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February 28, 2019

Via Electronic Filing

Ms. Tanowa Troupe
Administration/Docketing
Ohio Power Siting Board
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

Re: Vectren Energy Delivery of Ohio, Inc. Z50E Pipeline Replacement Project, Case No. 19-025-GA-BLN

Dear Ms. Troupe:

On February 14, 2019, the Ohio Power Siting Board ("OPSB") Staff issued a Report of Investigation approving the Letter of Notification subject to a number of conditions. Within this set of conditions, Condition No. 3 requires:

The Applicant must provide a frac-out contingency plan to Staff and the Ohio Environmental Protection Agency (Ohio EPA) detailing monitoring, containment measures, cleanup, and restoration in the event of an inadvertent return. The Applicant would also need to obtain a General Permit from the Ohio EPA for Authorization to Discharge Hydrostatic Test water.

In compliance with Staff Report Condition No. 3, attached is a copy of Vectren Energy Delivery of Ohio, Inc.'s HDD Contingency Plan for Z50 20" Replacement from Memorial Station to Howell Station.

Please contact me if you have any questions regarding this matter.

Sincerely,

Devin D. Parram

Attachment

cc: Ashton Holderbaum (w/Attachment)
Eric Morrison (w/Attachment)

HDD Contingency Plan for Z50 20” Replacement from Memorial Station to Howell Station

This Horizontal Directional Drilling (HDD) Contingency Plan (Plan) must be included in the Stormwater Pollution Prevention Plan (SWP3) for the above referenced project. A copy of this HDD Contingency Plan must be maintained on site and available for review at each location where drilling will occur.

A. Introduction

This HDD Plan provides procedures and steps to effectively address an inadvertent return of drilling mud to the surface on the Z50 20” Memorial Station to Howell Station natural gas pipeline replacement project.

This HDD Plan will be implemented and maintained on each site where HDD operations are intended. For this project, the Mad River and State Road 4 will be crossed by HDD.

All key personnel associated with HDD operations, including inspection and monitoring, will be trained with respect to all contents of the Plan. See the Best Management Practices (BMPs) section of this plan for more information.

Polymers and/or additives may be incorporated in the drilling mud to enhance hole stabilization and control fluid loss. Additives have been evaluated in accordance with the Drilling Fluid Additives and LCM sections of the Plan.

B. Planned HDD Crossings

The pipeline is being installed by horizontal directional drilling beneath State Road 4, the Mad River, and Springfield Street. Impacts to these features should be avoided by installing the pipe at the following depths:

1. State Road 4 will be crossed at a planned depth between and 60 feet.
2. The Mad River will be crossed at a planned depth of 87 feet.
3. Springfield Street will be crossed at a planned depth of 94 feet.

The contractor’s drill plan is included for reference. The plan describes drill pit entry and exit locations, pilot hole installation, reaming operations, and pipe installation.

The pipe will be hydrostatically tested following construction. Spent test water will be discharged to the ground at the west end of the project near Wrightway Road.

Areas of disturbed soil will be restored with appropriate seed mix and straw mulch to match existing conditions. Areas with steep slopes and concentrated flow channels will be seeded to match existing conditions and stabilized with erosion control blanket.

The drilling fluid composition is described in the enclosed contractor drill plan. All drilling fluids are limited to a non-toxic clay, water, and any drilling fluid additives used in accordance with the drilling fluid/LCM section stated in Part II.I of General Permit OHCG00001. The makeup water will be obtained from municipal water supply.

An Inadvertent Return is defined as:

- The unintended movement of drilling fluid to the surface at an unplanned location; or
- The loss of drilling fluid into underground formations defined by:
 - A loss of fluids and/or annular pressure which exceed 50 percent over a 24-hour period, or
 - A 25 percent loss or greater of fluids and/or annular pressure sustained over a 48-hour period, or
 - A daily max (24 hours) not to exceed 50,000 gallons of drilling fluid loss.

Protocol for Monitoring Drilling Pressures

Drill pressures are monitored by the drill rig operator. In the event of a significant drop in down hole fluid pressure or fluid returns, the driller will notify the site superintendent.

Protocol for Monitoring Circulation

Circulation is monitored by the drill rig operator and the site superintendent. See the enclosed SPCC Plan for HDD Operations for Drill Fluids, Page 6, “Partial Loss of Annular Returns.”

Protocol for Loss of Fluids to Underlying Formations

There are no known karst features in this area. There are no other known geologic formations into which drilling fluids may be released.

The fluid returning to the drill site is called “returns”. A percentage of the drilling fluid returns to the rig site. As the drill progresses, more of the returns are absorbed by the earth and are not returned to the rig site. At some point, gravity, friction and/or hole obstruction may overtake the ability of the fluid to return to the drill site. It is not uncommon to not have any of the fluid return to the drill site during the majority of the bore, without any release of the fluid to the surface. The drilling fluid is usually absorbed by the formation or is drawn down into fractures. It is important to understand that a loss of returns, even a complete loss of returns, is a fairly normal occurrence during HDD that does not necessarily mean the drilling fluid is coming to the surface or impacting the environment.

C. Site Specific Information

C.1. Geology and hydrogeology

The project will replace an existing pipeline, so previous excavation has occurred at the site.

The project crosses two roadways, railroad tracks, and a gravel pit.

The City of Dayton disturbed the project corridor in late 2017 by installing a water line.

Two site-specific geotechnical borings were taken as part of the site investigation for the HDD beneath the Mad River. Boring #B-1 was taken on the east side of the HDD (City of Oregon property). Boring #B-2 was taken on the west side of the HDD (Sperry property). The borings were terminated at depths of 70' and 75', respectively. The soil encountered in both boring locations was comprised primarily of stiff clay, which is generally impermeable and favorable for maintaining drilling fluid circulation.

