

**RESOURCE CONSERVATION AND RECOVERY ACT
CURRENT CONDITIONS SUMMARY / FACILITY
INVESTIGATION WORK PLAN FOR THE**

**FORMER GM POWERTRAIN DIVISION LIVONIA
12200 MIDDLEBELT ROAD, LIVONIA, MICHIGAN**

USEPA ID #MID000718874

by

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for

**Revitalizing Auto Communities
Environmental Response Trust
Ypsilanti, Michigan**

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LIST OF SUPPORTING DOCUMENTS

Document Title

Resource Conservation and Recovery Act
Facility Investigation Field Sampling Plan
For The Former GM Powertrain Division Livonia
12200 Middlebelt Road, Livonia, Michigan, USEPA ID #MID000718874

Resource Conservation and Recovery Act
Facility Investigation Quality Assurance Project Plan
For The Former GM Powertrain Division Livonia
12200 Middlebelt Road, Livonia, Michigan, USEPA ID #MID000718874

Resource Conservation and Recovery Act
Facility Investigation Public Involvement Plan
For The Former GM Powertrain Division Livonia
12200 Middlebelt Road, Livonia, Michigan, USEPA ID #MID000718874

LIST OF ACRONYMS AND ABBREVIATIONS

AOI	Area of Interest
BGS	Below Ground Surface
CCS	Current Conditions Summary
DMP	Data Management Plan
EI	Environmental Indicators
FSP	Field Sampling Plan
GM	General Motors
Haley & Aldrich	Haley & Aldrich of Michigan, Inc.
LNAPL	Light Non-aqueous Phase Liquid
DNALP	Dense Non-aqueous Phase Liquid
mL/min	Milliliters per minute
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDNRE	Michigan Department of Natural Resources and Environment
MI	Michigan
Michigan 10 Metals	Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, and Silver, and Zinc
Part 201	Part 201 of Michigan's Natural Resources and Environmental Protection Act of 1994 (as amended)
PAHs	Polycyclic Aromatic Hydrocarbons
PBA	Performance Based Agreement
PCBs	Polychlorinated Biphenyls
POTW	City of Livonia publicly-owned treatment works
RCRA	Resource Conservation and Recovery Act
QAPP	Quality Assurance Project Plan
RFI	RCRA Facility Investigation
TAL	Target Analyte List
TCL	Target Compound List
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

1. INTRODUCTION

1.1 General

Revitalizing Auto Communities Environmental Response Trust (RACER) of Ypsilanti, Michigan has entered into negotiations with the Region 5 of the United States Environmental Protection Agency (USEPA) to undergo Corrective Action at the former General Motors (GM) Powertrain property located at 12200 Middlebelt Road, Livonia, Wayne County, Michigan (the Site), under a Performance Based Corrective Action Agreement, to be executed under the Resource Conservation and Recovery Act (RCRA) (Draft PBA). This agreement is being negotiated despite that hazardous waste has not been stored at the Site for more than 90 days, and the Site has not been subject to RCRA interim status.

Pursuant to Section II of the Draft PBA, RACER must investigate, and as necessary, remediate all releases of hazardous wastes or constituents at or from the Site, and specifically per Section V of the Draft PBA, RACER must conduct the following actions:

- Preparation of a report covering all areas of the Site, which summarizes current conditions of the Site with respect to prior investigations, historic operations, and physical setting, as well as past treatment, storage or disposal of hazardous waste or hazardous constituents (Draft PBA Section V.1.a.); and
- Investigation of the Site to identify the nature and extent of any releases of hazardous waste and/or hazardous constituents at or from the Site which may pose an unacceptable risk to human health or the environment (Draft PBA Section V.1.b.).

In support of RACER's fulfillment of its obligations under Section V of the PBA, and to streamline the RCRA Corrective Action process for this Site, Haley & Aldrich of Michigan, Inc. (Haley & Aldrich) has prepared this document on behalf of RACER to serve as both a Current Conditions Summary of the Site, as well as a RCRA Facility Investigation (RFI) Work Plan.

The current environmental conditions at the Site were assessed primarily by reviewing available Site and regulatory agency files and historic aerial photographs; conducting interviews of site personnel; and observing and documenting current conditions through several Site visits. Through this process we identified 38 areas where hazardous waste or hazardous constituents were potentially treated, stored or disposed (released). We have identified these as Areas of Interest (AOIs).

AOIs where a release of hazardous waste or hazardous constituents was known or is probable are recommended for further investigation as proposed herein. This information is summarized in Table I and on Figure 1.

1.2 Site Background

The Site is located at 12200 Middlebelt Road in Livonia, Michigan and is approximately 40 acres. The Site is a generally square-shaped tract of land that is situated in a mixed industrial / commercial / residential area. It is located east of Middlebelt Road between Industrial Road and Plymouth Road, in Wayne County, Michigan. The Site is bordered on the north by the CSX Railroad tracks. Commercial

property is located beyond the railroad tracks to the north. The Site is bordered to the east and south by a residential and commercial area. The Site is bordered on the west by City of Livonia Fire Station and Middlebelt Road. Beyond Middlebelt Road, to the west, is a large industrial property.

A single building occupies the Site which, until June 2010, was used for machining operations associated with automotive manufacturing. There is approximately 1.2 million square feet under roof. Former operations included an engine plant, warehouse, and a wastewater treatment plant. The original building was constructed in 1971 and operated as Livonia Machining, which encompassed approximately 20 percent of the existing floor space. In 1984, there was a large expansion for engine work and a new warehouse.

Topographically, the Site is flat. The general area has a gradual gradient from west to east/southeast. Surface water flow in the areas of the building and the paved driveways and parking areas are largely controlled by drainage structures along roadways and in paved areas. The City of Livonia Municipal Water Department provides drinking water to the Site.

Previous reports associated with the Site state that surface soil texture in the area typically consists of fill and some sandy or silty deposits, generally less than ten feet thick. Underlying the surface soils is a thick firm silty clay layer, locally referred to as “blue clay”, with occasional sand lenses and pebbles (e.g. till). with occasional sand lenses and pebbles, which is locally referred to as “blue clay”. The “blue clay” layer is often greater than 100 feet thick in the Livonia area, and has an inherently low hydraulic conductivity. Underlying the surface, shallow and deep soils, are bedrock deposits classified as Paleozoic Era, Devonian System and Upper Devonian Series.

Previous reports for environmental investigations at the Site have described the stratigraphy as creating two groundwater systems: a perched system with a superficial layer, and a confined system within the bedrock. Previous reports have also indicated perched groundwater being encountered approximately three feet below ground surface, and groundwater flow direction generally to the west.

1.3 Past Site Investigations/Assessments

Based on review of available records, investigations of the Site have been limited to the assessment and closure of underground storage tanks (USTs), as well as a more recent environmental assessment performed in general accordance with the American Society for Testing and Materials (ASTM) document E 1527-05. These past investigations/assessments are summarized in the documents listed in Section 6.

2. AREAS OF INTEREST

2.1 General

Areas of Interest (AOIs) are areas associated with the Site where there is the potential that hazardous waste or hazardous constituents have been released to the environment. Table I lists the 42 AOIs identified for the Site. For discussion purposes, each AOI has been assigned a number. The AOIs identified in Table I will be used for discussion purposes throughout the RCRA corrective action process. Table I also provides the location and description of each AOI, along with other information, which is discussed later in this document. Figure 1 illustrates the approximate locations of each of the 42 AOIs. Photographs taken of select AOIs are included in Appendix A.

2.2 Information Reviewed

To identify AOIs, Haley & Aldrich reviewed RACER's records of past investigations/assessments, spills and releases, environmental sampling data, process descriptions and diagrams, and Site drawings, etc., as well as documents obtained from Environmental Data Recourses, Inc. (EDR). Section 6 lists the primary documents subject to review.

Files maintained by the Michigan Department of Environmental Quality and the City of Livonia Fire Department were accessed through requests submitted under the Freedom of Information Act.

2.3 Selection Criteria for AOIs Requiring Additional Investigation

As stated above, AOIs are areas associated with the Site where there is the potential that hazardous waste or hazardous constituents have been released to the environment. The identification of AOIs retained for further investigation was based on the following:

- Areas with a confirmed release to the environment;
- Areas with a probable release based on visual evidence or interview with knowledgeable personnel;
- Areas where a release to the environment is possible because a release pathway could not be ruled out (e.g., where oils were visibly present and/or historically used and impact of fluids discharging into sumps or trenches may have resulted in degradation of the integrity of that system and no evidence to the contrary was available, such systems were considered AOIs warranting further investigation); and/or
- Areas with the likely presence of free product, regardless of its composition.

AOIs were eliminated from further investigation based on the following:

- Areas where no hazardous waste or hazardous constituents were reportedly managed;
- Areas where no release pathway to the environment was identified or no evidence of a significant release was observed, documented, reported, or suspected; and/or

- Areas where, based on the volumes of materials managed, the potential for release was considered *de minimis*.

Further investigation of AOIs may include the following:

- Additional research and review of available historic information and Site records (e.g., lease agreement in case of electrical substation, property ownership history records in case of former USTs at 12434 Middlebelt Road, 90-day storage area records, etc.);
- Cleaning of current or former process equipment and discharge systems and inspecting the integrity of such systems visually and/or through the use of video recording;
- Intrusive soil and/or groundwater investigations, including laboratory analyses of soil and groundwater samples.

Further details concerning proposed further investigations are provided in Sections 3, 4, and 5.

Based on the evaluation described above and the information summarized in Table 1, 36 AOIs have been identified for further investigation in the RFI.

The remaining 6 AOIs warrant no further action, and will not be carried forward through the Corrective Action process.

3. PROPOSED RCRA FACILITY INVESTIGATION ACTIVITIES

3.1 RFI Goals and Objectives

The overall goal of the RFI is to characterize the nature and extent of any release of hazardous waste and/or hazardous constituents at the Site which may pose an unacceptable risk to human health and the environment.

To meet these goals, the objective of the RFI is to collect data of sufficient quality and quantity to support an assessment of potential current and future risks to human health and the environment associated with releases of hazardous waste and/or hazardous constituents.

Specifically, the RFI will:

- Determine whether releases of hazardous waste/constituents have occurred to soil, groundwater, surface water, or sediment at AOIs identified in Table I;
- Characterize the source(s) of a release and determine the nature and extent of constituents in environmental media to the extent necessary to protect human health and the environment;
- Characterize actual and potential migration pathways, actual and potential human and environmental receptors, and current and reasonably expected future land and groundwater uses;
- Assess potential risk to human health and the environment associated with releases of hazardous waste/constituents;
- Determine whether interim corrective measures are necessary to control current unacceptable human exposures, or to control migration of contaminated groundwater;
- Provide sufficient data to support a demonstration that current human exposures to contamination above applicable criteria are under control, and that the migration of groundwater contaminated above acceptable levels is stabilized; and
- Determine if final corrective measures are necessary to mitigate all current and future unacceptable risks, if any, to human health and the environment.

The results of the RFI will be used to demonstrate that: 1) all current human exposures to media contaminated with hazardous waste and/or hazardous constituents above risk-based levels are under control; and 2) migration of groundwater contaminated with hazardous waste and/or hazardous constituents above acceptable levels is stabilized within any existing areas of contamination, and any discharge of contaminated groundwater to surface water is either insignificant or shown to be currently acceptable. This demonstration will be documented in Environmental Indicators Reports for Human Health (CA725) and Groundwater (CA750). The results of the RFI will be used to support the selection of final Corrective Measures necessary to protect human health and the environment from identified current and future unacceptable risks due to releases of hazardous waste or hazardous constituents at the Site.

3.2 RFI Approach

The RFI of the AOIs presented in Table I will be undertaken in a phased approach. After each phase, adequacy of the data will be evaluated to determine whether additional data collection is warranted. When data of sufficient quality and quantity have been collected, the data will be used to support decisions regarding the need for interim or final corrective measures. The first field event (Phase I) includes the following:

- Additional research and review of available historic information and Site records , as appropriate, concerning select AOIs;
- Characterizing soil and/or groundwater quality at AOIs that have been identified for further investigation of potentially impacted media;
- Conducting ground surveying to establish sample and monitoring well location and elevation information;
- Evaluating the integrity of the sumps, pits, and subsurface waste and product lines, as appropriate, to determine if potential releases to the environment have occurred; and
- Conducting a preliminary assessment of potential human and ecological exposures to environmental media at and surrounding the Site by comparing results to screening criteria.

Subsequent field events will consist of soil boring and/or well installations at individual AOIs where a potential impact to soil and/or groundwater is indicated from Phase I results. The second event will also include additional soil and groundwater sampling, as necessary, to achieve RFI goals, as discussed above.

Overall, the RFI activities will be implemented with the following considerations:

- Soil boring/monitoring well installations and soil and groundwater sampling and analysis will be implemented in an phased approach for data collection;
- To the extent possible, data evaluation concerning AOIs that are clustered geographically and/or functionality will be combined;
- Characterization of a suspected release will be biased toward areas of highest potential impacts by positioning borings/wells within or downgradient of likely release areas such as primary/surrogate components (sumps, pits, trenches, etc.) of each AOI or group of AOIs.
- Initially during Phase I activities, all soil borings will be converted temporary monitoring wells (screen and riser installation with sand pack, but no pack/surface seal, surface mount, or protective casing) to facilitate initial borehole groundwater sampling;
- Temporary monitoring wells will be converted to permanent installations during Phase II efforts, pending the results of Phase I efforts.

Further details concerning the collection and analysis of soil and groundwater samples are provided in Section 3.3.

The following documents are prepared under separate covers, and provide supporting information, means, methods, etc. in support of completing the RFI for this Site:

- Field Sampling Plan (FSP): The FSP presents Standard Operating Procedures for the collection of soil, sediment, and groundwater samples;
- Quality Assurance Project Plan (QAPP): The QAPP presents the organization, objectives, plan activities and specific quality assurance/quality control procedures which will be utilized during the implementation of the RFI; and
- Public Involvement Plan (PIP): The PIP presents a framework for involving the public, government officials, and other parties who may be interested in the environmental investigation and cleanup of the Site.

3.3 Sampling and Analysis Plan for Areas of Interest

A total of 42 Site-related AOIs have been identified. Table I describes each of these AOIs, as well as the recommendation for investigation as part of the RFI. The locations of these AOIs are illustrated on Figure 1.

Environmental sampling and analysis efforts to be implemented as part of the RFI are discussed below.

3.3.1 Sampling and Analysis Plan for Soil and Groundwater

Soil boring will be performed at each AOI that is slated for subsurface investigation, as noted in Table I. The location(s) of this boring will be selected based on field conditions, such as utility locations, overhead clearance, etc., and will be biased based on historical process information (e.g., historical drain, tank, or equipment locations), Site specific physical parameters (e.g., downgradient), observed potential evidence of contamination (e.g., surficial stains), or observed potential evidence of preferential pathways (e.g., cracked concrete). To the extent possible, all soil borings will be advanced using Geoprobe® techniques; however, conventional auger techniques may be necessary to facilitate monitoring well installations in some cases. Unless intended specifically for assessing the presence of dense non-aqueous phase liquid (DNAPL) or characterizing the local/regional confining layer, soil sampling will be collected at each boring location in 2-foot depth intervals, and each will be screened with a photoionization detector [PID], visually characterized for lithology, and subjected to oil/water shake tests.

During Phase I efforts, soil samples will be submitted for laboratory analyses if obvious evidence of release (e.g., visual evidence of gross contamination, positive shake test results, and/or relatively high PID readings) is noted at the time of sample collection. These samples (if any) will be analyzed as noted below.

Each of the Phase I soil borings will initially be converted to a temporary monitoring well (screen and riser installation with sand pack, but no pack/surface seal, surface mount, or protective casing) to facilitate initial borehole groundwater sampling. Borehole groundwater will be collected from each of these temporary monitoring wells during Phase I efforts, and will be analyzed as noted below. It should be noted, analysis for Michigan 10 metals will be

conducted on samples of both filtered and unfiltered borehole water in the event borehole water turbidity is less than 10 Nephelometric Turbidity Units (NTUs). These temporary wells will be converted to permanent installations during Phase II efforts, pending the Phase I borehole water results. The Phase I borehole water results will be used as the primary indicator of release at each AOI. In the event that a well cannot be installed at the original boring location due to area limitations, an alternative well location will be selected accordingly; however, if the alternative well location is more than 10 feet from the original boring location, additional soil characterization (sampling and analysis) will be performed at that location.

