

HUSKY ENERGY INC.

Surface Water Sampling and Analysis Plan

2018 Superior Refinery Fire

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5/8/2018

Environmental Unit Leader

Signature_____
Date

Operations Section Chief

Signature_____
Date

Planning Section Chief

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Date

Incident Commander

Signature_____
Date



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Prepared at the Request of Counsel



Surface Water Sampling and Analysis Plan

Superior Refinery Fire

Husky Energy Inc.
Husky Superior Refinery

2407 Stinson Avenue
Superior, WI 54880, USA

Prepared for: Husky Energy

GHD | 455 Phillip Street Waterloo Ontario N2L 3X2 Canada
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1. Introduction and Objectives

At the request of Husky Energy Inc. (Husky), GHD Services Inc. (GHD) has prepared the following surface water Sampling and Analysis Plan (SAP) in response to the fire that occurred at the Husky Superior Refinery located at 2407 Stinson Avenue, Superior, WI 54880, USA (Site).

The objective of the SAP is to evaluate potential impacts to surface water on the Site and in surface water bodies that may have been impacted from materials released during the fire and from firefighting activities. Surface water from the Site outside of the Refinery process units is conveyed to on-site stormwater ponds and/or the ditch located on the north side of Stinson Ave., both of which discharge from the Site into the 21st St. Impoundment and Newton Creek that flows to the northeast and ultimately discharges into Superior Bay, located approximately 1.5 miles from the Site. Surface water located in the process units flows to the on-site WWTP for recovery and treatment with eventual discharge to the impoundment/Newton Creek. The following tasks will be completed to achieve the objective:

- Collect surface water samples at sampling locations within surface water bodies on the Site and in the creek. Samples will be submitted for the following laboratory analyses:
 - Gasoline range organics (GRO), Method 8015B
 - Diesel range organics (DRO), Method 8015B
 - Oil range organics (ORO), Method 8015B
 - Oil and Grease, Method 1664A
 - Volatile Organic Compounds (VOCs), Method 8260
 - Semi-volatile Organic Compounds (SVOCs), Method 8270
 - RCRA 8 Metals, Methods 200.7, 6018B, 6010C
 - Sulfate, Method 300.0
 - Per- and Polyfluoroalkyl substances (PFAS), ASTM D7979-17
- Collect samples of wastewater already containerized on-Site to evaluate potential treatment options.

2. Surface Water Monitoring and Sampling

Surface water monitoring and sampling will be conducted at sample locations within the creek and in surface water bodies on the Site that have the potential to be impacted by materials released during the asphalt fire and from firefighting activities. Initial sample locations have been selected based on known sensitivity or risk, field conditions including site safety conditions, accessibility, and visual observations of any free phase oil or sheen. The number of surface water monitoring/sampling locations and frequency of the monitoring/sampling will be adjusted, as required, based on the work being conducted and results of the initial sampling events.



If sheen or free product is observed on the water surface at the time of sampling, field staff will move the sample location downstream of the where the sheen or free product is observed. At each sample station, water quality parameters will be collected during sample collection and the water will be observed for presence of sheen, odor, or free product. Samples will be collected from within 6 inches below the surface of the water. Surface water samples will be collected by filling dedicated laboratory supplied bottles containing no preservative to transfer the surface water into the sample bottles, or by filling the sample bottles directly from the surface water location. The final monitoring/sampling locations will be recorded using a handheld GPS device. Additional monitoring/sampling locations may be added, as needed, based on analytical results from initial sampling activities.

The surface water monitoring/sampling program will be used to determine downstream surface water quality in the vicinity of the spill location. The initial monitoring/sampling program will consist of collecting grab surface water samples from sampling locations daily between April 29, and April 30, 2018. Following the April 30, 2018 sampling event, the frequency of the surface water sampling was modified to every other day. The frequency of the surface water monitoring/sampling and the number of sampling locations will be adjusted, as required and approved by the WDNR, based on the work being conducted and results of the initial sampling events.

Initial surface water locations are shown on the attached Surface Water Sampling Locations figure.

3. Quality Assurance/Quality Control Program

A Quality Assurance/Quality Control (QA/QC) program will be implemented to ensure quality data are generated. This program will involve both field and laboratory QA/QC measures. The QA/QC program will be initiated to ensure that if any form of sample contamination occurs, or if any lack of precision in the analytical methods employed is evident, the potential source and degree of the contamination or analytical imprecision can be identified and properly addressed.

Samples will be collected in laboratory-supplied sampling containers with the appropriate preservative and submitted under chain-of-custody protocol to the analytical laboratory for chemical analysis. From the time of collection to the time of submission to the laboratory, samples will be stored in a cooler and packed on ice to maintain sample integrity.

The following measures will be implemented for quality assurance:

- Between collection of each surface water sample, sampling field personnel will don a new pair of disposal nitrile gloves.
- Calibration of monitoring equipment will be completed, as required.
- Pre-cleaned laboratory supplied sampling containers will be used.
- Samples will be submitted to the analytical laboratory following chain-of-custody procedures. The chain-of-custody forms document the condition and handling of the samples throughout the collection, transportation, and final analyses of the samples.
- Field duplicates will be prepared as a check on analytical procedures. Field duplicates are samples of materials collected in the field from the same location, at the same time and



analyzed for the same constituents. They are used to test the consistency of the sampling method and precision of the laboratory. At a minimum, one field duplicate will be prepared for every ten samples submitted to the laboratory. Duplicates will be labeled so that the laboratory is unaware of their identity as duplicates (blind duplicates).

- Following receipt of the analytical data from the laboratory, a GHD chemist will perform a data quality assessment and validation. The evaluation of the analytical data is based on the QA/QC information provided by the laboratory including laboratory blank data, laboratory duplicate data, and laboratory surrogate spike and check recovery data, as well as sample holding times, field duplicate analysis, and reagent blank analysis.

The following additional measures will be implemented for PFAS analysis:

- Laboratory supplied containers designated specifically for PFAS analysis will be used. All samples will be handled and preserved in accordance with ASTM D7979 guidance.
- For surface water samples, the outside of all capped sample containers will be rinsed multiple times with the surface water being sampled before filling the containers. Samples will be collected at the air/water interface.
- Detergents or soaps used for decontamination must have their SDSs reviewed to ensure that no fluoro-surfactants are listed as ingredients.
- A field reagent blank must be collected with each sample set (samples collected from same site at the same time). Sampler must fill the blank with water provided by the lab.

4. Reporting

Sampling data will be collected, compiled, and assessed in accordance with applicable guidelines/legislation. The manually-collected monitoring/sampling data will be entered into an electronic database (spreadsheet or equivalent), and it will undergo a quality assurance and quality control (QA/QC) review. Data entry forms and field notes will be kept on-site and retained for reference upon completion of the project. If necessary, full laboratory analysis data packages will be provided, and associated data validation processes will be arranged. Results will be communicated to Site representatives, applicable property owners, stakeholders, and government agencies, as required.

As the sampling plan proceeds and results are obtained, the plan may be revised as necessary and appropriate to meet the objectives as previously stated.