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MEMORANDUM

DATE: August 24, 2017

TO: Brooks Stanfield, On-Scene Coordinator, EPA, Seattle, WA, Mail Stop ECL-133

FROM: David Burford, START-IV Project Manager, E & E, Seattle, WA

SUBJECT: Proposed Sampling Approach
Treoil Facility Site
Ferndale, Washington

REF: Contract Number EP-S7-13-07
Technical Direction Document Numbers: 17-01-0012 and 17-03-0003

A proposed sampling approach has been designed for the Treoil Facility site, which is located in Ferndale, Washington (Figure 1). Proposed sample locations are presented on Figure 2.

Site Description:

The Treoil Industries Biorefinery (Site) has been the focus of numerous environmental inspections and compliance concerns since the late 1980s. The Washington State Department of Ecology (Ecology) issued a Notice of Violation to facility operators for "the discharge of spilled material to a drainage ditch that eventually leads to the Strait of Georgia." This spill occurred in October of 1991. The spill was described at that time as "pine oil" in Ecology's documents, but later has been referred to as "tall oil" which is a byproduct of kraft processes and is used commercially as a component of rubber products, inks, adhesives, and is used as an emulsifier for asphalt. The facility operators were not aware of the approximately 1,000-gallon spill and had to be alerted by an adjacent facility. In Ecology's Notice of Violation, it was noted that this was the second instance in which this facility had spilled oil but failed to report the spill to the State, as required by state law. Also during this event, it was discovered that the facility was discharging industrial waste water to the same ditch without an NPDES permit.

In 2000, the EPA conducted a Removal Site Evaluation to determine potential threats of discharge of oil to waters of the United States. EPA's Removal Site Evaluation report referenced Ecology's files showing "many years of poor housekeeping" at the Site. At that time, the On-Scene Coordinator conducting the Removal Site Evaluation was led to believe that the tall oil in the aboveground storage tanks (ASTs) was solid. Based on this information, the OSC determined there was not a threat of discharge of oil to waters of the United States. Despite this determination, in the final report the OSC outlined several suggested actions at the Site including:

- Removal and disposal of the remaining drums and contents;
- Removal of the sludge and water inside the secondary containment area;
- Removal of sandblast grit and rosin material left uncontained at various locations throughout the Site;
- Removal of chemical containers inside all buildings for disposal at a hazardous materials landfill or through the Industrial Materials Exchange Program when applicable; and,

- Excavation in the areas of other stained soils until analytical results indicate contamination below the appropriate MTCA cleanup level.

In 2014, the State received a formal complaint about the Site, which was followed up by several inspections by Whatcom County Health Department and Ecology's Hazardous Waste and Water Quality programs. On September 23, 2015 Ecology issued an Amended Order to comply with State Dangerous Waste regulations. Numerous concerns reported during the several inspections included:

- Black oily residue visible under fresh gravel that was recently placed on the entire length of driveways on the property;
- Large quantities of oily residue released to the surface of the ground outside of the secondary containment structures;
- A large (10'x10'x4') pit located outside of the western property fence line heavily impacted by black oily substance;
- An oily substance was present in the secondary containment structures floating on at least one foot of water;
- Uncertainty regarding the integrity of tanks, pipes, and secondary containment;
- Numerous containers of chemicals that were being inappropriately stored and/or poorly managed; and
- Numerous totes with unknown liquids with no secondary containment and/or that were inappropriately stored.

In the one and a half years following issuance of Ecology's order #12892, state program officials became concerned by the lack of effort exhibited by the property owner to comply with the order. On February 15, 2017, the EPA met with Ecology and Whatcom County Health Department at their request to determine EPA's ability evaluate and address potential threats of discharge of oil to waters of the United States as well as any potential releases of hazardous substances to the environment. On March 8, 2017, the EPA received a photo log documenting a field visit that had been conducted by Ecology two days prior, which outlined a deterioration of many of the same safety and environmental conditions observed previously on the property including but not limited to: hazardous substances that had released from containers, improper storage and labeling of chemicals in several hundred containers ranging up to 275-gallon totes and two 6,700 gallon-capacity ASTs containing glycerin crude. The EPA observed evidence of releases of these chemicals from containers (as evident by odors and visible staining), threats of release, improper storage and labeling of containers, as well as failing secondary containment for the two ASTs. Containers were found to be structurally unsound, open and otherwise stored in precarious situations. In addition to these concerns, EPA also discovered thousands of gallons of tall oil in drums, totes, and ASTs that were leaking, threatening to leak, and/or had no secondary containment. This oil was secured and removed separately under EPA's oil response authorities under the National Contingency Plan (40 CFR § 300.300).