Environmentally sensitive areas that may be impacted by an IR, including those outside the permanent and temporary easements:

- Mad River (crossed by project)
- Great Miami River (approx. 5.5 river miles downstream)
- City of Dayton water supply pond (adjacent to the project from STA 420+00 to STA 394+00)
- Three perennial streams
 - Stream 1: HHEI 50
 - Stream 2: HHEI 48
 - Stream 3: HHEI 58
- Wetland 1: scrub/shrub/emergent, 0.12 ac, ORAM 38.5, Category 2, near STA 436+00

Identify any specific equipment or supplies, not already identified in the Plan, needed to address an IR within each sensitive area:

- A turbidity curtain may be necessary within the Mad River to control an IR and keep it from reaching the Great Miami River.

C.2. Evaluation of alternate conditions

Other than loss of circulation, identify other site-specific factors that may indicate that conditions are favorable for an IR such as bridge walls, wells, and other previous soil disturbance:

- See previous section for list of features and conditions favorable for an IR.

C.3. Standard Operating Procedures (SOPs)

After review of the site and subsurface conditions, the potential to encounter abnormal conditions is expected to be low. Standard protocol when a loss of fluids/circulation is encountered is provided in Section D.2 - Loss of Fluids/Circulation. In the event of an IR, the HDD contractor shall follow the steps outlined in Section E - Notification Procedures, Section F – Corrective Actions, Section G - Best Management Practices, and Section H - Alternative Contingency Plan.

C.4. Relief well

Relief wells are typically installed on HDDs at locations where excessive drilling fluid pressure may exceed the soil's capability to resist hydrofracture. Locations are analyzed and selected that are accessible for containment and cleanup equipment, making it easier to maintain a clean worksite, while avoiding damage to sensitive areas.

A hydrofracture risk assessment was performed on the proposed HDD alignment. IRs near the exit point are common during HDD construction. Because of this, the contractor will have workers stationed near the exit point so that if drilling fluid does surface, the driller can immediately be notified and the drilling fluid pump can be turned off to reduce the surficial impact.

Given the low risk associated with an IR near inaccessible areas and environmentally sensitive features, the use of a relief well is not warranted for this HDD. InterCon will have equipment and personnel staged at the HDD exit and will be prepared in the event an IR occurs in this area.

C.5. Resource evaluation

Identify the location of all water bodies within the potential area of impact of an IR:

- City of Dayton water supply pond: immediately adjacent along the south side of the HDD path
- Mad River: Crossed by HDD path at STA 427+44
- Great Miami River: Approximately 5.5 river miles downstream of HDD path

The nearest public water supply is the City of Dayton water supply pond immediately adjacent to the HDD path.

C.6. Containment measures

See enclosed SPCC Plan for HDD Operations for Drill Fluids, Page 6.

Containment requirements are detailed in *Section F – Corrective Actions* and *Section G – Best Management Practices*. Materials and equipment required for containment of an IR will be located at the HDD entry site and must be located so they are readily accessible so a response can be implemented without delay.

In the event of an IR, the primary and secondary containment systems will need to be designed to ensure the IR is contained and controlled over the expected course of the IR. Secondary controls are required as redundancy and the containment volume must support 110 percent of the primary containment volume.

Site specific containment measures are listed below for the road and river crossings:

1. State Road 4 and Springfield Street:
 - a. If a surface release has occurred, isolate the area with straw bales or sand bags to contain the spread of drilling fluids. Traffic control may be required for an IR within road right-of-way.

- b. Mobilize a vacuum truck and/or small excavator to the location and begin removing drilling fluids. DO NOT use a hose/water to wash drilling fluid from paved surfaces.
- c. Drilling fluid located outside road right-of-way shall be contained and allowed to dry. Once dried, the material shall be removed to match existing grade.
- d. Once excess drilling fluids are removed, unpaved areas will be seeded to match existing vegetation at the site.

2. Mad River

- a. No control measures are planned to be installed within the Mad River prior to initiating the HDD.
- b. If a release occurs, stop drilling activity. The pressure of the water may mitigate seepage of excess fluids.
- c. Monitor the IR location to determine if mud congeals. Bentonite will usually harden, thereby effectively sealing the IR location.
- d. If drilling fluid congeals, take no further action that would potentially suspend sediments in the water column.
- e. If drilling fluid does not congeal, continue monitoring the area. Do not install any physical containment structures within the river without prior authorization.

If the release is beyond the capabilities of on-site crews to contain and clean up, then a spill response contractor will be called.

The following controls can be expeditiously implemented in the event of an IR:

- Pumps
- Vacuum truck
- Excavator
- Storage tanks
- Silt fence
- Sand bags
- Straw bales

C.7. Recovery equipment redundancies

IR response equipment and supplies are solely dedicated for containment and recovery actions related to an IR event.

Equipment and supply levels will be maintained and replenished in the case of multiple IR events at the same HDD location.

C.8. Adjacent property owners

- Donald E. Stout, Inc.
- City of Dayton
- Wright Patterson Air Force Base

C.9. Pneumatic Hammer Contingency Plan

Pneumatic hammers/rammers are typically utilized on HDDs to assist with the following:

1. Conductor Barrel Installation
 - a. Casings are rammed through difficult soil conditions to more desirable drill starting points and can also provide a friction-free section for product pullback.
2. Pullback Assistance
 - a. During pullback, pipe rammers are attached to the product pipe to aid in moving the pipe forward, while maintaining acceptable stress levels. The ramming function helps to reduce friction on the pull section.
3. Removing Stuck Product Pipe
 - a. In the event the product pipe becomes stuck during pullback, rammers can aid in removing the product pipe from the borehole.

Based upon the completed soil analysis, InterCon does not anticipate the need for a pneumatic hammer on this HDD. This is a relatively small HDD (diameter and length), with clays and consolidated materials. Pneumatic hammers are typically used on HDDs of larger diameter/length, typically when soil conditions are less conducive for a successful HDD.

D. Monitoring Procedures

HDD activities must be continually monitored and documented by the construction inspector, contractor, environmental inspector, third-party inspector, or any combination of the four.

The drill path must be evaluated prior to commencement of drilling operations to assess any condition that impedes the ability to conduct visual observations.

The job site inspector's daily report must include the results of HDD monitoring, including a statement indicating whether or not an IR was detected.

