in advance all

exercise dates/locations and will operate to notify the appropriate AER field centre per required timeframes.

8.6.1 Drills and Exercises as Required by the NPREP

The NPREP contains regulatory guidance for United States industry members who are regulated by the United States Coast Guard, Environmental Protection Agency, and Department of Transportation. Since portions of South Bow's crude oil pipelines are subject to these regulations, South Bow has adopted the NPREP for all oil pipeline assets.

The following internal drills and exercises shall be scheduled in South Bow's drill and exercise program to meet the guidance in the NPREP:

- Unannounced LFO Leadership Notification Drills shall be scheduled quarterly.
- Equipment Deployment Drills.
- A minimum of one Spill Management Tabletop Drill (or similar exercise) shall be scheduled annually. The Tabletop can be announced or unannounced.
- Every three years, all components of the entire ERP must be exercised. To meet the triennial requirement, it is not necessary to exercise the entire ERP at one time. Instead, the ERP may be exercised in segments over a period of three years, across the entire Canada Liquids BU Region.

WCSS Oil Spill Cooperative members (duty holder's) must have a representative attend the annual training exercise in the Cooperative where that member has operations. Exemption criteria allows for the duty holder to have a representative attend the exercise in another area or complete a recognized oil spill response program provided that the duty holder that chooses the exemption notifies the appropriate Cooperative Area Administrator.

8.6.2 Participation in Other Exercises

The AER Regulated Liquids Pipelines are not required to participate in any other exercises. However, South Bow shall participate in exercises conducted by mutual aid groups and industry cooperative to support development of a culture of preparedness across the petroleum industry.

8.6.3 South Bow Required Drills and Exercises

South Bow corporate program requires that all personnel with a role in emergency response attend a tabletop exercise annually. Since it is not possible to gather all personnel at one time, a number of smaller scale tabletop exercises will be conducted over the course of a calendar year to ensure that all employees meet this Company mandate.

South Bow requires each Operations Region conduct an annual External Field Exercise. The purpose of this exercise is to test the site spill response organization with or without other side scenarios (i.e. fires, injuries, etc.).

South Bow recognizes three types of field exercises:

- Internal field exercises involve the establishment of a site Incident Management Team and a site Incident Command Post, and coordination of the onsite response with the EOC as appropriate. There is no participation by external response agencies. Internal exercises are only conducted once and only at newly acquired facilities.
- External Field Exercises involve the establishment of a site Incident Management Team and a site Incident Command Post, coordination of the onsite response with the EOC, and participation by federal, provincial and/or local agencies.
- Full Scale Exercises involve the establishment of a site Incident Management Team and a site Incident Command Post, coordination of the onsite response with the fully staffed EOC, and participation by federal, provincial and local agencies. One Full Scale Exercise is run across the Company annually at a site to be determined by the Emergency Management Team. A site that hosts an annual Field Exercise need not conduct a "regular" External Field Exercise.

8.6.4 Coordination/Conduct of Drills and Exercises

Development of the Corporate Field Exercise scenario will be coordinated with a representative from the Emergency Management Team. Whenever necessary, a subject matter expert may be designated to assist with the development of the scenario to ensure a scenario's technical accuracy. The scenarios shall include, but not be limited to, the following:

- The basic objectives of the drill.
- The date, time and place of the drill.
- The organizations and/or personnel participating in the drill.
- A narrative summary of the drill scenario that details the initiating events and expected responses.
- Drill messages to support the scenario.

The scenarios will be structured to allow for as much free play, discussion and decision making as possible. The scenarios at each site will be rotated from year to year to ensure all elements of the plan/procedures are tested.

As stated, appropriate offsite response organizations will be invited (and should be encouraged) to participate in the annual field exercises.

A series of tabletop and/or training drills may be held prior to an exercise as a form of additional training for response personnel.

Applicable procedures will be utilized to ensure adequacy of the communication systems and overall response.

Once the exercise is deemed complete, all paperwork (e.g. procedural checklists, notes, ICS Forms, Initial Actions Plans, etc.) that were generated during the exercise shall be routed to the exercise Documentation Unit Leader or, if a DUL was not assigned during the exercise, to the site's designated individual.

8.7 Training, Drills and Exercise Recordkeeping

Drill and exercise observers and controllers shall be stationed at various locations throughout the exercise to evaluate the response of personnel and adequacy of the ERP. The notes taken by these observers and controllers and the exercise debriefing explained below, provide critical information used to improve the Plan and emergency response program.

