CAPSTONE INFRASTRUCTURE

Kneehill Solar

2023

KNEEHILL SOLAR

EMERGENCY RESPONSE PLAN

Revision History

Revision	Date	Description	Prepared by	Reviewed by
0	15 March 2023	Initial Release	Volkan Goklerinoglu	Justin Longlade
1	15 October 2023	Cover Photo and Emergency Contacts List Updated.	Volkan Goklerinoglu	Justin Longlade
2	21 October 2023	Cover Photo, 2.0 section, 4.0 contact numbers, emergency updates, 12.0 contents fire verbiage to reflect site actuals, 13.0 refers to AB. Appendix B phone numbers.	Justin Longlade	Volkan Goklerinoglu

Caution: Un-Controlled Copy

Valid only at time of retrieval from network source directory.

User should verify that the revision number is the most current.

THIS SITE-SPECIFIC EMERGENCY RESPONSE PLAN WAS DEVELOPED FOR THE FOLLOWING CAPSTONE SITE:

KNEEHILL SOLAR

SITE SPECIFIC DETAILS WRITTEN BY: Volkan Goklerinoglu (Capstone HSE Administrator)

SITE MANAGER REVIEW: Justin Longlade

(Signature)

INITIAL RELEASE DATE: 15 March 2023

Distribution List

The following groups/individuals shall be provided a copy of any updates/revisions made to this Emergency Response Plan. The Site Manager, with the assistance of the Capstone HS Manager, are responsible to ensure updates and final revisions are transmitted in a timely manner, and acknowledgment of receipt is obtained.

Person / Company	Contact Person *(If applicable)*	Contact Details
Director Emergency Management – Kneehill County	Deb Grosfield	debra.grosfield@kneehillcounty.com
Deputy Director Emergency Management – Kneehill County	Dan Marsellus	403-443-5541 Dan.marsellus@kneehillcounty.com
Deputy Director Emergency Management – Kneehill County	Natalie Chubala	natalie.chubala@kneehillcounty.com

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Appendices

1.0 PURPOSE

This Emergency Response Plan (ERP) has been developed by Capstone Infrastructure Corp. (Capstone) to provide a formal emergency preparedness program that protects human health and property in the event of an emergency such as medical, fall rescue and confined space rescue, fire, explosion, etc. This plan also formalizes the arrangements with local police, fire departments, hospitals, and emergency response providers, in case of an emergency. A copy of this plan should be reviewed with each employee during orientation and annually thereafter and be posted on the Site Health & Safety Bulletin Board.

2.0 FACILITY INFORMATION

Kneehill Solar is a 25MW renewable energy facility located 1km Northwest of the Town of Three Hills in the Municipal District of Kneehill County, Alberta and achieved commercial operation in February 2023. Every year, the facility will generate enough electricity to power more than 6,000 average Alberta homes and offset approximately 30,000 tonnes of CO2e. The Sawridge First Nation, a Cree people that is an original signatory to Treaty No.8, is an equity partner in Kneehill Solar.

Table 1. ***Facility Information***

Facility Name:	Kneehill Solar
Address/Location:	Townshiproad Rd 322 and Range Rd 241, Alberta
Capstone BU Director:	Keith Peddle
Site Manager:	Justin Longlade
Site Health & Safety Rep:	N/A
Site Emergency Map:	Located in Appendix A of this ERP

3.0 KEY CONTACTS AND RESPONSIBILITIES

Key individuals and related job descriptions that are trained to coordinate response to emergency events are identified throughout this plan. These persons will have responsibility and authority during emergency situations.

For the ERP implementation process, Table 2 below outlines the responsibilities and roles associated to the development and maintenance of this program.

Table 2. ***Roles & Responsibilities Matrix***

RESPONSIBILITIES	ROLES				
	CORPORATE			KSP	
	Chief Operating Officer	Manager – HSE	Coordinator – HSE	Business Unit Director	Site Manager
Assess Potential Emergency Scenarios		√	√	√	√
Formulate Emergency Response Protocols		√	√	√	√
Approve	√			√	√
Communicate				√	
Implement					√
Drill and Evaluate		√			√
Update		√			√
Assess Understanding and Capabilities		√		√	
Ensure Personnel are Trained				√	
Participate in Relevant Training					√
Test and Evaluate Capabilities		√		√	

4.0 EMERGENCY CONTACTS

Primary Capstone emergency contact information for this Site is presented in Table 3 below. A list of external emergency communication numbers, including surrounding pipeline and cable companies, is found in Table 4.

Table 3. ***Capstone Internal Emergency Contact Information***

NAME	TITLE	CONTACT INFO
Keith Peddle	Director – Solar & Cardinal	**(613) 657-1400**
Josh Gale	Western Regional Manager	**(403) 928-0511**
Patrick Leitch	Chief Operating Officer	**(647) 273-5562**
Volkan Goklerinoglu	Sr. HSE Coordinator	**(647) 800-9599**
Nicole James	HSE Coordinator	**(289) 201-3642**
Dana Sallouha	Sustainability & Environment Manager	**(647) 919-9740**
Megan Hunter	Corporate Communications Manager	**(647) 686-6945**
Justin Longlade	Plant Manager	**(403) 601-9282**
Cody Leighton	Assistant Plant Manager	**(403) 973-5121**

Table 4. *External Emergency Services Contact Information*

EMERGENCY SERVICES	CONTACT INFO	
Ambulance (Local)	**N/A**	**911**
Fire Department (Local)	**403-443-5541**	
Police (Local)	**403-443-5539**	
Hospital – Three Hills Health Services	**403 443-2444**	
Alberta Electric System Operator One Call	**403-539-2450**	
Alberta OHS	**866-415-8690**	
Poison Control	**1-800-332-1414**	
Environmental (Spills Response)	**1-800-222-6514**	
Provincial OHS Reporting (Critical Injury / Serious Event Reporting)	**1-866-415-8690**	
Other: Alberta First Call (Call Before You Dig)	**1-800-242-3447**	

5.0 INCIDENT NOTIFICATION & INVESTIGATION

- Incident notification and investigation shall be performed in accordance with Capstones Incident Management Standard (HSE-C-10HM).
- All communications, including those from management, the HSE Department, and regulatory and law enforcement shall be conducted in a timely manner.
- Any media inquiries shall be directed to the Capstone Corporate Communications Manager.

6.0 EMERGENCY DRILLS

- Emergency drills shall be performed at least annually. As there is often limited (1-2) site personnel working full-time at a solar park, consideration will be provided and allow for the use of tabletop emergency response review/drills. The Capstone HSE Manager may be utilized to assist in putting together appropriate drills.
- A post drill review shall be conducted for physical drills, to assess the effectiveness of the plan and the need for review (Appendix D – Evacuation Drill Review Form).

7.0 PROVINCIAL OHS AUTHORITIES & REPORTING

Depending upon the emergency, local authorities may come to site to carry out an investigation (e.g., provincial OHS authority). In the case of any incident in which third-party notification is required, the Capstone HSE Manager shall be notified by phone prior to calling the provincial reporting hotline. The Capstone HSE Manager will assist in reviewing the steps that need to be taken to ensure the scene is secured and materials are gathered and prepared for the anticipated visit and inspection.

Some steps that may be taken include:

- Record all current known details to prepare for the call. This includes the date and time of event, current information on what happened, individuals involved, extent of damage or injuries, etc. Take notes during the call and request a reporting ID number from the operator.
- Secure the scene using "Danger" tape (or other means). All material, tools and equipment shall be left where they are. Tags shall be placed on all sides of the secured area, identifying that no individual is permitted within the boundaries until authorized to do so by the assigned OHS Investigator/Inspector.
- Work shall not continue in the immediate area – but all work may cease on site depending on the incident. This decision may be made by the Capstone management, the HSE Manager or local authorities.
- From behind the secured area, take photos of the incident scene in its current condition. When the inspector is on site, ensure they are accompanied by a Capstone manager. Take additional photos of the scene while with the inspector – including photos of areas that the inspector is also photographing.
- Training records, JHA's, safe work procedures, and other material may be required to be gathered to provide to the inspector upon request.

8.0 TRAINING

- All individuals who participate in the site orientation shall receive an orientation sticker for their hardhat (Example seen in Figure 1). The sticker includes emergency information for contacting 911 and, including the site address.

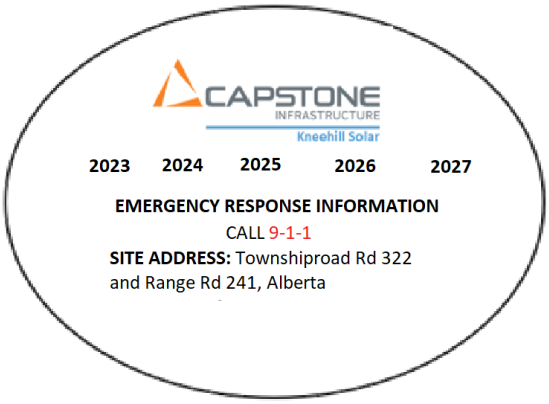


Figure 1. Orientation Sticker Example

- Training in emergency response includes:
  - Emergency Preparedness.
  - Knowledge of the site evacuation plan.
  - Understanding utilizing 911.
  - Effective utilization of safety equipment and communication devices.
  - Emergency medical training including first aid and CPR.
  - Confined Space and Fall Rescue (where applicable).
- Facility personnel shall be trained to use the various emergency response systems. These training activities involve a combination of the following programs:
  - On-site programs given by Capstone supervision or management and/or certified training instructors providing recognized programs,
  - Vendor-provided training for purchased systems,
  - Contractor-provided training in procedures for emergency response, and
  - At least once annually, employees should be given fire & evacuation drill training.
- Capstone supervisors shall be certified in both Standard First Aid and CPR. As a solar park is generally staffed by a small team (1-4 personnel), it is preferred that all Capstone staff assigned to work on site are first aid certified.
- The Site Manager shall be responsible for annual emergency drills and associated training on site. This may be performed with the assistance of the Capstone HSE Manager.
- Training records shall be maintained by the Site Manager (or their designate) in eCompliance.

9.0 EVACUATION (GENERAL)

Evacuation of the facility may be ordered based upon the judgment of Capstone Management or at the request of local authorities. However, workers are encouraged to use their best judgement in any emergency and sound the evacuation alarm if they feel as though the situation warrants an evacuation, such as a fire or explosion. No worker shall be disciplined for sounding the evacuation/emergency alarm when there is a valid concern or emergency identified.

1. Notification of Evacuation

Employees, contractors, visitors, or the public may be informed of an evacuation by means of:

- Radio communication-Plant manager and his/her designate should be ensure everybody who enters the site have a radio with good working conditions.
- Cell phone/Word of Mouth

2. Stop Work / Make Work Area Safe

- Stop all work immediately.
- If safe to do so, lower all suspended loads, shutdown/turn-off any equipment and suspend all energy services activities and hot work.
- Proceed in an orderly manner to the designated meeting place / muster point.
- Report immediately to your supervisor and/or your Capstone representative (for visitors and contractors). Your name shall be checked-off. Report any unsafe conditions that may have been left behind.

3. Proceed to Muster Point(s)

- All individuals are to immediately proceed to the designated muster point(s) as outlined on the Site Emergency Map (Appendix A). It is important for all individuals on site to know the location of the nearest emergency assembly area for the site quadrant they are in:
  - **Gate B1**
  - **Gate B3**
  - **Gate B4**

4. Report to Capstone Supervisor or representative

- Due to the large size of the site, headcounts may be completed via cell phone or radio between Capstone personnel at each muster point. All contractors on site shall take one (1) radio for their work crew, and also have a copy of their Capstone representatives cell phone number on their person.
- **Employees, contractors and visitors:** report to your immediate supervisor (or Capstone representative) upon arrival to the muster point so that an accurate head count may be collected. All individuals are to remain at the muster point until otherwise directed by the Capstone Site Manager.
- ***The Capstone Site Manager shall be notified of any persons who are determined to be missing during the head count, and their last known location*.**

5. All-Clear / Resume Work

- No persons shall re-enter the site until an all-clear is given by the Capstone Site Manager.
- Any work permits that were issued/under work during the time of the evacuation are considered invalid. A new permit must be issued prior to work re-commencing to ensure there are no new hazards presented.