E. Notification Procedures

Provide the following information to Vectren Environmental Services immediately upon discovering an IR:

- Location of the IR
- Amount of drilling fluid released
- Has the IR resulted in a discharge of drilling fluid to surface waters?
- Does the IR pose a threat to public health or safety?

Vectren Environmental Services shall notify Ohio EPA via telephone call to Ohio EPA's 24-hour Emergency Spill Hotline at (800) 282-9378 of all inadvertent returns within 60 minutes of discovery.

Immediately upon discovery of an IR, initiate corrective action pursuant to the Corrective Action section of the Plan.

Contact the property owner affected by the IR. Coordinate with the property owner within 60 minutes of discovery on corrective actions necessary to contain and remediate the release.

If Ohio EPA's Office of Emergency Response staff deploy to the incident, Ohio EPA's On Scene Coordinator (OSC) will manage the incident by following Incident Command System principles. The OSC is the Company's point of contact throughout the duration of the incident and until the OSC makes a positive determination that no further emergency response actions are necessary.

Ohio EPA reserves the right to activate its Level of Effort Contractor as appropriate to redress an environmental emergency to protect public health, safety and the environment. Company may be subject to response costs as set forth in ORC Section 3745.12.

F. Corrective Actions

Upon discovery of a sustained loss of circulation or pressure exceeding a duration of 30 minutes, the drilling operator will begin to reduce down-hole pressure and conduct a visual inspection of the drill path and sensitive areas for evidence of an IR. The following shall be initiated if an IR is detected as defined in this Plan:

- If public health and safety are threatened by an IR, drilling operations will be immediately shut down until the threat is eliminated. For example, an IR that results in drilling fluid on a road surface.
- Upon discovery of an IR within surface waters or other sensitive area, drilling operations will be temporarily suspended until measures acceptable to Ohio EPA are in place to manage, control, and contain the IR.
- Provide containment structures to effectively contain the IR. Consider whether containment structures will cause additional adverse environmental impact. Secondary containment supporting 110 percent of the primary volume will also be installed as practicable and necessary.
- Collected drilling fluids will be returned to the drilling operation or sent to an Ohio EPA approved disposal location.
- For IR within wetlands or waterbodies, determine the potential movement of released drilling fluids and consider remediation/mitigation options accordingly.
- Document all releases to surface waters in the monitoring/inspection logs and include relative information, including but not limited to:
 - Date and time of release
 - Drilling conditions leading up to the release
 - Location coordinates in decimal degrees
 - Photographs
 - Estimated quantity of released drilling fluids
 - Location of public and private water supplies
 - Corrective actions taken

- Evaluation of effective containment and remediation equipment on site
- Upon completion of drilling operations, consult with applicable regulatory agencies and develop a final site-specific cleanup plan.
- Remediate impacts to benthic and/or aquatic communities to restore the function of the community. Develop site-specific plans to offset or mitigate any long-term impacts to the aquatic environment via mitigation or other form of replacing the loss of function or value.
- For impacts to public or private water supplies, provide temporary or permanent, short- or long-term replacement of the water supply until the water supply is restored to its pre-IR condition.
- For IR in a stream, implement Ohio EPA approved corrective measures such as:
 - Turbidity curtain
 - Straw bales (backed with impermeable layer)
 - Sand bags
 - Cofferdams
 - Dam and pump section
 - Flumed section
 - Stand pipe or alternate in-stream containment
 - Relief well

G. Best Management Practices (BMPs)

G.1. The following BMPs shall be implemented:

- Effective sediment barriers, including the installation of silt fence and/or other equivalent erosion control devices (ECDs).
- Installation of slope breakers in areas where ground disturbance leading to or from the HDD location may cause sedimentation downslope.
- Installation of silt fence and other ECDs at wetland or waterbody edges near the HDD location to further protect the resources.
- Sediment ponds or traps when the design parameters of sediment barriers are exceeded.
- Proper trench dewatering techniques for trenches leading to or from the HDD location, using a filter bag and silt fence/straw bale structures to comply with applicable water quality standards. There will be no turbid discharges to surface waters resulting from dewatering operations.
- Use of secondary containment for pumps or equipment within 50 feet of a wetland or waterbody.
- Relevant sections of Ohio EPA's Rain Water and Land Development Manual or other applicable state design specifications.
- Timely reclamation and stabilization of the areas following construction, with temporary ECDs maintained and monitored until final stabilization is achieved, at which time any necessary permanent ECDs would be installed.

G.2. An appropriate supply of materials and equipment for containing an IR at both sides of the HDD, including but not limited to the following, will be staged on site prior to drilling:

- Straw bales
- Silt fence
- Sand bags
- Hand tools
- Pumps and hoses
- Vacuum truck(s)
- Backhoe/trackhoe
- Equipment mats

The materials and equipment for containing an IR will be readily accessible to both sides of the HDD.

G.3. In the event of an IR, an appropriate number of pumps will be staged to volumetrically control the current release, as well as any further anticipated releases. Additional equipment and supplies will be brought in to supplement and provide for redundancy of critical systems in case of mechanical failure or an increase in the severity of a situation. In addition, pumps or other active relief systems will be continuously monitored while in use.

G.4. All personnel associated with the HDD will attend training on this Plan and other applicable construction plans approved for the project. All training will occur on site and the training events and attendees will be documented. In addition, records of occurrences and attendees of job safety analysis meetings will be documented.

G.5. Annular flow and injection pressure will be monitored on a continuous basis to identify any significant, rapid variances, which may be a sign of reduction or loss of circulation.

H. Alternative Contingency Plan

If the corrective actions described above do not correct the problem, the drill hole will be abandoned and alternate measures will be considered. Ohio EPA will be consulted to determine if an HDD failure has occurred and to evaluate alternate site-specific remedies. An HDD attempt will be considered failed if any of the following occur:

- Circulation is insufficient to maintain the integrity of the borehole
- Circulation losses present an imminent risk to human health or the environment
- The borehole location cannot be maintained within the required limits due to an IR as defined in this Plan

In the event of a borehole failure, the borehole will be promptly abandoned and a decision will be made regarding whether to re-attempt the HDD crossing, or use another crossing method, as described below:

- Grout will be pumped into the borehole to completely seal and fill 30 feet of hole entirely with grout, understanding that the top 5 may be filled with topsoil, and
- The location will be graded to the original contour.