The EPA inventory and sampling efforts confirmed that approximately 200 containers and drums contained CERCLA hazardous substances. Among the contaminants identified were lead, sulfuric acid, potassium hydroxide, sodium hydroxide, ammonium chloride, formaldehyde, cupric sulfate, paradichlorobenzene, triethanolamine, glycol ether, xylene, toluene, friable asbestos, and other chemicals confirmed as RCRA characteristic hazardous waste. In addition, several large totes and the two 6,700-gallon ASTs contained a combined 7,050 gallons of glycerin crude.

Environmental Setting:

As previously noted, stained soil has been documented at the Site which is assumed to be a result of improper operations with regards to the contents of the ASTs. It is unknown how much or how frequently releases to the ground from these tanks, totes, drums, and various other containers has occurred. In addition, there are three secondary containments present at the Site. During the

March 2017 event, areas of obvious soil staining were mapped (Figure 2). Areas of visible soil staining as of March/April 2017 are outlined on the figure and the area where sandblast grit was noted. At the time of this evaluation, the ground was saturated due to heavy rainfall and an additional site reconnaissance for soil staining is recommended.

Neither of the secondary containments have been completely emptied, and the nature of the bottom material has not been documented. If the bottoms of these containments are not concrete, it is possible contamination associated with the tanks as well as leakage directly to the ground from tanks without secondary containment could be impacting groundwater.

Approximately 200 of the over 700 containers discovered on the property contained CERCLA hazardous substances and due to their deteriorated condition and lack of proper controls, presented a potential threat to sensitive ecosystems. Analysis of sediment samples collected from the concrete trench located inside Warehouse B had such high concentrations of lead it required disposal as RCRA hazardous waste. Sediment samples from the concrete trench in Warehouse A contained petroleum, toxic metals, Volatile Organic Compounds (VOCs) and Semivolatile Organic Compounds (SVOCs). A pipe was observed to be leading from the endpoint of Warehouse B's trench extending west outside the building creating potential concerns for the spread of contaminants found in the trench sediment to the adjacent wetland. After some investigation, crews could not determine the exact route of this pipe after it leaves the building (or whether it leaves the building at all). There is also a potential connection from the trench in Warehouse A to the environment outside. Old site schematics for septic system show a potential path from the trench to south sump area. Further investigation is warranted.

Surface water from the Site flows generally southwest until it reaches a drainage ditch. The ditch flows west from the Site approximately one mile where it connects with a wetland and unnamed creek. The creek flows another 1.5 miles before ultimately discharging directly into an area of the Georgia Strait that has been designated by the State of Washington as the Cherry Point Aquatic Reserve. During the Emergency Response Removal Action, surface water sheet flow pathways to the adjacent wetland were noted. Several pathways of flow into the wetland and a stream to the west of the wetland were noted and mapped (Figure 2). There are three sumps in the wetland adjacent to the Site (Figure 2). It has been postulated water from the Site drains to these sumps then continues through the wetland to the stream which then flows south and merges with the drainage ditch referenced above.

Cherry Point has a unique marine and freshwater ecosystem that supports a variety of natural resources, fish and wildlife. Aquatic diversity along this area is very high with cobble intertidal habitat, large rocks and boulders, sandy beaches, eelgrass beds, and kelp. At one time, Cherry Point provided spawning habitat for the largest herring population of Puget Sound and the Strait of Juan de Fuca. The area is a nearshore migratory corridor for juvenile salmon, and provides significant habitat and foraging areas for marine seabirds and migratory waterfowl populations. Five species of salmon— sockeye, Chinook, coho, chum, and pink —and three species of forage fish: Pacific herring, sand lance, and surf smelt rely upon these habitats.

Water well logs of a nearby well (4300 Aldergrove Road; attached) indicates static water level in the well at 44 feet below ground surface in late August, 1994. Shallow groundwater may be present at as little as 20 feet below ground surface during more rainy seasons.

