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AND ENVIRONMENTAL HEALTH, LLC

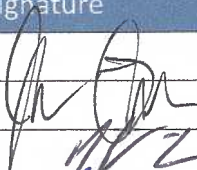
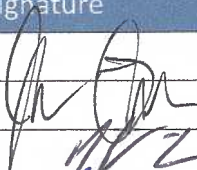
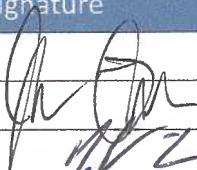
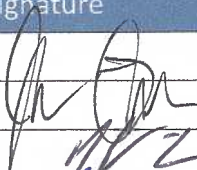
# Site Safety & Emergency Response Plan

For Response Personnel

Poplar Pipeline Release  
Glendive, MT

January 20, 15

v1.0

	Name/Position	Signature	Date Signed
Prepared By:	BJ Fogleman/ESPM		01/19/2015
Reviewed By:	Jacob Fenske/Project Manager		01/19/2015
Approved By:	Kiell Elisson		1/20/15
Approved By:	Paul R. Kerkendall OSC		
Approved By:			
Approved By:			
Approved By:			

## Health & Safety Plan Management of Change

Change 001			
<i>Description of Change (include sections &amp; page numbers):</i>			
	Name/Position	Signature	Date Signed
Prepared By:			
Approved By:			
Change 002			
<i>Description of Change (include sections &amp; page numbers):</i>			
	Name/Position	Signature	Date Signed
Prepared By:			
Approved By:			
Change 003			
<i>Description of Change (include sections &amp; page numbers):</i>			
	Name/Position	Signature	Date Signed
Prepared By:			
Approved By:			

Document	Organization	Sector	Electronic Filename
HASP	CTEH	ER	PoplarPipelineRelease_HASP_v1_0.docx

## 1 SITE INFORMATION

**EFFECTIVE DATE:** 1/20/2015  
**PROJECT NAME:** Poplar Pipeline Release  
**LOCATION:** Glendive, MT

## 2 SITE & EMERGENCY CONTACTS

Emergency Services	Emergency	Contact Information
Fire Dept – Dawson County	911	406-377-2365
Police Dept – Glendive	911	406-377-2364
Ambulance – Glendive	911	406-377-2361
Sheriff's Dept – Dawson County	911	406-377-5291
CTEH-Toxicology	1-866-869-2834	1-866-869-2834

CTEH Contacts	Company	Contact Number
Jacob Fenske – Air Project Manager	CTEH	501-584-8239
Chase Ertzberger – Env Project Manager	CTEH	501-366-0394
Cory Davis – Principal Consultant	CTEH	501-258-7881
Dr. Kelly Scribner – Proj. Technical Director	CTEH	501-516-7524

Project Contacts	Company	Contact Number
Ken Dockweiler	Bridger Pipeline	307-251-5312

## 3 SITE CONTROL

**SITE SECURITY AND ACCESS POINTS:** Site security is being provided as needed by Dawson County Sheriff's Department. Site is accessible via multiple points along the Yellowstone River. HWY 10 should be utilized as the primary access point.

**LOCATION OF EXCLUSION ZONE:** N/A

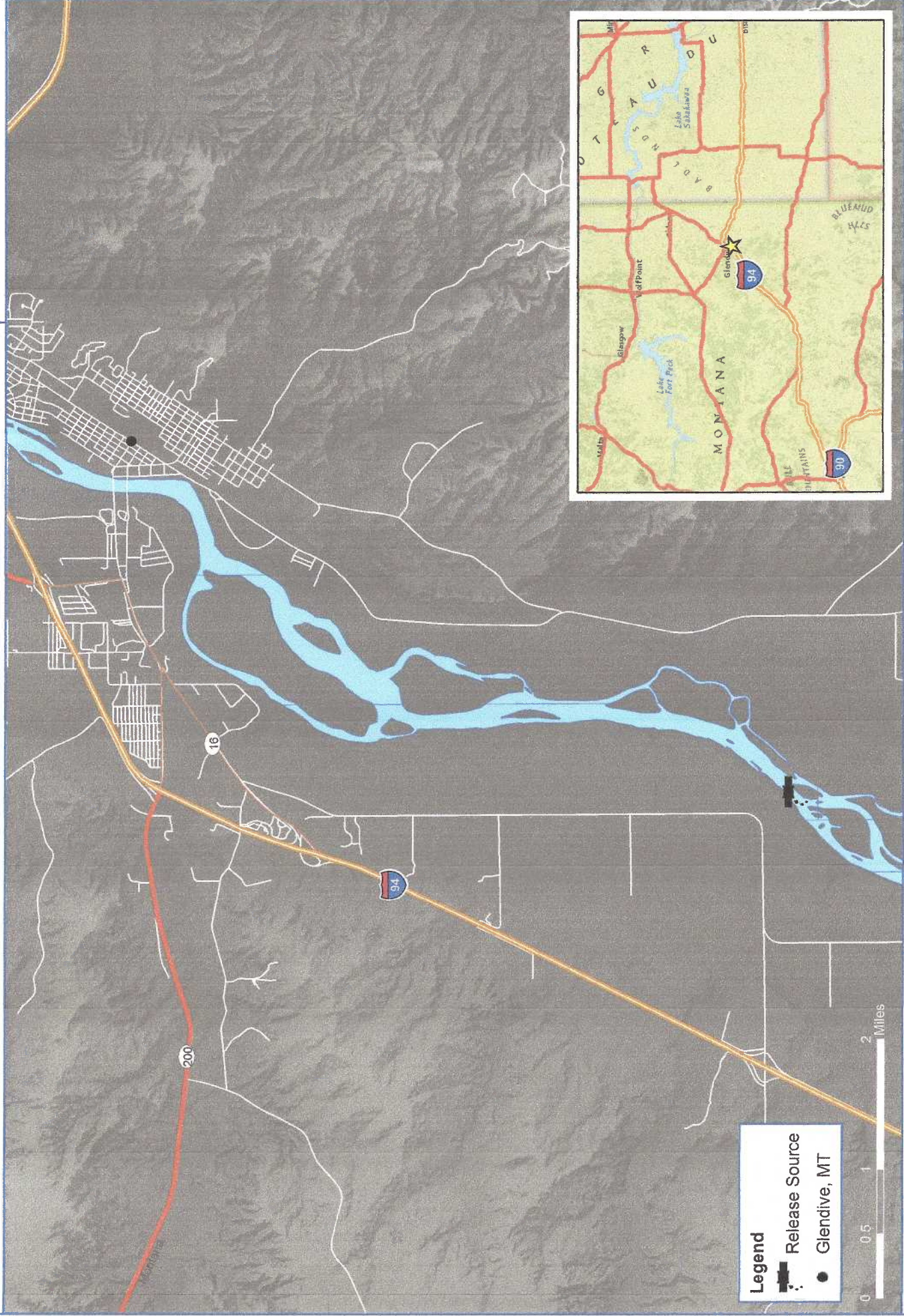
**LOCATION OF CONTAMINANT REDUCTION ZONE:** N/A