6. Notification of Incident

- The Capstone HR Manager, in conjunction with the Director – Solar & Cardinal and Corporate Communications Manager, are responsible for notifying family members of any injured worker. No one other than the HR Manager, or their designate, is to contact family members or emergency contacts.

- In the event of a serious incident, the Site Manager shall (as soon as practicable) notify the Director – Solar & Cardinal and the Capstone HSE Manager about the incident. Further internal notifications are provided by those individuals as per the reporting process.
- In the event that external notification is also required (e.g., Provincial OHS authorities), the Capstone HSE Manager shall be notified prior to reporting, and may assist in the process. As per local legislated requirements, any incidents that fit the OHSA reporting requirements of that province shall be reported.

7. Debriefing

- Following emergencies on site there may be a need for workers to be debriefed on the event(s). This is particularly important when there has been a medical emergency. During this time, individuals will be able to express their concerns regarding the events that took place. Additional resources may be provided via Capstone based on the severity of the incident and how well workers are coping. The Capstone EAP (Employee Assistance Program) is available at any time as well for workers to utilize.
- In addition to debriefing, any feedback and opportunities for improvement in future emergency response activities shall be recorded and provided to the HSE Manager. All employees shall evacuate the facility and surrounding property upon learning of a fire or explosion or other emergency by the fire alarm, air horn, paging system or vocal communication.
- Depending on the severity of the incident, supporting Capstone personnel may travel to site as soon as possible post-incident to assist.

10.0 FIRST AID & MEDICAL EMERGENCIES

During an emergency, the prompt delivery of quality first aid assistance to injured persons and immediate communication with local emergency services, as required, is the priority of the site first aid attendant(s). In the event of a severe or life-threatening medical emergency or fatality in the workplace, the ERP must be activated once emergency medical assistance has been obtained for the person(s).

- Appropriate first aid and other emergency response equipment on-site shall be in good working order, and regularly inspected (i.e. quarterly), maintained, and replaced, as necessary.
- All personal injuries resulting from a work-related incident must be immediately reported.
- If the injury is more serious or if the injured person is unable to safely make their way to the first aid station, emergency response services shall be contacted.

> DO NOT move a seriously injured worker unless remaining in the area is an immediate danger to life. This includes suspected head, neck, or back injuries.
>
> - Do not endanger yourself to assist another.
> - Stabilize.
> - Support.
> - Keep injured person warm while you wait for First Aid/EMS.

- As appropriate, trained first aiders shall assess the emergency to determine the extent of current injuries and injuries which may occur due to the situation. First aid attendants shall summon appropriate on-site or off-site resources (e.g., ambulance, fire department) and coordinate their arrival.
- See attached map (Appendix C) for directions to the local Hospital or Medical Clinic. A Capstone representative (or, if a contractor, their supervisor/designate) shall ideally accompany injured workers to the hospital.
- In the event of a critical injury (as defined by the OHSA), the local provincial OHS authority shall be notified via telephone and the scene secured to allow for investigation. No individual shall enter a secured scene for *any* reason until after the assigned investigator has released the scene back to Capstone. This means a worker may not go in to retrieve tools or any other materials. If the scene is unsafe to be left as-is, any changes done to make the location safe shall be documented – including photos of the before and after process, when available.

Appendix A – Site Emergency Map

Appendix C – Directions to Hospital

10.1. Certified First Aiders

Capstone site employees are certified first aiders and maintain valid certification of this training. A list of all certified first aiders shall be posted at the First Aid kit/station in the Capstone office. As a solar park is generally staffed by a small team (1-4 personnel), it is preferred that all Capstone staff assigned to site are first aid certified.

10.2. Locations of Facilities / Equipment:

On site, the following facilities/equipment are available:

- First Aid Kits are available at: Capstone Site office, E-house & Capstone vehicles.
- AED is located at: Capstone Vehicles (Site Manager & Assistant Site Manager trucks)

- Eyewash Stations are located at: Capstone Site Trailer & Switching station E-House

10.3. Medical Emergency Response Guidelines

The following are only guidelines for handling emergency first aid and do not replace formal first aid training. Obtain the assistance of First Aiders on site.

1. Notification / Initiate Emergency Response

Immediately notify other workers in the area of the need to provide medical assistance by any means necessary (word of mouth, radio, cell phone, etc.). Request a first aider to come to the scene.

2. Provide First-Aid / Support to Injured Party

Following the direction of the primary first aider, provide ongoing patient care / first aid permitting it is safe to do so and within your scope of training.

3. Emergency Services (911)

Upon determining that an **ambulance** is required on the project, the primary first aider (or the individual who is aware of the incident) shall:

- **Call 911 for any emergencies.**
- If possible, assign an individual the responsibility to contact 911, and state the following:
  - We have a work-related incident requiring (*police/fire/ambulance*);
  - We are located at: (*include roadway and gate number).*
  - Injured person(s) information (gender/age/suspected injury or condition if possible).
  - Current status of or availability of support (ongoing first aid provided, AED, etc.).

It is important that the individual responsible for speaking with the emergency services dispatcher/operator stays on the phone and follows / relays any instructions provided until EMS arrives.

4. Arrival of Emergency Medical Services to Incident Location

The Site Manager or designate will assign responsibility to an individual that will meet emergency services personnel at the site entrance/gate. It is important for this individual to await the arrival of EMS and provide them directions to the location of the injured person(s).

5. Provide Ongoing Support / Control of Medical Emergency

As required, provide ongoing assistance to EMS.

11.0 FIRE EMERGENCIES – GENERAL

This section provides a general fire emergency response only - *Section 12.0 should also be referenced for additional fire response procedures that are specific to the solar farm – such as fires in the Switching station, converters, solar arrays, grassfires, etc.*

11.1. General Guidelines

- All workers must evacuate upon sounding of the fire alarm (i.e., horn, siren, radio/cellular request, etc).
- Close, but do not lock doors to rooms/buildings.
- Assemble at the Muster Point for a head count. Notify Supervisor if you notice a co-worker is missing.
- Do NOT leave the Muster Point until authorized to do so.
- Do NOT attempt to remove any equipment or vehicles from the parking area unless it has been declared safe to do so from the Site Manager (and/or you have been directed to do so)
- Do NOT re-enter the facility/work area until authorized to do so.

11.2. Assessing Severity of Fire – Evacuate or Respond?

In the event of a fire, the health and safety of all workers on the project is a top priority. Quickly assess the severity / Potential severity of the fire before attempting to extinguish. Considerations to include:

- Size of fire,
- Type of materials involved,
- Nearby exposure risks (chemicals, combustibles, accelerants such as fuel etc.),
- Proximity of available fire extinguishers or fire suppression equipment,
- Condition or availability of emergency evacuation route.

11.3. Fire (Basic Procedure)

1) Sound Alarm. Notify other workers in the area by any means necessary:
    - Yelling **"FIRE, FIRE, FIRE"**
    - Use **radio** to notify others.
    - If a **vehicle/air horn** is available, **blast 3-long consecutive times**. **Repeat 3 times**, with approximately **5 sec between each set**.
    - **Notify others** that you pass as you travel towards a muster station.
2) Evacuate. Assign responsibility for taking roll call at the muster location(s).
3) Call:
    - Fire Emergency Number (911)
    - Capstone Operations personnel (on emergency contact list)

4) Assist in extinguishing the fire if safe and trained to do so (see Section 11.4 & 11.5 below).
5) Secure the area.
6) Assist in completing an incident report.
7) Capstone management shall notify authorities where required.
8) Take other necessary action (e.g., preventative actions, clean-up when authorized to do so, etc.).

11.4. Small Controllable Fire

Worker Responsibilities:

1) If you discover the fire, call for help.
2) Ensure your safety and the safety of others.
3) Contain the fire if trained to do so. Do not put yourself at risk. Never allow the fire to be between you and an exit. *Note: A fire in the Switching station and inverters are particularly dangerous. There are 996-L of flammable Type 2 mineral oil. See section 12.0 below for additional information and response guidelines.*
4) Inform your supervisor and follow their instructions.

11.5. Large Uncontrollable Fire

IF AT ANY TIME THE FIRE BECOMES LARGE AND UNCONTROLLABLE, FOLLOW THE PROCEDURES BELOW FOR LARGE, UNCONTROLLABLE FIRES.

Worker Responsibilities:

1) If you discover the fire, shout "FIRE, FIRE, FIRE" and sound the alarm if able to do so (i.e. air horns, electronic alarm, radio, cell phone, etc).
2) Evacuate the area.
3) Assist those who require assistance to evacuate.
4) Call for help (911).
5) Inform your supervisor and follow their instructions.

Supervisor Responsibilities:

1) Evacuate workers and ensure all are safe (do or assign roll call). Close doors behind you where applicable.
2) Call for Emergency Response Personnel (911 - Fire department)
3) Call for First Aid Attendant to attend to any injured person(s)
4) Inform Site Manager.
5) Obtain list of workers (site sign-in binder) and report to muster area.
6) Take roll call of all individuals (including employees, visitors, contractors, etc.).
7) Identify to Site Manager the worker headcount, providing the names and/or number of workers "missing" or unaccounted for. If the fire was in your work area, provide any other information.
8) Await further instruction from Site Manager or emergency services personnel.

Site Manager (or their designate)

1) Sound emergency alarms (where available)
2) Call 911 and report fire if not already done. Give your name, the company name, address, major intersections, entrance to building, area of building and advise that an individual will meet them outside to provide direction. Remain on phone until 911 Operator terminates the call, remain near phone.
3) Receive head count from supervisors at muster area. Report any missing personnel to emergency services personnel.
4) Designate individuals to:
    a. notify adjacent businesses/buildings (where applicable)
    b. shut down any natural gas service (Note: natural gas must not be shut down if leaking and burning).
    c. shut down electrical service (if safe).

d. meet and direct Emergency Services.

5) Meet with emergency services personnel upon arrival to scene and provide status of situation.
6) Remotely shut-down the park if necessary to allow EMS safe access on site.
7) Emergency Services to provide Site Manager with status of building/site and safe return to building or alternative requirements.
8) Notify Capstone HSE Manager and Director – Solar & Cardinal.
9) Secure affected area. Do not touch or remove anything. Contact appropriate provincial OHS reporting authorities via telephone to report the fire. Await the arrival of the OHS Investigator. Capstone supporting personnel (as per step 7 above) may begin travel to site to assist.
10) Begin obtaining witness statements as per the Capstone incident investigation process.

12.0 SOLAR PARK SPECIFIC EMERGENCIES (SWITCHING STATION, TRANSFORMER, ARRAYS, ETC)

Although the Switching station is unattended, it is equipped with an automatic signal system which summons Capstone site personnel in an emergency. The switching station is equipped with a grounding transformer for protection. Switching station buildings present different hazards from buildings that emergency responders usually enter and can endanger anyone who is unfamiliar with them. Capstone shall ensure that emergency services personnel (EMS) receive copies of the site ERP, including future revisions, and have been provided familiarization tours of the solar park, including the Switching station.