Groundwater elevation measurements will be collected from each temporary monitoring well at the time of sampling. Initially, during Phase I efforts, groundwater samples will be collected as grab samples, using a peristaltic pump. During Phase II, if groundwater samples are to be collected from permanently-established wells, these samples will be collected via low stress/low flow sampling techniques (i.e., purge rates of 100 to a maximum of 500 milliliters per minute [mL/min]). Of these samples to be subject to metals analyses, both filtered and unfiltered analyses will be performed, if the given sample exhibits a turbidity reading of greater than 10 NTUs. Otherwise, only unfiltered samples will be analyzed.

Borehole water and groundwater samples will generally be analyzed for the following analytes:

- Target Compound List (TCL) volatile organic compounds (VOCs);
- TCL polycyclic aromatic hydrocarbons (PAHs);
- Michigan 10 metals* (Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Silver and zinc).

Borehole water and groundwater from all monitoring wells sampled will also be analyzed for the following parameters in the field:

- Dissolved Oxygen;
- Oxidation-reduction potential (ORP);
- Alkalinity/acidity (pH);
- Temperature;
- Conductivity; and
- Turbidity.

Groundwater sampling subsequent to Phase I efforts (e.g., Phase II efforts) may incorporate newly installed monitoring wells, to further evaluate groundwater conditions based on the results of Phase I groundwater sampling or soil sampling results. Groundwater samples will be analyzed consistent with Phase I efforts.

* Analyses will be performed as total concentration for each analyte, with the exception of chromium, which will be speciated in select instances, as warranted.

Examples of conditions that might necessitate subsequent monitoring well installation and sampling include:

- Potential evidence of light non-aqueous phase liquid (LNAPL) (e.g., significant sheen, staining, or odor) may be identified during soil boring completion. In this case, a monitoring well may be installed across the water table at the location.
- Constituents may be identified at concentrations in soil that would indicate potential leaching to groundwater. In this case, a monitoring well may be installed downgradient of the area unless a previously installed temporary well indicates no significant impact to groundwater in the area. The monitoring well would be screened at an appropriate interval to identify probable maximum concentrations of the constituent(s).
- Site-wide trends in groundwater concentrations may suggest the presence of a source area where monitoring wells are not located.

Soil samples subject to analyses will generally be analyzed for the following analytes:

- TCL VOCs;
- TCL PAHs;
- TCL polychlorinated biphenyls (PCBs); and/or
- Michigan 10 metals[†].

During Phase II efforts, at AOIs exhibiting evidence of release based on the Phase I borehole water results, soil samples will be collected and submitted for analyses based on the following criteria:

- At unpaved areas, representative 0- to 2-foot depth interval soil samples will be selected for analyses. Soil from the 0- to 2-foot interval below ground surface represents soil likely to be encountered by potential receptors if uncovered. It also represents the area most likely to be impacted by a release to the ground surface. If the soil is overlain by concrete, asphalt, sub-base, railway ballast, or other material, the sample will be collected from the uppermost 0- to 2-foot soil interval for analyses.
- Globally, at all soil borings, soil samples will be collected from unsaturated soils above the water table for analyses. One sample will be collected for analyses from the 8- to 10-foot depth interval (construction worker scenario), provided that this depth is significantly (e.g., 2 feet) above the sample taken in the unsaturated soil above the water table. (For example, if the water table is at 11 feet below ground surface [bgs], a sample would be collected from unsaturated soil just above the water table; a sample would not be collected for analyses from the 8- to 10-foot depth interval.)

[†] Analyses will be performed as total concentration for each analyte, with the exception of chromium, which will be speciated in select instances, as warranted.

- At least one other sample may also be collected for analyses, pending the findings of the field observations (visual evidence of gross contamination, positive shake test results, and/or relatively high PID readings).

Non-aqueous phase liquid (NAPL) samples will be collected for analyses, when/if it is encountered, to characterize such occurrences. Dissolved-phase groundwater sampling will be performed in NAPL areas (if any) during Phase II efforts, in a manner that minimizes the risk that the collection of such samples through the NAPL will not result in significant cross contamination

3.3.2 Sampling and Analysis Plan for Non-aqueous Phase Liquid (NAPL)

In the event free phase NAPL is encountered, the NAPL will be sampled instead of groundwater. Samples will be analyzed for viscosity, specific density, and TCL VOCs, PAHs, and PCBs, as well as Michigan 10 metals.

4. DATA EVALUATION

4.1 Objectives

The purpose of the RFI is to determine whether the potential risk to human health and the environment associated with hazardous waste or constituents released at AOIs identified for investigation warrants interim or corrective measures. As noted above, data collected during the RFI will be used for achieving the RFI goals and objectives discussed in Section 3.1, and as also noted above, RFI data collection will be conducted in phases. After each phase, the adequacy of the data for the defined data uses will be evaluated to determine whether additional data collection is warranted. When data of sufficient quality and quantity have been collected, the data will be used to support decisions regarding the need for interim or corrective measures.

4.2 Sample Tracking and Data Management

Sample tracking and data management will be performed as discussed in the QAPP (Appendix B) and DMP (Appendix C) to ensure that the sampling program is completed properly, and that the sample turnaround times and requested analyses are appropriate.

Communication between field sampling crews and the laboratory will be provided by the project chemist. The sample tracking and management activities will include:

- Coordinating the delivery of sample containers, shipping coolers, and sampling supplies from the laboratory to the Site;
- Ensuring that sample shipments from the field arrived at the laboratory properly preserved;
- Resolving sample documentation issues;
- Identifying samples with unique turnaround time requirements or special analyses;
- Maintaining the integrity of field data (e.g., water levels, pH, conductivity) and sample identification information (e.g., field duplicate samples) through the use of standardized spreadsheet templates that are completed by field sampling crews and electronically transferred to the database management team;
- Arranging for re-collection of samples (if necessary) before the field sampling crew demobilizes from the Site; and
- Distributing preliminary and final data packages to the data users in a timely manner.

Earthsoft, Inc.'s Environmental Quality Information System (EQuIS) will be used for storing and managing RFI data. EQuIS is designed to include all tabular data including sampling and chemistry information for various media, groundwater elevations, well completion and lithology, and other information.

4.3 Laboratory Data and Data Validation

A standardized electronic data deliverable (EDD) will be required to ensure that laboratory data is received in a format efficient for import into an EQuIS database. The data will be validated as discussed in the QAPP (Appendix B) to ensure that the data are consistent and correct.

Cross-checking between various data sets will be performed to ensure that the data are consistent and correct. This may include comparison between RFI sample results in the same area, comparison between RFI and historical sample results in the same area, and concurrent evaluation of chemical and physical data (for example, groundwater quality data should be consistent with measured groundwater flow directions and velocities).

4.4 Description of Potential Receptors

Under current and reasonably expected future conditions, the populations with potentially significant on-site exposures are routine workers, maintenance workers, construction workers, and trespassers. The off-site areas around the Site consist of a mixture of commercial/industrial and residential land use. Current zoning for these areas is expected to remain unchanged. As such, the largest potentially exposed populations at and around the Site are residents, routine workers, maintenance workers, and/or trespassers.

4.5 Potential Exposure Media/Pathways

Potential exposure media include air, soil and groundwater. There is no exposure to surface water and/or sediment since there are no surface water bodies on the property and no impact on off-site surface water bodies.

4.6 Evaluation of Need for Additional Investigation

The primary purpose of data collection during the investigation is to provide sufficient characterization of the nature and extent of any releases of constituents to allow a reliable quantification of the risk from potential exposures. That is, the analytical data collected during the RFI must be adequate for achieving the goals and objectives discussed in Section 3.1. To ensure adequacy for these intended uses, the analytical data will be evaluated in accordance with Part 201 of the Michigan Natural Resources and Environmental Protection Act of 1994, Michigan Public Act 451, as amended (Part 201) and procedures outlined in USEPA guidance on baseline risk assessments (USEPA, 1989 & 1997).

4.6.1 Qualitative Data Review

One element in the evaluation of the analytical data will be a qualitative review of the data with respect to adequacy of the samples in characterizing the average concentrations of constituents for each exposure pathway identified as potentially relevant during the investigation. The qualitative review, using professional judgment, will include an examination of the following:

- Consistency in the types of constituents found in all sampled media at each AOI or in Site-wide groundwater vis-à-vis expectations based on history of operations and

- chemical properties of the constituents, which may indicate potential for false negative or false positive identification of constituents;
- Lateral and vertical distribution of constituent concentrations to detect any obvious spatial trends, which may indicate that concentrations significantly higher than the measured concentrations may be likely in unsampled areas or depths; and
 - Presence of unusually high constituent concentrations, which may indicate the presence of non-aqueous phase liquids.

If the qualitative review identifies conditions that are likely to cause risk-based assessments of the data to provide unreliable conclusions regarding the need for interim or corrective measures, further sampling or other actions (e.g., checking for laboratory errors) will be taken to address such conditions.

4.6.2 Quantitative Data Review

In conjunction with the qualitative review, the data will be evaluated using appropriate, conservative human health risk-based screening levels to identify potentially significant concentrations. The screening will be conducted on each data point generated during the investigation. The presence of concentrations higher than screening levels will not necessarily mean that additional investigation is warranted. Similarly, the absence of concentrations higher than screening levels will not necessarily mean that additional investigation is unnecessary. Rather, decisions regarding the need for further investigation will be made based on professional judgment, considering the screening results and results of the qualitative review discussed above, including the magnitude of the concentrations, their spatial distribution, and other factors (e.g., background levels, as discussed below).

The analytical data also will be reviewed to identify constituents that are present at concentrations in soil that are within background levels. Site-related concentrations are those in excess of background levels, which are estimated from site-specific data collected during the field investigations, or from published data appropriate to the region in which the facility is located if site-specific data are not available. Background levels will be calculated after the completion of Phase II activities in a way that facilitates estimation of background risks separately from site-related risks. For this purpose, they will be calculated in the same way as exposure concentrations (as 95% upper confidence limits on the means). Other types of statistical limits (e.g., prediction limits) may be used for other purposes in the RFI (e.g., determining whether a concentration differs from background at a statistically significant level).

Although laboratory analytical data collected during the RFI will be validated as discussed in the QAPP, the evaluation of data after each phase of investigation will be conducted without waiting for data validation to be completed. This will allow for more timely decisions regarding the need for further field investigations. However, the use of data to support decisions regarding the need for interim or corrective measures will be based on validated data.

Specifically, soil and groundwater characterization data will be compared to screening criteria in order to determine if potentially significant releases to the environment have occurred, and if the field investigation adequately characterized the nature and extent of these potentially

significant releases. Soil characterization data pertaining to the Site will be compared with screening criteria that are based on cleanup criteria developed by MDEQ to facilitate implementation of Part 201. The following are the Part 201 screening criteria to be used to evaluate the soil characterization data:

- Part 201 Residential Drinking Water Criteria;
- Part 201 Residential Volatilization to Indoor Air Inhalation Criteria;
- Part 201 Residential Direct Contact Criteria;
- Water Solubility Levels;
- Flammability and Explosivity Levels; and
- Acute Inhalation Levels.

Borehole water samples will be collected from all initial soil borings to assist in the assessment of potential groundwater impact and in the potential placement of future groundwater monitoring wells. Although care will be taken to minimize the potential for introducing contaminants (including soil particles) into the sample, such influence may not be entirely eliminated because of the nature of the samples. As such, the borehole water data may not necessarily represent groundwater quality in the saturated zone or the groundwater quality over the saturated thickness of the water-bearing zone. Therefore, these data will not provide an appropriate basis for identifying the presence of potentially significant releases to groundwater. However, these data will be compared with the screening criteria for groundwater to provide an additional point of reference.

A potentially significant release of hazardous constituents to the environment at an area will be identified when the highest site-related concentrations of constituents detected in soil or groundwater at the area are higher than any of the screening criteria. The presence of constituent concentrations higher than the screening criteria may not mean that the media necessarily poses a significant risk to human health or the environment. It only means that the potential to pose a significant risk should be further evaluated with consideration for additional site-specific factors

The analytical data resulting from the RFI will be initially compared to screening criteria noted above. Chemicals with at least one concentration exceeding the screening criteria anywhere at the Site will be selected for display on “data-box” figures. The data-box figures will illustrate the concentrations of these chemicals across the Site. Because current and foreseeable future uses of the Site may involve commercial/industrial uses, the chemicals found to exceed Part 201 residential criteria will be further screened against corresponding Part 201 nonresidential criteria. Chemical concentrations found to exceed such screening criteria will be highlighted on the data-box figures with contrasting color.

4.7 Use of Investigation Data

As noted above, the RFI is to determine whether potential risk to human health and the environment associated with hazardous waste or constituents warrants interim or corrective measures. This

determination will rely on a risk-based assessment (which could be a baseline risk assessment) that will characterize the potential human health risk associated with each AOI or Site-wide (e.g., groundwater) from reasonable maximum exposures under current and reasonably expected future land and groundwater uses at and near the Site.

The Part 201 screening criteria represent conservative and generic exposure conditions, and thus may not represent actual Site-related exposure conditions, such as actual exposure populations and/or exposure durations. As such, conditions at the Site which exhibit levels of contamination exceeding these criteria may not necessarily require altered exposure activities (e.g., the use of personal protective equipment or engineering controls) and/or corrective measures. Once field investigations are completed, it will be determined whether or not all of the characterization data generated for the Site will be evaluated in a RFI Baseline Human Health Risk Assessment, to identify any conditions that warranted corrective measures.

If implemented, the risk assessment will include development of exposure scenarios, consistent with current and reasonably expected future land and groundwater uses, that describe potential exposure pathways by which on-site and off-site human populations may become exposed to hazardous constituent releases to the environment from the AOI. Documentation to confirm reasonably expected future land and groundwater uses will be developed during the investigation for the baseline risk assessment. The physical characteristics of the Site, including topography, hydrology, hydrogeology, and geology will be evaluated in conjunction with chemical data to assess chemical fate and transport mechanisms. This information will be used to assess the current and potential future impact, if any, of any releases identified at any AOIs.

If implemented, the results of the RFI Baseline Human Health Risk Assessment will serve as a basis for slating areas for consideration for corrective measures (if any). Future land use at the Site is expected to remain commercial/industrial. A deed restriction is expected to be executed as part of RCRA corrective action implementation, to maintain continued non-residential use of the Site and to prevent any future use of groundwater at the Site.

5. REPORTING

The following submittals are anticipated:

- Annual Progress Reports;
- Phase I and Phase II RFI Reports;
- Environmental Indicators Reports; and
- Final Corrective Measures Proposal;
- Final Remedy Construction Completion Report.

5.1 Annual Progress Reports

Annual Progress Reports will be submitted to USEPA by the 15th day of the month following close of each year. The Annual Progress Reports will list work performed to date, data collected, problems encountered, project schedule and estimated percent project completed.

5.2 Phase I and Phase II RFI Reporting

After completion of each of the Phase I and Phase II investigation events, the resulting analytical data will be tabulated and illustrated on figures, relative to the screening criteria discussed in Section 4.6.2, for the purpose of documenting the completion of site characterization efforts. The Final RFI Report will be an Executive Summary type report, and will document any deviations from this RFI Work Plan and summarize the data collected in support of defining the nature and extent of any releases of hazardous waste and/or hazardous constituents at or from the Facility which may pose an unacceptable risk to human health and the environment. The data analysis and conclusions presented in this report will form the basis for the Environmental Indicators Report and Final Corrective Measures Proposal. Any data deficiencies identified in the RFI that are necessary to complete these reports will be identified and filled by the collection of additional data.

5.3 Environmental Indicators Reports

The following environmental indicators reports will be submitted to USEPA:

- Current human exposures to contamination at or from the Site are under control (EI CA725); and
- Current migration of contaminated groundwater at or from the Facility is stabilized (EI CA750).

5.4 Final Corrective Measures Proposal

A Final Corrective Measures Proposal (CMP) will be submitted to USEPA, which will propose the final Corrective Measures necessary to protect human health and the environment from all current and

future unacceptable risks due to releases of hazardous waste and/or hazardous constituents at or from the Site, if any.

5.5 Final Remedy Construction Completion Report

A Final Remedy Construction Completion Report will be submitted to USEPA, which will document the work performed pursuant to the Final Decision in which USEPA will select the final Corrective Measures. An operations and maintenance plan of the Final Remedy, if required, will be included in the Final Remedy Construction Completion Report.