An exercise debriefing, a post-exercise discussion, must be completed immediately following an exercise or drill and should include a review of the exercise assessing results of the exercise objectives. The discussion should be led by an appropriate management representative from South Bow and should include input from all involved personnel. One or more individuals should be made available to document the post-exercise discussions. At a minimum, the following debriefings should be conducted:

- One debriefing with the response team, emergency services personnel, and, if applicable, members from any media organizations that participated.

Regardless of the number of debriefings conducted, a Debriefing Template Form shall be completed for each session. The template for the Debriefing Template Form can be accessed at the Emergency Management webpage. All completed Debriefing Forms shall be attached to the Issue/Incident that is generated for the exercise.

The exercise shall be entered into the South Bow system database within 30 days from completion of the event. The EM team shall ensure that scans of relevant paperwork (in accordance with documentation requirements) are attached to the record. Photos taken during the event should also be attached.

Provide the exercise attendance sheets to the LMS Team who is responsible for entering the exercise participation data into the record retention program. If exercise credit is being taken for an actual emergency, it is the responsibility of the Emergency Management Team to provide the LMS Coordinator with a comprehensive list of event participants.

8.8 Review and Revision of this Plan/Manual

This Section provides procedures and information useful to responders for post incident/exercise review and evaluation. Post incident/exercise reviews should be conducted in a timely manner following an incident/exercise. The Plan should be evaluated to determine its usefulness during the incident/exercise

and appropriate revisions should be made. All incident/exercise documentation should be included in the Plan evaluation process.

Lessons learned from drills and exercises are a valuable source of information and reference data for the emergency planning program. Any outcomes that necessitate change to this Plan must be implemented and the plan must be updated appropriately. If additional training is required, South Bow must schedule the training.

8.8.1 Annual Review

The emergency management team is responsible for conducting annual reviews of all Tier 3 (Site-Specific) ERPs pertaining to facilities/assets within the region; this Plan (a Tier 2 ERP) is maintained by the EM team. As a minimum, ERP reviews will address the following:

- Lessons learned from drills or actual events.
- Changes that have occurred at the facility including organizational changes.
- Changes in federal, provincial, or municipal requirements.

Once the annual ERP review is completed, the necessary revisions will be made to the Plan. Copies of the revisions will be submitted to all controlled copy holders of the response plan, and a Record of Change will be entered in the Administrative Section of the Plan. In the event that no revisions are required, the completion of the annual review will be recorded on the Record of Changes page and a letter will be sent to all controlled copy holders indicating that the Plan remains valid with no changes.

8.8.2 Review following an Incident

Like drills and exercises, actual emergency incidents provide an opportunity to review ERPs and processes. After the facility has been returned to operations following an emergency event, key personnel will meet to review the incident. The focus of the meeting will be to assess the effectiveness of the emergency response. The meeting may result in recommendations for physical changes to the facility, the purchase of new or different equipment, and/or changes to the ERP and response procedures. Meeting notes will be kept on file for reference. Opportunities to improve the ERP identified following an actual emergency will be incorporated at the time they are identified; these changes will be incorporate in the same manner as improvements identified during the annual review process, but the EM Team will not wait for the annual review to make the changes.

8.8.3 Required Changes

Revisions or amendments to the ERP will be made whenever there is:

- A change in the design configuration, construction, operation, or maintenance that significantly affects the information included in the ERP.

- A change in the type of hazardous substances handled, stored, or transported that affects the required response resources.
- A change in the facility's operating area.
- Any other change that significantly affects the implementation of the ERP.

All call-out lists which support notification procedures will be maintained as appropriate.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A – COMPANY CONTACT INFORMATION

Refer to applicable Annex for Local Response and Contract Resource Contact Information.

Response Team

Liquids Pipelines Control Center

Title	Telephone Number
Liquids Pipelines Control Center (LPCC) - Mainline	Information has been redacted from this section to protect the safety and security of South Bow. Information redacted includes confidential Company telephone numbers.
Liquids Pipelines Control Center (LPCC) - Alternative Line	

Emergency Operations Center (EOC)

The Field Operations Emergency Operations Center (EOC) Conferen

Moderator Number	Conference ID	Purpose
		Combined EOC

South Bow 24-hour Telephone Number

Telephone Line	Telephone Number
Sure Call Third Party Answering Service)	866-920-0007

APPENDIX B – FORMS

Formal documentation is a critical component of Emergency Management. Documentation of exercise and actual incidents aids in communication between key stakeholders, provides a means to track activities for regulatory compliance, and, most importantly, helps keep emergency responders safe by noting and communicating work related hazards.