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# 4. Poplar Pipeline Release Site Location

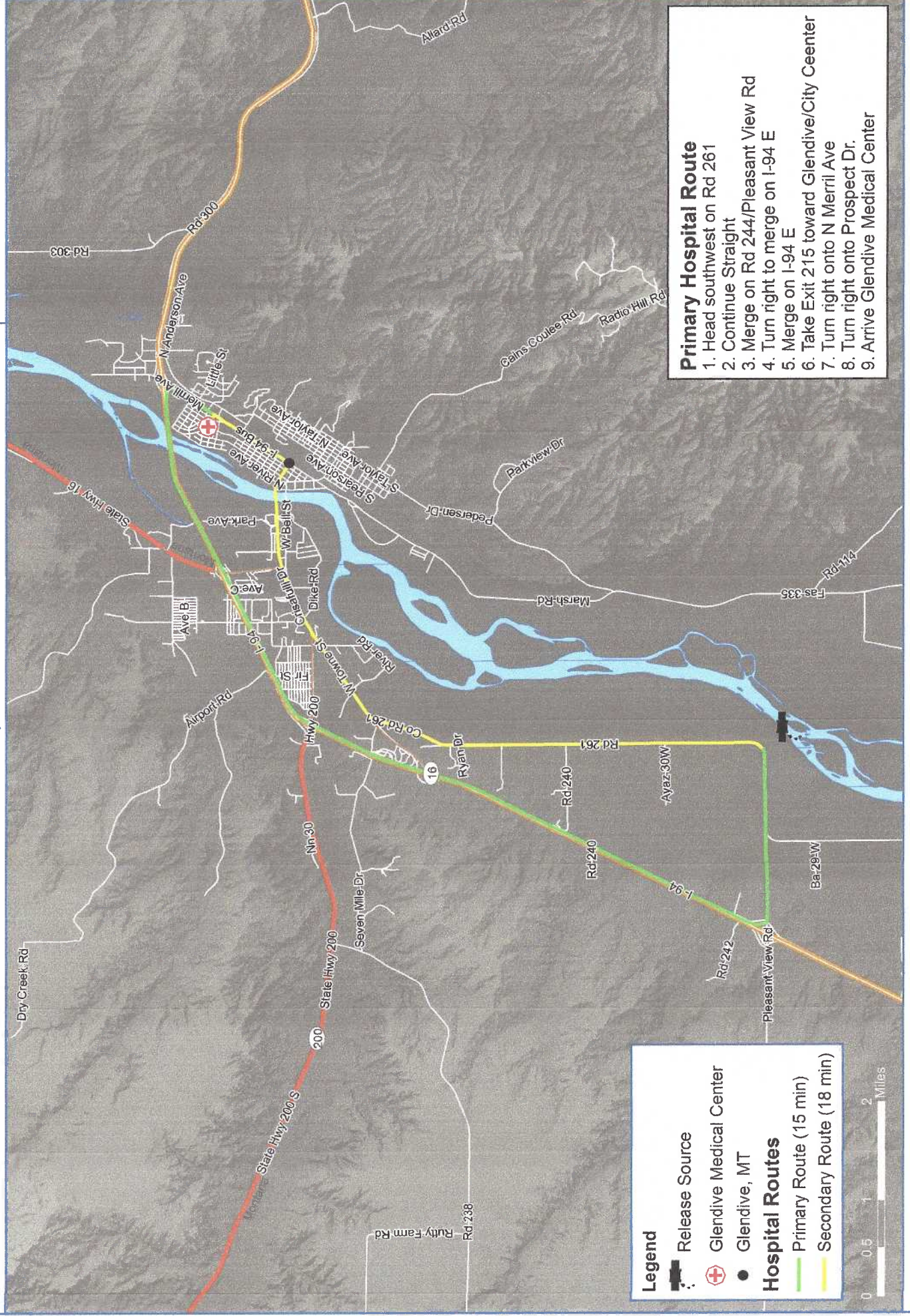
Project: 106955  
Client: Bridger Pipeline  
City: Glendive, MT  
County: Dawson