The above abandonment procedures will be discussed with Ohio EPA and all appropriate permitting and regulatory agencies prior to implementation.

H.1 Alternative Crossing Locations and Methods

If the HDD cannot be completed at the proposed location, the HDD will be re-attempted at an alternate location. Before a determination is made on an alternate crossing location, an effort will be made to identify and assess the reason for the drill failure. This may be critical for the selection of the alternate crossing.

Considerations of alternate locations include, but are not limited to the following:

- Horizontal relocation of the drill hole
- Changing the drill profile (depth)
- Changing drill procedures (slurry viscosity/pressure/flow velocity, bit rotation/ velocity, etc.)
- Additional soil borings and geotech evaluation

If the entry and exit points need to be relocated, consideration will be given to:

- Stream bank type, flow width, depth, velocity and flow volume
- Surrounding topography
- Condition of riparian areas
- Condition and extent of wetlands, if any, on each side of the alternate crossing
- Aquatic biota
- Downstream water uses
- Entry and exit angles for the HDD path
- Permitting considerations

These and other factors will be considered and discussed with Ohio EPA and all appropriate regulatory agencies to secure the appropriate approvals.

Alternate crossing methods, if determined to be necessary, may include:

- Open cut
- Auger boring
- Pipe jacking
- Microtunneling

I. Drilling Fluid Additives and Lost Circulation Materials (LCMs)

Drilling fluid additives and LCMs must be comprised of and consistent with materials used in the drinking water distribution industry. Acceptable materials would include products only containing nontoxic clays, cements, ash and other non-toxic substances as indicated by the corresponding safety data sheets (SDS). Any use of drilling fluid or LCMs containing any petroleum-based products is strictly prohibited. Safety Data Sheets (SDS) for the following additives are included at the end of this plan.

- PolyPac UL
- Magna Fiber
- Platinum Pac UL
- MIX II

J. Disposal Considerations for Drilling Fluids and Drill Cuttings

Drilling fluids must be analyzed to ensure appropriate disposal. Representative sampling must be done in accordance with sampling method SW-846 8260B for volatile organic compounds and SW-846 8270C for semi-volatile organic compounds. In lieu of disposal at an approved sanitary landfill, drilling fluids determined to be non-toxic, that contain drilling fluids or additives consistent with drinking water standards, and the analytical results indicate there is no presence of petroleum constituents, may be considered for on-site disposal pursuant to the following conditions:

- For an on-location burial option, the site must be fully contained within the right-of-way of the transmission line being installed.
- The placement does not occur in surface waters or result in a discharge to surface waters.
- The spent drilling fluids and drill cuttings should be buried in either an excavated pit or mixed with overburden removed from the right-of-way at a ratio of 1:1.
- The material must be buried in a manner to prevent ponding or transport of storm water through the material (e.g., crested in the middle and a slope to the edge of the disposal area).
- The burial location is not to be located in sensitive hydrogeological areas (e.g., shallow ground water, shallow sand and gravel lenses, or fractured bedrock, etc.).
- The burial location must be located at least 100 feet from any permanent surface water.
- The burial location must be located a minimum of 100 feet from any potable water supply well and 300 feet from any large supply public water supply well.
- All off-site disposal, other than an approved sanitary landfill, must be approved by Ohio EPA.



InterCon Construction, Inc.
Z50 Memorial to Howell Pipeline Project
Drill Plan

Introduction

Vectren proposes to install two horizontal directional drills on the Memorial to Howell pipeline project in Greene and Montgomery Counties in Ohio. ~1083' of 20" steel pipe will be installed under State Route 4 with the second crossing to be installed beneath the Mad River a total of ~1658'. Other geographic features that will be crossed include Springfield Road, railroad right of way and timber lands.

This plan will provide procedures for the set up, pilot hole drilling, reaming and pipe installation for the directional drilled crossings. Also included are procedures to address any inadvertent drilling fluid loss and/or release to the formation or ground surface.

This plan will be accessible to all crew members, inspectors and any other parties involved with the HDD crossings. Personnel involved will be made aware and trained in the scope of this plan.

The anticipated drilling fluid components include: potable water, bentonite clay, soda ash if needed to modify the PH of the water to maximize bentonite properties. PolyPac UL and/or Magma Fiber may be added to enhance hole stabilization and control fluid loss.

This plan will be at the drill locations for reference and continued training as needed.

Downhole Equipment

Mad River HDD

The pilot hole will be drilled using an 8" adjustable bend downhole mud motor supplied by National Oilwell Varco with a 12.25" PDC bit. Drill pipe to be utilized is 6 5/8" OD "slick stick" with 5 1/2" FH-DS connection. The downhole guidance system comprises of a High Definition Tensor magnetic steering tool embedded within an 8" non-magnetic drill collar along with the use of Tru-Tracker to allow location of the pilot hole during the drilling process. The guidance services are supplied by InterCon technicians.

Highway 4 HDD

The pilot hole will be drilled using an 8" 2-degree bent housing with a 12.25" mill tooth bit. Drill pipe will be 6 5/8" OD "slick stick" with 5 1/2" FH-DS connection. The downhole guidance system comprises of a High Definition Tensor magnetic steering tool embedded within an 8" non-magnetic drill collar along with the use of Tru-Tracker to allow location of the pilot hole during the drilling process. The guidance services are supplied by InterCon technicians

Drilling location

Mad River

The entry point of the Mad River HDD is located south of the railroad tracks south of intersection of Springfield Road and Highway 444 in Greene County. The wooded area will be cleared to establish the work site. The path of the drill will pass beneath the railroad tracks, Springfield Road, Mad River, a wooded area to the exit point along a farm field in a wooded area that will be cleared for the exit work area.

Highway 4

The Highway 4 HDD will be drilled from East to West from a clearing adjacent to an existing trail, under a wooded area, crossing the Highway 4 right of way and exiting in a wooded area that will be cleared to accommodate the exit/pipe side work area.