Members of the Lummi Nation visited the Site and noted there are areas of cultural significance to the tribe at the Site. They requested no earth removal activities be conducted at the Site without their consultation.

Applicable Analysis:

Based on sites historic uses, suggested analyses for all samples include SVOCs, Target Analyte List (TAL) metals, and diesel and heavy oil total petroleum hydrocarbons. Because the nature of the sandblasting activities are not known, it is recommended to add tributyltin analysis to samples collected from this area, unless it can be determined that sandblasting was not conducted on any boats.

Stained Soil:

Six areas of stained soil and one area of sandblast grit were identified in March 2017. An additional area of stained soil in the northern portion of the Site was added in July 2017. As previously stated, it is recommended additional reconnaissance be conducted prior to sample collection activities to ascertain if there are stained areas that were not previously noted due to saturation of site soils at the time of the survey. The number of samples should be based on the overall size of the area of stained soil, with at least one sample collected from each area. The depth of potential contamination is not known; however, if subsurface soil samples are anticipated, members of the Lummi Nation should be consulted prior to digging any soils at the Site.

During the second phase of work, a small excavation was conducted near Tank 50. Tank 50 had visible oil pools around its perimeter and a decision was made to remove the tank and excavate visibly contaminated soil. An approximately 2000 sq ft area was scraped down to a maximum depth of 18 inches. The area still contains soils that are stained or may be contaminated as the impact of the leaking oil is not fully known. The area should be sampled and investigated similarly to other stained soils on the property.

Wetlands/Drainage Ditch:

Wetlands are present surrounding the Site and along the preferential water pathway from the Site to the Georgia Strait. As previously noted, a spill at the Site impacted the drainage ditch to the south, extending all the way to Gulf Road. Impacts of contamination from the Site to the drainage ditch is not fully known. Samples of sediment and/or surface water should be collected to determine if contamination has impacted the drainage ditch. Also noted were pathways for contamination to migrate west of the Site into a wetland, before discharging into the drainage ditch. Sediment and/or surface water samples are recommended to be collected from the wetlands adjacent to the Site, the drainage pathways to the unnamed stream to the west of the Site, as well as the drainage ditch to the south of the Site, to determine if contamination has migrated.

Sumps:

Three sumps are located immediately adjacent to the Site outside of the western fence line. Anecdotal information suggests the origin of the sumps are somewhere on the Site. Where appropriate, surface water and surface soil samples from each of the three sumps should be collected. If possible, digging down to various depths to help understand the extent of impact is also recommended. If soil is to be disturbed, consultation with the Lummi Nation should take place.

Secondary Containment:

There are three secondary containments on the Site, two of which have stagnant water and residual material on the bottom. Water samples along with samples of sludge material should be analyzed for containments of concern from each containment. The smallest secondary containment is seasonally affected and it may not be feasible to grab samples. If the opportunity is present, samples should be collected.