# 5. Poplar Pipeline Release Release Site Hospital Routes

Project: 106955  
Client: Bridger Pipeline  
City: Glendive, MT  
County: Dawson



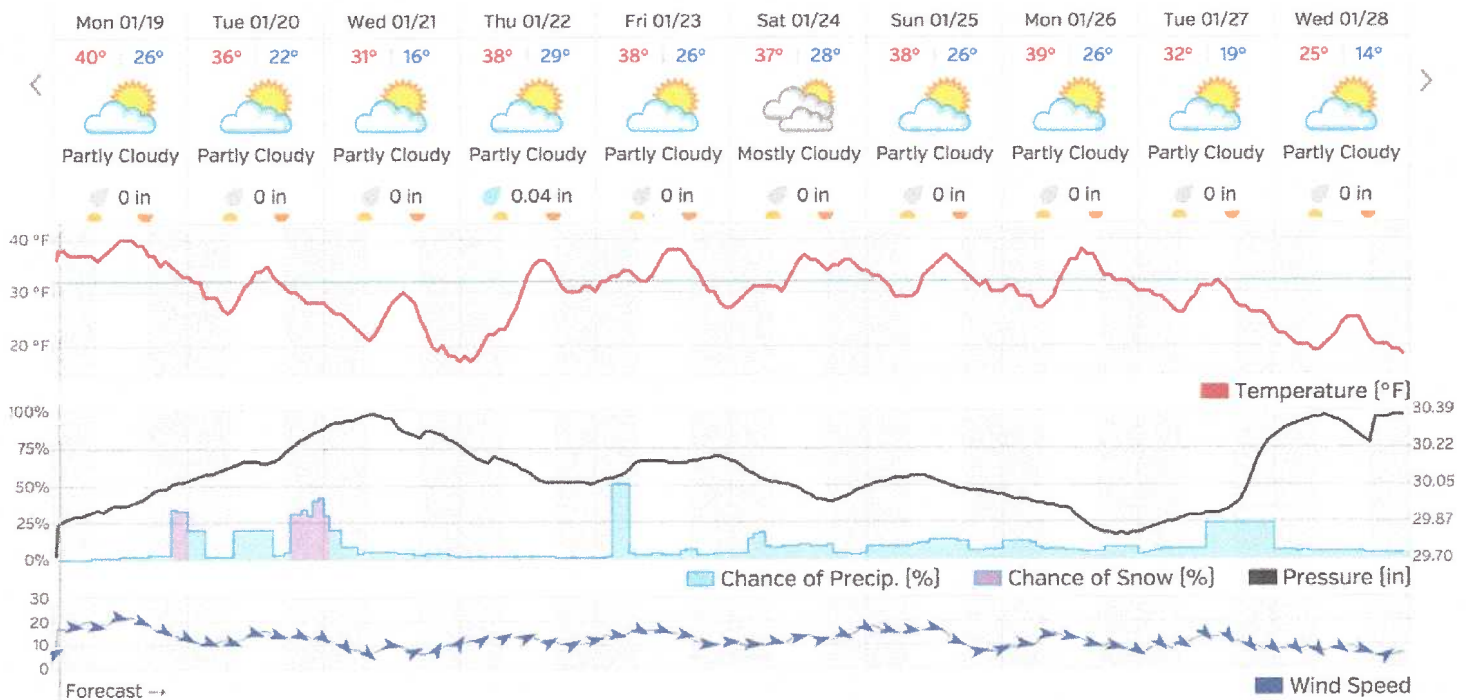


## 6 SITE CHARACTERIZATION

### 6.1.1 Weather & Cold Stress

Over the next three days, temperatures are expected to range from 16 to 40 degrees Fahrenheit, with winds between 10 and 20 mph. Precipitation is possible.

Guidelines for handling cold stress are outlined in Attachment A.



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### 6.1.2 Moving Vehicles

Be cautious of all motor vehicles on site as well as in the community. As a pedestrian, look 360 degrees before walking to identify any moving vehicles in your nearby vicinity.

### 6.1.3 Distracted Driving and Driving Safety

Response personnel must abide by client, state and local regulations and guidelines regarding driving while using cell phones. Under no circumstances are response personnel permitted to text or email while driving. In most cases, response personnel should pull over safely away from traffic to conduct cell phone or radio communications. While on site, cell phone use is only permitted in designated areas.

Response personnel are not permitted to operate a motor vehicle without seatbelts being properly worn. Once you have secured your seatbelt, please adjust your window and driver mirrors. Do not block windows with contents such that your view is obstructed while driving.

### 6.1.4 Railway Hazards

When operating a motor vehicle, look both ways before entering a roadway or crossing intersections. Look for pedestrians on or near roadways.

### 6.1.5 Heavy Equipment

Heavy equipment includes track hoes, bulldozers, dump trucks, vacuum trucks, commercial pickup trucks, and other heavy machinery. Stay outside of the boom radius of any lever-based heavy machinery. See also Moving Vehicles section above.

### 6.1.6 Electrical

Underground power lines, generators, light plants, and plug-in power sources may create the potential for electrical shock or electrocution. Assess all power equipment and power cords for defects. If any electrical equipment is defective, remove it from service.

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### 6.1.7 Fire & Explosion

Crude oil is defined as a Class II combustible liquid. This is based on the various hydrocarbon constituents that compose crude oil and their combined combustible properties. Crude oil can be easily ignited by heat, sparks, or flames. Vapors may form explosive mixtures with air. Vapors may travel to a source of ignition and flash back. Most vapors are heavier than air; they will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. Substance may be transported hot.

**Table 4.1 Combustible Gases & Flammability Limits**

Chemical	Flammability	Flash point	LEL %	UEL %	LEL CF
Benzene	3-Flammable	12°F	1.2	7.8	2.1
Toluene	3-Flammable	40 °F	1.1	7	2.4
n-Hexane	3-Flammable	-7 °F	1.1	7.5	2.1
Hydrogen Sulfide	4-Extremely Flammable	N/A	4.3	46.0	

**Table 4.2 Combustible Gas Detection**

Chemical	Action Level (1% LEL)	PID Correction Factor	PID Action Level* (ppm)	Sensor Action Level** (% of LEL)
Benzene	120 ppm	0.47	255	1
Toluene	110 ppm	0.45	244	1
n-Hexane	110 ppm	4.3	25	1
Hydrogen Sulfide	430 ppm	3.3	130	NA

\* Values listed in table 4.4 under PID Action Level column is derived from the RAE Systems published correction factor for a 10.6 eV PID lamp based on calibration using 100 ppm isobutylene.

\*\* Valued listed in table 4.4 under Sensor Action Level column is derived from the RAE Systems published correction factor for the LEL electrochemical sensor calibrated with 50% methane.

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### 6.1.8 Hot Work

Response operations may include hot work (i.e. cutting or grinding). Due to the fire and explosion hazard from crude oil, WELDING OR USE OF TORCHES IS NOT PERMITTED UNLESS WRITTEN PERMISSION IS OBTAINED FROM THE SITE HEALTH AND SAFETY OFFICER -NO EXCEPTIONS. If hot work occurs, and CTEH® is tasked with providing air monitoring for the hot work permit, ensure that no combustible gas is detected at or near the CTEH Action Levels for the material of concern.

### 6.1.9 Trip Hazards

Uneven, icy, or muddy-slick terrain provides an environment in which slips, trips, and falls should be considered. Be aware of your travel path prior to walking or changing directions. Search for any obstructions that may present as a trip hazard.

### 6.1.10 Noise

Emergency Response work sites are considered non-traditional and often difficult to characterize noise exposures. Please keep hearing protection readily accessible. For work areas experiencing high noise levels (greater than 90 dB) and/or impact noise (greater than 140 dB), please utilize hearing protection.

### 6.1.11 Water Hazards

Employees working in areas unprotected by passive fall protection systems (OSHA specified railings or nets) where the danger of drowning exists must wear a U.S. Coast Guard-approved life jacket or buoyant work vest, commonly referred to as a personal flotation device (PFD). However, this regulation can be superseded with the use of 100% fall protection. If an employee cannot fall into the water as a result of use of active or passive fall protection, there is no danger of drowning, and a PFD is not required. For example, where an employee is working on a steep slope and could fall into water, a PFD is required. Safety lines that prevent employees from reaching the water eliminate the danger of drowning and negate the need for a PFD. The same is true when working on a barge or floating platform with an approved railing system.