Right of way monitoring procedure

Right of way monitoring will commence when drilling operations begin. While drilling and mud returns are at the recovery pit, the right of way will be monitored every two hours. The location of the bit will be conveyed to the personnel monitoring the area on a continual basis. The area at or near the bit will be an area of prime concern. All areas forward of the bit location and to the rear of the location will be monitored as well. Locations to the right and left of the centerline will be viewed on an intermittent basis.

If drilling mud loss occurs, right of way monitoring will be continuous while corrective measures are taken to gain full annular returns.

During the pilot drilling process, drilling mud is pumped through the drill pipe to the downhole motor to power the PDC bit. The drill pipe is advanced along the predetermined path until completely buried. The resulting flow of the drilling mud will carry the drill cuttings to the surface where it exits the hole at the entry point. The drilling mud travels along the drill pipe within annular space as the pilot is created. The location of the survey tool is determined and documented as well as plotted on a working drawing. The working drawing will allow visual comparison of the actual drilled location to the planned location at any point along the path of the drill. This information will allow the monitoring to occur along the as drilled path.

Drilling Fluids

The drilling fluid (mud) is a critical component for the success of the drill. The makeup water will be tested for PH levels and adjusted with soda ash as needed. The initial mix will include approximately 25 lbs of bentonite per 100 gallons of water. This mix will be tested and adjusted to achieve the desired viscosity in a range from 65 to 70 seconds. This initial mud weight will be ~9 lbs. per gallon.

Drilling will commence with this mix. As the pilot progresses, mud volumes will be monitored to recognize any mud loss. If loss is determined, Poly-Pac UL will be added to the mix to help the bentonite create a wall cake. This will inhibit water loss into the geology and mud loss into the formation. Platinum Pac UL may be added to inhibit sticking materials. MIX II may be added if mud loss is greater than can be controlled with the drilling mud being utilized.

The drilling mud rheology will be tested hourly or as needed to maintain the correct mix. The mud volumes and material usage will be documented daily with the production reports. If the mud weight exceeds 11 lbs. per

gallon, mud will be disposed of and an equal volume will be generated to maintain the preferred mud weight and rheology.

Pilot Hole drilling

The equipment to be utilized will include:

- A: DD 440 drill rig – 440,000 push/pull – upgraded to 80,000 ft/lbs of rotary force
- B: Mud Pump- Tulsa Rig Iron TT 750 triplex pump with 750 gpm.
- C: MCM 750 Tulsa Rig Iron mud cleaning and recycling system – 1200 gpm capacity
- D: Excavator
- E: Vacuum Truck
- F: Truck Tractor
- G: Case Backhoe
- H: Dump Truck
- I: Small pumps

Pilot hole duration: 6 – 12 hour days

Reaming and Swabbing the hole

A 30" TCI reamer will be installed on the drill pipe to be pulled enlarging the pilot for the installation of the pipeline. The reamer will be pulled through the crossing while drilling mud is injected to vacate the cuttings. The drilling mud will be collected, recycled and used again. Once the ream is complete a 26" reamer will be installed to perform a mud pass or swab to clean the hole and insure that the crossing is prepared for the pipe installation. Once the pilot hole is completed to the exit, the following equipment will have been set up. This equipment will be used to perform the reaming, swabbing and recover displaced fluids and cuttings during the pipe pulling processes.

- A: Mud mixing/recycling system
- B: Mud Pump
- C: Generator
- D: Excavator
- F: Truck Tractor

The drilling mud will be mixed, pumped, captured and recycled. Some disposal of drilling fluids will occur as well as drill cuttings that accumulate from the reamed hole.

Pipe Pull

Upon completion of the reaming and swabbing, the pipe will be pulled into the completed bore hole. The pipe will be set upon rollers at 50' intervals to support the pipe during the pullback. The rollers are double inclined neoprene rollers with 4' by 4' base for stability.

Frac tanks will be set up to allow drilling mud displacement to be collected. The drilling mud will exit collected to be disposed of with some of the volume to be transported to the drill rig to be used as the pipe pull continues. Drill mud cuttings will continue to be collected and hauled away.

InterCon Construction Co., Inc.
Spill Prevention Containment and Control (SPCC) Plan For
Horizontal Directional Drilling (HDD) Operations
For Drill Fluids

INTRODUCTION

Horizontal directional drilling is recognized as the least environmentally disturbing construction technique available for installing product lines beneath environmentally sensitive areas.

The measures presented in this plan are integral components of the HDD procedure.

The equipment to be used in the HDD operation includes: HDD rig, power unit/control cab, mud pump, mud mixing/cleaning plant, backhoe, forklift, and other miscellaneous support supplies and equipment.

PURPOSE OF THE PLAN

The purpose of this plan is to establish monitoring and response criteria that will minimize the environmental effects of the HDD operation. In particular this plan addresses the containment and control of drilling fluids. The HDD operation uses drilling fluid to facilitate the drilling of a borehole and installation of the product pipe. The fluid also serves to stabilize the surrounding formations and provide a seal that reduces the risk of the fluid migrating into the formation. The fluid is composed of naturally occurring clay and water. The clay is insoluble and made up of small particles that function as both a lubricant for the drill head and pipe and a sealant that fills the pore spaces surrounding the drill hole. Various benign, non-toxic additives may be added to the drilling fluid to optimize its properties.

With HDD, it is possible that some of the drilling fluids will be lost in fractures within the formation. In cases where the fracture is lateral these lost fluids will not surface. While it is not anticipated, in other cases, drilling fluids may reach the surface (e.g., the fracture comes close enough to the surface that the pressure causes the release of drilling fluid above ground). Such a release is termed an inadvertent return.

HDD MONITORING

The site superintendent has the overall responsibility for monitoring the HDD operations for inadvertent returns. He may delegate this responsibility as he sees fit. The drill rig operator or driller is the individual who is responsible for monitoring drilling fluid pressures and fluid returns. In the event of a significant drop in down hole fluid pressure or fluid returns the driller will notify the site superintendent. The superintendent, with the assistance of the more senior crewmembers, is responsible for visually monitoring the length of the bore for inadvertent returns.