PRIMARY REFERENCES

1. The Avendt Group, Inc. Engineers and Scientists, Site Assessment Related to Underground Storage Tank Removal BOC Powertrain – Livonia Engine, 26 October 1989.
2. ARCADIS-US, Inc., Phase I Environmental Site Assessment, MLC ID 1195 General Motors Powertrain (GMPT) - Livonia 12200 Middlebelt Livonia, Michigan 48150, 8 April 2010.
3. ARCADIS-US, Inc., Remediation Cost Estimate Summary, 30 October 2009, Revised May 2010.
4. The Chester Engineers, Site Assessment for UST Nos. 4, 5, 6, and 7 Removal, 22 February 1991.
5. The Chester Engineers, Work Plan for Hydrogeological Site Investigation in the Area of USTs 1, 2, 4, 5, 6, 7, 15 May 1991.
6. Environmental Data Recourses, Inc., Aerial Photo Decade Package, Inquiry Number 3176438.7, 3 October 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
7. Environmental Data Recourses, Inc., Aerial Building Permit Report, Inquiry Number 3176438.11, 3 October 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
8. Environmental Data Recourses, Inc., Sanborn Map Report, Inquiry Number 3176438.3, 3 October 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150 (No maps available).
9. Environmental Data Recourses, Inc., City Directory Abstract, Inquiry Number 3176438.6, 4 October 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
10. Environmental Data Recourses, Inc., Lein-Search Report, Inquiry Number 3176438.7, 3 October 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
11. Environmental Data Recourses, Inc., Topographic Map Permit Report, Inquiry Number 3176438.4, 30 September 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
12. Environmental Data Recourses, Inc., Property Tax Map, Inquiry Number 3176438.8, 29 September 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
13. Environmental Data Recourses, Inc., Radius Map Report With GeoCheck, Inquiry Number 3176438.2s, 30 September 2011, GMC-Powertrain Livonia Engine, 12200 Middlebelt Road, Livonia, MI 48150.
14. GM Engine Division, Initial Abatement Steps as Follow-up to a Confirmed Regulated Substance Release, 28 January 1991.
15. The Traverse Group, Leaking Underground Storage Tank Closure Report, 11 June 1996.
16. The Traverse Group, Leaking Underground Storage Tank Closure Report, 23 August 1996.

TABLE I
CURRENT ASSESSMENT SUMMARY
AREAS OF INTEREST (AOIs) PROPOSED INVESTIGATIONS
RACER SITE #1195
GMPT LIVONIA

AOI #	AOI Title	Location Column/Bay	AOI Source	Description / Components	Photos	Materials Managed	Further Action Recommended (Yes or No)	General Description of Further Action				
								No. borings per AOI; GW collected from each boring	GROUNDWATER			Other/Comments
									VOCs	PAHs	MI 10 Metals	
01	Teal Dock/Former Rail/Truck Bay/Chip Bunkers	South wall, D24-J24	Site walk /Facility drawings	Former rail line for loading/unloading raw material, waste/recycling material	Photographs: 6 and 7	Metals, oils, cutting fluid, coolant	Yes	8	8	8	8	None
02	South Gallery	D23-M23 x D2-M20	Site walk /Facility drawings	Management of metal grinding, coolant, lubricant, cutting fluid	Photographs: 1 - 5	Metals, oils, cutting fluid, coolant	Yes					
03	Blue Dock	M24-N24	Site walk	No staining observed	no photo	Various	No	Not Applicable				
04	East Gallery	M14-P14	Site walk /Facility drawings	Management of metal grindings, coolant, lubricants, cutting fluid	Photographs: 8 - 11 and 90 - 91	Metals, oils, cutting fluid, coolant	Yes	4	4	4	4	None
05	Wash/Dump station	K14-L14	Site walk /Facility drawings	Process waste, oily waste, floor cleaning	Photographs: 92	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
06	West Gallery	D3-E13	Site walk /Facility drawings	Management of metal grindings, coolant, lubricants, cutting fluid	Photographs: 12 - 16	Metals, oils, cutting fluid, coolant	Yes	4	4	4	4	None
07	Dump station	Near West Gallery, F15-G15	Site walk /Facility drawings	Process waste, oily waste, floor cleaning	no photo	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
08	Former paint shop/shed	K12/L12	MDEQ FOIA - Environmental/Emergency Response Plan (Feb. 2002)	Environmental/Emergency Response Plan describes shed with 825-gallon containment sump installed below shed, no floor drains in proximity. Paints, thinners, paint reducer (xylenes). Arcadis report identifies "Tank 8" as a 100-gallon paint reserve tank. Location is not described.	no photo	Paint-related material	Yes	1	1	1	1	GPR to locate possible "Tank 8" Intrusive work pending.
09	Oil supply sump	L8-M8	Site walk /Facility drawings	May have been associated with operation of East Gallery. Oil Sump near columns L8/M8 is approximately five feet in diameter. Oil Pit near 8N maybe associated with Oil Sump near L8/M8, contains oily material.	Photographs: 86 - 89	Oils, cutting/honing coolant, metal working oils	Yes	1	1	1	1	None
10	Equipment pit	L7-M7	Site walk /Facility drawings	Containment for heavy equipment. Equipment Pit contains approximately 3 feet of oily / coolant water.	Photographs: 85 and 86	Oils, cutting/honing coolant, metal working oils	Yes	1	1	1	1	None
11	Dump station	J6-K6	Site walk /Facility drawings	Process waste, floor cleaning. Dump Station near Columns J5/K5 pit is filled with oily / coolant sludge.	Photographs: 83 and 84	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None

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								No. borings per AOI; GW collected from each boring	GROUNDWATER			Other/Comments
									VOCs	PAHs	MI 10 Metals	
12	Equipment pits (2) - containment beneath heavy equipment	F5-D5	Site walk /Facility drawings	Currently contains oily waste liquid. Oil-filled trench/flume located approximately 25 feet from equipment pit, extending approximately 100 feet north of the pit. Oil-filled trench / flume system, may be associated with equipment pit. Oil-filled pit near Column G4.	Photographs: 75 - 82	Metals, oils, cutting fluid, coolant	Yes	2	2	2	2	None
13	Wash/Dump station	B4-C4	Site walk /Facility drawings	Large wash and process waste station. Lines for cold water, hot water, compressed air and process waste observed at this station. Floor drain located approximately 6 ft. east of this pit.	Photographs: 72 - 74	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
14	Equipment pit - containment beneath heavy equipment	A3-B3	Site walk /Facility drawings	Containment beneath heavy equipment. Slopes downward toward south end of feature. Approximately 6" of oily/coolant water toward south end, 2-4" of oil/coolant water at north end of feature. Outlets located in south and east corners. Poured concrete. Minor cracking in side walls. A shallow trench drain is located south of this AOI.	Photographs: 29 and 30	Metals, oils, cutting fluid, coolant	Yes	2	2	2	2	None
15	Equipment pit - containment beneath heavy equipment	D2-E2	Site walk /Facility drawings	Containment beneath heavy equipment. Oil/coolant observed in trough connected to adjacent flume. Poured concrete. Minor chipping, minor delamination observed at southeast end.	Photographs: 69 - 71 and 93	Metals, oils, cutting fluid, coolant	Yes	1	1	1	1	None
16	Dump station	M1A-N1A	Site walk /Facility drawings	Process waste, oily waste, floor cleaning. Associated with process waste system. Oily/coolant sludge observed in pit.	Photographs: 67	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
17	Former 750-gallon UST	WP5-WR5	ARCADIS	Note: ARCADIS REC - former underground oil storage tank. Use unknown	no photo	Unknown	Yes	1	1	1	1	GPR to locate possible former UST Intrusive work pending.
18	Dump station	K3A-L3A	Site walk /Facility drawings	Process waste, oily waste, floor cleaning. Associated with process waste system. Approximately 1 ft. deep. Note: this unit appeared to be deeper than other dump stations observed during the October 2011 site reconnaissance.	Photographs: 55 and 56	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
19	Trash compactor and oil pump station	N5A-P5A	Site walk /Facility drawings	Dark staining and oily residue observed in compactor area interior and exterior. Storm drain and process waste drain observed at compactor area exterior. Dark staining and oily residue observed on concrete berm providing containment around oil pump station and on floor in proximity to station.	Photographs: 59 - 66	Hydraulic oil, motor oil, lubricants, coolants	Yes	3	3	3	3	None
20	Orange Dock	M8A-P8A	Site walk /Facility drawings	No staining observed on concrete.	Photographs: 57 and 58	Various	No	Not Applicable				
21	Heavy Equipment Lift	J5A-K5A	Site walk /Facility drawings	Observed oily staining on concrete floor around hydraulic reservoir; however, the no below grade component of the lift was observed. No floor drains in proximity to the staining. Two engine oil dispensing ports were observed adjacent to lift and hydraulic reservoir. Dark staining/oily residue was observed in proximity to the dispensing ports.	Photographs: 51 - 54	Hydraulic oil	No	Not Applicable				

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								No. borings per AOI; GW collected from each boring	GROUNDWATER			Other/Comments
									VOCs	PAHs	MI 10 Metals	
22	Dump station	H6A-J6A	Site walk /Facility drawings	Process waste, oily waste, floor cleaning. Associated with process waste system. Station was dry at time of October 2011 site reconnaissance.	no photo	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
23	Dump station	WR2-WS2	Site walk /Facility drawings	Process waste, oily waste, floor cleaning. Associated with process waste system.	Photographs: 47	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None
24	Green Dock	WM1-WN1	Site walk /Facility drawings	No staining observed on concrete. Negligible amount of sheen observed on water in blind trench. Blind trench constructed of poured concrete with steel grate covers.	Photographs: 48 - 50	Various	No	Not Applicable				
25	Purple Dock	WAA4-WA4	Site walk /Facility drawings	No staining observed on concrete. Blind trench constructed of poured concrete with steel grate covers.	Photographs: 44 - 46	Various	No	Not Applicable				
26	Paint booth area	D20/D21	Site Walk / Drawing Review - Tetra Tech site plan material storage areas, 10/22/07; Arcadis report refers to "Tank 8"	Paint booth observed with signage "Only aerosol can spraying". No floor drains observed in area. Sump covers located approximately 20' west of booth, 18' east of booth. Arcadis report refers to paint reserve "Tank 8". Location is not described.	Photographs: 27 and 28	Paint-related material	Yes	See AOIs 01, and 02				GPR to locate possible "Tank 8"
27	Below grade process flumes	J14-J18, M19-M-20	Site walk/Facility drawings	Conveyed fluidized metal chips, metal filing debris for galleries	no photo	Fluidized metal chip, metal filing debris for galleries	Yes	7	7	7	7	Inspect via remote camera; Intrusive work pending inspection.
28	Below grade process waste conveyances	wP15-wP17, wT10-wT11	Site walk/Facility drawing provided by GM. No date or title	Conveyed process waste from operations, sumps, trenches to onsite WWTP	no photo	Oily waste, coolant, metal fines	Yes	7	7	7	7	Inspect via remote camera; Intrusive work pending inspection.
29	Former Railroad Spur	G5A-H4A	Site walk /Facility drawings/Aerial photographs		no photo	Various	Yes	3	3	3	3	None

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								No. borings per AOI; GW collected from each boring	GROUNDWATER			Other/Comments
									VOCs	PAHs	MI 10 Metals	
30	12434 Middlebelt - former gas station?	wAA1A-wD4	City of Livonia Building Dept. records	Building Department records indicate the following: 1,000-gallon buried UST removed 04/20/1965; 2,000-gallon UST removal 04/21/1965; septic system disconnected 10/06/1970; inspection of 220-gallon heating oil tank 1954. Building Dept. inspector stated a gas station was formerly located at 12434 Middlebelt. The property was acquired by GM for plant expansion.	no photo	Vehicle fuels, heating oil	Yes	4	4	4	4	Administrative investigation/file review.
31	Fire pump house (post 1989)	wG6-wG10	Site walk /Facility drawings	3 fire pump generators, 3 184-gallon diesel fuel ASTs. Evidence of staining associated with the oldest (as reported by Securitas) of the three diesel fire pump engines. Floor drains located in building. Blow down/condensate drains from engines. Staining in proximity to drains.	Photographs: 37 - 42	Diesel, oils	Yes	2	2	2	2	None
32	Former fire pump house (pre-1989)	wP4-wT4	Aerial photographs/figures/ City of Livonia Building Dept. records	Building Department records refer to relocation of fire pump house and equipment.	no photo	Diesel, oils	Yes	2	2	2	2	None
33	WWTP main building and exterior wash pad	Northeast portion of site	Site walk /Facility drawings	Basement constructed beneath majority of WWTP main building. Basement may extend 20' below grade. Sumps are constructed in basement	Photographs: 17 - 20, 22 - 26	Process waste, alkaline cleaners, laboratory waste	Yes	4	4	4	4	Administrative investigation/Locate and review facility drawings; Intrusive work pending.
34	Less than 90-day HW storage area	Interior location, west of WWTP main building	Site walk /Facility drawings	Less than 90-day storage of hazardous wastes. Facility plans (Livonia Fire Dept) describe as bermed, enamel coated floor. Secondary containment provided by containment pallets and poly overpack drums	Photographs: 21	Various	Yes	1	1	1	1	Review facility docs for descriptions of wastes Soil, GW sampling Intrusive work pending.
35	Air Compressor Building	Adjacent to WWTP main building, west side	Site walk /Facility drawings	Location of multiple large air compressor units. Provided compressed air source for main manufacturing and assembly building	no photo	Oils, lubricants	No	Not Applicable				
36	Oil Storage Building	Adjacent to WWTP main building, west side	Site walk /Facility drawings	Bulk storage of oil products, lubricants, hydraulic oils. Building signage: "Fluid Storage Building". Area outside of building to west is identified on Site Plan and Material Storage Areas drawing as loading and unloading area. Sump pit and pump located within secondary containment area, 4ft x 4ft x 5ft. Evidence of release from bulk tank labeled: 3,250 gallons Product SP 735 (caustic).	no photo	Safetyclean AW-46 hydraulic, 6187 Mobil Clean 5W-30 E2, GM FF 5W-30-FG Mobil Engine Oil #2, GM FF 5W-30-FG #3, Product SP735 (Caustic), Gemway 68, Gemway 220	Yes	4	4	4	4	None
37	ASTs (2)	West of WWTP	Site walk /Facility drawings	1 800-gallon unleaded gasoline tank and 1 200-gallon diesel fuel tank. Both tanks located within containment area. Fuel used for vehicles. Dispensing hoses extend beyond containment area.	no photo	Unleaded gasoline, diesel fuel	Yes	1	1	1	1	None

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								No. borings per AOI; GW collected from each boring	GROUNDWATER			Other/Comments
									VOCs	PAHs	MI 10 Metals	
38	Detroit Edison Substation	East of WWTP	Site walk /Facility drawings	Main electrical transformer and switching yard for the plant.	no photo	Cooling oils	Yes	4	4	4	4	Administrative Research lease agreement, etc. to understand Ts & Cs of potential liabilities Intrusive work pending.
39	Equipment pit	A15/A14	Site walk/Facility drawings	Containment for heavy equipment. Poured concrete, 4 concrete berms for equipment elevation. Feature is sloped downward toward south end. Two outlets approximately 18" bgs at south and east corners. Oily sludge with miscellaneous debris remaining in pit. Material is approximately 2" deep at south end.	Photographs: 31 and 32	Oils, cutting/honing coolant, metal working oils	Yes	1	1	1	1	None
40	Sump for equipment pit	A11/A12	Site walk/Facility drawings	Sump may have operated for management of materials contained in equipment pit. Steel construction. At time of site reconnaissance, contained debris and equipment, possibly from decommissioning.	Photographs: 33	Oils, cutting/honing coolant, metal working oils	Yes	1	1	1	1	None
41	Equipment pit	A7/A6	Site walk/Facility drawings	Containment for heavy equipment. Poured concrete. Return coolant lines observed over pit. Several inches of oil/coolant water at south end of pit. Inlet/outlet observed in southeast corner of pit. Floor drain located adjacent to pit, south of pit.	Photographs: 34 - 36	Oils, cutting/honing coolant, metal working oils	Yes	1	1	1	1	None

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								No. borings per AOI; GW collected from each boring	GROUNDWATER			Other/Comments
									VOCs	PAHs	MI 10 Metals	
42	Dump station	G2	Site walk /Facility drawings	Process waste, oily waste, floor cleaning. Oily sludge observed in the pit.	Photographs: 68	Process waste, oily waste, floor cleaning	Yes	1	1	1	1	None

1.