### 6.1.12 Inclement Weather

In the event of stormy weather, response personnel should evaluate weather conditions such as lightning and wind. Response personnel should seek shelter if lightning is observed at a distance of 10

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miles or closer. Lightning distances can be estimated using hand-held instruments or by counting the seconds from visible lightning and the corresponding thunder. Lightning stand-downs should be communicated to the CTEH Project Manager to await further instructions.

For marine-based job tasks, response personnel must be able to egress to shelter, off-water, at the first sign of lightning. If winds increase, site marine-safety officials should evaluate wind speeds to determine if marine-based work is safe. If response personnel are uncomfortable with the wind speeds while performing marine-based tasks, communications should be made to the CTEH Project Manager to assist in their egress while supplementing the need for personnel with other means of air or environmental monitoring.

#### 6.1.13 Chemical Hazards

**Table 6.1.1 Occupational Exposure Standards and Guidelines for Constituents of Crude Oil**

Chemical	OSHA PEL		ACGIH TLV		Additional
	TWA <sup>a</sup> (ppm)	STEL/CEIL (C) <sup>b</sup> (ppm)	TWA <sup>c</sup> (ppm)	STEL/CEIL (C) <sup>d</sup> (ppm)	
Benzene	1	5	0.5	2.5	URT, eye & skin Irr; carcinogen
Toluene	200	300 (C); 500*	20	-	Visual impair
n-Hexane	500	-	50	-	CNS impair; URT, eye irr
Hydrogen Sulfide	-	20 (C); 50*	1	5	URT irr; CNS impair

\* 10 minute peak; once per 8 hour shift

- a. OSHA PEL-TWA = The permissible concentration in air of a substance that shall not be exceeded in an 8-hour work shift or a 40-hour work week (OSHA 29 CFR: 1910.1000).

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- b. OSHA PEL-STEL = The time-weighted average exposure that should not be exceeded for any 15-minute period (OSHA 29 CFR: 1910.1000).  
OSHA PEL-Ceiling = The exposure limit that shall at no time be exceeded. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time-weighted average (TWA) exposure, which shall not be exceeded at any time during the working day. (OSHA 29 CFR: 1910.1000).
- c. ACGIH TLV-TWA = The Threshold Limit Value-TWA is the concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect (ACGIH, 2014c).
- d. ACGIH TLV-STEL = The STEL exposure limit is a 15 minute time weighted exposure that should not be exceeded at any time during a work day. (ACGIH, 2014c).  
ACGIH TLV-Ceiling = The ceiling exposure limit is the to which workers cannot be exposed to for any period of time (ACGIH, 2014c).

#### 6.1.14 Dermal Contact Hazards

Crude oil may cause contact dermatitis if exposed to skin for prolonged periods. Avoid skin contact with crude oil with the use of appropriate chemical resistant gloves, boots, and coveralls. If skin contact occurs, wash with copious amounts of water for at least 15 minutes. Remove any contaminated clothing and discard. If redness or other irritation symptoms persist, seek medical attention.

#### 6.1.15 Eye Protection

Vapors originating from volatiles contained in crude oil may be irritating to the eyes. As benzene is the primary chemical of concern due to its low exposure standard, air-purifying full-face respirators should be worn if concentrations exceed 0.5 ppm based on the ACGIH TLV-TWA exposure guideline.

If any product gets in your eyes, wash your eyes immediately with copious amounts of water, lifting the lower and upper lids occasionally. Once first aid (flushing) has been administered, seek medical attention immediately.

The site also may include dusty conditions or particulate hazards from other sources. If dusty conditions are present, helmet-mounted goggles should replace safety glasses to further protect your eyes from particulate-induced eye injury.

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## 7 WORK PLAN

### 7.1.1 Personal Protection Requirements

The following are the defined levels of PPE required. These levels may be modified depending on specific site conditions or job tasks as determined by the Project Manager.

- Level A- Fully encapsulated chemical resistant suit, air-supplied respirator, inner/ outer gloves, over boots, and two-way communications
- Level B- SCBA (or Airline with escape pack), Nomex, Sarnex or Coated Tyvex, chemical resistant boots, chemical resistant gloves, and hard hat.
- Level C- Full/half face air purifying respirator, Nomex or Coated Tyvex, chemical resistant (or safety toe) boots, chemical resistant gloves, eye protection, and hard hat.
- Level D- Hard hat, eye protection, foot protection, hearing protection, and FRC. Level D PPE also includes helmet-mounted eye protection goggles.

**Table 7.1.1 CTEH PPE Matrix – Suggested Personal Protective Equipment**

Job Task	Level	Work Zone	Environment	Respirator	CPC	Gloves/Boots
<b>Benzene</b>						
General Air Monitoring	D	Work Area/Community	Conc<0.5 ppm	None	None	Safety-toed boots
Air Monitoring w/ vapor exposure (moderate conc)	C	Work Area	Conc>0.5 ppm but less than 25 ppm (APF of 50)	SCOTT AV2000 742 MPC OVM	Tychem TF, C3, BR, LV, RC, TK, RF	Nitrile
Air Monitoring w/ vapor exposure (high conc)	B	Work Area	Conc ≥ 25 ppm (IDLH applied)	SCBA or airline respirator w/ 10 min escape	Tychem TF, C3, BR, LV, RC, TK, RF	Nitrile
<b>Toluene</b>						
General Air Monitoring	D	Work Area/Community	Conc<20 ppm	None	None	Safety-toed boots
Air Monitoring w/ vapor exposure (low conc)	C	Work Area	Conc ≥ 20 ppm but less than 500 ppm (IDLH Applied)	SCOTT AV2000 742 MPC OVM	Tychem BR, LV, RC, TK, RF	Nitrile