PILOT HOLE AND REAMING

Drilling of the pilot hole and reaming includes the use of drilling fluid to cut through the earth material, to seal off fractures in the formation, to lubricate the drill pipe during installation, and to remove the drilled soil or cuttings from the bore. The drilling fluid is pumped through the inside of the drill pipe and exits through the

drill bit. The fluid then can return to the surface at the rig site through the annular space between the outside of the drill pipe and the borehole. The fluid returning to the drill site is called “returns”. A percentage of the drilling fluid returns to the rig site. As the drill progresses, more of the returns are absorbed by the earth and are not returned to the rig site. At some point, gravity, friction and/or hole obstruction may overtake the ability of the fluid to return to the drill site. It is not uncommon to not have any of the fluid return to the drill site during the majority of the bore, without any release of the fluid to the surface. The drilling fluid is usually absorbed by the formation or is drawn down into fractures. It is important to understand that a loss of returns, even a complete loss of returns, is a fairly normal occurrence during HDD that does not necessarily mean the drilling fluid is coming to the surface or impacting the environment.

PARTIAL LOSS OF ANNULAR RETURNS

During the pilot hole drilling if a partial loss of returns is realized, the following steps will be taken.

- Drilling will stop immediately
- Drilling mud parameters will be tested including mud weight, sand content and viscosity.
- Drilling mud parameters may be altered to better suit the geology.
- Spotters will be sent along the right of way to inspect for any inadvertent release to the surface
- The drill pipe will be extracted until full annular returns are established.
- If no loss of fluid to the surface is found drilling will again commence.

INAVERTENT RETURNS TO THE SURFACE

If a release occurs in an upland area or accessible wetland, appropriate reasonable actions to reduce, eliminate or control the release will be taken. The actions to be taken will depend on the location of the release point and the amount of fluid being released. The actions may include:

- constructing a small pit or sand bag coffer around the release point, installing a section of geotextile filter fabric (“silt fence”) and or hay bales to trap the sediment and place a pump hose in the pit to pump the drilling fluid back to the bore site,
- reducing drilling fluid pressures,
- thickening drilling fluid mixture, and
- adding pre-approved loss circulation materials (LCM’s) to the fluid mixture
- extracting drill pipe to reestablish annular returns.

Which of these actions will be implemented will depend on the specific boring conditions at the time of the release and the volume of the release. The Owner and the client’s representative will determine which methods are the most appropriate to eliminate, reduce or control the release. Drilling fluid that is recovered will be recycled and reused to the extent that is practical. Documentation describing the nature of the release including physical characteristics of the fluid, location and extent (area, estimated volume and duration); the modified procedures used to reduce the rate of leakage; the measures employed at the site of leakage to contain and remove drilling fluid; and the extent to which these measures are successful in containing or eliminating the release.

If the release occurs in an inaccessible area, wetland or water body drilling will cease while notifications are made to the Owner and Owner's representative. A plan will be devised to mitigate the situation after all parties have reviewed the event.

RESPONSE & NOTIFICATION

The Owner's representative will immediately be notified of any sudden losses in returns or any inadvertent returns. If an inadvertent return to the ground surface is observed, certain reasonable actions to eliminate, reduce, or control the release will be taken. The actions to be taken will depend on the location and time of release, the geologic conditions there and the volume of the release.

TRAINING

Supervisory and other key personnel that will be on site will have received training with respect to the control and containment of drilling fluid. The training includes:

- the details of this plan,
- the need for environmental protection,
- environmental resources located at or near the site,
- specific permitting conditions and requirements,
- the need to monitor the HDD operation,
- lines of communication,
- lines of authority and responsibility,
- the information that will need to be provided to the owners and other site representatives,
- contact names and phone numbers of the appropriate individuals and agencies.
- events that need to be reported and to whom.

EQUIPMENT AND MATERIALS

Equipment and materials used onsite to control and reclaim drilling mud if an event occurs that will include but not limited to:

- silt fence
- hay bales
- pumps and hoses
- shovels
- buckets
- squeegees
- fresh water
- vacuum truck and hoses
- excavator

HDD ENTRY AND EXIT POINTS

Measures will be implemented to contain and control the drilling fluid at the HDD crossing entry and exit point. These measures typically consist of the excavation of a containment pit around the entry and exit points.

Pumps will be used to remove any fluid that collects in the pit and pump it to a steel mud system. All drilling fluid that is recovered will be recycled and reused. While making-up and breaking apart drill string, it is normal that drilling fluid is spilled on the drill rig; this fluid will be collected and recycled.

DOCUMENTATION

The daily reports submitted to The Owner and the drillers log will contain all relevant information pertaining to any inadvertent returns and the measures implemented to contain and control them.



A Schlumberger Company

MATERIAL SAFETY DATA SHEET

MSDS No. 10341

Trade Name: MAGMA FIBER

Revision Date: 10/01/2010

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: MAGMA FIBER

Chemical Family: Mixture

Product Use: Drilling fluid additive.

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.slb.com

Telephone Number: 281-561-1512

Emergency Telephone (24 hr.): 281-561-1600

Prepared by: Product Safety Group

Revision No. 2

HMIS Rating

Health: 1*

Flammability: 0

Physical Hazard: 0

PPE: E

4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage. Potential cancer hazard. Contains crystalline silica which may cause cancer.

Canadian Classification:

UN PIN No: Not regulated.

WHMIS Class: D2A

Physical State: Powder **Color:** White to Gray **Odor:** Slight

Potential Health Effects:

Acute Effects

Eye Contact: May cause mechanical irritation

Skin Contact: May cause mechanical irritation.

Inhalation: May cause mechanical irritation.

Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects: See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.

Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS No.	Wt. %	Comments:
Mineral fiber	NONE	60 - 100	No comments.
Silica, crystalline, quartz	14808-60-7	1 - 5	No comments.