All samples will be collected by Haley & Aldrich, Inc. and all analyses will be performed by Merit Laboratories, Inc.
2.

Soil boring will be performed at each AOI that is slated for subsurface investigation, as noted.
3.

The soil boring locations will be selected based on field conditions, such as utility locations, overhead clearance, etc., and will be biased based on historical process information (e.g., historical drain, tank, or equipment locations), Site specific physical parameters (e.g., downgradient), observed potential evidence of contamination (e.g., surficial stains), or observed potential evidence of preferential pathways (e.g., cracked concrete).
4.

To the extent possible, all soil borings will be advanced using Geoprobe® techniques; however, conventional auger techniques may be necessary to facilitate monitoring well installations in some cases.
5.

Unless intended specifically for assessing the presence of dense non-aqueous phase liquid (DNAPL) or characterizing the local/regional confining layer, soil sampling will be collected at each boring location in 2-foot depth intervals, and each will be screened with a photoionization detector [PID], visually characterized for lithology, and subjected to oil/water shake tests.
6.

During Phase I efforts, soil samples will be submitted for laboratory analyses if obvious evidence of release (e.g., visual evidence of gross contamination and/or relatively high PID readings) is noted at the time of sample collection.

These samples (if any) will be analyzed as noted below.

> Target Compound List (TCL) volatile organic compounds (VOCs);

> TCL polycyclic aromatic hydrocarbons (PAHs);

> TCL polychlorinated biphenyls (PCBs); and

> MI 10 metals (Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Selenium, Silver, Zinc).
7.

Each of the Phase I soil borings will initially be converted to a temporary monitoring well (screen and riser installation with sand pack, but no pack/surface seal, or surface mount, or protective casing) to facilitate initial borehole groundwater sampling. Borehole groundwater will be collected from each of these temporary monitoring wells during Phase I efforts, and will be analyzed as noted below. These temporary wells will be converted to permanent installations during Phase II efforts, pending the Phase I borehole water results.
8.

The Phase I borehole water results will be used as the primary indicator of release at each AOI. In the event that a well cannot be installed at the original boring location due to area limitations, an alternative well location will be selected accordingly; however, if the alternative well location is more than 10 feet from the original boring location, additional soil characterization (sampling and analysis) will be performed at that location.
9.

Groundwater elevation measurements will be collected from each temporary monitoring well at the time of sampling. Initially, during Phase I efforts, groundwater samples will be collected as grab samples, using a peristaltic pump.
10.

During Phase II, if groundwater samples are to be collected from permanently-established wells, these samples will be collected via low stress/low flow sampling techniques (i.e., purge rates of 100 to a maximum of 500 milliliters per minute [mL/min]).
11.

Borehole water and groundwater samples will generally be analyzed for the following analytes:

> TCL VOCs;

> TCL PAHs; and

> MI 10 metals.
12.

Borehole water and groundwater from all monitoring wells sampled will also be analyzed for the following parameters in the field:

> Dissolved Oxygen;

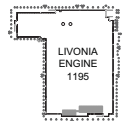
> Oxidation reduction potential (ORP);

> Alkalinity/acidity (pH);

> Temperature;

> Conductivity; and

> Turbidity.



KEY PLAN
NOT TO SCALE

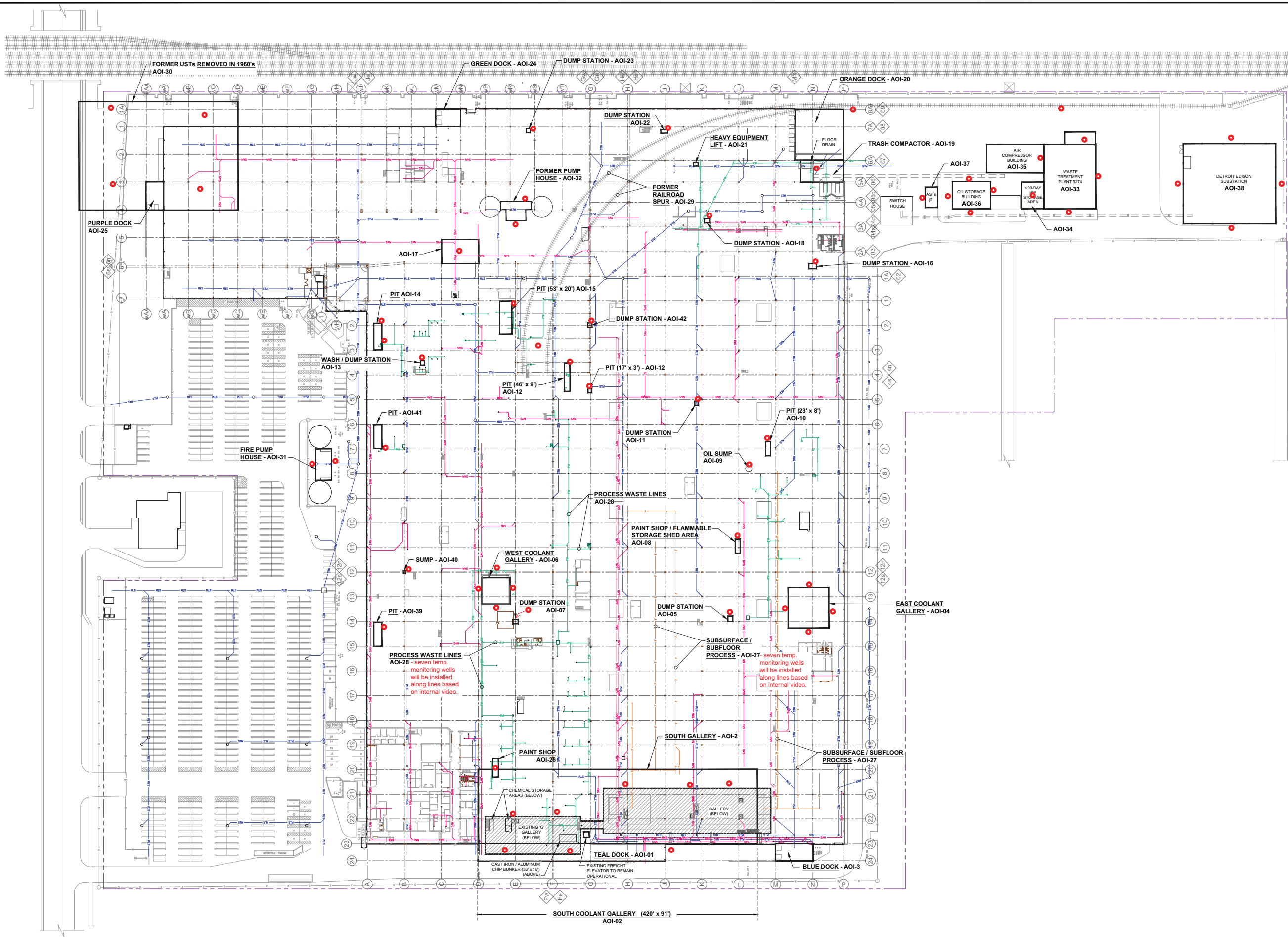
Project No.: 37290-009-01
Scale: AS SHOWN
Date: 01-DEC-2011
Drawn By: SJL
Designed By: DK
Checked By: DK
Approved By:
Stamp:

GMPT - LIVONIA
SITE ID: 1195
LIVONIA, MICHIGAN

SITE PLAN, AREAS
OF INTEREST AND
PROPOSED
INVESTIGATIONS

1

Sheet: 1 of 1



NOTES

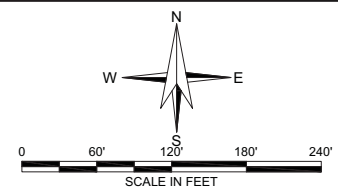
- ALL LOCATIONS APPROXIMATE AND BASED ON ONE OR MORE OF THE FOLLOWING:
 - GMPT - LIVONIA DRAWING NUMBER AE-01, DATED 11-15-2009 (PREPARED BY GENERAL MOTORS CORPORATION)
 - GMPT - LIVONIA DRAWING NUMBER CS1-00, DATED 11-15-2009 (PREPARED BY GENERAL MOTORS CORPORATION)
 - SITE PLAN AND MATERIAL STORAGE AREAS, DRAWING NUMBER 2, DATED 10-22-2007 (PREPARED BY TETRA TECH, INC.)
 - OVERALL PLOT PLAN, DRAWING NUMBER P-1, DATED 4-4-1979 (PREPARED BY GENERAL MOTORS CORPORATION)

- APPROXIMATE LOCATIONS OF AOI AND SITE FEATURES MARKED DURING SITE RECONNAISSANCE CONDUCTED ON 10/12/2011 - 10/13/2011. ALSO INCLUDES INFORMATION GATHERED FROM SPCC PLAN, DATED FEB 11, 2000 RECEIVED FROM DEQ THROUGH FOIA REQUEST.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- RAILROAD TRACKS
- STORM SEWER
- SANITARY SEWER
- PROCESS WASTE LINES
- BELOW GROUND FLOOR FLUME

- PROPOSED TEMPORARY MONITORING WELL LOCATION (APPROX.)



APPENDIX A

SITE PHOTOGRAPHS – AOI's



Photograph 1. (AOI-02) South Gallery, west side, sub-basement. Note level of water accumulated in basement, approximately 12" to 18" deep with possible oil and coolant content.



Photograph 2. (AOI-02) South Gallery, west side. Oily residue on honing/chip processing equipment. Oily residue also observed on floor surrounding equipment.



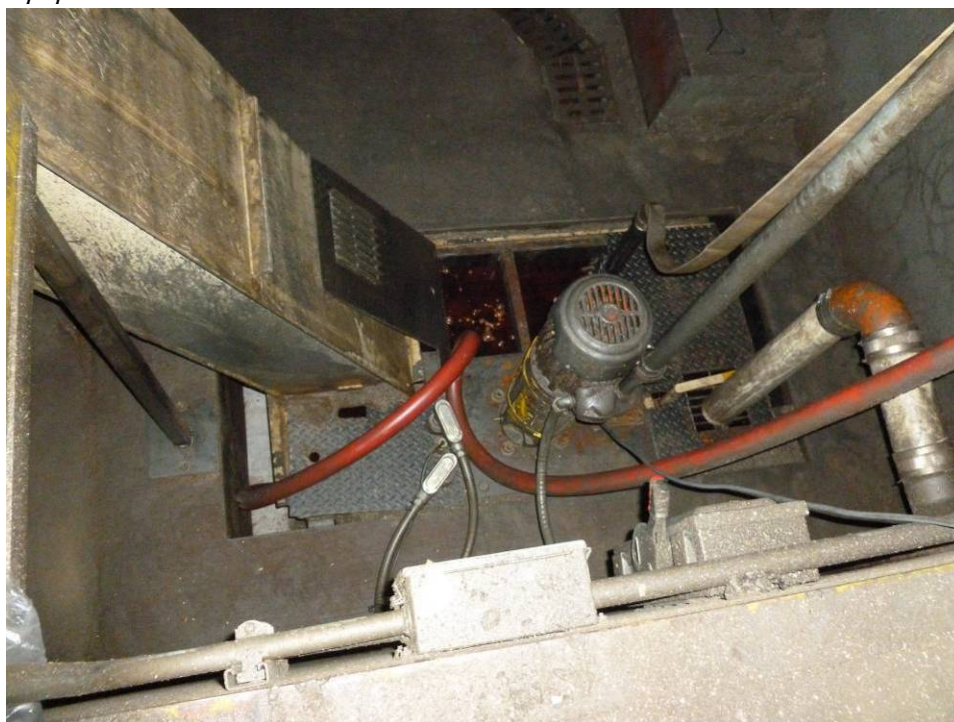
Photograph 3. (AOI-02) South Gallery, west side. Honing and chip processing equipment.



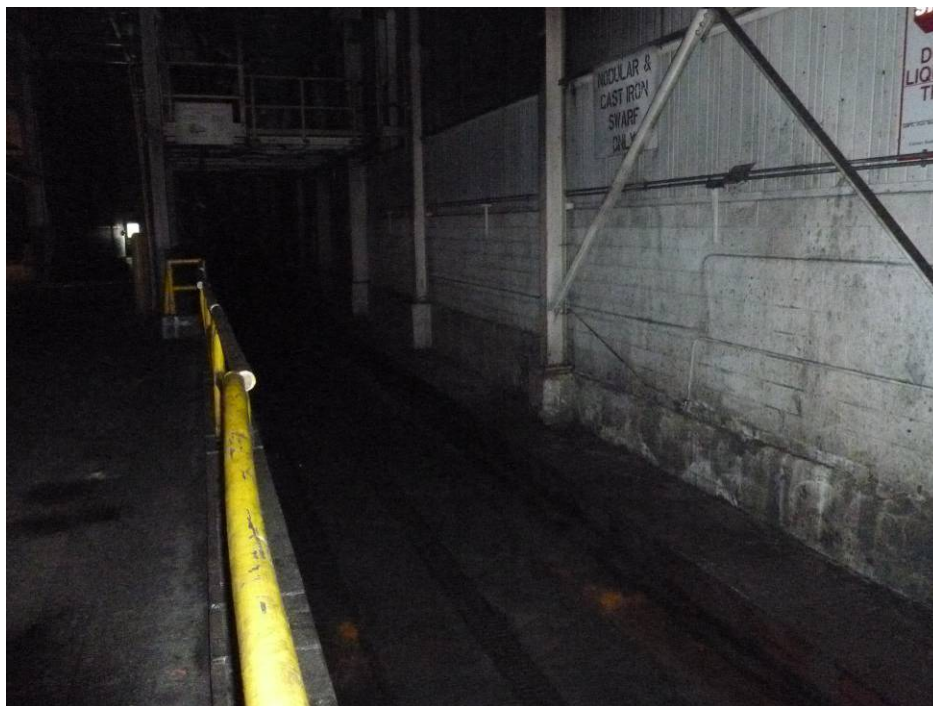
Photograph 4. (AOI-02) South Gallery, east side. Block grinding equipment.



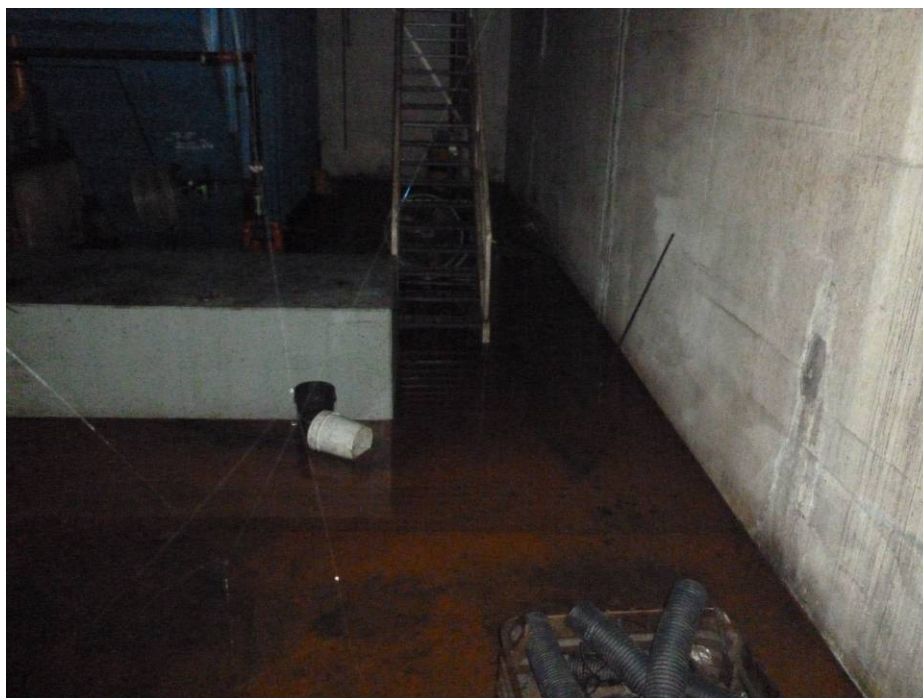
Photograph 5. (AOI-02) South Gallery, east side. Oily residue on block grinding equipment. Oily residue also observed on floor surrounding equipment.