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Job Task	Level	Work Zone	Environment	Respirator	CPC	Gloves/Boots
Air Monitoring w/ vapor exposure (high conc)	B	Work Area	Conc $\geq$ 500 ppm (IDLH Applied)	SCBA or airline respirator w/ 10 min escape	Tychem BR, LV, RC, TK, RF	Nitrile
n-Hexane						
General Air Monitoring	D	Work Area/ Community	Conc < 50 ppm	None	None	Safety-toed boots
Air Monitoring w/ vapor exposure (low conc)	C	Work Area	Conc $\geq$ 50 but less than 1,100 ppm (IDLH applied)	SCOTT AV2000 742 MPC OVM	Tychem BR, LV, RC, TK, RF	Nitrile
Air Monitoring w/ vapor exposure (high conc)	B	Work Area	Conc $\geq$ 1,100 ppm (IDLH applied)	SCBA or airline respirator w/ 10 min escape	Tychem BR, LV, RC, TK, RF	Nitrile
Hydrogen Sulfide						
General Air Monitoring	D	Work Area/ Community	Conc < 1 ppm	None	None	Safety-toed boots
Air Monitoring w/ vapor exposure (low conc)	C	Work Area	Conc $\geq$ 1 ppm but less than 50 (APF of 50)	SCOTT AV2000 742 MPC OVM	Tychem BR, LV; Zytron 500	Nitrile
Air Monitoring w/ vapor exposure (high conc)	B	Work Area	Conc $\geq$ 50 ppm (APF of 50)	SCBA or airline respirator w/ 10 min escape	Tychem BR, LV; Zytron 500	Nitrile

### 7.1.2 RESPIRATORY PROTECTION PLAN

The objective of this Respiratory Protection Plan is to provide guidance for the use of respiratory protection as a means of reducing worker exposure to the chemical hazards associated with the response and remediation efforts of the impacted areas.

Guidance for respiratory protection provided herein is based on the Occupational Safety and Health Administration (OSHA) respiratory protection standard 29 CFR 1910.134. All workers that use respiratory protection in accordance with this plan must meet the minimum requirements outlined in 29 CFR 1910.134, which include but are not limited to:

- **Worker must have been trained on how to select respiratory protection.**
- **Worker must have passed an acceptable medical evaluation including a pulmonary function test (PFT).**

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- Workers must have been fit-tested for the respirator (make and model) being used.
- Workers must have been trained on proper methods for cleaning, disinfecting, storing, inspecting, repairing, and discarding respirators.

### 7.1.3 CHEMICAL HAZARDS REQUIRING RESPIRATOR

**Table 7.1.2 Occupational Exposure Guidelines & Action Levels**

Chemical	OSHA (ppm)			ACGIH (ppm)		CTEH Action Level (ppm)
	PEL-TWA	PEL-STEL	PEL-CEIL	TLV-TWA	TLV-STEL (C)	
Benzene (ppm)	1	5	0.5	2.5	0.5	0.5/ 8-hr, 2.5/ 15-min

Benzene is considered the primary inhalation hazard of the chemical constituents of crude oil. Acute or sub-acute respiratory effects include upper respiratory and mucous membrane irritation. Respiratory protection guidelines recommended in this section area based on the ACGIH benzene TLV-TWA and STEL of 0.5 ppm and 2.5 ppm respectively.

### 7.1.4 RESPIRATORY PROTECTION GUIDELINES

The following are the CTEH Action Levels for the benzene. These guidelines are only recommendations and should not be relied upon when site conditions suggest additional protection may be necessary.

**Table 7.1.3 Action Level Based Respiratory Protection Criteria**

Respirator Selection Criteria		
Chemical	Don Full-Faced APR	Don SCBA
Benzene	≥ 0.5 ppm*	≥ 25 ppm*

\* These action levels are based on persistent exposure, which does not include instantaneous or episodic exceedances.

### 7.1.5 Regulated Area & Critical Operations

Based on the potential presence of benzene vapor, as per OSHA 29 CFR 1910.1028, a regulated area will be established for locations where >0.5 ppm benzene vapor is sustained. This regulated area will be designated using caution tape and signage. Respiratory protection must be used for those entering

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the regulated area. At a minimum, a **full-faced APR equipped with cartridges compatible for protection against benzene is required for all entrants into the regulated area.**

For critical operations where there is a potential for elevated acute exposures to volatiles contained in crude oil (>2.5 ppm for 15 min), SCBA should be used. Some examples of critical operations include, but are not limited to:

- **Impacted soil excavation**
- **Product transfer**
- **Environmental sampling**

#### 7.1.6 Cartridge Breakthrough Schedules for APR

The following respirator breakthrough schedules are based on the wearer of Scott AV3000 full-faced APR with 742 OVM cartridges. For workers wearing APR other than the Scott AV3000 full-faced APR, please reference the appropriate manufacturer recommended cartridge change out schedules prior to use.

As a general rule, cartridges that have been removed from their sealed container and installed onto the APR, regardless of the chemical concentration in air, should be replaced prior to the start of next shift.

If required, response personnel will utilize the SCOTT AV3000 Full-faced Air Purifying Respirator in Modified Level D and Level C applications. This APR utilizes the 742 OVM P100 acid gas cartridges. This cartridge is resistant to oils and filters particulates of 0.3 um in aerodynamic diameter with 99.97% efficiency.

For level B applications, response personnel will utilize the pressure demand SCOTT AV3000 SCBA pack or pressure demand supplied airline respirator.

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**SureLife**  
Cartridge Calculator

**SCOTT**  
SAFETY

January 28, 2013

7:07:26 PM

American Central Time (GMT-UTC - 6)

USA

2920

## USER DETAILS

Scott Skelton  
5018018610  
sskelton@cteh.com

CTEH  
5120 North Shore , , North Little Rock, AR,  
USA-English 72118

## RESPIRATOR

<b>Category</b>	<b>Air Purifying (APR)</b>
<b>Certification</b>	<b>NIOSH 42 CFR pt 84</b>
<b>Mask</b>	<b>AV2000</b>
Part Number	804069-xx
Mask Type	Full Facepiece
Protection Factor	50
<b>Cartridge</b>	<b>742 MPC P100 PLUS</b>
Part Number	7422-SD1
Protection	P100, OV, SD, HC, CD, CL, HS, HF, FM, AM, MA
<b>Connector</b>	<b>742 Series 1/4 Turn Adapter</b>
Part Number	805622-01
<b>Blower</b>	<b>Not Required</b>
Part Number	