To properly complete required and recommended incident documentation, as noted above, the South Bow Emergency Management Team has developed and identified a number of standardized forms.

Some of the document templates, located online and accessible through the link above, are critically important for Initial Incident Response. These forms should be readily available to South Bow First Responders and Initial Incident Commanders during the first moments of response. To make these critical forms readily available, this Appendix of this Plan includes copies of the follow forms for use during incident response:

Below is a sample of the Forms available on the South Bow Intranet.

- ICS Forms
  - ICS 201-CG Incident Briefing
  - ICS 205a-CG Communication List
  - ICS 206-CG Medical Plan
  - ICS 207-CG Incident Organization Chart
  - Initial Health and Safety Plan
  - ICS 211p-OS Check-In List (Personnel)
  - ICS 213 RR-CG Resource Request Message
  - ICS 214 Activity Log
  - ICS 214a-CG Chronology of Events Log
  - ICS 230-CG Daily Meeting Schedule
- Portable Gas Detector Monitoring Measurements Recording Form
- AER Reporting Checklist
- First Call Communication
- AER Release Report
- Public Protection Group Status Summary
- Public Contact Record
- Reception Centre Registration
- Daily Expenses Claim Form
- Evacuee Concerns Record
- Roadblock Record

APPENDIX C - ROLES AND RESPONSBILITIES CHECKLIST

ICS Role Kits are located at on an internal Emergency Management Sharepoint that is accessible to South Bow Employees.

Role Checklists available:

- First Responder's Checklist – Liquid Pipeline Operations
- Incident Commander's Responsibilities & Actions Checklist
- Public Information Officer's Responsibilities & Actions Checklist
- Liaison Officer's Responsibilities & Actions Checklist
- Safety Officer's Responsibilities & Actions Checklist
- Operations Section Chief's Responsibilities & Actions Checklist
- Staging Area Manager's Responsibilities & Actions Checklist
- Air Operations Branch Director's Responsibilities & Actions Checklist
- Planning Section Chief's Responsibilities & Actions Checklist
- Resource Unit Leader's Responsibilities & Actions Checklist
- Situation Unit Leader's Responsibilities & Actions Checklist
- Documentation Unit Leader's Responsibilities & Actions Checklist
- Demobilization Unit Leader's Responsibilities & Actions Checklist
- Environmental Unit Leader's Responsibilities & Actions Checklist
- Logistics Section Chief's Responsibilities & Actions Checklist
- Communication Unit Leader's Responsibilities & Actions Checklist
- Facility Unit Leader's – Responsibilities & Actions Checklist
- Security Manager's Responsibilities & Actions Checklist
- Finance/Administration Section Chief's - Responsibilities & Actions Checklist
- Legal Specialist's Responsibilities & Actions Checklist
- Medical Unit Leader's Responsibilities & Actions Checklist
- Public Protection Group Supervisor's Responsibilities & Actions Checklist
- Reception Centre Team Leader's Responsibilities & Actions Checklist
- Roadblock Team's Responsibilities & Actions Checklist
- Evacuation / Search Team's Responsibilities & Actions Checklist
- Environmental Monitoring Team's Responsibilities & Actions Checklist

APPENDIX D – ACRONYMS AND DEFINITIONS

Acronyms			
AER	Alberta Energy Regulator	KBBLS	1000 X Barrels of Oil
		L	Liter
LFO	Canadian Liquids Field Operations	LOFR	Liaison Officer
cm	Centimeters	LPCC	Liquids Pipelines Control Center
COML	Communications Unit Leader	LSC	Logistics Section Chief
COMP	Compensation Unit Leader	OPBD	Branch Director
CS&E	Community, Safety, and Environment	OSC	Operations Section Chief
DIVS	Division Supervisor	PIO	Public Information Officer
DMOB	Demobilization Unit Leader	PROC	Procurement Unit Leader
DOCL	Documentation Unit Leader	PSAP	Public Safety Answering Point (or 911 dispatch)
ENVL	Environmental Unit Leader	PSC	Planning Section Chief
EOC	Emergency Operations Center		
EPC	Emergency Preparedness Coordinator	RESL	Resource Unit Leader
EPT	Emergency Preparedness Team	SARA	Species at Risk Act
ERG	Emergency Response Guidebook	SCADA	Supervisory Control and Data Acquisition
ERP	Emergency Response Plan	SECM	Security Manager
FACL	Facilities Unit Leader	SITL	Situation Unit Leader
FDUL	Food Unit Leader	SOFR	Safety Officer
FOBS	Field Observer	SPUL	Supply Unit Leader
FSC	Finance/Administration Section Chief	STAM	Staging Area Manager
HS&E	Health, Safety, and Environment	STCR	Strike Team Leader
IAP	Incident Action Plan	SUBD	Support Branch Director
IC	Incident Commander	SVBD	Service Branch Director
ICP	Incident Command Post	TFLD	Task Force Leader
ICS	Incident Command System	THSP	Technical Specialist
IMLV	Intermediate Mainline Valve	TIME	Time Unit Leader
IMT	Incident Management Team	UC	Unified Command