An extensive grounding grid system is located under the gravel at the Switching station. All equipment and fencing are connected to it. The gravel covering the ground at the switching station is used to insulate people from the grounding grid. The grid's function is to protect personnel from high voltage levels during fault conditions. For example, should lightning strike a power line, it could cause an insulator arc-over at the Switching station, which would raise the ground voltage several thousand volts. Under normal conditions, personnel are not exposed to any hazard because the grounding grid distributes the voltage over a wide area.

12.1. Trespassers in switching station.

Most people do not understand the components that are inside a Switching station and the electrical hazards that are present. All equipment must be considered electrically hazardous. The following procedures apply depending on the type of Switching station entry scenario:

12.1.1. Individuals climbing over a fence into switching station / Individuals inside station.

1) Notify the Site Manager (or operations personnel) of the situation and contact the appropriate authorities: police, fire, or ambulance. Consider your own personal safety (i.e., are the individual(s)

children, adults, inebriated, thieves, etc.). Consider the potential for injury and contacting EMS proactively.

2) The operations personnel shall remotely **power-down the Switching station.**
3) If the person is on equipment, remain calm and tell them to "Stay still, don't move and don't touch anything".
4) If they are inside on the ground, calmly tell them (if safe to do so) to "Come to the fence and remain there".
5) Warn the individual(s) of the danger.
6) If safe to do so, the Operations personnel may proceed to assist in escorting the individual(s) out of the Switching station area. If not, personnel should await the arrival of authorities and follow their instructions.

12.1.2. Injured person(s) in switching station.

1) Contact EMS if required (911), or the appropriate authorities.
2) Contact the Site Manager to notify them of the situation. The Switching station may be remotely powered down by operations personnel.
3) Calmly ask the person(s) to move to the fence if they are able.
4) If safe to do so, the operations personnel may proceed to assist in escorting the individual(s) out of the Switching station area. If not, personnel should await the arrival of authorities and follow their instructions.

12.2. Switching station fires

When responding to a fire in a Switching station, the following actions shall be taken. It should be noted that fires in the Switching station would most likely involve a transformer. Transformers are devices used to step-up or step-down voltages. They contain insoluble cooling insulating (mineral) oil which is combustible and has a flash point of 140°C. SDS are available on site and located in Appendix E of this ERP.

1) Initiate evacuation procedures for the site.
2) Call 911.
3) Call the Site Manager to inform them of the fire.

4) The Site Operations personnel shall **remotely shut down the flow of electricity if the area has not been tripped off already.**
   - *Be aware that shutting off the flow of electricity into a Switching station may take time. Be patient and do not enter the Switching station until the Site Operator has indicated it is safe to do so.*
5) Upon arrival, **all** vehicles and emergency response apparatus shall be parked well away from distribution power lines. Power lines may break and fall.
   a. Ensure that the limits of approach are maintained with all apparatus and lines, even with those Switching station components which are de-energized. **All individuals should maintain at least a 10m (33ft) distance from the Switching station fencing**.
   b. Fire fighting vehicles that could contact live equipment must be connected to the ground grid or to a ground gradient control mat that the operator must stand on.
   c. Metal ladders must not be placed against a Switching station fence or used in fighting Switching station fires. Metal objects, such as tape measures and extension cords, can also create a hazard and must not be used inside Switching stations.
6) Assess the situation. Obtain a copy of the emergency response plan from the site office or electronically (eCompliance, TEAMS, Sharepoint, etc.)
7) Inform emergency responders of the dangers (e.g., electrical, explosion, chemical).
8) On-lookers must be kept back, where possible, a minimum of 100 meters (330 ft) due to the risk of an explosion. Pieces propelled and burning oil from an exploding oil-filled breakers or transformers can be deadly.
9) **The responding fire department shall determine what they will be doing when it comes to managing or fighting the fire. It should be noted however, that if the fire involves a transformer, the fire will most likely burn – and continue to do so – due to the mineral oil. In this case, the goal would be to prevent the spread of fire and protect (wetting) the surrounding area.**
10) Responding EMS should not enter the Switching station without qualified operations personnel on site. They will be able to inform responding EMS personnel of the hazards specific to this location.
11) Emergency services personnel shall follow their guidelines for fighting electrical fires, including the use of water fog or spray on electrical equipment.

12.3. Fire at Solar Arrays or Invertor Pads

A fire at the solar panels would most likely be caused by the string wires at the panels. The panels would not be at high risk of combustion themselves, however the vegetation under the panels will most likely catch fire. There are invertors on site, located on gravel-pads throughout the solar field, and contain mineral oil – SDS is available on site and attached in Appendix E.

The site vegetation should be maintained adjacent and beneath the solar racking. Flying embers from an off-site fire may inundate the area during fire events. Ignition of the ground cover could result in a fast moving, but lower intensity fire that burns in a patchy manner on the site beneath the modules. This type of fire would be relatively short- duration as vegetative fuels are consumed rapidly. There would not be a sustained source of heat and or flame as there would be with surrounding wildfires.

12.3.1. Fire starting at the solar panels/invertor:

1) **If the fire is small and it is safe to do so**, attempt to extinguish the fire using a fire extinguisher (fire extinguishers on site are dry chemical. Water extinguishers are not permitted on site and use of water may result in electrical shocks or arcs).
    a. Extinguishers are located at all designated smoking areas on site.
    b. Extinguishers must be available in all personnel work vehicles/mobile equipment.
2) If the fire is spreading rapidly, or is too large to safely extinguish, initiate site evacuation procedures, and call 911.
3) Notify the Site Manager. Operations personnel shall remotely power-down equipment. Ensure that you provide them with information on what section/inverter station the fire is located.
4) As site vegetation is maintained at a height of 18" or less, the fire may move quickly under the panels. The fire department shall determine the best means of controlling the fire – which may include protecting surrounding areas to prevent further spread.
5) The fire department will determine their best actions for managing the fire (either extinguishing or letting it burn). Surrounding property may be wetted to contain and prevent spread and damages.

12.4. Grassfires / Wildfires

A grass fire is a fire that burns large amounts of grass. They mainly occur in grasslands and/or Great Plains. A Grassfire can spread rapidly, travelling at speeds of up to 25 km/hr., and can quickly threaten lives and properties.

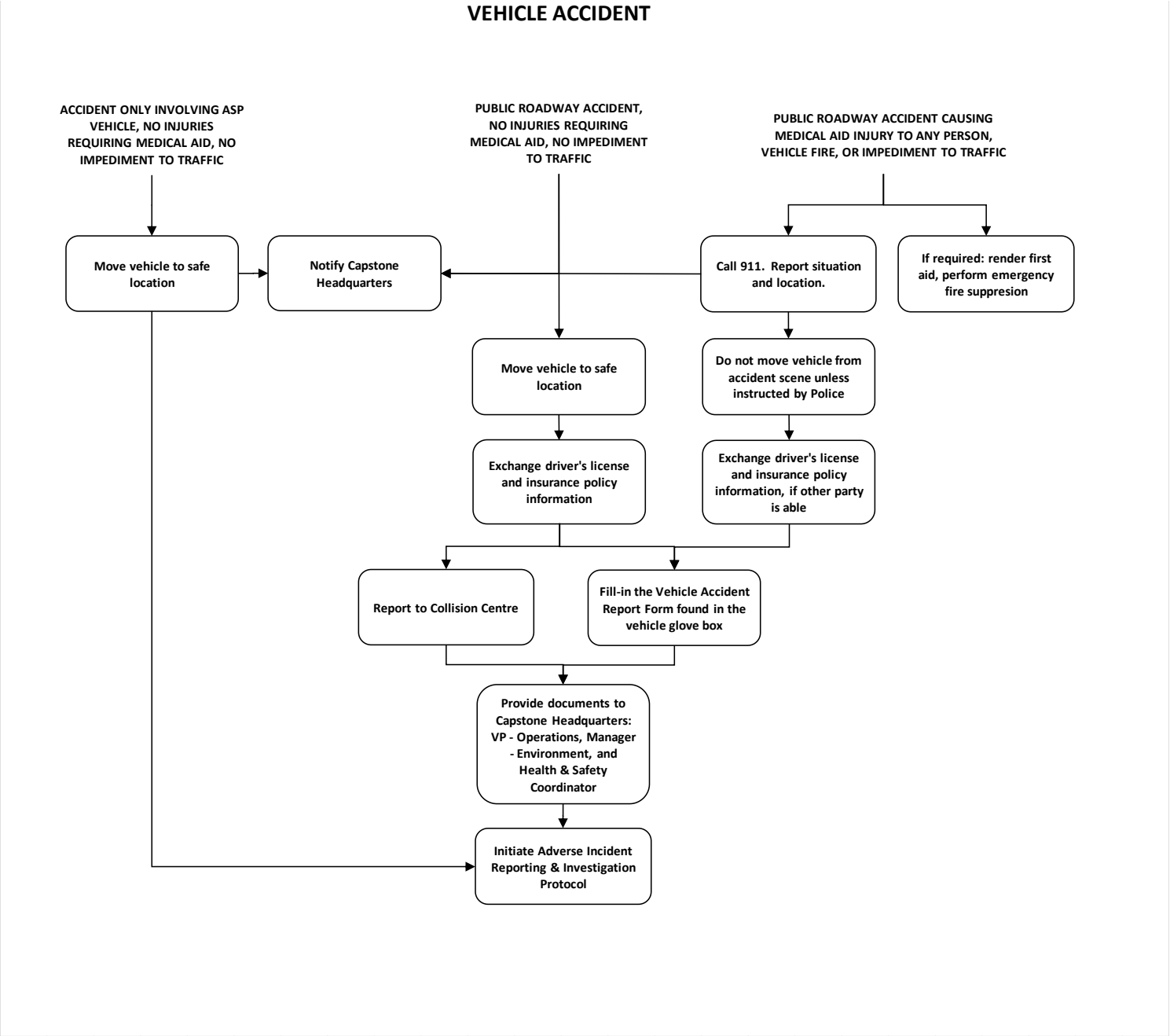
In the event of a grassfire/wildfire that has started at site, is approaching site, or has entered onto the site, the following measures should be taken:

1) For **small grassfires** that start on site, extinguish using a shovel or ABC (dry chemical) fire extinguisher.
2) For **larger grassfires** – do not attempt to extinguish. Call 911 and initiate evacuation procedures, notifying all site personnel, contractors, and visitors of the emergency.

3) Contact Capstone Site Manager or operations personnel. Operations staff will remotely power-down the equipment.
4) Site personnel shall evacuate site using the safest route given the situation (based on location of fire, wind, etc). Individuals shall, if safe to do so, evacuate to the main muster station (Gate B4) located near the Capstone site office so that a head count may take place. If it is not safe to be at the plant, individuals shall send a text message to their supervisor (or call) to let them know they are safely off site.
5) Depending on the situation, the fire department and local farmers will be responding to the grassfire. Individuals' personal homes and businesses will be the primary focus of protection by these parties. If there is equipment available, the area at risk surrounding the solar farm may be wetted or tilled to try to prevent the spread of the grassfire onto the property. The fire department will be responsible for determining the availability of resources for this, depending on the individual situation.

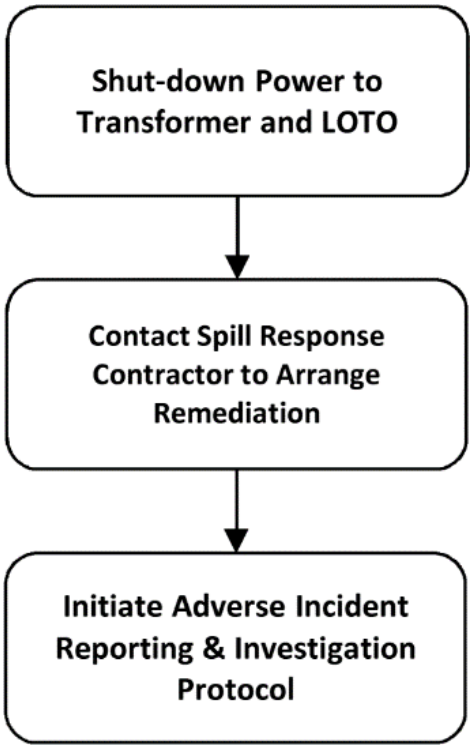
13.0 MOTOR VEHICLE ACCIDENTS

In the event a Capstone owned/operated vehicle is involved in a collision, the following flowchart outlines the process that shall be followed.