## CONTAMINANTS

Contaminant	Site Concentration (ppm)	Exposure Limit (ppm)
*# Benzene	25	0.5

\* Limiting Contaminant  
# Eye Irritant

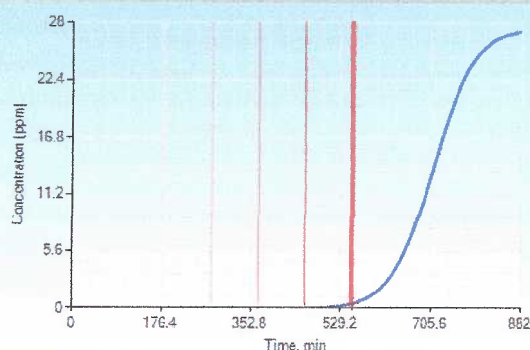
## SITE CONDITIONS

Temperature (°F)	65 ±5%
Relative Humidity (%)	75 ±10%
Atmospheric Pressure (atm)	1 ±1%
Average Breathing Rate (lpm)	40 ±10%

**SERVICE LIFE** = 551 MIN (9.2 HR)

**SAFETY FACTOR** = 52.2 %  
Hazard Ratio = 50  
Maximum Use Concentration = 25 PPM  
Protection Factor = 50

BENZENE - CONCENTRATION PROFILE



This software is intended to be used as part of an organized respiratory protection program. Improper use of the information provided by this software may result in injury or death.

\* Please read the Disclaimer on the next page.

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### 7.1.7 Dermal Protection Plan

For work activity where dermal exposure to crude oil may occur, dermal protection must be used to prevent skin contact. Full-faced respirators should be used to protect the eyes and face. Chemical resistant coveralls, with hood, should be used to prevent skin contact to the head, neck, extremities, trunk and feet, if appropriate. Gloves and boot seams must be taped with chemical resistant tape. Taped seams must be applied and inspected prior to working in dermal protective PPE.

See the CTEH PPE matrix for recommended protective gear.

## 8 DECONTAMINATION

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**General Guidelines:** Effective decontamination procedures shall be practiced to ensure the spread of any released material is controlled to minimize the effects to employees, the public, or the environment.

**Decontamination Solutions:** The use of soap and water solution will be appropriate in cases of severe contamination. The use of commercial hand cleaners (D&L, GOJO, Fast Orange, etc.) is authorized to remove hydrocarbons that have contacted the skin. Environmental and Safety personnel will permit solvents for use on equipment and tools upon review of the MSDS. All decontamination solutions are to be contained and collected for proper disposal.

## 9 AIR SAMPLING

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See CTEH Air Sampling and Analysis Plan for extensive detail.

## 10 MEDICAL SURVEILLANCE

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For benzene:

### 1910.1028(i)(1)(i)

The employer shall make available a medical surveillance program for employees who are or may be exposed to benzene at or above the action level 30 or more days per year; for employees who are or may be exposed to benzene at or above the PELs 10 or more days per year; for employees who have been exposed to more than 10 ppm of benzene for 30 or more days in a year prior to the effective date of the standard when employed by their current employer.

### 1910.1028(i)(1)(ii)

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The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician and that all laboratory tests are conducted by an accredited laboratory.

#### 1910.1028(i)(1)(iii)

The employer shall assure that persons other than licensed physicians who administer the pulmonary function testing required by this section shall complete a training course in spirometry sponsored by an appropriate governmental, academic or professional institution.

#### 1910.1028(i)(1)(iv)

The employer shall assure that all examinations and procedures are provided without cost to the employee and at a reasonable time and place.

#### 1910.1028(i)(4)

Emergency examinations.

#### 1910.1028(i)(4)(i)

In addition to the surveillance required by (i)(1)(i), if an employee is exposed to benzene in an emergency situation, the employer shall have the employee provide a urine sample at the end of the employee's shift and have a urinary phenol test performed on the sample within 72 hours. The urine specific gravity shall be corrected to 1.024.

#### 1910.1028(i)(4)(ii)

If the result of the urinary phenol test is below 75 mg phenol/L of urine, no further testing is required.

#### 1910.1028(i)(4)(iii)

If the result of the urinary phenol test is equal to or greater than 75 mg phenol/L of urine, the employer shall provide the employee with a complete blood count including an erythrocyte count, leukocyte count with differential and thrombocyte count at monthly intervals for a duration of three (3) months following the emergency exposure.

## 11 EDUCATION & TRAINING

Personnel are required to be trained in accordance with 29CFR 1910.120 for the level at which they are performing duties.

Site specific training required:

In addition to the training requirements above, the following site specific training topics are to be reviewed prior to work on the site:

- ☒ Site Hazards (material released, physical hazards, etc.)
- ☒ Work areas / activities identified
- ☒ Site Emergency Alerting / Contingency Plan
- ☒ Evacuation Route / Assembly Areas
- ☒ Required PPE

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- ☒ Obtaining Medical Treatment / First Aid  
☒ Decontamination procedures  
☒ Buddy System  
☐ Confined Space  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

Site safety briefings will be completed each day, documented, and kept on file.

## 12 SAFETY EQUIPMENT, LOCATION, RESPONSIBILITY

Safety Equipment	Location	Responsibility
<b>First Aid Kit</b>	Command	First Aid/CPR trained CTEH personnel may use this kit to administer first aid as necessary.
<b>Fire Extinguisher</b>	Command	Fire Extinguisher trained CTEH personnel may use this to extinguish small, manageable fire. Do not attempt to extinguish chemical fires based on compatibility, nor large fires for which the extinguisher is incapable of mitigating. For chemical fires or large fires, contact the fire dept.
<b>Communication</b>	On CTEH personnel	Two-way radios and cell phones shall be used to maintain constant communication for all CTEH personnel.
<b>Sanitation</b>	Throughout site	Portable latrines or designated restroom facilities should be used accordingly.
<b>Lighting</b>	Throughout site and on CTEH personnel	Portable light plants should be used to illuminate the work area during dark or night operations. CTEH personnel should also be equipped with flashlights or headlamps during dark or night

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operations.

## 13 CONTINGENCY PLANS

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In the event of an emergency (at this incident site) the person first observing the emergency should notify other workers in the immediate area. Evacuation should commence at once if the emergency poses any threat to the safety of the workers. Upon receiving notification of an emergency, the individual in charge of the work area should take appropriate measures to protect human life, the environment (including wildlife) and property.

Escape Routes:

Evacuation or escapes routes will be designated on-site and communicated to CTEH personnel during shift safety briefings.

Three long air horn blasts at the release site will indicate that site conditions are no longer safe and workers should egress as directed. Communicate through two-way radios and/or cell phones.