APPENDIX E - DEFINITIONS

Definitions	
Term	**Definition**
Adjacent to	For purposes of Directive 071, within 25m
Discharge	Includes, but is not limited to, any actual or imminent spilling, leaking, pumping, pouring emitting, emptying or dumping of a hazardous substance into the environment.
Drill	A drill is a test of a portion of a facility's ERP and procedures. They are supervised instructional events aimed at testing, developing, and maintaining skills in a particular operation. A drill is often component of an exercise.
Emergency	An unforeseen or imminent event that requires prompt coordination of resources, special communications and/or heightened authority for employees to protect the health, safety or welfare of people, and then to limit damage to property, the environment or to South Bow's operations facilities.
Emergency Response Plan	An Emergency Response Plan is a document that outlines the course of action developed to mitigate the damage of potential events that could endanger an organization's ability to function. Such a plan should include measures that provide for the safety of personnel and, if possible, property and facilities. It should also include provisions to assess the severity of an incident and implement steps to eliminate the problem - for example, contacting firefighters in case of a fire.
Emergency Services	Local emergency response agencies such as police, fire and ambulance services. The term may also include local utility emergency responders.
Environmental Incident	A release or suspected release into the air, on land, or into water of any material or hazardous substance that has the potential to cause damaged to the environment, impact property, or have an adverse effect on public health.
Evacuation	An organized, phased and supervised withdrawal of member people from dangerous or potentially dangerous areas to safe areas.
Event	A planned, non-emergency activity.
Exercise	An exercise typically tests many facets of a site's Facility Response Plan and procedures and of its response organization. Exercises often involve close coordination between the facility and federal, provincial and local emergency response organizations.

Definitions	
Term	**Definition**
First Responder	The first person to come upon an emergency incident. The First Responder is responsible for initiating the emergency response by making appropriate notifications and taking defensive steps to stop or mitigate the situation.
Hazardous Substances	Dangerous goods either in solids liquid, or gaseous form that can harm people, other living organisms, property, or the environment. They are often subject to chemical regulations.
Incident	An occurrence that results in: Death or serious injury to a person; A significant adverse effect on the environment; An unintended fire or explosion; An unintended release of a hazardous substance.
Incident Action Plan	An oral or written plan containing general objectives reflecting the overall strategy for managing an incident. It will include the identification of operational resources and assignments, and attachments that provide direction and important information for management of the incident. An IAP is written to cover a single Operational Period.
Incident Command Post	The location at which the primary tactical-level incident command functions are performed.
Incident Command System	The Incident Command System is a management system used for the command, control, and coordination of emergency response.
Incident Commander	The South Bow employee given the authority to command and control TC operations at the site of an emergency. The IC sets the incident objectives, strategies, and priorities, and has overall responsibility for the incident.
Offsite	That area beyond the asset property boundary.
Oil	Any material including but not limited to petroleum, fuel oil, mineral oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.
Onsite	That area within the asset property boundary.
Operational Period	The period of time scheduled for the execution of a set of operational actions as specified in an Incident Action Plan. An OP can be of various lengths, usually 8 or 12 hours, but no longer than 24 hours.
Resources	Personnel and major items of equipment, supplies and facilities available or potentially available for assignment to incident operations and for which status is maintained.

Definitions	
Term	**Definition**
Tabletop Exercise	A tabletop exercise is defined as an exercise of the response plan and procedures without the actual deployment of response resources. As the name implies, the participants sit round-table and discuss the response to a scenario presented by the Tabletop facilitator. A tabletop is a form of training that allows personnel to familiarize themselves with the emergency documents in a setting that allows them to question and discuss free from the pressure of "active response." The tabletop also provides the participants with a forum for suggestions for procedural and equipment improvements.
Unified Command	Unified command is a form of command structure in the ICS in which responding agencies and/or jurisdictions with responsibility for the incident share incident command and control.