Photograph 6. (AOI-01) Truck Bay, west side. Pump below aluminum swarf management area.



Photograph 7. (AOI-01) Truck Bay, facing east.



Photograph 8. (AOI-04) East Gallery, sub-basement. Note accumulation of water, possibly containing oil and coolants.



Photograph 9. (AOI-04) East Gallery. Oily residue on rod machining equipment.



Photograph 10. (AOI-04) East Gallery. Sub-basement.



Photograph 11. (AOI-04) Sump located in southeast area of East Gallery.



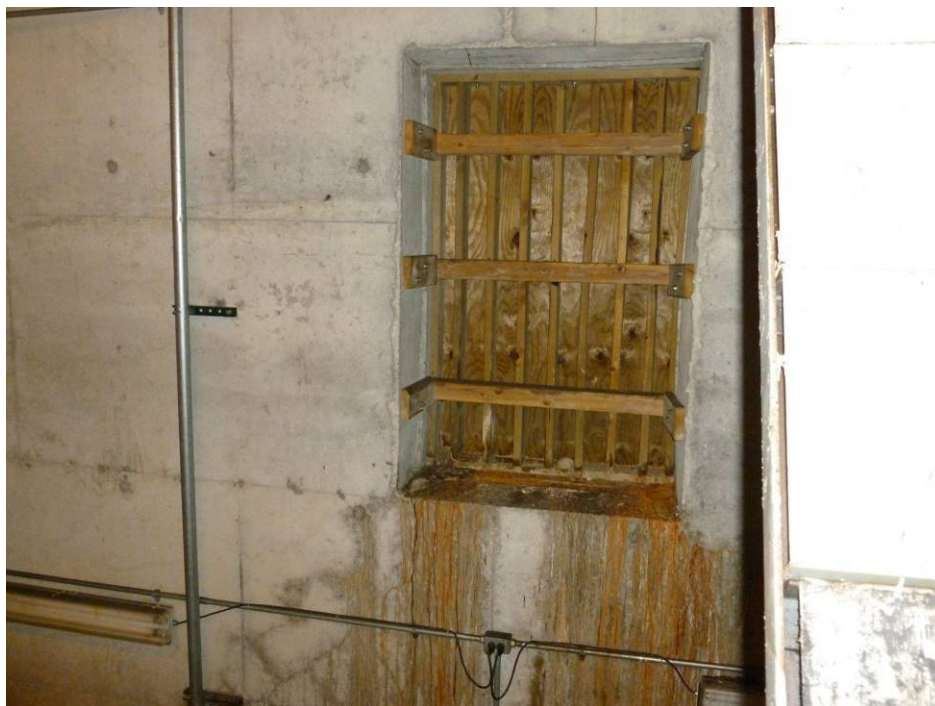
Photograph 12. (AOI-06) West Gallery. Note accumulation of water, possibly containing oil and coolants.



Photograph 13. (AOI-06) West Gallery. Modular crank shaft machining equipment.



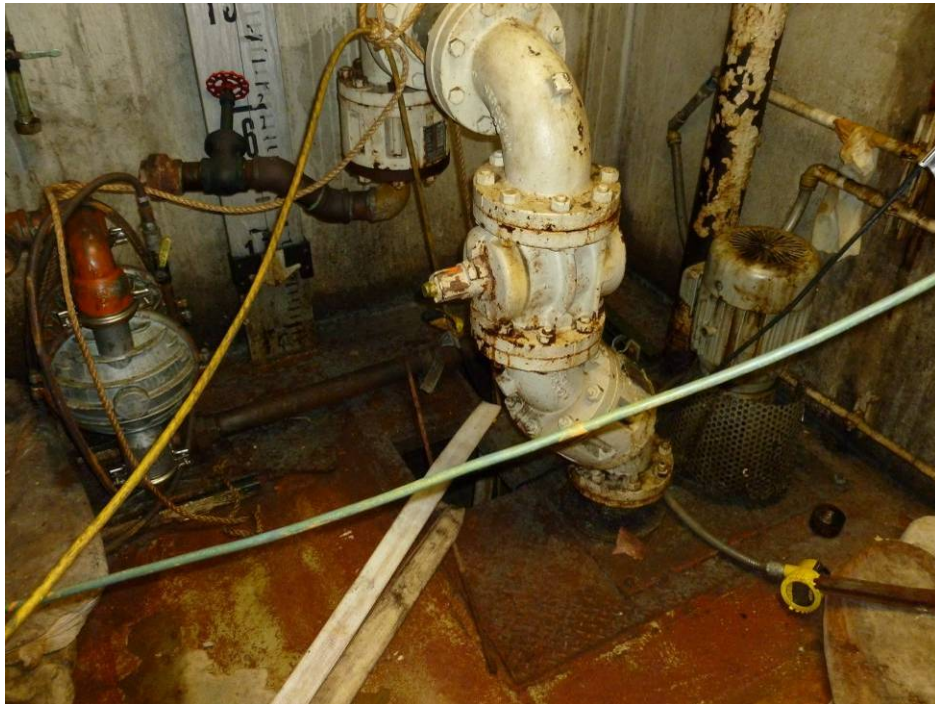
Photograph 14. (AOI-06) West Gallery. Oily residue on crank shaft machining equipment.



Photograph 15. (AOI-06) West Gallery. Evidence of renovation – purpose or previous use unknown.



Photograph 16. (AOI-06) Equipment in West Gallery.



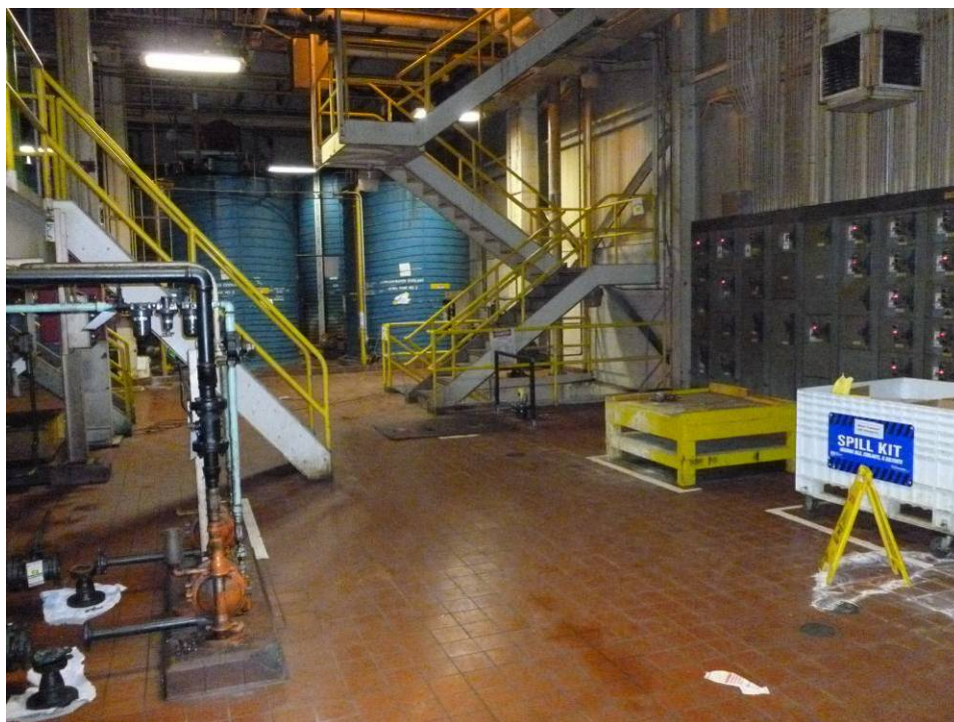
Photograph 17. (AOI-33) Wastewater Treatment Plant (WWTP). Sump near spent coolant management tank. Photo taken in basement level of WWTP.



Photograph 18. (AOI-33) Elevator in Wastewater Treatment Plant. Photo taken in basement level of WWTP.



Photograph 19. (AOI-33) Control room for WWTP elevator.



Photograph 20. (AOI-33) Coolant storage tanks in WWTP. Note evidence of release near floor drain in foreground.



Photograph 21. (AOI-34) Less than 90-day hazardous waste storage area. Note berm at entrance, absence of floor drains.



Photograph 22. (AOI-33) WWTP wash pad. Photo taken facing east.



Photograph 23. (AOI-33) Wash pad located exterior to WWTP, north. Note staining.



Photograph 24. (AOI-33) Fillports located within wash pad, exterior north side of WWTP.



Photograph 25. (AOI-33) Drain located within wash pad, exterior north side of WWTP.



Photograph 26. (AOI-33) Drain located within wash pad. Removed cover to take photo.



Photograph 27. (AOI-26) Paint booth near Columns D20/D21. Interior view of paint booth.



Photograph 28. (AOI-26) Paint booth near Columns D20/D21. Exterior view of paint booth.



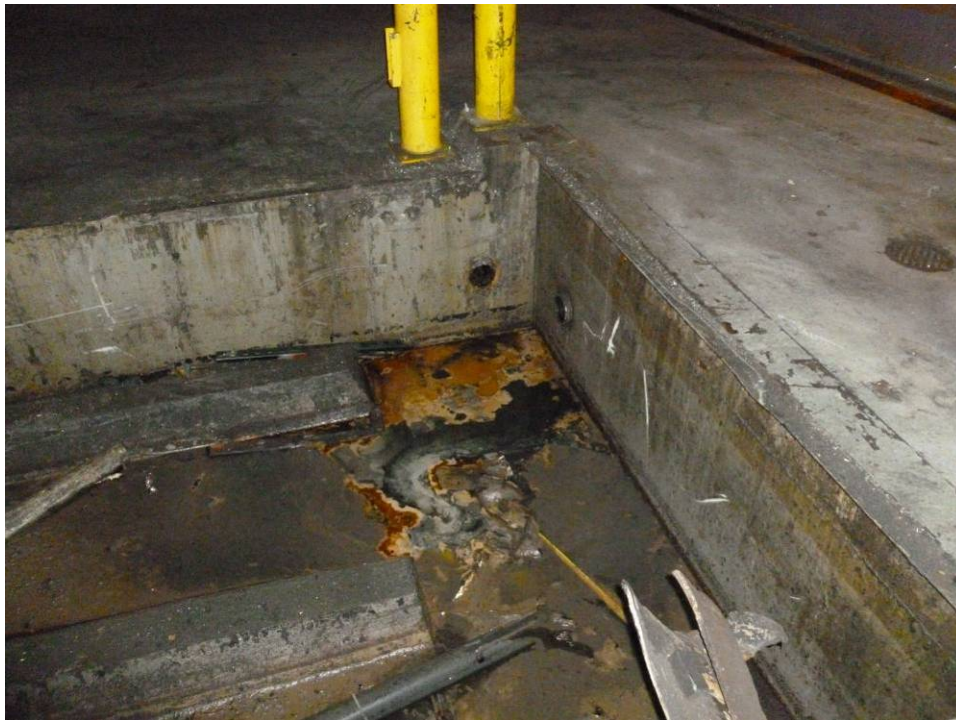
Photograph 29. (AOI-14) Equipment Pit near Columns A3/A2. Note oily coolant/water remaining in pit. Photo taken facing south.



Photograph 30. (AOI-14) Equipment Pit near Columns A3/A2. Note outfalls in southeast corner.



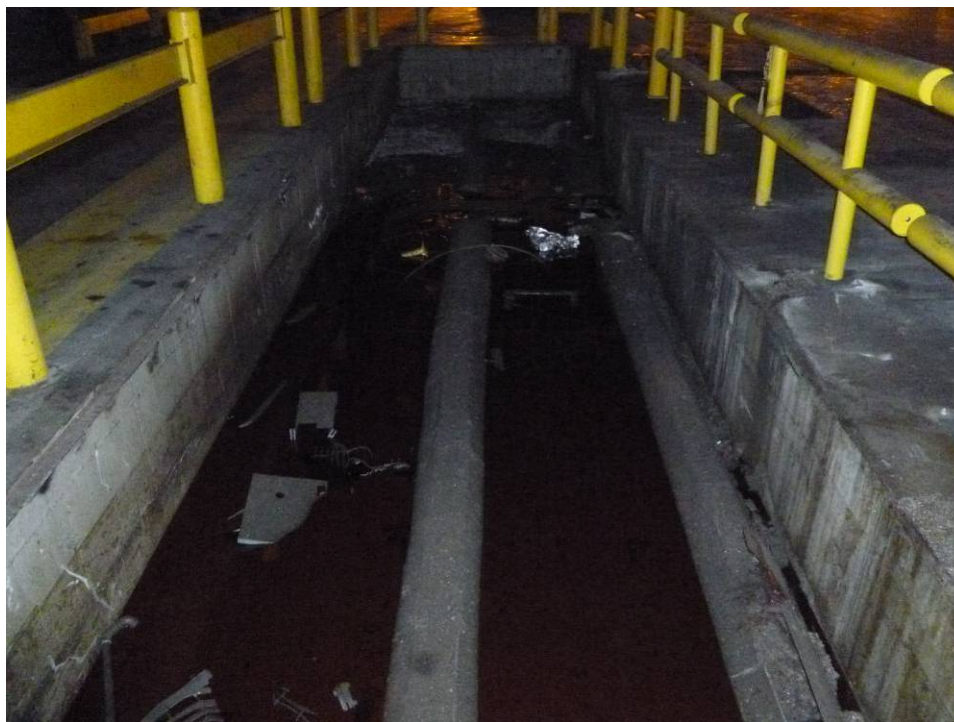
Photograph 31. (AOI-39) Equipment Pit near Columns A15/A14. Photo taken facing south.



Photograph 32. (AOI-39) Equipment Pit near Columns A15/A14. Note outfalls in southeast corner and oily/coolant sludge in south area of pit. Note concrete berms in pit.



Photograph 33. (AOI-40) Sump near Columns A11/A12, near west wall of Plant. Steel construction. Contains miscellaneous debris, possibly associated with plant decommissioning.



Photograph 34. (AOI-41) Equipment Pit near Columns A7/A6. Note oily/coolant water in pit and concrete berms.



Photograph 35. (AOI-41) Equipment Pit near Columns A7/A6. South end of pit. Note outfalls in southeast corner and several inches of oily/coolant water.



Photograph 36. (AOI-41) Equipment Pit near Columns A7/A6. Northeast area of pit.



Photograph 37. (AOI-31) Fire Pump House and 2 water tanks. Photo taken facing southwest.



Photograph 38. (AOI-31) Fire Pump House. Three aboveground diesel fuel storage tanks located along interior northeast wall.



Photograph 39. (AOI-31) Fire Pump House. Oily staining on concrete floor near floor drain, located in northwest area of building.



Photograph 40. (AOI-31) Fire Pump House. Diesel fire pump engine #3. Note oily staining beneath engine and blow down/condensate drain in foreground.



Photograph 41. (AOI-31) Fire Pump House. Fire pump engine #3. Note oily staining.



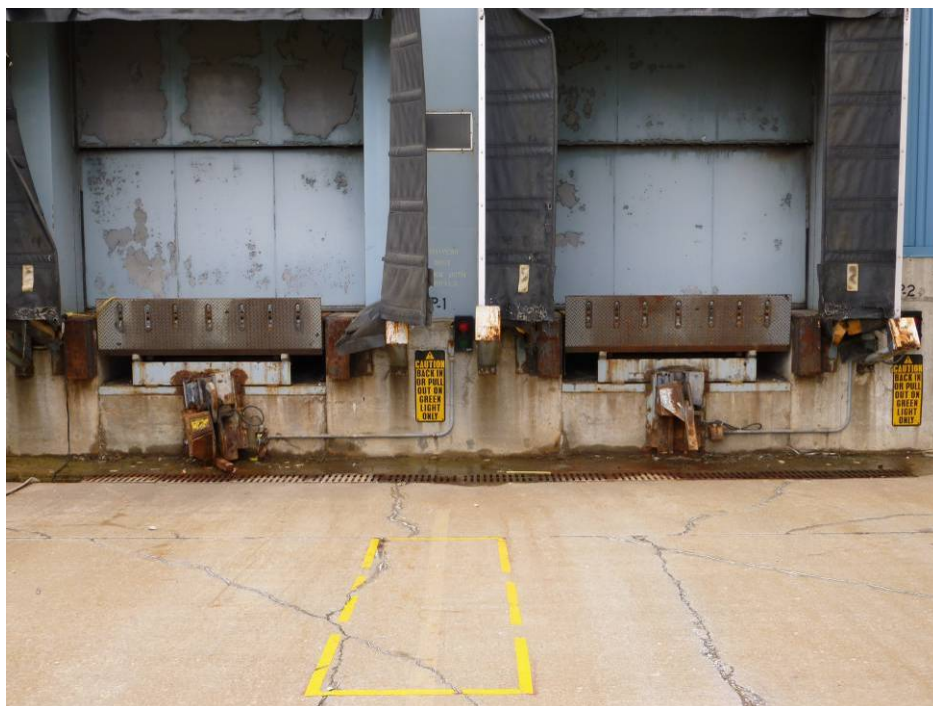
Photograph 42. (AOI-31) Fire Pump House. Trench for electrical conduit. Note dark staining.