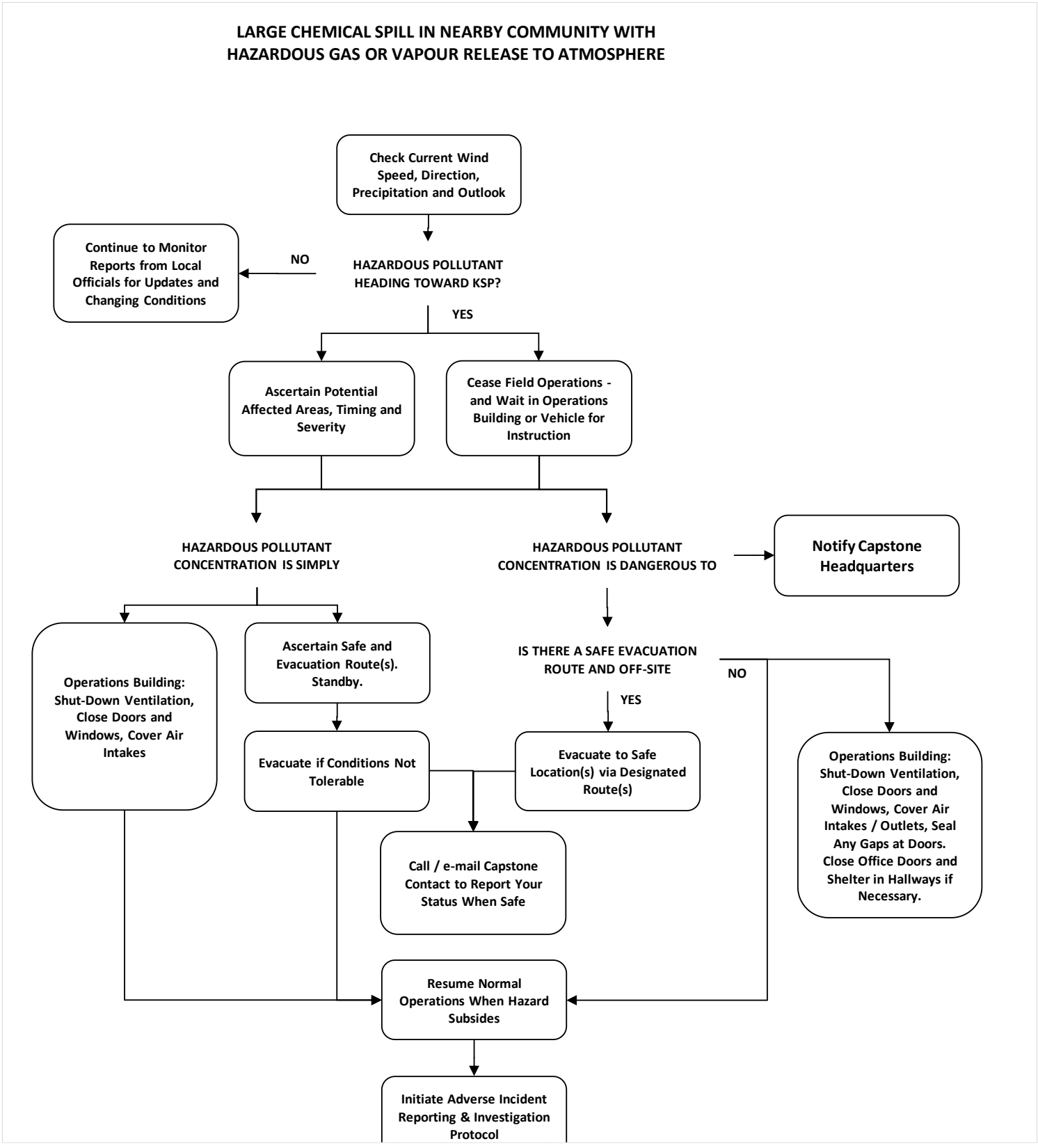


14.0 ENVIRONMENTAL RELEASES

14.1. Large Chemical Spill – Transformer Oil



14.2. Large Chemical Spill in Nearby Community (Hazardous Gas or Vapor Release)



15.0 WEATHER / NATURAL PHENOMENA

The potential for extreme or violent weather (i.e., tornadoes and snow/ice storms, etc.) presents the possibility of workplace hazards or serious injury. Weather cannot be predicted with absolute certainty of time, severity, or direction of travel. The best way to reduce the risk of extreme weather events is to provide the earliest possible warning.

During severe storms:

- Operations of mobile cranes shall be suspended. Booms should be laid down if time permits.
- Take refuge.
- Stay safe, warm, dry, and calm.
- Avoid driving.
- If possible, notify your supervisor of your location and the number of people you are with.
- Make yourself comfortable and look after each other.

15.1. Extreme Windstorms

1) Shut off gas and/or the flow of flammable liquids.
2) Shut down all work at heights.
3) Shut down all crane operations.
4) Cover all equipment and materials to protect against weather exposure.
5) Tie-down and effectively secure all materials to limit the risk of flying debris.
6) Securely support any structures under construction.
7) Eliminate or minimize ignition sources.

Before re-starting operations:

1) Inspect live power lines, leaking flammable gases or liquids and structures in danger of falling.
2) Separate damaged from undamaged materials.
3) Inspect structural stability of building structures, scaffolds, material stockpiles, etc.

15.2. Lightning (Thunderstorms)

Lightning always accompanies thunderstorms. Thunderstorms are intense local storms averaging 20 miles across and reaching as high as 10 miles. Lightning is an electrical discharge resulting from a build-up of static electricity between clouds or between clouds and the ground. All Capstone employees are required to have the weather alert app installed and operational on their phone for local lightning alerts.

Before Lightning Strikes…

- Keep an eye on the sky. Look for darkening skies, flashes of light, or increasing wind. Listen for the sound of thunder.

- It you can hear thunder; you are close enough to the storm to be struck by lightning. Find shelter immediately.
- If possible, attain information on the weather forecasts (radio, television, internet…).

When a Storm Approaches…

- If safe to do so, ensure equipment, tools and accessories are de-energized, turned-off or unplugged to prevent potential damage that could be caused by a sudden surge of energy (lightning strike).
- Find shelter in a building, car, or piece of closed-top equipment (rubber tires or tracks will serve and in insulator and provide additional protection). Keep car windows closed and avoid open-top vehicles. Do not go outside unless it is absolutely necessary.
- Avoid standing near materials that could act as an electrical conductor. Lightning will naturally strike the highest point on a level plane. Consider this when determining where to take shelter.
- Telephone lines, metal pipes and structural steel can conduct electricity. Unplug electrical equipment. Avoid using the telephone or any electrical equipment. Stop work on all structural steel and find shelter.
- Avoid running water for any purpose.
- Turn off the air-conditioner. Power surges from lightning can overload the compressor, resulting in costly repair jobs.
- Draw blinds and shades over windows. If a window breaks, the shades will prevent shattered glass from entering the building.

Before Lightning Strikes…

- Keep an eye on the sky. Look for darkening skies, flashes of light, or increasing wind. Listen for the sound of thunder.
- It you can hear thunder; you are close enough to the storm to be struck by lightning. Find shelter immediately.

If Caught Outside…

- In a wooded area, take shelter under the shorter trees.
- On the water, get to land and find shelter immediately.

Protecting Yourself Outside…

- Go to a low-lying, open place away from trees, poles, or metal objects.
- Make sure the place you pick is not subject to flooding.

Be a Very Small Target…

- Squat low to the ground

- Place your hands on your knees with your head between them. Make yourself the smallest target possible.
- Do not lie flat on the ground – this will make you a larger target.

After the Storm Passes…

- Stay away from storm-damaged areas.
- Listen to the radio for information and instructions.

If Struck by Lightning…

- People struck by lightning carry no electrical charge and can be handled safely.
- Call for EMS. Contact the first aider and tell them to bring the first aid kit and AED.
- The injured person has received an electrical shock and may be burned, both where they were struck and where the electricity left their body. Check for burns in both places.
- Give first aid. Prepare the AED on the individual if available. If breathing has stopped, begin rescue breathing. If the heart has stopped beating, a trained person should provide CPR and follow AED prompts if available.

15.3. Earthquakes

- Do not be surprised if the electricity goes out, fire or elevator alarms begin ringing, or a sprinkler system activates.
- Expect to hear noise from broken glass, creaking walls and falling objects.

Steps to Take During an Earthquake:

1) Remain inside the building.
2) Seek immediate shelter under a heavy desk or table or brace yourself inside a doorframe or against an inside wall.
3) Stay clear of windows – at least 15 feet away.
4) Stay put. If shaking causes the desk or table to move, be sure to move with it.
5) Resist the urge to panic. Organize your thoughts. Think as clearly as possible and anticipate the sights and sounds that may accompany an earthquake.

Steps to Take Immediately After an Earthquake:

1) Remain in the same “safe” location for several minutes after the earthquake, in case of aftershocks.
2) Do not attempt to evacuate or leave your immediate area unless it is dangerous to remain or instructed to do so by a proper authority.
3) Check for injuries and administer necessary first aid. Recognize and assist co-workers who are suffering from shock or emotional distress.

4) Implement our survival plan. Establish a temporary shelter if rescue teams are expected to be delayed.
5) Use a stairway when instructed to exit any building.

Earthquake Aftermath Procedure:

1) Assist injured and account for all workers/personnel in the area.
2) Remove injured from area as soon as it is safe to do so.
3) Limit ignition sources.
4) Provide a constant fire watch.
5) Stabilize structures.
6) Remove combustible debris.
7) Check equipment for possible damage before returning to service.
8) Institute repair and salvage operations.

15.4. Toxic Gas Release

Notify your supervisor and evacuate the area. Do not re-enter the area until gas testing has been completed and determined that is safe to return to work.

16.0 SECURITY THREATS

16.1. Violence in the Workplace

Please refer to the Capstone Workplace Violence and Harassment Policy.

16.2. Suspicious Package

In the event that any worker discovers a suspicious package on or near the project, the following guidelines are to be followed:

1) Immediately notify the Site Manager. Do not touch, shake, or open the package.
2) If there is any suspicion that the contents of the package pose a threat to the site or the general public, the local authorities shall be contacted immediately. The Site Manager shall call 911 and inform the dispatcher of the potential emergency situation.
3) The site shall be evacuated as per Section 8.0 – Evacuation (General) of this ERP. All individuals evacuating shall be sent to muster points that is as far away from the suspicious package as possible.
4) The area shall be secured to prevent any unauthorized or unsuspecting individuals from entering the potentially dangerous environment. As this situation may result in a police investigation, this also prevents any trespassing, tampering of evidence or disruption of the environment as well.
5) Personnel on site may be required to actively participate in any investigation carried out by the local authorities.

16.3. Bomb Threat

Although rare in nature, most bomb threats are relayed to the intended target via anonymous phone call or letter(s). In the event that the site, any worker, visitor or contractor receives a bomb threat or discovers a suspicious package believed to be a bomb, the following guidelines shall be followed:

1) Bomb Threat - Telephone

1) Remain as calm as possible. Keep the caller talking and on-line for as long as possible. Do not hang-up the phone until the caller hangs-up.
2) If possible, enlist the assistance of the nearest co-worker indicating that such a call is in progress and they must call the police.
3) Write down all communication as exactly as possible. Try to get a response to the following questions:
    - *When is the bomb going to explode?*
    - *Where is the bomb?*
    - *What kind of bomb is it?*
    - What does the bomb look like?