## 14 NOTIFICATION NUMBERS

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### NATIONAL / REGIONAL SOURCES OF ASSISTANCE

CHEMTREC	1-800-424-9300
National Response Center	1-800-424-8802

## 15 AMENDMENTS TO SITE SPECIFIC HEALTH & SAFETY PLAN

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- A. This Site-specific Health and Safety Plan is based on information available at the time of preparation. Unexpected conditions may arise which necessitate changes to this plan. Unplanned activities and/or changes in the hazard status should initiate a review of major changes in this plan.
- B. Changes in the hazard status or unplanned activities are to be submitted on "Amendments to Site-specific Health and Safety Plan" which is included as Page 1 of this plan.
- C. Amendment must be approved by the Site Safety Officer prior to implementation of amendment.

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- i. All notes and documentation, records must NOT be discarded after their use. Documents are to be submitted to History Person (Finance Section) for record retention.

## 16 SITE SAFETY PLAN PREPARATION

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- |  |                        |
|--|------------------------|
| A. Prepared By: BJ Fogleman/ESPM             | Date: January 19, 2015 |
| B. Reviewed by: Jacob Fenske/Project Manager | Date: January 19, 2015 |
| C. Approved by: Kelly Scribner/PTD           | Date: January 19, 2015 |

Kelly Scribner  
(print)

Kelly Scribner  
(signed)

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## 17 SIGN-IN

[illegible]

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CENTER FOR TOXICOLOGY  
AND ENVIRONMENTAL HEALTH,LLC

# Attachment A:

## Poplar Pipeline Release

### Cold Stress and Hypothermia Prevention Plan

Glendive, MT

Prepared By:

Center for Toxicology and Environmental Health, L.L.C.

5120 North Shore Blvd

Little Rock, AR 72118

501-801-8500

[www.CTEH.com](http://www.CTEH.com)

January 20, 15

v1.0

	Name/Position	Signature	Date Signed
Prepared By:	Scott Skelton, MS, CIH		1-2-2013
Reviewed By:	BJ Fogleman/ESPM		January 19, 2015
Approved By:			
Approved By:			
Approved By:			
Approved By:			
Approved By:			

## 1 Work Environment and Weather Conditions

The weather forecast for Glendive, MT includes ambient temperatures ranging from -3 C to 6 C (17 to 43 degrees Fahrenheit). Winds are expected to blow 10 km/h to 35 km/h (6 – 24 mph) from the south, southeast. The American Conference of Industrial Hygienists has developed a wind chill chart that estimates the equivalent wind chill temperature (in degrees Celsius) based on ambient temperature vs. wind. Based on the lowest predicted ambient temperature and the greatest predicted wind velocity, the resultant equivalent chill temperature on 1/19/2015 is expected to be near 31 degrees Celsius.

Table 1 ACGIH TLV Wind Chill Chart

WIND CHILL CHART										
		Ambient Temperature (°C)								
		4	-1	-7	-12	-18	-23	-29	-34	-40
Wind km/h	Velocity mph	Equivalent Chill Temperature (°C)								
Calm										
0	0	4	-1	-7	-12	-18	-23	-29	-34	-40
8	5	3	-3	-9	-14	-21	-26	-32	-38	-44
16	10	-2	-9	-16	-23	-30	-35	-43	-50	-57
24	15	-6	-13	-20	-28	-36	-43	-50	-58	-65
32	20	-8	-16	-23	-32	-39	-47	-55	-63	-71
40	25	-9	-18	-26	-34	-42	-51	-59	-67	-76
48	30	-16	-19	-22	-36	-44	-53	-62	-70	-78
56	35	-11	-20	-29	-37	-46	-55	-63	-72	-81
64	40	-12	-21	-29	-38	-47	-56	-65	-73	-82

Adapted from: Threshold Limit Values (TLV™) and Biological Exposure Indices (BEI™) booklet; published by ACGIH, Cincinnati, Ohio

Little danger in less than one hour exposure of dry skin

Maximum danger of false sense of security

DANGER – Exposed flesh freezes within one minute

GREAT DANGER – Flesh may freeze within 30 seconds

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## 2 Description of Cold Stress Hazards, Symptoms & First Aid

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The information included in Section 2 is from the Centers for Disease Control Workplace Safety & Health Topics for Cold Stress.

### 2.1 Hypothermia

When exposed to cold temperatures, your body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up your body's stored energy. The result is hypothermia, or abnormally low body temperature. A body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it.

#### Symptoms

Symptoms of hypothermia can vary depending on how long you have been exposed to the cold temperatures.

Early Symptoms:

- Shivering
- Fatigue
- Loss of coordination
- Confusion and disorientation
- Late Symptoms
- No shivering
- Blue skin
- Dilated pupils
- Slowed pulse and breathing
- Loss of consciousness

#### First Aid

Take the following steps to treat a worker with hypothermia:

- Alert the supervisor and request medical assistance.
- Move the victim into a warm room or shelter.
- Remove their wet clothing.
- Warm the center of their body first-chest, neck, head, and groin-using an electric blanket, if available; or use skin-to-skin contact under loose, dry layers of blankets, clothing, towels, or sheets.

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- Warm beverages may help increase the body temperature, but do not give alcoholic beverages. Do not try to give beverages to an unconscious person.
- After their body temperature has increased, keep the victim dry and wrapped in a warm blanket, including the head and neck.
- If victim has no pulse, begin cardiopulmonary resuscitation (CPR).

## 2.2 Cold Water Immersion

Cold-water immersion creates a specific condition known as immersion hypothermia. It develops much more quickly than standard hypothermia because water conducts heat away from the body 25 times faster than air. Typically people in temperate climates don't consider themselves at risk from hypothermia in the water, but hypothermia can occur in any water temperature below 70°F. Survival times can be lengthened by wearing proper clothing (wool and synthetics and not cotton), using a personal flotation device (PFD, life vest, immersion suit, dry suit), and having a means of both signaling rescuers (strobe lights, personal locator beacon, whistles, flares, waterproof radio) and having a means of being retrieved from the water.

## 2.3 Frostbite

Frostbite is an injury to the body that is caused by freezing. Frostbite causes a loss of feeling and color in the affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage body tissues, and severe cases can lead to amputation. In extremely cold temperatures, the risk of frostbite is increased in workers with reduced blood circulation and among workers who are not dressed properly.