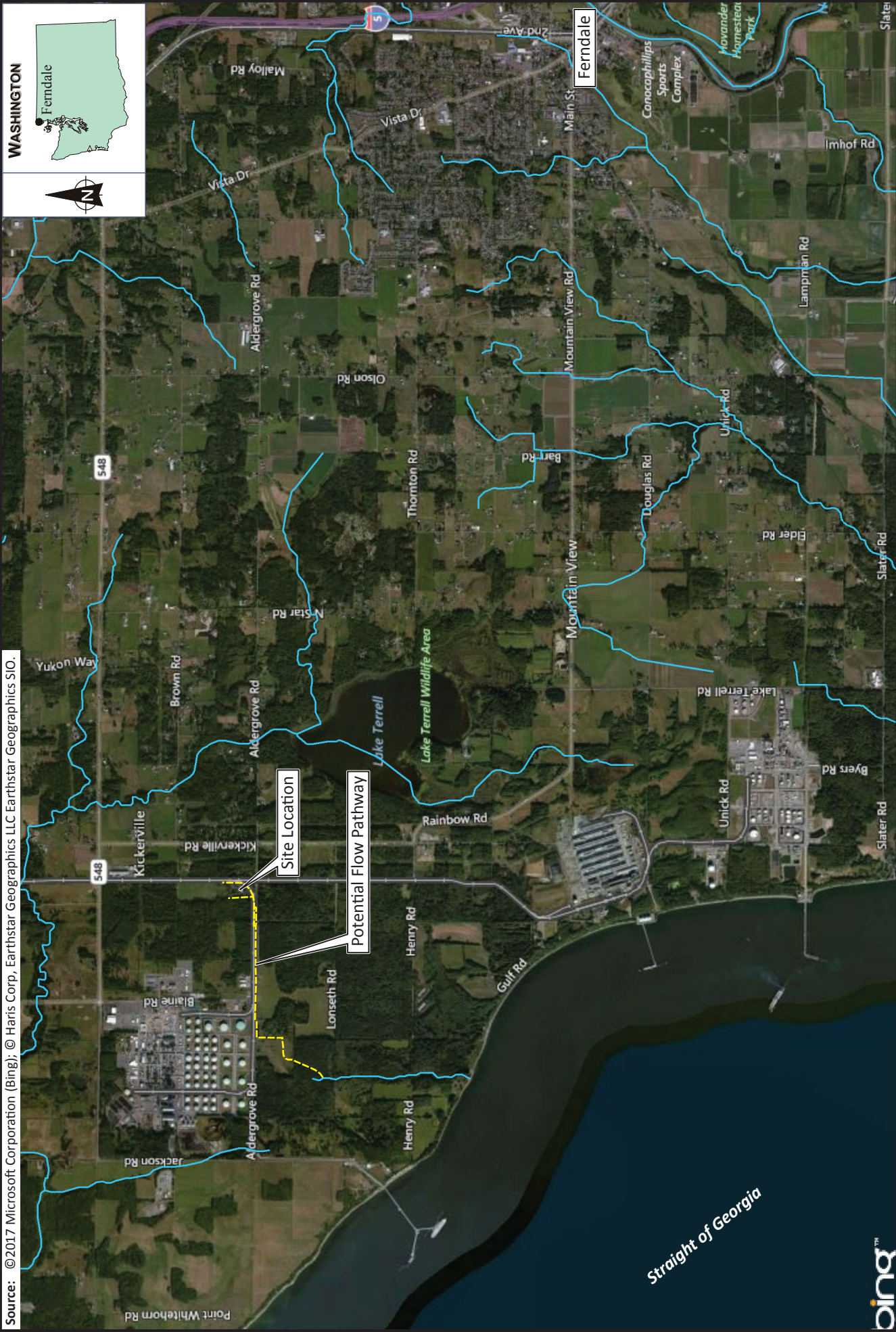
Groundwater:

It is recommended that at least 4-8 groundwater samples be taken and assessed for contaminants. Location suggestions for sampling is indicated on Figure 2. Groundwater impacts can be from the numerous stained soils on Site, secondary containment, or any one of the unknown releases of product. Generally, groundwater flows towards the southwest. Establishing a groundwater plume may be necessary to understand contamination leaving the Site. Well installation, if incorporated, should not be completed without consultation with the Lummi Nation.

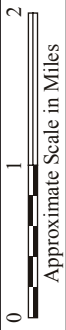
Other Sampling Guidelines:

Background samples will need to be considered carefully since the area resides in a heavy industrial area. Ground water samples should be taken near the northeastern side of the property to account for potential impact from the railways, and surface soil/sediment samples should be taken outside the property or in an area less likely to contain site containments. A water well sample from 4300 Aldergrove can be used for a potential background if access to railways is not possible. Suggested sample locations are marked on Figure 2.

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TREOIL INDUSTRIES
 Ferndale, Washington



Date: 5/9/17

Drawn by: AES

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Figure 1
 SITE LOCATION MAP



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

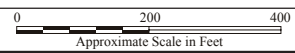
DigitalGlobe, Microsoft, CNES/Airbus DS | Source: USFWS | Esri, HERE, Garmin, IPC, NRCAn

Key:

- X Catch Basin
- ◇ Background Sample
- Sump
- Groundwater Boring
- Drainage
- Stained Soil
- Secondary Containment
- Sand Blast Grit

TREOIL INDUSTRIES BIOREFINERY RESPONSE
 Ferndale, Washington

Figure 2
 PROPOSED SAMPLE LOCATIONS



Date:	Drawn by:
8/23/17	AES
10:START IV:17030003/fig 2	

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