- Why did you place the call to notify us of the bomb?

- Try to determine the following from the conversation:
  - Sex of person (male / female, adult / child)
  - Accent (local / foreign)
  - Language (good / average / poor)
  - Background noise (machinery / traffic / music / children)
  - Manner (calm / angry / emotional)

2) Bomb Threat – Letter or Note

- Do not tamper or handle the letter or note any more than required (it will be critical evidence for a police investigation).
- Contact the Site Manager and notify them of the threat.
- If this note was provided in person – attempt to identify physical attributes of the individual. Write down all information you recall as soon as possible so that you do not forget important details. This will be required when providing details to the police.

3) Contact Local Authorities (911)

- The Site Manager (or their designate) shall call 911 and inform the dispatcher of the potential emergency situation and any details collected thus far.

4) Evacuate the Site

- Following Section 8.0 – Evacuation (General) of this ERP, all individuals on site shall be immediately evacuated to a muster point. If any details of the location of the bomb was provided, a muster station far away from that location shall be selected. Await further instructions from emergency response personnel.

5) Secure the Site

- As this scenario may potentially turn into a dangerous environment, it is important to secure the area and prevent any unauthorized or unsuspecting individuals (workers, visitors, contractors, delivery personnel, etc.) from entering. Additionally, as this scenario may result in a police investigation – any trespassing, tampering of evidence or disruption to the environment could hinder the process.

6) Participate in Investigations

- Personnel on site may be required to actively participate in any investigation carried out by the local authorities. Statements will be required immediately to provide the local authorities with as much detail as possible.

17.0 CONFINED SPACE RESCUE PLAN

All individuals performing Confined Space Entry must have a rescue plan in place prior to work commencing. Please see SP-HSE-20E - Confined Space Rescue Plan (Template). Contractors may use the Capstone template if they do not have a rescue plan template of their own.

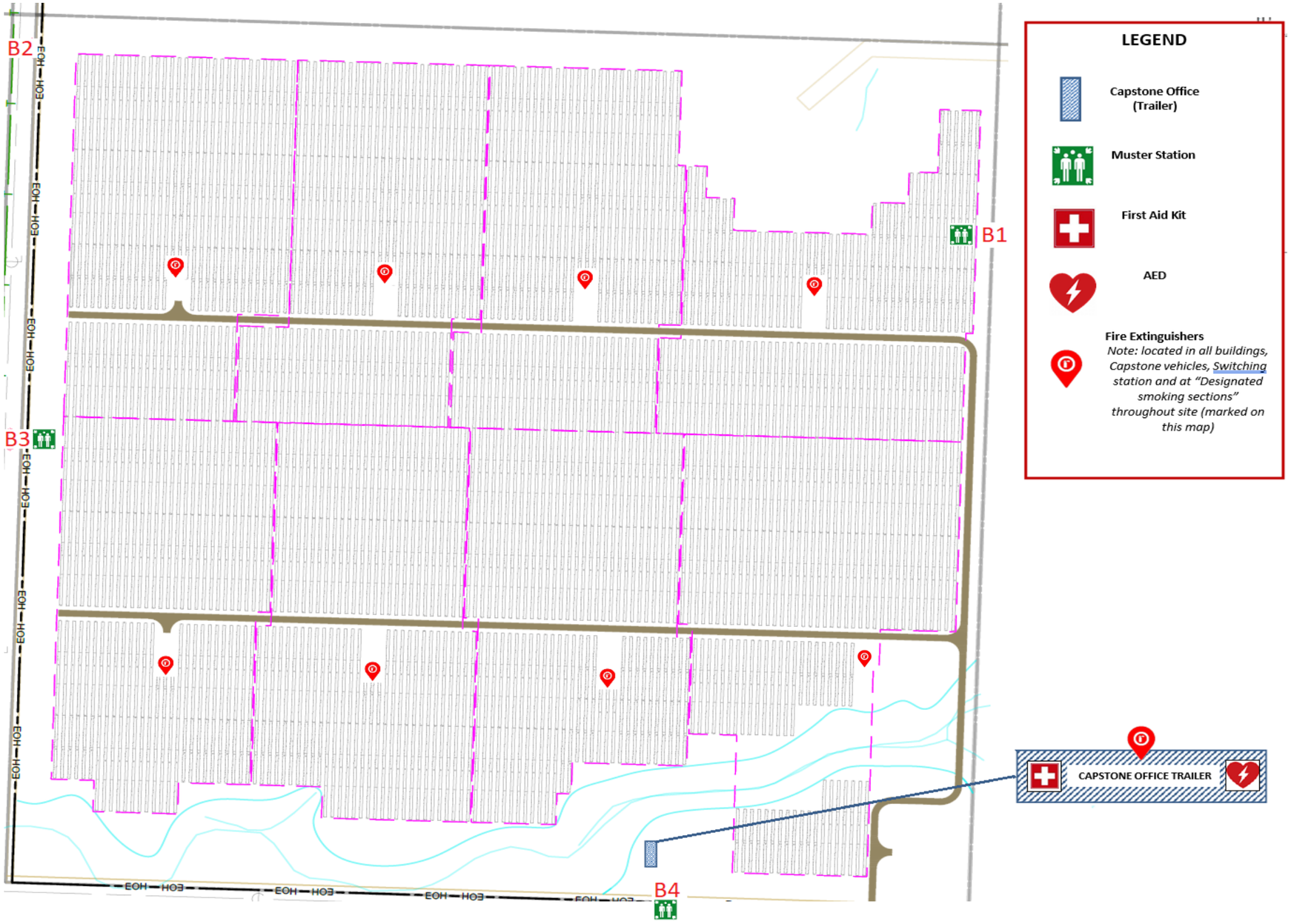
SP-HSE-20E – Confined Space Rescue Plan (Template)

18.0 FALL RESCUE PLAN

All individuals performing Work at Heights (WAH) must have a rescue plan in place prior to work commencing. Please see SP-HSE-29A – Fall Rescue Plan (Template). Contractors may use the Capstone template if they do not have a rescue plan template of their own.

SP-HSE-29A – Fall Rescue Plan (Template)

ERP APPENDIX A – SITE EMERGENCY MAP



ERP APPENDIX B – EMERGENCY CONTACT LIST

NAME	TITLE	CONTACT INFO
Keith Peddle	Director – Solar & Cardinal	**(613) 657-1400**
Josh Gale	Western Regional Manager	**(403) 928-0511**
Patrick Leitch	Chief Operating Officer	**(647) 273-5562**
Volkan Goklerinoglu	Sr. HSE Coordinator	**(647) 800-9599**
Nicole James	HSE Coordinator	**(289) 201-3642**
Dana Sallouha	Sustainability & Environment Manager	**(647) 919-9740**
Megan Hunter	Corporate Communications Manager	**(647) 686-6945**
Justin Longlade	Plant Manager	**(403) 601-9282**
Cody Leighton	Assistant Plant Manager	**(403) 973-5121**

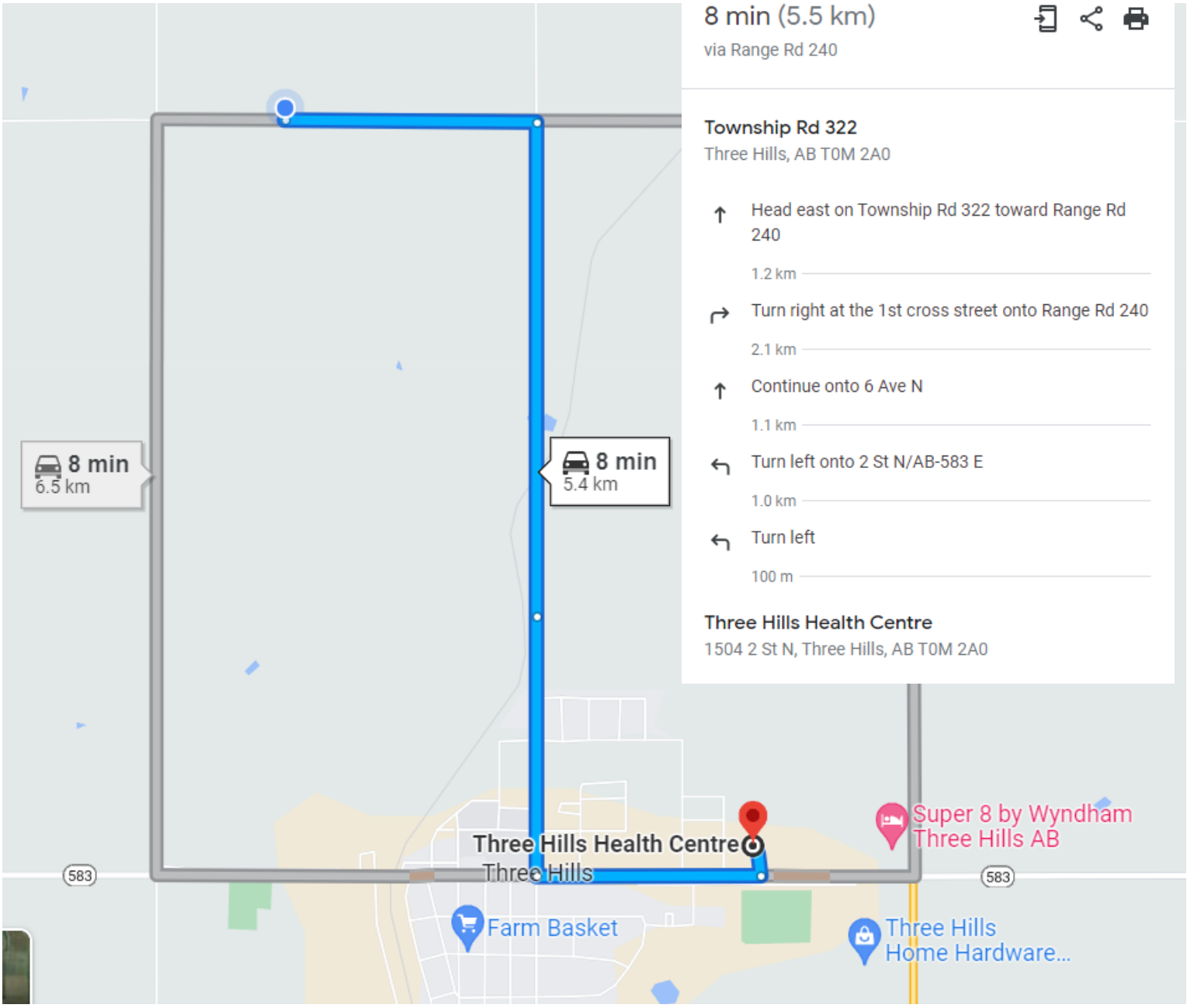
EMERGENCY SERVICES	CONTACT INFO	
Ambulance (Local)	**N/A**	**911**
Fire Department (Local)	**403-443-5541**	
Police (Local)	**403-443-5539**	
Hospital – Drumheller Health Services	**403-443-2444**	
Alberta Electric System Operator One Call	**403-539-2450**	
Alberta OHS	**866-415-8690**	
Poison Control	**1-800-332-1414**	
Environmental (Spills Response)	**1-800-222-6514**	
Provincial OHS Reporting (Critical Injury / Serious Event Reporting)	**1-866-415-8690**	
Other: Alberta First Call (Call Before You Dig)	**1-800-242-3447**	