Photograph 43. Northwest area of Plant, area between Columns WB and WJ, facing north wall. Dark brown spots appear to be oily condensate dripping from overhead lines.



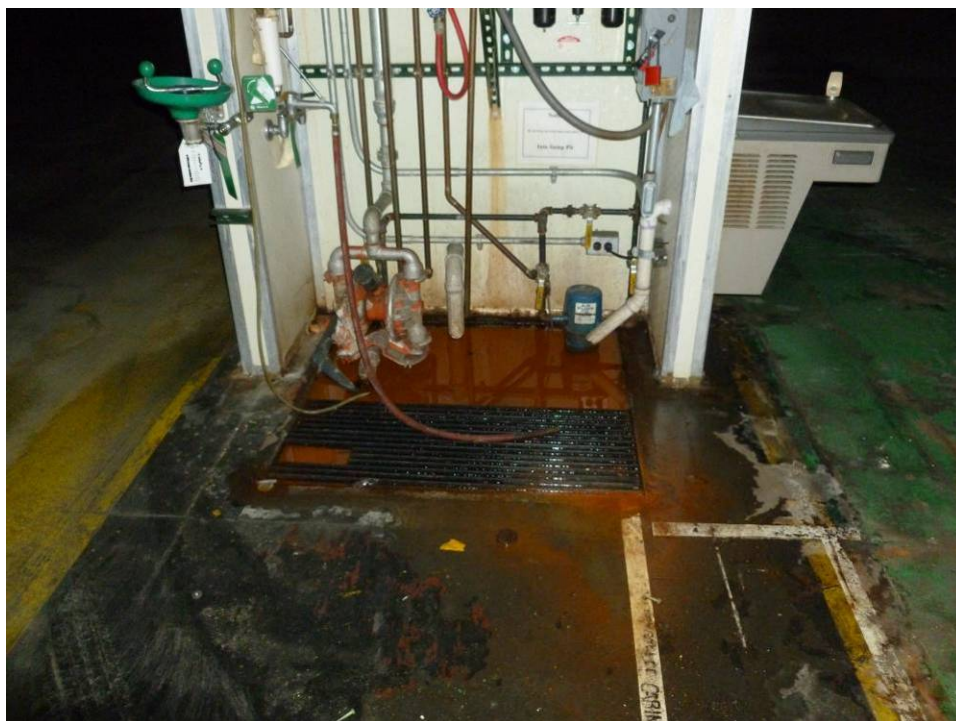
Photograph 44. (AOI-25) Purple dock area. Photo taken inside Plant, facing west.



Photograph 45. (AOI-25) Purple dock exterior. Photo taken facing east. Dark areas near blind trench are likely associated with recent precipitation event at time of reconnaissance.



Photograph 46. (AOI-25) Purple dock. Blind trench exterior to dock area. Minor sheen observed.



Photograph 47. (AOI-23) Dump Station near Columns WR/WS. Appears to be pumped to process waste system.



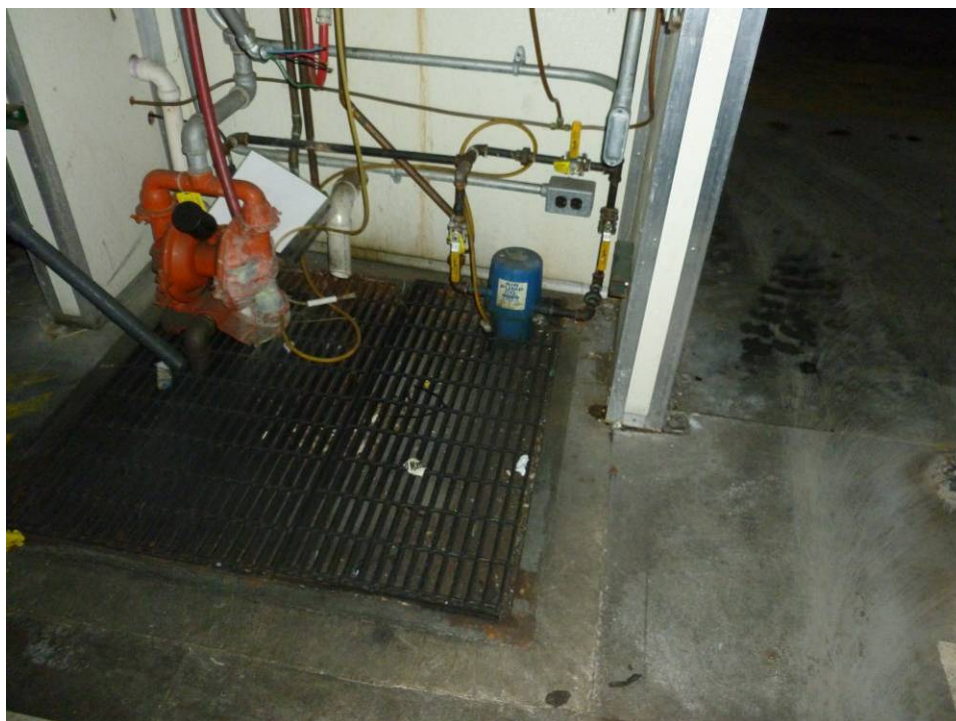
Photograph 48. (AOI-24) Green dock exterior. Photo taken facing east.



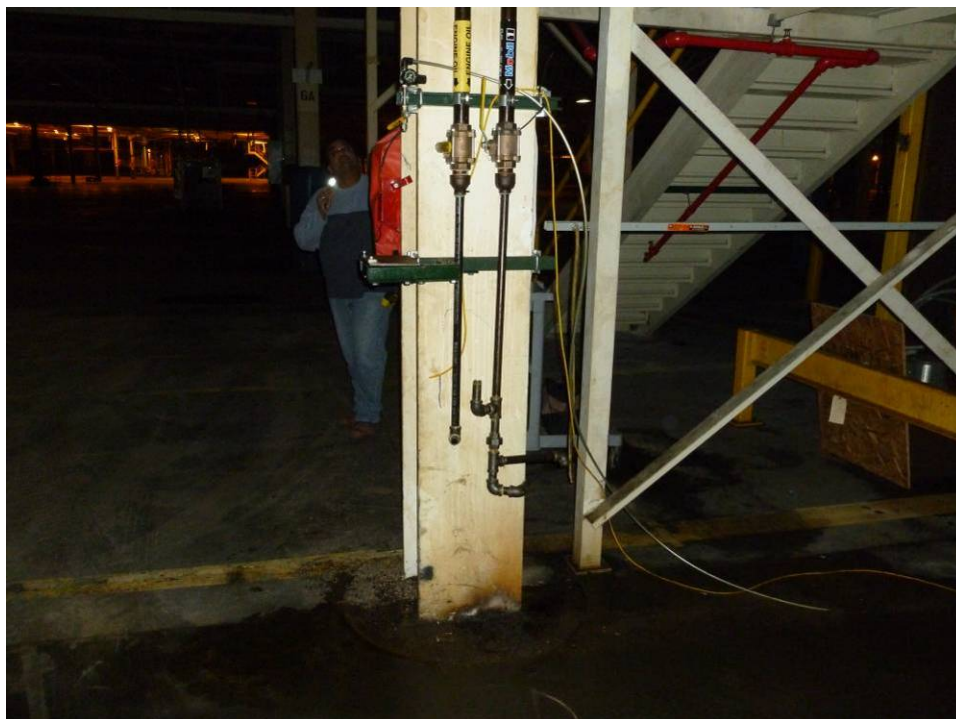
Photograph 49. (AOI-24) Green dock. Blind trench at exterior of dock.



Photograph 50. (AOI-24) Green dock. Photo taken facing south.



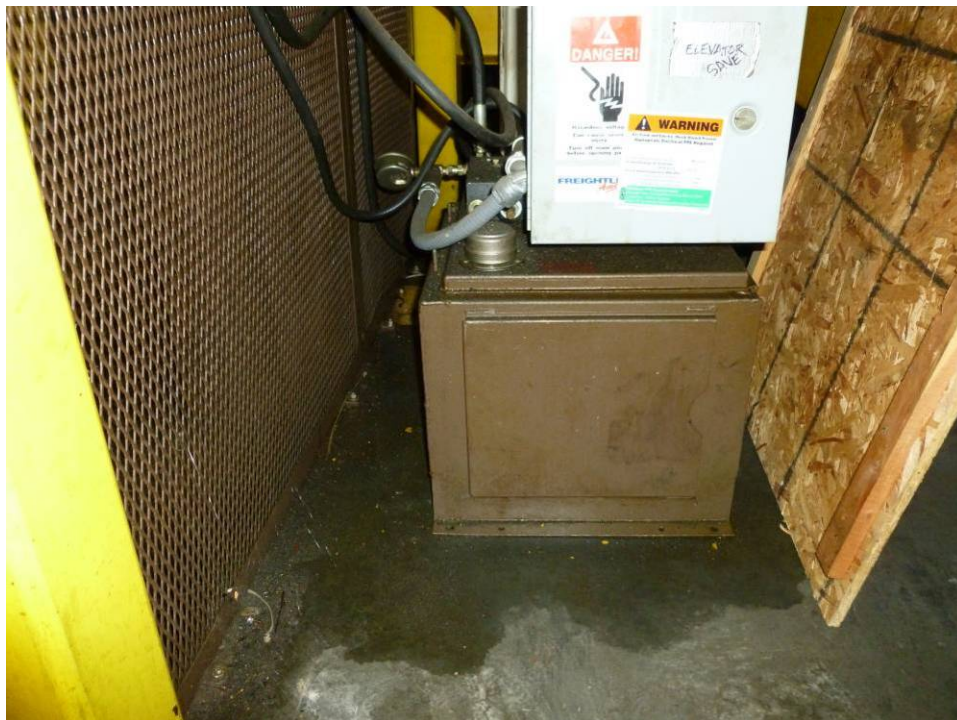
Photograph 51. (AOI-22) Dump Station near Column 8A, located approximately 20 feet from north wall of Plant. Appears to be pumped to process waste.



Photograph 52. (AOI-21) Oil dispensing ports near heavy equipment lift (to mezzanine). Near Columns 6A/K.



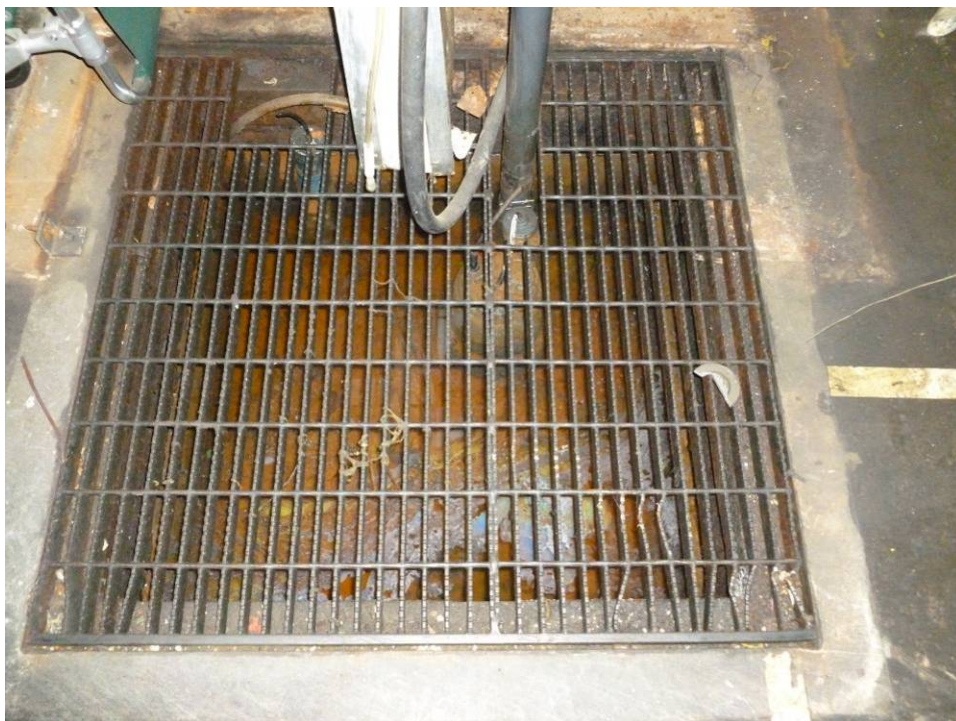
Photograph 53. (AOI-21) Oily staining near oil dispensing ports at heavy equipment lift. Near Columns 6A/K.



Photograph 54. (AOI-21) Heavy equipment lift. Staining in proximity to hydraulic oil reservoir. Note all components appeared to be located above the grade of the Plant concrete floor.



Photograph 55. (AOI-18) Dump Station near Columns 4A/J. Note, this Dump Station appeared to be approximately 1 foot deep and was partially filled with water.



Photograph 56. (AOI-18) Dump Station near Columns 4A/J. Note oily sheen on water in Dump Station.



Photograph 57. (AOI-20) Orange dock exterior. Photo taken facing west.



Photograph 58. (AOI-20) Orange dock exterior. Blind trench beneath truck bays contained water. Negligible amount of sheen observed.



Photograph 59. (AOI-19) Trash compactor area exterior. Photo taken facing west. Note dark staining / oily residue at east end of trash compactor bay. Note deteriorated condition of concrete.



Photograph 60. (AOI-19) Trash compactor area exterior. Note storm drain in northeast area of compactor bay. Note deteriorated condition of concrete.



Photograph 61. (AOI-19) Trash compactor area exterior. Close-up of dark staining / oily residue. Pools of liquid on metal rails are likely result of recent precipitation event. No sheen was observed on the water.



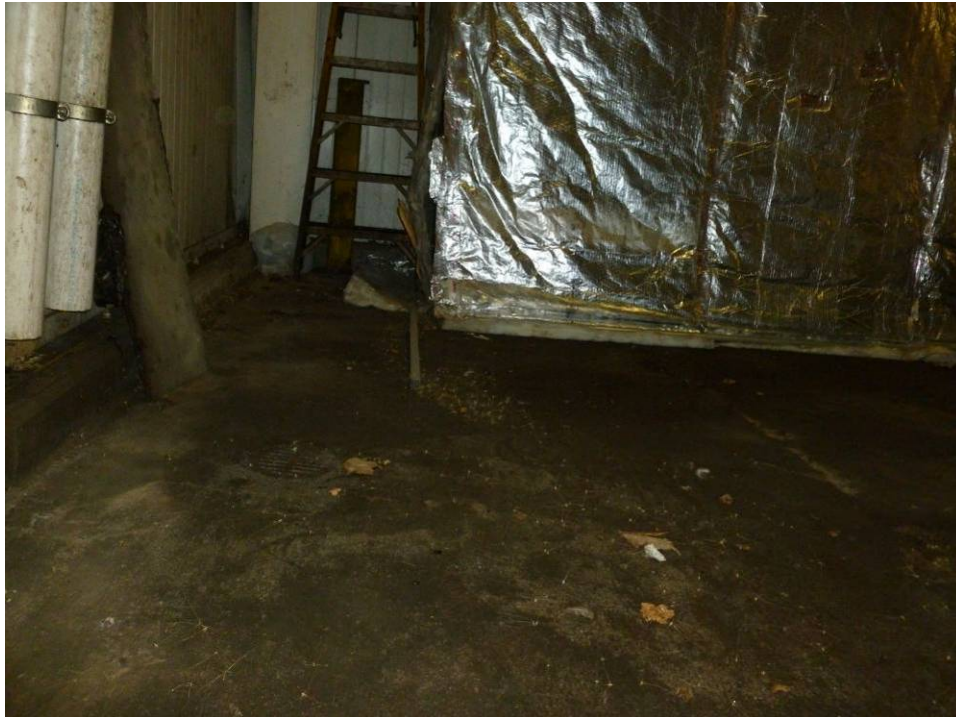
Photograph 62. (AOI-19) Trash compactor area exterior. Bay entrance to building. Photo taken exterior to bay, facing west. Note dark staining / oily residue on concrete pad.