4. FIRST AID MEASURES

Eye Contact: Promptly wash eyes with lots of water while lifting eye lids. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If irritation persists or signs of toxicity occur, seek medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): NA

Flammable Limits in Air - Lower (%): NA

Flammable Limits in Air - Upper (%): NA

Autoignition Temperature: F (C): NA

Flammability Class: NA

Other Flammable Properties: ND

Extinguishing Media: Use extinguishing media appropriate for surrounding fire. This material is not combustible.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

Hazardous Combustion Products: Not combustible

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate the spill area with the exception of the spill response team. Contain spilled material. Do not allow spilled material to enter sewers, storm drains or surface waters. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

MATERIAL SAFETY DATA SHEET

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Environmental Precautions: Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Use only in a well ventilated area. Wash thoroughly after handling.

Storage: Store at room temperature in dry, well ventilated area. Keep in original container. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

Ingredient	CAS No.	Wt. %	ACGIH TLV	OSHA PEL	Other	Notes
Mineral fiber	NONE	60 - 100	10 mg/m ³ (Inhalable); 3 mg/m ³ (Respirable)	15 mg/m ³ (Total); 5 mg/m ³ (Respirable)	NA	None
Silica, crystalline, quartz	14808-60-7	1 - 5	0.025 mg/m ³	see Table Z-3	50 mg/m ³ IDLH (NIOSH)	(R)

Notes

(R) Respirable fraction.

Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. 29 CFR 1910.1000.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Neoprene. Nitrile.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

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General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: White to Gray
Odor: Slight
Physical State: Powder
pH: NA
Specific Gravity (H₂O = 1): 2.6 at 68F(20C)
Solubility (Water): Insoluble.
Flash Point: F (C): NA
Melting/Freezing Point: 2401F (1316C)
Boiling Point: ND
Vapor Pressure: NA
Vapor Density (Air=1): NA
Evaporation Rate: NA
Odor Threshold(s): ND

10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Keep away from heat, sparks and flame.
Materials to Avoid: Contact with acids.
Hazardous Decomposition Products: For thermal decomposition products, see Section 5.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

Ingredient	Component Toxicological Summary
Mineral fiber	Mineral fibers can release airborne respirable fibers during their use. The International Agency for Research on Cancer (IARC) has classified man-made mineral fibers such as glass wool, rock wool, slag wool and ceramic fibers as Group 2b carcinogens (possibly carcinogenic to humans based on animal sufficient data, insufficient data in humans).
Silica, crystalline, quartz	Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41). The National Toxicology Program (NTP) classifies crystalline silica as "reasonably anticipated to cause cancer in humans" (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)

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Product Toxicological Information:

No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: Component ecotoxicity data are listed below. If no data are listed, none were found in the component review.

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND

Bioaccumulation: ND

Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description:	Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.
Canada TDG Shipping Description:	See U.S. Shipping Description.
UN PIN No:	Not regulated.
IMDG Shipping Description:	See U.S. Shipping Description.
ICAO/IATA Shipping Description:	See U.S. Shipping Description.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

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Ingredient	SARA 302 / TPQs	SARA 313	CERCLA RQ	CA 65 Cancer	CA 65 Dev. Tox.	CA 65 Repro. F	CA 65 Repro. M
Silica, crystalline, quartz	---	---	---	X	---	---	---

State Comments: Proposition 65: This product contains chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 to cause cancer and/or reproductive toxicity. See table under U.S. Federal and State Regulations for the specific chemicals.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union - EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
New Zealand - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A

16. OTHER INFORMATION

The following sections have been revised: All sections.

NA - Not Applicable, ND - Not Determined.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



Safety Data Sheet PLATINUM PAC⁺ UL

1. Identification

1.1 Product identifier

Product name PLATINUM PAC⁺ UL
Product code 12481

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.
P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com

Prepared by
Global Chemical Regulatory Compliance (GCRC) , Bethicia Prasek

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600
Telephone Number - 281-561-1511

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards Not classified
Environmental hazards Not classified

Physical Hazards

Combustible dust	-
------------------	---

2.2 Label elements



Signal word
WARNING

May form combustible dust concentrations in air

Precautionary statements

P240 - Ground/bond container and receiving equipment

P243 - Take precautionary measures against static discharge

P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	CAS-No	Weight % - range
Carbohydrate	Proprietary	60 - 100

Comments

The exact percentage (concentration) of composition has been withheld as a trade secret

4. First aid measures

4.1 First-Aid Measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.
Eye contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Suspended dust may present a dust explosion hazard.

Hazardous combustion products

Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Evacuate personnel to safe areas. Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

Environmental exposure controls

Avoid dust formation.

6.3 Methods and materials for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Material becomes slippery when wet. Use caution if wet.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions

Ensure adequate ventilation. Provide appropriate exhaust ventilation at places where dust is formed. Keep airborne concentrations below exposure limits.

Storage precautions

Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits

Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Component	ACGIH TLV	OSHA PEL
Carbohydrate	Not Determined	Not Determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection

Tightly fitting safety goggles.

Hand protection

Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory protection

All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator.

If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.

Skin and body protection

Wear suitable protective clothing.

Hygiene measures

Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid powder
Appearance	Opaque
Odor	Mild Odorless
Color	White - Yellow
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH		
pH @ dilution	6.5-8.5 @ 1% in H ₂ O	
Melting/freezing point		
Boiling point/range	No information available	
Flash point	Does not flash	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	0 mmHg	
Vapor density	Not applicable	
Specific gravity	0.3 - 0.5	
Bulk density	No information available	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	Not determined	
Explosive properties	Not Applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available

VOC content(%) None
Density No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

Hazardous Reactions

None known.

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides (COx).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye contact Dust may cause mechanical irritation.

Skin contact Repeated exposure may cause skin dryness or cracking.

Ingestion Irritant; may cause pain or discomfort to mouth, throat and stomach.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Carbohydrate	= 27000 mg/kg (Rat)	> 2 g/kg (Rabbit)	> 5800 mg/m ³ (Rat) 4 h

Component	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Carbohydrate	No data available	No data available	No data available	No data available

Sensitization This product does not contain any components suspected to be sensitizing.

Mutagenic effects This substance has no evidence of mutagenic properties.