ERP APPENDIX C - DIRECTIONS TO HOSPITAL

Hospital Name: Three Hills Health Centre

Hospital Address: 1504 2 St N, Three Hills, AB T0M 2A0

Phone Number: (403) 443-2444



ERP APPENDIX D – EVACUATION DRILL REPORT FORM

Site Name: _____ **Date:** _____

Name of Evaluator: _____ **Time:** _____

Title: _____ **Signature:** _____

Time alarm initiated:	
Time **all** workers in area at muster area:	
Time headcount completed:	
Time Emergency Services Arrived (if applicable):	
Time stand-down called:	
Time notified:	
Other:	

Were all employees/visitors accounted for? ☐ **Yes** ☐ **No**

Muster Area Head Count		
Company Name	***Head count provided***	***Actual***

		YES	NO	N/A
1.0	Could you hear the evacuation alarm easily?	☐	☐	☐
1.1	*If the initial alarm was not signaled in your area, how did you know there was a site-wide evacuation?*			
2.0	Was complete evacuation of the site/buildings completed?	☐	☐	☐
2.1	Were all areas of the site/buildings checked? By the Supervisors as they left?	☐	☐	☐
2.2	*Who performed the area checks? :*	☐	☐	☐
3.0	Were all evacuation routes clear and free of debris/materials?	☐	☐	☐
3.1	Were all evacuation routes/stations easily identified?	☐	☐	☐
3.2	Were designated evacuation routes used?	☐	☐	☐
	If Not, Explain:			
4.0	Did excessive noise accompany the evacuation?	☐	☐	☐
4.1	Did workers evacuate calmly (walking, taking proper paths, etc)?	☐	☐	☐
	If Not, Explain:			
5.0	Did workers meet in designated areas/groups? (i.e. each contractor or trade was in groups)	☐	☐	☐
5.1	Did each evacuation group meet and stay in their designated locations until told what to do next by Management?	☐	☐	☐

		YES	NO	N/A
5.2	Did each contractor have an individual performing a head count?	☐	☐	☐
5.3	Was the individual performing the head count at the muster area and easy for the workers to recognize (i.e. did he call the workers to him, did the Supervisors point him out, was he wearing special gear to identify him, etc)?	☐	☐	☐
5.4	Did a Supervisor address the workers and give updates as to what was happening on site?	☐	☐	☐
6.0	If it was safe to do so, was all equipment shut-down during the evacuation?	☐	☐	☐
	If Not, Explain:			
6.1	Did all emergency equipment function properly?	☐	☐	☐
6.2	Was a representative assigned to meet emergency personnel when they arrived? (if applicable)	☐	☐	☐
7.0	Were head-counts from all areas collected by one individual to ensure all workers were accounted for? ***Who?***	☐	☐	☐
7.1	Was a proper Stand-Down called by the Capstone Manager?	☐	☐	☐
	If Not, Explain:			
7.2	Was a short debriefing held for the workers by the Manager prior to returning to work?	☐	☐	☐

ADDITIONAL COMMENTS *(explain all "No" Responses, additional observations, suggested corrective actions, etc.)*

HSE Manager/Rep: _____ **Date:** _____

Site Operations Manager: _____ **Date:** _____

ERP APPENDIX E – SAFETY DATA SHEET (SDS)

KunLun LUBRICANT

Material Safety Data Sheet

KunLun KI40X Transformer Oil

Version: A2 **Release Date: May 1, 2021**

Section 1 Product and Company Identification

Product Name:I-30℃Transformer Oil (General) GB2536
Product Type:ElectricalInsulating Oil
Trade Name:KunLun KI40X Transformer Oil
Recommended Use: Apply to the transformers with the voltage under 220KV and the similar electronic equipments.
Service Call:400-810-3000 800-810-3001
Website:http://www.kunlunlube.com.cn
Manufacturer:PetroChina Lubricant Company
Address:17/F Building A,PetroChinaKunLunPlaza, No.8 Taiyanggong Jinxingyuan,Chaoyang District Beijing, China
Fax:0086-10-63592290
Emergency Call:0086-10-62095168

Section 2 Composition/Information of Ingredient

This product is mixture of hydrotreating light naphthenic-base fraction and the additive, the composition content is listed by weight
Generic Composition: Severe treat min. oils & additives

Ingredient	Value(WT%)	CAS No.
Distillates (petroleum), solvent-refined light naphthenic	<50	64741-97-5
Hydrotreated Light naphthenic-base Distillates	>50	64742-53-6
2,6-BHT	<0.4	128-37-0

Section 3 Hazards Identification

This Product is Class B Combustible Liquid according to National Standard "Fire Prevention Code of Petro-Chemical Enterprise Design".
This product is not classified as dangerous goods according to"List of Dangerous Goods"(GB12268), The product does not exist the unpredictable risk under normal condition of use.
Physical / chemical hazard class: Not classified as hazardous waste.
Health risk categories: no significant hazards.
Health hazards: This product may generate oil mist to cause skin and eye irritation, excessive exposure to liquid and oil mist may cause respiratory irritation and damage, and aggravate existing asthma and other respiratory diseases. The inadvertent large amounts are ingested severe damage to the digestive system; it is timely to take rescue measures.
Environmental Hazards: Be harmful to the environment, should prevent the pollution of soil, water.

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Section 4 First Aid measures

Inhalation: Rapidly take away to fresh air, keep ventilation. Seeking immediate medical assistance if dizziness, nausea or unconsciousness.

Ingestion: Induce vomiting by drinking enough water, a large number of swallow should be immediately sent to hospital for treatment to induce vomiting or other rescue measures under the guidance of a physician.

Eye Contact: Immediately open the upper and lower eyelids, Flush thoroughly with water and physiological saline. If irritation occurs, get medical assistance.

Skin Contact: Take off polluted clothes and wash contact areas with water and soap. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency.

Section 5 Fire Fight Measures

Risk Characteristics:Flash Point ＞135℃, can cause combustion by fire, high temperature or oxidant.

Hazardous Combustion Products:CO/CO_2/Sulfide/ Suspended Solid Particles and Complex Combustion Mixture

Fire Fighting Instructions: Firefighters are required to wear gas masks and firefighting suits, Put out fire downwind. Take containers away from the scene to empty Department. Evacuate immediately when color change of containers or sound from the pressure relief safety devices.

Extinguishing Media: Dry chemical, carbon dioxide (CO_2), foam or sand. Do not use a direct stream of water.

Section 6 Accidental Release Measures

Emergency Treatment: When a leak is discovered, immediately cut off the source of fire, isolate combustible. After risk assessment, organize contaminated areas personnel to a safe area if necessary. Must wear personal safety protection equipment when cleaning leakage and should pay attention to prevent secondary disasters such as personal injury and environmental pollution during emergency rescue.

A small leak: collecting leaking liquid in a sealed containers much as possible, use sand, activated carbon or other inert materials to absorb the residue. Can also use non-flammable dispersant is made of latex to wash, lotion needs harmless disposal.

Large Leak: briefing to the relevant departments according to the degree of risk. Build a causeway or trenching asylum. Transferred to a sealed container with a pump and recycling or shipped to waste disposal sites.

Section 7 Handling and Storage

Handling Precautions: comply with the fire safety design specification requirements when using this product and avoid excessive oil mist generated during the operation. The operator should be subject to fire safety training, equipped with the necessary labor protective equipment to avoid inhalation of oil mist, eliminate leakage of production and operating equipment and avoid slipping.

Storage Note: This product should be sealed storage, stored in a cool, dry, ventilated place, away from open flames and high temperature heat, strong oxidants and flammable materials,

KunLun LUBRICANT

to avoid mixing with water and impurities and other foreign matter. The storage area should be equipped with the necessary fire equipment, leakage processing equipment. Empty containers may still remain product, avoid heating, cutting, welding.

Section 8 Exposure Control/Personal Protection

Exposure limits: When oil mists and smoke can occur, the following standards are recommended: 3 mg/m³ 15min - AFS (Sweden, 6/2005) STEL, 1 mg/m³ 8h - TWA.

Recommended Monitoring Procedures: If the components of the product have exposure limits, it needs to have air or biological monitoring for personal and workplace to determine the effectiveness of ventilation facilities, or take other control measures, or to use necessary respiratory protective devices. It should refer to EU EN689 assessment method standard about inhalation of chemical reagents and national guidance documents on the detection of harmful substances.

Profession Exposure Control: Forced ventilation and local exhaust can reduce the exposure concentration in the air. The operating device uses oil-resistant material. Store under the recommended conditions. If heating, temperature control device should be used to avoid overheating.

Health Measures: Operating in accordance with the industrial hygiene and safety measures.

Respiratory Protection: If the product needs manually heating, it should choose to wear A1P2 or A2P2 filter respirator. Automatic production line with good ventilation does not need to wear a respirator.

Hand Protection: Wear suitable oil-resistant protective gloves made by Nitrile rubber or high quality PVC.

Eye Protection: If contact is likely, safety glasses should be worn.

Skin and Body Protection: Wear protective clothing if there is a risk of skin contact and change them frequently, or when contaminated.

Section 9 Physical and Chemical Properties

Items	Typical Data
Form	Viscous Liquid
Color	<0.5
Odor	Odorless
Pour Point	-42°C
Density, 20°C	885kg/m³
Flash Point, Close	140°C
Solubility in Water	Non soluble
Solubility in Organic Solutions	Soluble
Viscosity, 40°C	9.5mm²/s
DMSO Extraction (IP346)	<3%

Section 10 Stability and Reactivity

Stability: Stable at normal conditions

Avoid: Excessive highly oxidizing agents.

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Avoid condition: Open flame, high heat resource
HazardousDecomposition Products: Material does not decompose at ambient temperatures.
HazardousReaction Potential: Polymerization will not occur

Section 11 Toxicological Information

Potential Acute Health Hazards
Acute toxicity: Lower
Ingestion:May induce nausea and even vomiting and diarrhea.
Inhalation:Inhalation of oil mist or vapor produced under high temperature may cause irritation to the respiratory tract.
Skin contact: Prolonged or repeated exposure may lead to skin dryness or cracking.
Eye contact: May cause redness and transient pain.
Potential Chronic Health Hazards
Chronic Effects: Inhalation of oil mist or vapor produced under high temperature may cause irritation to the respiratory tract.

Section 12 Ecological Information

Ecotoxicity: Not expected to be harmful to aquatic organisms, but potential bioaccumulate may cause ecotoxicity.
Mobility: Non-volatilized liquid, no oil mist pollution to air; Low solubility and floats and is expected to migrate from water to the land. It will be absorbed by the soil particles and can not flow when entering into the soil.
Persistence/degradability: The base oil is expected to be inherently biodegradable with potential bioaccumulation.

Section 13 Disposal Consideration

Disposal Recommendations: Waste Mineral Oils listed in HW08 of"National Catalogue of Hazardous Wastes"

Regulatory Disposal Information: Comply with local laws and regulations. If possible, should be entrusted with the appropriate qualified hazardous waste disposal agency for product recycling. Recommended as a boiler fuel under controlled conditions and monitor the emission gases harmful substances of high-temperature combustion. Airtight container stored and the necessary identification when temporary saves.

Section 14 Transportation Information

"List of Dangerous Goods"(GB12268): The product is not classified as 9 categories of hazardous goods
China / international transport regulations: Not Regulated for Land Transport
SEA (IMDG): Not Regulated for Sea Transport
AIR (IATA): Not Regulated for Air Transport

Section 15 Regulatory Information

According to principles of hazardous substances and preparations classification in China and Europe, it is not regarded as hazardous goods. No legal identification is required.

KunLun LUBRICANT

Comply with the chemicals directory requirements of the following countries and regions: IECSC (China), DSL (Canada), EINECS (EU), on ENCS (Japan), KECI (Korea), PICCS (Philippines), TSCA (United States) and AICS (Australia).