### Symptoms

Symptoms of frostbite include:

- Reduced blood flow to hands and feet (fingers or toes can freeze)
- Numbness
- Tingling or stinging
- Aching
- Bluish or pale, waxy skin

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### First Aid

Workers suffering from frostbite should:

- Get into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on frostbitten feet or toes-this increases the damage.
- Immerse the affected area in warm-not hot-water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Warm the affected area using body heat; for example, the heat of an armpit can be used to warm frostbitten fingers.
- Do not rub or massage the frostbitten area; doing so may cause more damage.
- Do not use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator for warming. Affected areas are numb and can be easily burned.

## 2.4 Trench Foot

Trench foot, also known as immersion foot, is an injury of the feet resulting from prolonged exposure to wet and cold conditions. Trench foot can occur at temperatures as high as 60 degrees F if the feet are constantly wet. Injury occurs because wet feet lose heat 25-times faster than dry feet. Therefore, to prevent heat loss, the body constricts blood vessels to shut down circulation in the feet. Skin tissue begins to die because of lack of oxygen and nutrients and due to the buildup of toxic products.

### Symptoms

Symptoms of trench foot include:

- Reddening of the skin
- Numbness
- Leg cramps
- Swelling
- Tingling pain
- Blisters or ulcers
- Bleeding under the skin
- Gangrene (the foot may turn dark purple, blue, or gray)

### First Aid

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Workers suffering from trench foot should:

- Remove shoes/boots and wet socks.
- Dry their feet.
- Avoid walking on feet, as this may cause tissue damage.

## 2.5 Chilblains

Chilblains are caused by the repeated exposure of skin to temperatures just above freezing to as high as 60 degrees F. The cold exposure causes damage to the capillary beds (groups of small blood vessels) in the skin. This damage is permanent and the redness and itching will return with additional exposure. The redness and itching typically occurs on cheeks, ears, fingers, and toes.

### Symptoms

Symptoms of chilblains include:

- Redness
- Itching
- Possible blistering
- Inflammation
- Possible ulceration in severe cases

### First Aid

Workers suffering from chilblains should:

- Avoid scratching
- Slowly warm the skin
- Use corticosteroid creams to relieve itching and swelling
- Keep blisters and ulcers clean and covered

## 3 Controls for Protection Against Cold Stress & Hypothermia

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This section outlines reasonable control measures designed to prevent cold stress and hypothermia. This section only includes recommendations; therefore, field judgment may be required for

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circumstances that do not clearly meet the constraints provided herein. The control measures stated below have been derived from the ACGIH TLV Manual.

- For exposed skin, continuous exposure should not be permitted when the wind speed and the ambient temperature produce a resultant equivalent wind chill temperature of -32 degrees C.
- For workers who have become wet or immersed in water at temperatures of 2 degrees C or less, treatment for hypothermia must be administered. This includes a complete exchange of wet clothes for dry clothes. Workers should be kept in a warm, dry area during their hypothermia treatment.

### 3.1 Prevention of Cold Stress to Bare Hands

- For fine work in temperatures below 16 degrees C, auxiliary heating units such as warming fans, radiant heaters or contact warm plates should be used.
- For work in temperatures below 16 degrees C for sedentary, 4 degrees C for light, and -7 degrees C for moderate work, gloves must be worn.

### 3.2 Prevention of Frostbite

- When work is being performed on surfaces that are below -7 degrees C, contact with bare skin should be prevented. Gloves are required.
- If the air temperature is -17.5 degrees C or below, hands should be protected with mittens (gloves are not sufficient).

### 3.3 Prevention of Total Body Cold Stress

- Based on the forecasted temperatures and the likely presence of above average wind speeds, workers should use wind-blocking garments, such as Gore-Tex®. Wind blocks may be provided as well.
- In the presence of high humidity, snow, rain, ocean-spray, or mist, workers should be equipped with a waterproof outer layer. Workers should not be permitted to work in wet environments with non-waterproof outer garments.

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- Workers should not work at a work rate, nor wear such insulation that causes sweating. Garments should be equipped with ventilation such that a vigorous work rate does not cause sweat to dampen the layers of clothing closest to their body.
- Workers handling evaporative liquids (such as gasoline, alcohol, or solvent-based cleaning fluids) should take special precautions not to soak their gloves or clothing. If soaking occurs, the impacted gloves or garments must be replaced immediately.

## 4 Work-Warming Regimen

This section includes recommendations for providing a warm-up schedule for workers exposed to cold environments. In each work area, shelter should be provided in a manner that provides easy access and is reasonably close to the area(s) where work is to be performed. Controlled indoor environments are preferred; however, if a controlled indoor environment is not available, special heating shelters should be provided. The following items should be considered:

- A buddy system should be used so that workers can monitor each other's signs and symptoms of imposing cold stress.
- The work rate should not be so high that workers begin to sweat. If heavy work must be done, rest periods should be considered to avoid excessive sweating and provide workers opportunities to change from dampened clothes to dry clothes.

The ACGIH TLV manual provides a work-warming schedule designed to reduce worker exposure to conditions conducive to cold stress or hypothermia. Special considerations should be given to establishing a work-warming schedule that meets or exceeds the conditions included in Table 4 below.

Table 4 ACGIH TLV Work/Warm-Up Schedule for a 4-Hour Shift

Air temperature – Sunny sky		No noticeable wind		8 km/h wind		16 km/h wind		25 km/h wind		30 km/h wind	
°C (approx.)	°F (approx.)	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks
-26° to -28°	-15° to -19°	(Norm. breaks) 1	1	(Norm. breaks) 1	1	75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Norm. breaks) 1	1	75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min	3	40 min	4	30 min	5				
-38° to -39°	-35° to -39°	40 min	4	30 min	5	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease			
-43° & below	-45° & below	Non-emergency work should cease									

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NOTES:

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of 10 minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For light-to-moderate work (limited physical movement), apply the schedule one step lower in the table. For example, at -35° C (-30° F) with no noticeable wind (Step 4), a worker in a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 8 km/h – light flag moves; 16 km/h – light flag fully extended; 25 km/h – raises newspaper sheet; 30 km/h – blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factor given above would be: (1) special warmup breaks should be initiated at a wind chill cooling rate of about 1750 W/m<sup>2</sup>; (2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart over-compensates for the actual temperatures in the colder ranges because windy conditions rarely prevail at extremely low temperatures.
4. TLVs apply only to workers in dry clothing. Refer to the “Cold Stress” section of the current Threshold Limit Values and Biological Exposure Indices publication for further information

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