Carcinogenicity	This substance has no evidence of carcinogenic properties.
Reproductive toxicity	None known.
Developmental toxicity	Not known to cause birth defects or have a deleterious effect on a developing fetus.
Routes of exposure	Inhalation. Skin contact. Eye contact.
Routes of entry	None known.
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified.
Aspiration hazard	Not Applicable.

12. Ecological information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Carbohydrate (60 - 100)	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating or toxic (PBT)

This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Disposal Method	Disposal should be made in accordance with federal, state and local regulations.
Contaminated packaging	Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated
UN No. (DOT)	Not regulated

14.2 Proper shipping name

Not regulated for transportation by DOT, TDG, IMDG and ICAO/IATA.

14.3 Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated
DOT Hazard class	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated
DOT Packing group	Not regulated

Marine pollutant

No

14.6 Special precautions

Not Applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies

China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories

Not a SARA 311/312 hazard.

SARA 302/304, 313, CERCLA RQ, California Proposition 65

Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

Component	SARA 302 / TPQs	SARA 313	CERCLA RQ
Carbohydrate	N/A	N/A	N/A

State Comments

Proposition 65: This product is not known to contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer and/or reproductive toxicity at levels that are expected to pose a significant risk under anticipated use conditions.

Canadian Classification

This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

WHMIS Hazard Class Not a controlled product.

16. Other information

Supersedes date	14/Feb/2012
Revision date	08/Jan/2015
Version	4
The following sections have been revised	All sections. Updated according to GHS/CLP.

HMIS classification

Health	0
Flammability	1
Physical hazard	0
PPE	E

N/A - Not Applicable, N/D - Not Determined.

†A mark of M-I L.L.C.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.



Safety Data Sheet POLYPAC⁺ UL

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name POLYPAC⁺ UL
Product code 10070

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive Fluid loss reducer.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.
P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com

Prepared by
Global Chemical Regulatory Compliance (GCRC) , Bethicia Prasek

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600
Telephone Number - 281-561-1512

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards Not classified
Environmental hazards Not classified

Physical Hazards

Combustible dust

2.2 Label elements

Signal word
WARNING

May form combustible dust concentrations in air

Precautionary statements

P240 - Ground/bond container and receiving equipment

P243 - Take precautionary measures against static discharge

P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment

3. Composition/information on Ingredients

3.1 Substances

Component	CAS-No	Weight % - range
Carboxymethylcellulose sodium salt	9004-32-4	60-100

3.2 Mixtures

Not Applicable

4. First aid measures

4.1 Description of first-aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.
Eye contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice	The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.
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Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	Treat symptomatically.
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5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Suspended dust may present a dust explosion hazard.

Hazardous combustion products

Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Evacuate personnel to safe areas. Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment.

6.3 Methods and materials for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Material becomes slippery when wet. Use caution if wet.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions

Ensure adequate ventilation. Provide appropriate exhaust ventilation at places where dust is formed. Keep airborne concentrations below exposure limits.

Storage precautions

Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls/personal protection

8.1 Control parameters

Component	ACGIH TLV	OSHA PEL
Carboxymethylcellulose sodium salt 9004-32-4 (60-100)	Not Determined	Not Determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection

It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.

Hand protection

Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory protection

All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator.

If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.

Skin and body protection

Wear suitable protective clothing.

Hygiene measures

Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid powder
Appearance	Opaque
Odor	Mild Odorless
Color	Off-white - Tan
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	No information available	
pH @ dilution	6.5-8.0 @ 1% in H ₂ O	
Melting/freezing point		
Boiling point/range	No information available	
Flash point	Does not flash	
Evaporation rate (BuAc =1)		
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	0 mmHg	
Vapor density	Not applicable	
Specific gravity	1.5 - 1.6	
Bulk density	No information available	
Relative density	No information available	
Water solubility	Gels on contact with water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	Not determined	
Explosive properties	Not Applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

Hazardous Reactions

None known.

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides (COx).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation	Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.
Eye contact	Dust may cause mechanical irritation.
Skin contact	Repeated exposure may cause skin dryness or cracking.
Ingestion	Irritant; may cause pain or discomfort to mouth, throat and stomach.
Acute toxicity	0% of the mixture consists of ingredient(s) of unknown toxicity.

Component	LD50 Oral	LD50 Dermal	LD50 Inhalation
Carboxymethylcellulose sodium salt	= 27000 mg/kg (Rat)	> 2 g/kg (Rabbit)	> 5800 mg/m ³ (Rat) 4 h

Sensitization This product does not contain any components suspected to be sensitizing.

Mutagenic effects This substance has no evidence of mutagenic properties.

Carcinogenicity This substance has no evidence of carcinogenic properties.

Reproductive toxicity None known.

Routes of exposure Inhalation. Skin contact. Eye contact.

Routes of entry None known.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard No hazard from product as supplied.

12. Ecological information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Carboxymethylcellulose sodium salt	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating or toxic (PBT)

This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known. Check for additional information in sect. 7.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products

Dispose of in accordance with local regulations.

Contaminated packaging

Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

UN/ID No. (ADR/RID/ADN/ADG)

Not regulated

UN No. (IMDG)

Not regulated

UN No. (ICAO)

Not regulated

UN No. (DOT)

Not regulated

14.2 Proper shipping name

Not regulated for transportation by DOT, TDG, IMDG and ICAO/IATA.

14.3 Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated
DOT Hazard class	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated
DOT Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not Applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories Not a SARA 311/312 hazard.

SARA 302/304, 313, CERCLA RQ, California Proposition 65

Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class Not a controlled product.

16. Other information

Supersedes date 25/May/2011

Revision date 18/Jun/2014

Version 9

The following sections have been revised All sections.

HMIS classification

Health	1
Flammability	1
Physical hazard	0
PPE	E

N/A - Not Applicable, N/D - Not Determined.

†A mark of M-I L.L.C.

Disclaimer

The information provided in this Material 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.

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Case No(s). 19-0025-GA-BLN

Summary: Correspondence of Vectren Energy Delivery of Ohio, Inc. in Compliance with Staff Report Condition No. 3 electronically filed by Teresa Orahod on behalf of Devin D. Parram