Section 16 Other Information

This material safety data sheet is based on current knowledge and applicable laws and regulations, the description of the product from the health, safety and environmental requirements, having possibility of amendments to update existing reference standards and testing data.

The data and recommendations provided by the material Safety Data Sheet are only apply to this product. In addition to the prescribed use, China Petroleum oil company will not be held responsible due to failure to follow recommended any damage or injury caused by the views. Users can get additional information by the sales department and technical service department.

Sulfur hexafluoride

Safety Data Sheet E-4657

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 11-02-2022 Supersedes: 01-01-2021 Version: 1.0

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Trade name	:	Sulfur hexafluoride
Chemical name	:	Sulfur hexafluoride
CAS No	:	2551-62-4
Formula	:	SF6
Other means of identification	:	Sulfur hexafluoride
Product group	:	Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Industrial use Use as directed.

1.3. Supplier

Linde Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.lindecanada.ca

1.4. Emergency telephone number

Emergency number	:	1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Linde sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Simple Asphyxiant H380
Gases under pressure : Liquefied gas H280

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms :

GHS04

Signal word : WARNING

Hazard statements : CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
MAY CAUSE FROSTBITE.
MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.

Precautionary statements : Do not handle until all safety precautions have been read and understood
Use and store only outdoors or in a well-ventilated place.
Do not get in eyes, on skin, or on clothing.
Wear protective gloves/protective clothing/eye protection/face protection
Use a back flow preventive device in the piping.
Use only with equipment rated for cylinder pressure.
Do not open valve until connected to equipment prepared for use.

Sulfur hexafluoride

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Close valve after each use and when empty.
Protect from sunlight when ambient temperature exceeds 52°C (125°F).
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF exposed or concerned: Get medical advice/attention
IF ON SKIN:
Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention

2.3. Other hazards

Other hazards which do not result in classification : Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite.

2.4. Unknown acute toxicity (GHS CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Sulfur hexafluoride (Main constituent)	(CAS No) 2551-62-4	100	Sulfur fluoride (SF6) / Sulfur fluoride (SF6), (OC-6-11)- / Sulphur hexafluoride / Sulfur hexafluoride (SF6) / Sulphur hexafluoride (SF6) / Sulfur fluoride / Sulfur fluoride, (OC-6-11)-

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

No additional information available

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

No additional information available

5.2. Unsuitable extinguishing media

Unsuitable extinguishing media : Do not use water jet to extinguish.

5.3. Specific hazards arising from the hazardous product

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

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5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions	:	Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.
Protection during firefighting	:	Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	:	Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Stop flow of product if safe to do so. Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Evacuate area. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Monitor concentration of released product. Try to stop release.

6.2. Methods and materials for containment and cleaning up

6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	:	Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. **OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Sulfur hexafluoride (2551-62-4)		
USA - ACGIH	ACGIH OEL TWA [ppm]	1000 ppm
USA - OSHA	OSHA PEL TWA [1]	6000 mg/m³
USA - OSHA	OSHA PEL TWA [2]	1000 ppm
Canada (Quebec)	VEMP (OEL TWA)	5970 mg/m³
Canada (Quebec)	VEMP (OEL TWA) [ppm]	1000 ppm
Alberta	OEL TWA	5970 mg/m³
Alberta	OEL TWA [ppm]	1000 ppm
British Columbia	OEL TWA [ppm]	1000 ppm
Manitoba	OEL TWA [ppm]	1000 ppm
New Brunswick	OEL TWA	5970 mg/m³
New Brunswick	OEL TWA [ppm]	1000 ppm
New Foundland & Labrador	OEL TWA [ppm]	1000 ppm
Nova Scotia	OEL TWA [ppm]	1000 ppm
Nunavut	OEL STEL [ppm]	1250 ppm
Nunavut	OEL TWA [ppm]	1000 ppm
Northwest Territories	OEL STEL [ppm]	1250 ppm
Northwest Territories	OEL TWA [ppm]	1000 ppm
Ontario	OEL TWA [ppm]	1000 ppm
Prince Edward Island	OEL TWA [ppm]	1000 ppm
Québec	VEMP (OEL TWA)	5970 mg/m³
Québec	VEMP (OEL TWA) [ppm]	1000 ppm
Saskatchewan	OEL STEL [ppm]	1250 ppm
Saskatchewan	OEL TWA [ppm]	1000 ppm
Yukon	OEL STEL	7500 mg/m³
Yukon	OEL STEL [ppm]	1250 ppm
Yukon	OEL TWA	6000 mg/m³
Yukon	OEL TWA [ppm]	1000 ppm

8.2. Appropriate engineering controls

Appropriate engineering controls : Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Provide adequate general and local exhaust ventilation. Ensure exposure is below occupational exposure limits (where available).

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.

Hand protection : Wear working gloves when handling gas containers.

Eye protection : Wear goggles when transfilling or breaking transfer connections. Safety eye wear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection	:	**Respiratory protection:** Use air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below OEL (if applicable). Select in accordance with provincial regulations, local bylaws or guidelines. Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Thermal hazard protection	:	Wear cold insulating gloves when transfilling or breaking transfer connections. None necessary.
Environmental exposure controls	:	Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
Other information	:	**Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colourless gas.
Molecular mass	:	146 g/mol
Colour	:	Colourless.
Odour	:	No odour warning properties.
Odour threshold	:	Odour threshold is subjective and inadequate to warn of overexposure.
pH	:	Not applicable.
pH solution	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-50.8 °C
Freezing point	:	No data available
Boiling point	:	-63.8 °C
Flash point	:	Not applicable.
Critical temperature	:	45.5 °C
Auto-ignition temperature	:	0 °C
Decomposition temperature	:	No data available
Vapour pressure	:	2100 kPa
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	3760 kPa
Relative vapour density at 20 °C	:	No data available
Relative density	:	1.4
Relative density of saturated gas/air mixture	:	5.04
Density	:	0.0061 g/cm³ (at 20 °C)
Relative gas density	:	5
Solubility	:	Water: 41 mg/l
Log Pow	:	1.68
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Flammability (solid, gas)	:	Non flammable

9.2. Other information

Sublimation point	:	-63.9 °C

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Gas group	:	Liquefied gas
Additional information	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	None.
Conditions to avoid	:	None.
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified
Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

Sulfur hexafluoride (2551-62-4)	
Viscosity, kinematic (calculated value) (40 °C)	Not applicable.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Sulfur hexafluoride (2551-62-4)	
Persistence and degradability	Not applicable for inorganic gases.

12.3. Bioaccumulative potential

Sulfur hexafluoride (2551-62-4)	
Log Pow	1.68
Log Kow	Not applicable.
Bioaccumulative potential	No data available.

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12.4. Mobility in soil

Sulfur hexafluoride (2551-62-4)	
Mobility in soil	No data available.
Log Pow	1.68
Log Kow	Not applicable.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on the ozone layer : None.
Global warming potential [CO2=1] : 22200
Effect on global warming : Contains Fluorinated greenhouse gases covered by the Kyoto protocol.

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Do not discharge into any place where its accumulation could be dangerous. Avoid discharge to atmosphere.
Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN1080
TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gases
Proper shipping name : SULFUR HEXAFLUORIDE

Explosive Limit and Limited Quantity Index : 0.125 L
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 75 L

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 1080
Proper Shipping Name (IMDG) : SULPHUR HEXAFLUORIDE
Class (IMDG) : 2 - Gases
MFAG-No : 126

IATA

UN-No. (IATA) : 1080
Proper Shipping Name (IATA) : Sulphur hexafluoride
Class (IATA) : 2 - Gases

SECTION 15: Regulatory information

15.1. National regulations

Sulfur hexafluoride (2551-62-4)
Listed on the Canadian DSL (Domestic Substances List)

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15.2. International regulations

Sulfur hexafluoride (2551-62-4)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on INSQ (Mexican National Inventory of Chemical Substances)

SECTION 16: Other information

Date of issue : 15/10/1979

Revision date : 02/11/2022

Supersedes : 01/01/2021

Indication of changes:

Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

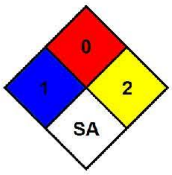
The opinions expressed herein are those of qualified experts within Linde Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Linde Canada Inc, SDSs are furnished on sale or delivery by Linde Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Linde sales representative, local distributor, or supplier, or download from www.lindecanada.ca. If you have questions regarding Linde SDSs, would like the document number and date of the latest SDS, or would like the names of the Linde suppliers in your area, phone or write Linde Canada Inc, (Phone: 1-888-257-5149; Address: Linde Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).

NFPA health hazard : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA instability : 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.

NFPA specific hazard : SA - This denotes gases which are simple asphyxiants.



HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

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SDS Canada (GHS) - Linde

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

HyVolt Insulating Oils

ERGON

HyVolt II

Electrical Insulating Oil Marketing Specification

This electrical insulating oil is produced from a severely hydrotreated naphthenic oil to meet the specification requirements defined in ASTM D3487. HyVolt products have very low pour points and excellent oxidation stability.

TEST DESCRIPTION	TEST METHOD	SPECIFICATIONS		TYPICAL VALUES
Physical Properties		**MIN**	**MAX**	
Viscosity, cSt at 100°C	ASTM D445		3.0	2.4
Viscosity, cSt at 40°C	ASTM D445		12.0	9.6
Viscosity, cSt at 0°C	ASTM D445		76.0	65.2
Specific Gravity, 15°C/15°C	ASTM D4052		0.9100	0.8836
Flash Point, COC, °C	ASTM D92	145		155
Color, ASTM	ASTM D6045		0.5	L0.5
Pour Point, °C	ASTM D5950		-40	-62
Aniline Point, °C	ASTM D611	63		78
Interfacial Tension, 25°C, dynes/cm	ASTM D971	40		48
Visual Examination, 25°C	ASTM D1524	Clear & Bright		Clear & Bright
Electrical Properties				
Dielectric Breakdown at 60 Hz, Disk electrodes, kV	ASTM D877	30		42
Dielectric Breakdown at 60 Hz, VDE, kV (1.0-mm) gap	ASTM D1816	20		25
Dielectric Breakdown at 60 Hz, VDE, kV (2.0-mm) gap	ASTM D1816	35		46
Impulse Breakdown Voltage, kV at 25°C	ASTM D3300	145		>300
Power Factor at 60 Hz, 25°C, %	ASTM D924		0.05	0.010
Power Factor at 60 Hz, 100°C, %	ASTM D924		0.30	0.088
Gassing Tendency, µL/min	ASTM D2300		30	12
Chemical Properties				
Oxidation Stability, 110°C	ASTM D2440			
72 hr: Sludge, % by mass			0.1	0.01
Total Acid Number, mg KOH/g			0.3	0.01
164 hr: Sludge, % by mass			0.2	0.01
Total Acid Number, mg KOH/g			0.4	0.01
Oxidation Stability (Pressure Vessel), minutes	ASTM D2112	195		274
Oxidation Inhibitor Content, wt%	ASTM D2668	0.15	0.30	0.27
Corrosive Sulfur	ASTM D1275	Noncorrosive		Noncorrosive
Water Content, ppm	ASTM D1533		35	14
Neutralization Number, mg KOH/g	ASTM D974		0.03	<0.01
PCB Content, ppm	ASTM D4059	Not Detected		Not Detected
Furanic Compounds, µg/L	ASTM D5837		25	1
Health and Safety Properties (not an ASTM D3487 requirement)				
Polycyclic Aromatic Compounds, wt%	IP 346		3	<3
Modified Ames Assay, MI	ASTM E1687		1	<1
FDA Regulation	21 CFR 178.3620 (C)	PASS		PASS

HyVolt II is a product of Ergon Refining, Inc.
June 27, 2019

ERGON®

SAFETY DATA SHEET

1. Identification

Product identifier	**HyVolt II**
Other means of identification	None.
Recommended use	Transformer Oil
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Company:	Ergon, Inc.
Address:	P.O. Box 1639 Jackson, MS 39215
E-mail:	sds@ergon.com
Emergency Contacts	
Customer Service:	1-800-222-7122
Chemtrec:	1-800-424-9300 After Business Hours (North America Only) 1-703-527-3887 After Business Hours (International)

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Aspiration hazard	Category 1
Environmental hazards	Not classified.	
OSHA defined hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	May be fatal if swallowed and enters airways.
Precautionary statement	
Prevention	Do not breathe gas/mist/vapors/spray.
Response	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.
Storage	Store locked up.
Disposal	Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. See section 13 of this SDS for disposal instructions.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT NAPHTHENIC		64742-53-6	30.0 - 99.9
LUBRICATING OILS (PETROLEUM), C15-30, HYDROTREATED NEUTRAL OIL-BASED		72623-86-0	0 - 50

Chemical name	Common name and synonyms	CAS number	%
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC		64742-55-8	0 - 45
DISTILLATES (PETROLEUM), SOLVENT-DEWAXED LIGHT PARAFFINIC		64742-56-9	0 - 10
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)]		128-37-0	< 0.3

Composition comments Not classified as a carcinogen. Meets EU requirement of less than 3% (w/w) DMSO extract for total polycyclic aromatic compound (PAC) using IP 346.