Photograph 63. (AOI-19) Trash compactor area exterior. Note drain located between metal rails and process waste manhole in foreground.



Photograph 64. (AOI-19) Trash compactor area interior. Note dark staining / oily residue. Photo taken facing northeast.



Photograph 65. (AOI-19) Trash compactor area interior. Note dark staining / oily residue. Note floor drain located near northeast corner.



Photograph 66. (AOI-19) Oil Pump Station located adjacent to trash compactor area along east wall of Plant. Note dark staining / oily residue on concrete berm and floor. Five dispensing units.



Photograph 67. (AOI-16) Dump Station near Column M/1A. Appears to be routed to process waste. Oily sludge observed in pit.



Photograph 68. (AOI-42) Dump Station near Column G2. Oily sludge observed in pit.



Photograph 69. (AOI-15) Equipment Pit near Columns D2/E2. Photo taken facing south.



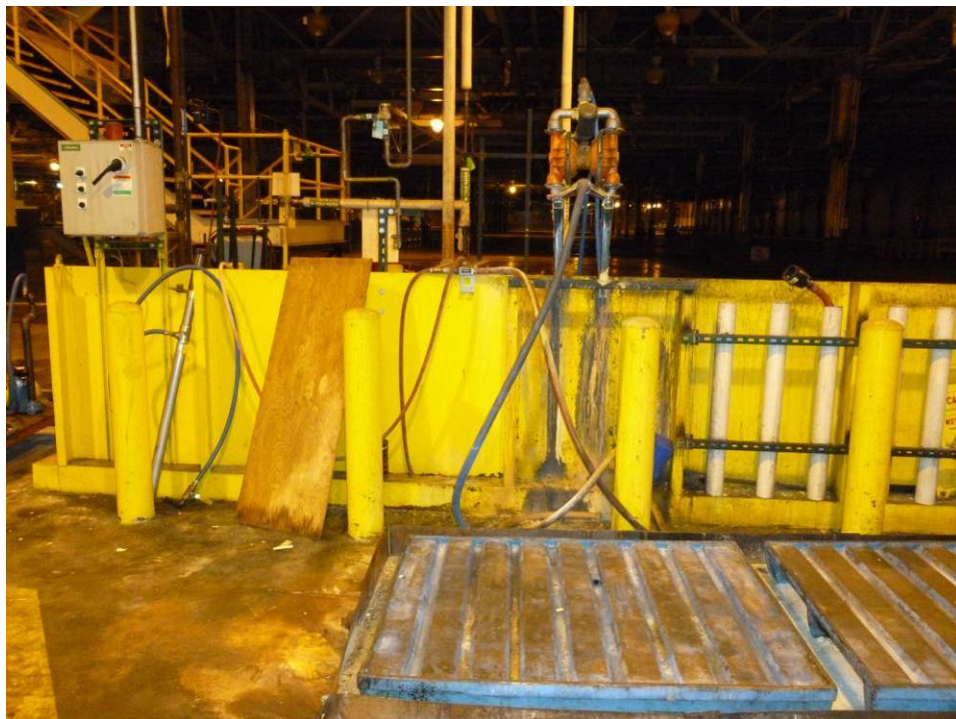
Photograph 70. (AOI-15) Equipment Pit near Columns D2/E2. Dark staining, some debris observed in pit.



Photograph 71. (AOI-15) Equipment Pit near Columns D2/E2. Coolant lines observed in pit area.



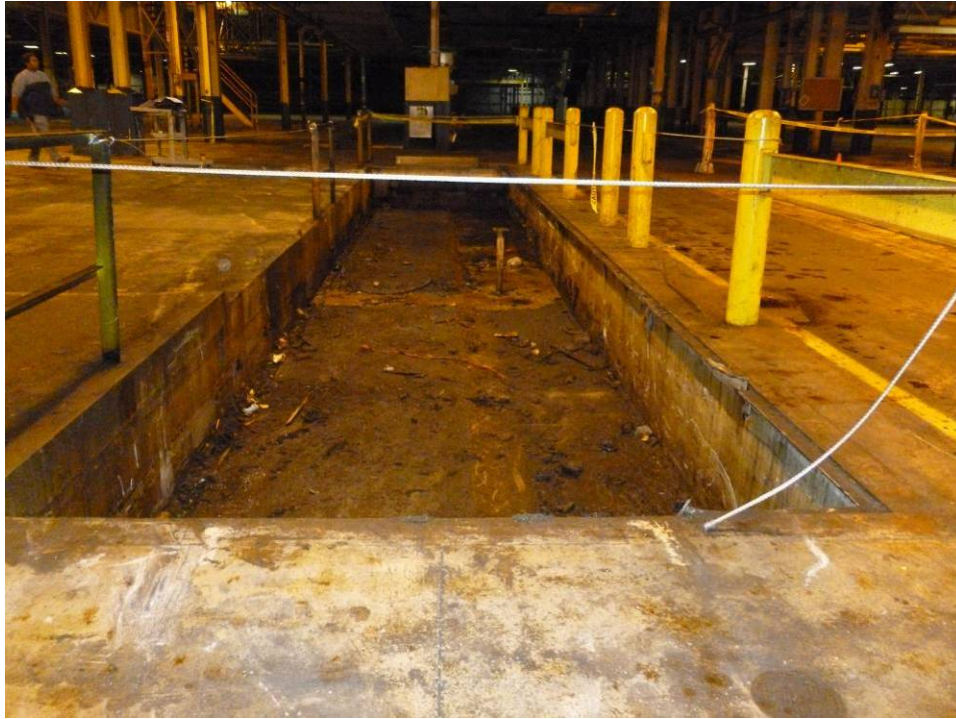
Photograph 72. (AOI-13) Wash / Dump Station.



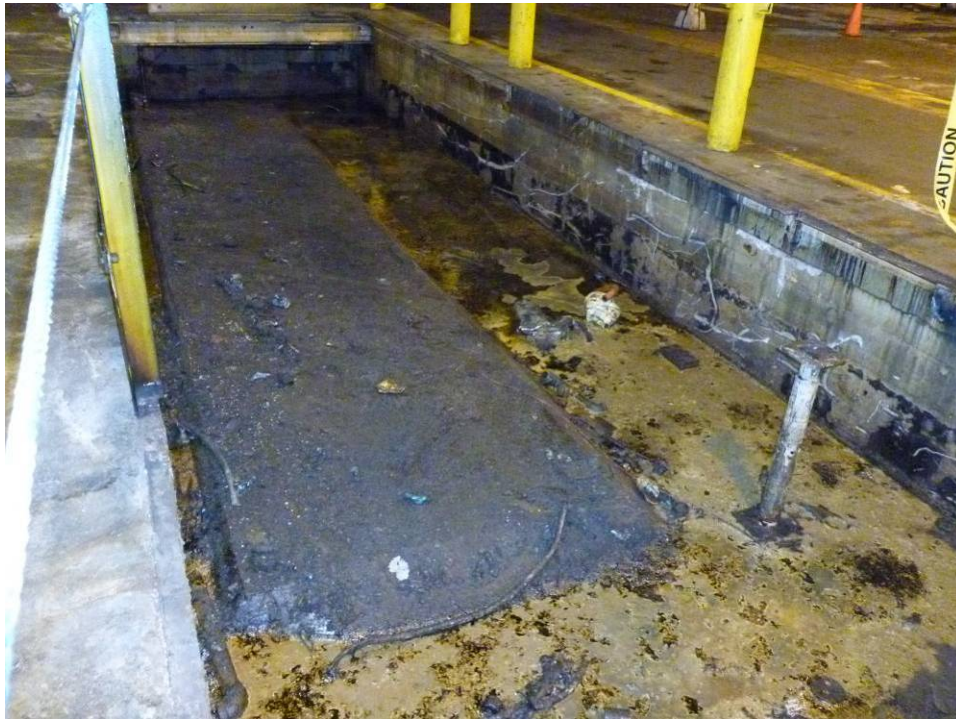
Photograph 73. (AOI-13) Wash / Dump Station. Observed hot and cold water lines, compressed air line, and process water line associated with this pit.



Photograph 74. (AOI-13) Wash / Dump Station. Photo taken facing west wall of Plant. Note view of Column marking "4 A 3" on west wall in background.



Photograph 75. (AOI-12) Equipment Pit. Picture taken facing north. Note concrete berm in northwest area of pit.



Photograph 76. (AOI-12) Equipment Pit. Picture taken facing north and east. Note accumulation of oily / coolant sludge in pit and metal grindings on concrete berm.



Photograph 77. (AOI-12) Oil-filled trench/flume located approximately 25 feet from equipment pit, extending approximately 100 feet north of the pit. Float observed in northwest corner of pit.



Photograph 78. (AOI-12) Oil-filled trench / flume system, may be associated with equipment pit.



Photograph 79. (AOI-12) Oil-filled pit near Column G4.



Photograph 80. (AOI-12) Oil-filled pit near Column G4.



Photograph 81. (AOI-12) Oil-filled pit near Column G4.



Photograph 82. (AOI-12) Oil-filled pit near Column G4.



Photograph 83. (AOI-11) Dump Station near Columns J5/K5. Note, the pit is filled with oily / coolant sludge.



Photograph 84. (AOI-11) Dump Station near Columns J5/K5.



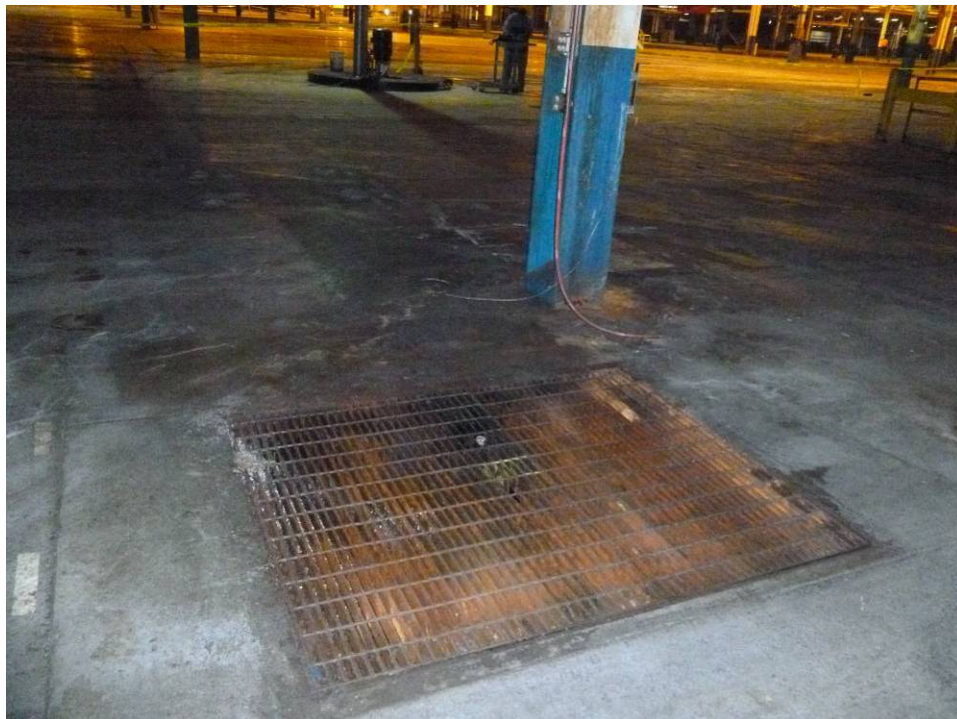
Photograph 85. (AOI-10) Equipment Pit. Note pit contains approximately 3 feet of oily / coolant water.



Photograph 86. (AOI-10) Flume conveyance between Equipment Pit (AOI-10) and Oil Sump (AOI-09). Flume extends approximately 22 feet from southeast area of AOI-10 to AOI-09.



Photograph 87. (AOI-09) Oil Sump near Columns L8/M8. Sump is approximately 5 feet in diameter.



Photograph 88. (AOI-09) Oil pit near Column 8N. May be associated with Oil Sump (AOI-09). Note location of oil sump in background of photo. Distance from sump is approximately 34 feet. Pit contains oily material.



Photograph 89. (AOI-09) Oil pit, possibly associated with Oil Sump (AOI-09). Note pit contains oily material.



Photograph 90. (AOI-04) Swarf management associated with East Gallery (AOI-04). Located on main level of Plant. Note signage: "Filter Media Contains Lead."



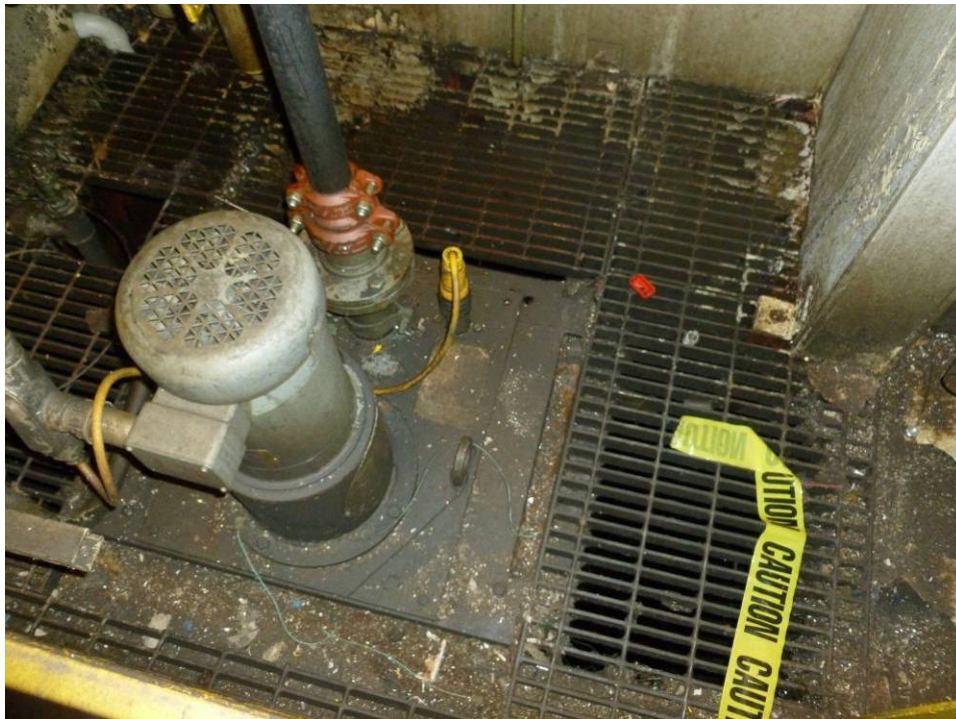
Photograph 91. (AOI-04) Swarf management associated with East Gallery (AOI-04). Located on main level of Plant. Note signage: "Iron Chips for Recycling Contain Lead."



Photograph 92. (AOI-05) Clean / Dump Station near Column L14. Note dark staining / oily residue around station.



Photograph 93. (AOI-15) Clean / Dump Station near Column L14. Hot and cold water lines, compressed air lines, and a hydraulic oil dispensing unit were observed at this station.



Photograph 94. (AOI-05) Clean / Dump Station. Close-up of pump. Note accumulation of metal fines and material.