4. First-aid measures

Inhalation Move to fresh air. Oxygen or artificial respiration if needed. IF exposed or concerned: Get medical advice/attention.

Skin contact Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If skin irritation or an allergic skin reaction develops, get medical attention.

Eye contact Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion Do NOT induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Call a poison control center immediately.

Most important symptoms/effects, acute and delayed Defatting of the skin.

Indication of immediate medical attention and special treatment needed Treat symptomatically.

General information Contact physician if discomfort continues.

5. Fire-fighting measures

Suitable extinguishing media Halon. Dry chemicals. Foam. Carbon dioxide (CO2). Water spray or fog. Do not use water jet as an extinguisher, as this will spread the fire.

Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical No unusual fire or explosion hazards noted.

Special protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions Cool containers exposed to flames with water until well after the fire is out. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Use pressurized air mask if product is involved in a fire.

General fire hazards No unusual fire or explosion hazards noted. Flammability Class: Combustible IIIB

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation.

Methods and materials for containment and cleaning up Large Spills: ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth or absorbent material then place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewer, basements or confined areas. Avoid discharge to the aquatic environment. Contact local authorities in case of spillage to drain/aquatic environment. Avoid discharge into drains, water courses or onto the ground. If this material is spilled into navigable waters and creates a visible sheen, it is reportable to the National Response Center.

7. Handling and storage

Precautions for safe handling DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Do not breathe dust/fume/gas/mist/vapors/spray. Wash hands after handling and before eating. Do not get this material in contact with eyes. Avoid contact with skin. Avoid prolonged exposure. All handling to take place in well-ventilated area. Shower after work. Remove and wash contaminated clothing promptly.

Conditions for safe storage, including any incompatibilities Store locked up. Keep away from heat, sparks and open flame. Store in a well-ventilated place. Use care in handling/storage.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT NAPHTHENIC (CAS 64742-53-6)	PEL	5 mg/m3	Mist.
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC (CAS 64742-55-8)	PEL	5 mg/m3	Mist.
DISTILLATES (PETROLEUM), SOLVENT-DEWAXED LIGHT PARAFFINIC (CAS 64742-56-9)	PEL	5 mg/m3	Mist.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)] (CAS 128-37-0)	TWA	2 mg/m3	Inhalable fraction and vapor.
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC (CAS 64742-55-8)	TWA	5 mg/m3	Inhalable fraction.
LUBRICATING OILS (PETROLEUM), C15-30, HYDROTREATED NEUTRAL OIL-BASED (CAS 72623-86-0)	TWA	5 mg/m3	Inhalable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value	Form
HyVolt II	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)] (CAS 128-37-0)	TWA	10 mg/m3	
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT NAPHTHENIC (CAS 64742-53-6)	Ceiling	1800 mg/m3	
	STEL	10 mg/m3	Mist.
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC (CAS 64742-55-8)	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.
DISTILLATES (PETROLEUM), SOLVENT-DEWAXED LIGHT PARAFFINIC (CAS 64742-56-9)	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Individual protection measures, such as personal protective equipment

Eye/face protection Goggles/face shield are recommended.

Skin protection

Hand protection Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves.

Other Chemical/oil resistant clothing is recommended. Launder contaminated clothing before reuse.

Respiratory protection Under normal conditions, respirator is not normally required. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Thermal hazards Not available.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

9. Physical and chemical properties

Appearance Clear & bright

Physical state Liquid.

Form Liquid.

Color Water White to Pale

Odor Mild Petroleum Odor

Odor threshold Not available.

pH Not applicable

Melting point/freezing point -85 °F (-65 °C) ASTM D5950

Initial boiling point and boiling range 545 °F (285 °C) ASTM D2887/ ISO 3924

Flash point 289.4 °F (143.0 °C) Pensky-Martens Closed Cup ASTM D93/ ISO 2719
311.0 °F (155.0 °C) Cleveland Open Cup ASTM D92/ ISO 2592

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	0.89 (59 °F (15 °C) ASTM D4052/ ISO 12185)
Solubility(ies)	
Solubility (water)	Insoluble
Partition coefficient (n-octanol/water)	Not established.
Auto-ignition temperature	> 599 °F (> 315 °C) ASTM E659
Decomposition temperature	Not available.
Viscosity	9.5 cSt (104 °F (40 °C) ASTM D445)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport
Chemical stability	Stable.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks. Avoid temperatures exceeding the flash point.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

11. Toxicological information

Information on likely routes of exposure	
Inhalation	May be fatal if swallowed and enters airways.
Skin contact	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis
Eye contact	May be irritating to eyes.
Ingestion	May cause gastrointestinal discomfort if swallowed. Do not induce vomiting. Vomiting may increase risk of product aspiration. May be fatal if swallowed and enters airways.
Symptoms related to the physical, chemical and toxicological characteristics	Defatting of the skin. Coughing. Shortness of breath. Discomfort in the chest.
Information on toxicological effects	
Acute toxicity	Not applicable.
Skin corrosion/irritation	May cause defatting of the skin, but is neither an irritant nor a sensitizer.
Serious eye damage/eye irritation	Not classified. May cause minor irritation on eye contact.
Respiratory or skin sensitization	
Respiratory sensitization	Not classified.
Skin sensitization	Not classified. May cause defatting of the skin, but is neither an irritant nor a sensitizer.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Meets EU requirement of less than 3% (w/w) DMSO extract for total polycyclic aromatic compound (PAC) using IP 346.

IARC Monographs. Overall Evaluation of Carcinogenicity
Not listed.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)
Not regulated.
US. National Toxicology Program (NTP) Report on Carcinogens
Not listed.

Reproductive toxicity	Contains no ingredient listed as toxic to reproduction
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	May be fatal if swallowed and enters airways.
Chronic effects	Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects
Further information	Risk of chemical pneumonia after aspiration.

12. Ecological information

Ecotoxicity Not expected to be harmful to aquatic organisms.

Product		**Species**	**Test Results**
HyVolt II			
Aquatic			
Crustacea	EC50	Daphnia	800 mg/l, 48 hours estimated
Components		**Species**	**Test Results**
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)] (CAS 128-37-0)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia pulex)	1.44 mg/l, 48 hours

Not available. * Estimates for product may be based on additional component data not shown.

Persistence and degradability	Not inherently biodegradable.
Bioaccumulative potential	Bioaccumulation is unlikely to be significant because of the low water solubility of this product.
Mobility in soil	Not available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	When this product as supplied is to be discarded as waste, it does not meet the definition of a RCRA waste under 40 CFR 261. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
Hazardous waste code	Not applicable.
Waste from residues / unused products	Dispose of in accordance with local regulations. Avoid discharge into water courses or onto the ground.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

14. Transport information

DOT
Not regulated as dangerous goods.
IATA
Not regulated as dangerous goods.
IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not available.

General information Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

HyVolt oils are certified to be PCB-free. HyVolt oils are processed from naturally occurring raw materials with no additives or recycled oils that might introduce PCB contamination.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories Aspiration hazard

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 01-13-2014

Revision date 12-28-2021

Version # 12

Further information Local CHEMTREC Numbers:
CHEMTREC Mexico: 1-800-681-9531

NFPA ratings Health: 1
Flammability: 1
Instability: 0

References
ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
Chemical Abstracts Service Registry Handbook
CRC: Handbook of Chemistry and Physics
ILO Safety Cards
International Labour Organization
International Maritime Organization Marine Pollutants List
NFPA Hazardous Chemical Data Sheets
NIOSH Pocket Guide
Registry of Toxic Effects of Chemical Substances (RTECS)
US DOT Hazardous Materials Regulations

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision information Composition/information on ingredients: Composition comments
Physical & Chemical Properties: Multiple Properties
Toxicological information: Carcinogenicity
GHS: Classification

ERP APPENDIX F – FIRST AID REQUIREMENTS FOR HIGH HAZARD WORK

Number of workers at work site per shift	Close work site (up to 20 minutes)	Distant work site (20 – 40 minutes)	Isolated work site (more than 40 minutes)
1	Type P First Aid Kit	Type P First Aid Kit	Type P First Aid Kit
2-4	1 Emergency First Aider No. 1 First Aid Kit	1 Standard First Aider No. 2 First Aid Kit 3 blankets	1 Standard First Aider No. 2 First Aid Kit 3 blankets
5-9	1 Emergency First Aider 1 Standard First Aider No. 2 First Aid Kit	2 Standard First Aiders No. 2 First Aid Kit 3 blankets	2 Standard First Aider No. 2 First Aid Kit 3 blankets
10-19	1 Emergency First Aider 1 Standard First Aider No. 2 First Aid Kit 3 Blankets	2 Standard First Aiders No. 3 First Aid Kit 3 blankets, stretcher, splints	2 Standard First Aiders No. 3 First Aid Kit 3 blankets, stretcher, splints
20-49	2 Emergency First Aider 1 Standard First Aiders No. 2 First Aid Kit 3 Blankets	3 Standard First Aiders No. 3 First Aid Kit 3 blankets, stretcher, splints	3 Standard First Aiders No. 3 First Aid Kit 3 blankets, stretcher, splints
50-99	2 Emergency First Aider 2 Standard First Aiders No. 3 First Aid Kit 3 blankets	2 Emergency First Aiders 3 Standard First Aiders No. 3 First Aid Kit 3 blankets, stretcher, splints es	4 Standard First Aiders Plus 1 Advanced First Aider No. 3 First Aid Kit 3 blankets, stretcher, splints
100-199	2 Emergency First Aider 2 Standard First Aiders 1 advanced First Aider First Aid Room	4 Standard First Aiders 1 Advanced First Aider First Aid Room	4 Standard First Aiders 1 Advanced First Aider First Aid Room
200 or more	2 Emergency First Aider 2 Standard First Aiders 1 Nurse or 1 ACP PLUS 1 standard First Aider for each additional increment of 1 to 100 workers First Aid Room	4 Standard First Aiders 1 Nurse or 1 ACP PLUS 1 standard First Aider for each additional increment of 1 to 100 workers First Aid Room	4 Standard First Aiders 1 Advanced First Aider 1 Nurse or 1 ACP PLUS 1 standard First Aider for each additional increment of 1 to 100 workers First Aid Room