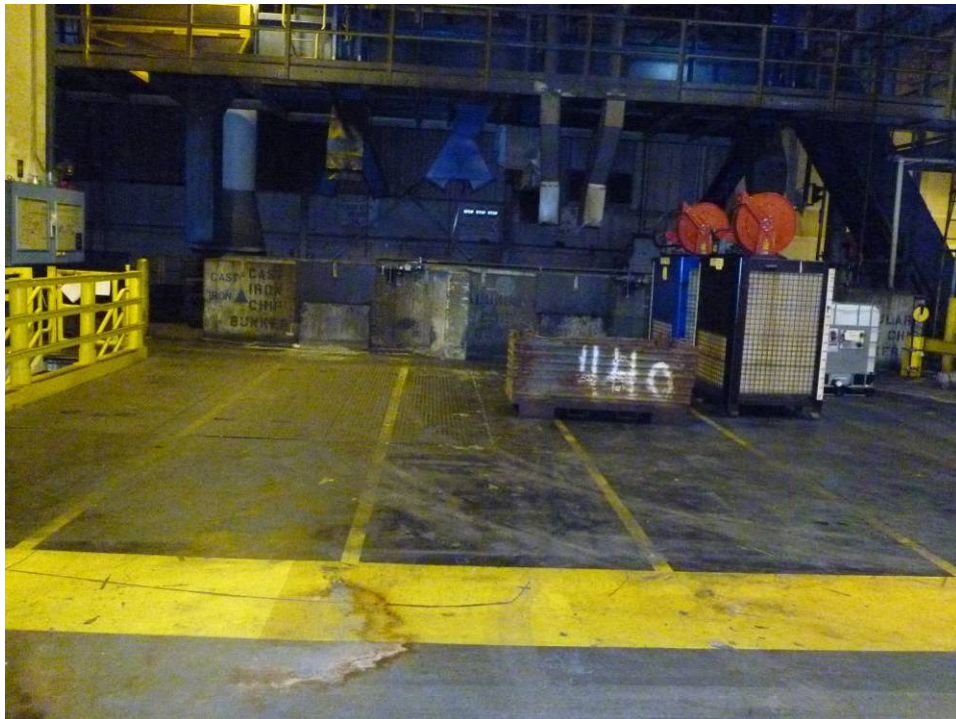
Photograph 95. (AOI-03) Blue Dock exterior. Photo taken facing west. No evidence of staining observed.



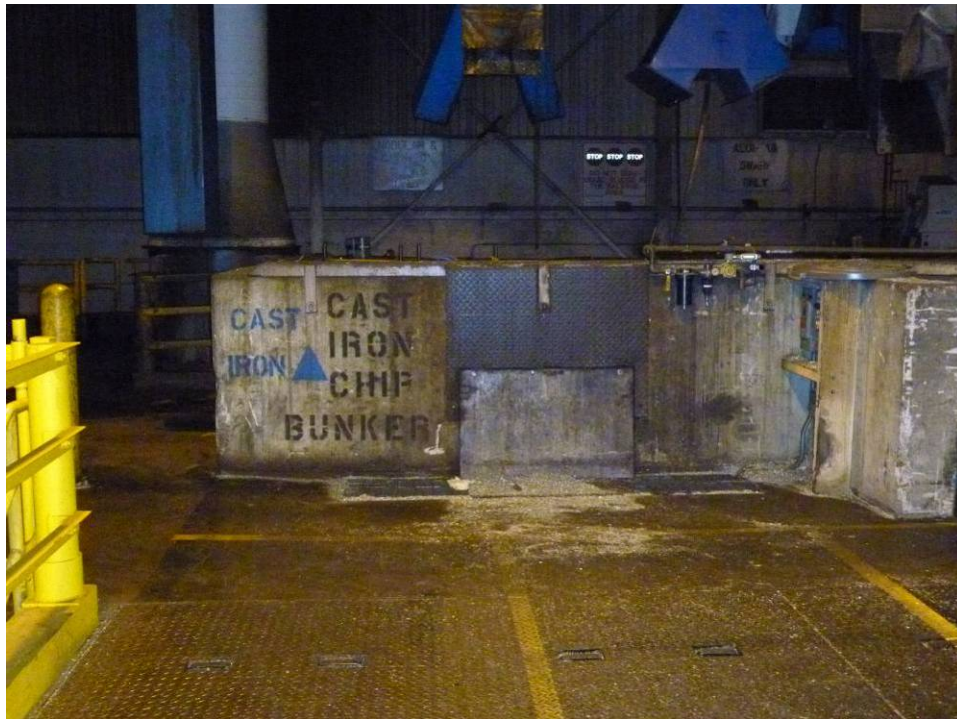
Photograph 96. (AOI-03) Blue Dock exterior. Close-up of blind trench drain. Negligible amount of sheen observed.



Photograph 97. (AOI-01) Teal Dock exterior. Photo taken facing east. No evidence of staining or sheen observed at the exterior of the Teal Dock.



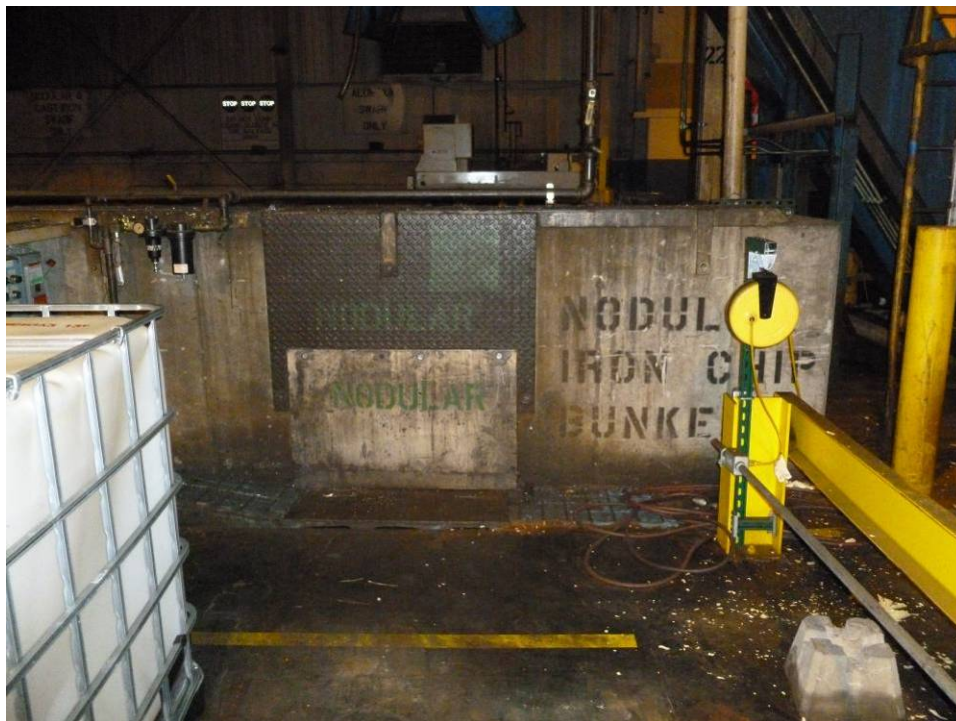
Photograph 98. (AOI-01) Chip Bunkers. Photo taken facing south wall of Plant. This area is located above the western portion of the South Gallery and adjacent to the Truck Bay.



Photograph 99. (AOI-01) Chip Bunkers. Photo taken at east end of bunkers, facing south.



Photograph 100. (AOI-01) Chip Bunkers. Close-up of aluminum chip bunker. Photo taken facing south.



Photograph 101. (AOI-01) Chip Bunker. Close-up of iron chip bunker. Photo taken at west end of bunkers, facing south. Note dark staining and oily residue on concrete.



Photograph 102. (AOI-01) Chip Management Area. Conveyance is located at the west end of the Truck Bay. Note sump and pump. Photo taken facing south wall of Plant.



Photograph 103. (AOI-01) Truck Bay. Photo taken facing south wall of Plant. Note dark staining on wall. Dark staining was also observed on the floor of the Truck Bay.



Photograph 104. (AOI-01) Truck Bay. Overhead iron and aluminum chip silos.



Photograph 105. (AOI-07) Dump Station near Column E14. Note hydraulic oil distribution line. Oily material was observed in the pit at the time of the site reconnaissance.



Photograph 106. (AOI-07) Dump Station near Column E14. Close-up of pit. Note oily material in pit. Depth unknown.



Photograph 107. (AOI-37) Two Aboveground Storage Tanks. Photo taken facing east. Tank at north end is labeled, "Diesel 200 Gallons." Tank at south end is labeled, "Unleaded 800 Gallons." Note Fluid Storage Building aka Oil Storage Building (AOI-36) in the background.



Photograph 108. (AOI-37) Two Aboveground Storage Tanks. Photo taken facing west.



Photograph 109. (AOI-37) Two Aboveground Storage Tanks. No liquids were observed in the containment around the tanks. Photo taken facing northeast.



Photograph 110. (AOI-35) Entrance to Air Compressor Building. Photo taken facing east.



Photograph 111. (AOI-35) Equipment in Air Compressor Building. Photo taken facing south wall of building. Note dark staining and oily residue on elevated concrete platform.



Photograph 112. (AOI-35) Equipment in Air Compressor Building. Photo taken facing northeast.



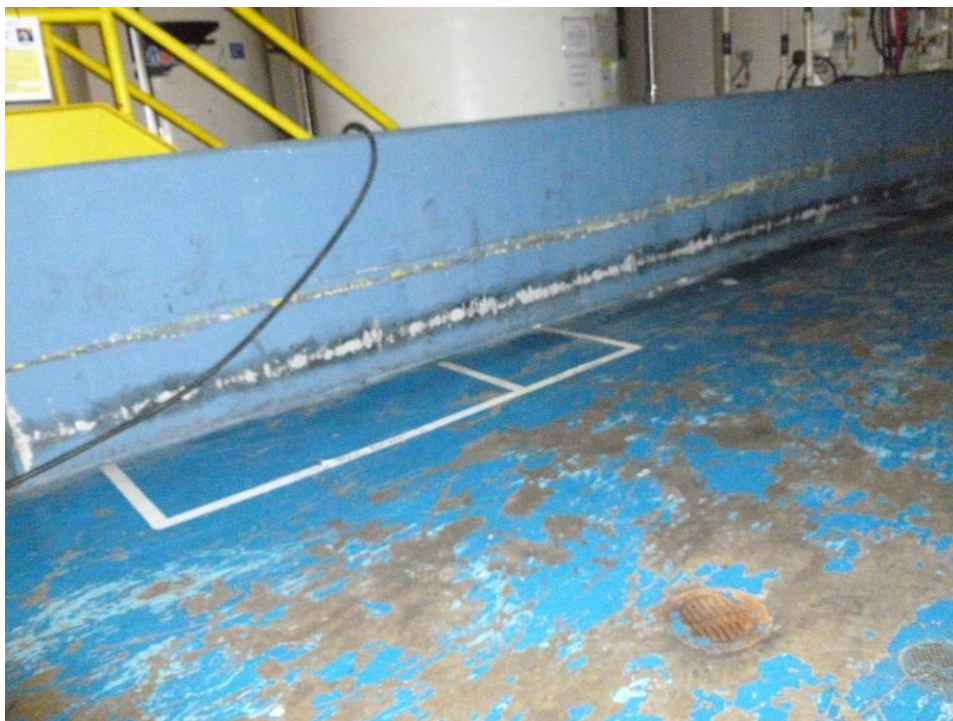
Photograph 113. (AOI-35) Equipment in Air Compressor Building. Lines extending from equipment located in northeast area of building to drain. Note dark staining and oily residue.



Photograph 114. (AOI-35) Substation located between Air Compressor Building and Wastewater Treatment Plant.



Photograph 115. (AOI-36) Oil Storage Building. Photo taken facing south. Bulk product storage of engine oil, hydraulic oil and caustic product.



Photograph 116. (AOI-36) Oil Storage Building. Floor drain located in aisle outside of secondary containment for bulk product storage.



Photograph 117. (AOI-36) Oil Storage Building. Photo taken from inside area of secondary containment, facing north. Note sump and evidence of release (blue colored material on/beneath pipes east of sump).



Photograph 118. (AOI-36) Oil Storage Building. Evidence of release from caustic product tank.



Photograph 119. (AOI-36) Oil Storage Building. Close-up of sump pit located within secondary containment area.



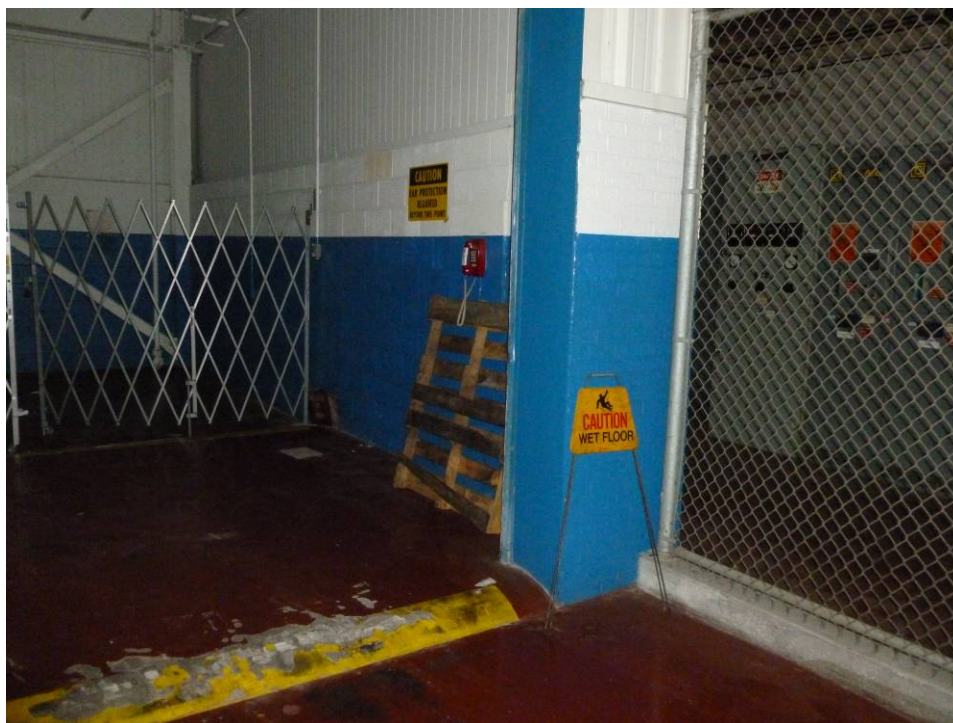
Photograph 120. (AOI-36) Oil Storage Building. Note staining on bulk engine oil storage tank. Unknown whether rust or oily staining at time of site reconnaissance.



Photograph 121. (AOI-36) Parkson Lamella System. Bulk process tanks located east of the Oil Storage Building, west of the Less Than 90-Day Hazardous Waste Storage Area (AOI-34).



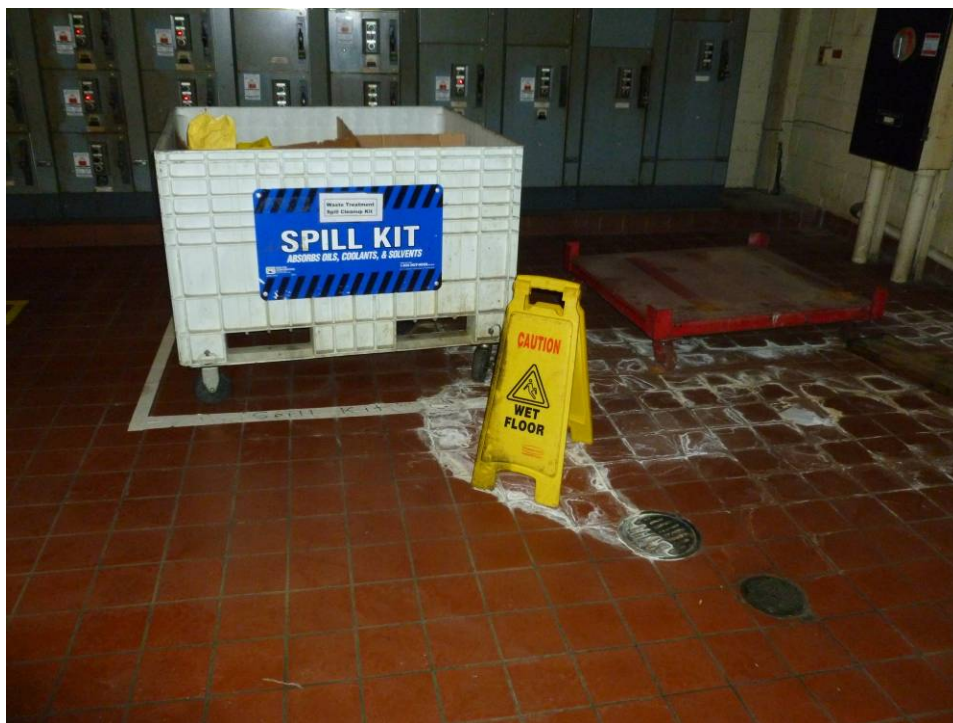
Photograph 122. (AOI-34) Less Than 90-Day Hazardous Waste Storage Area.



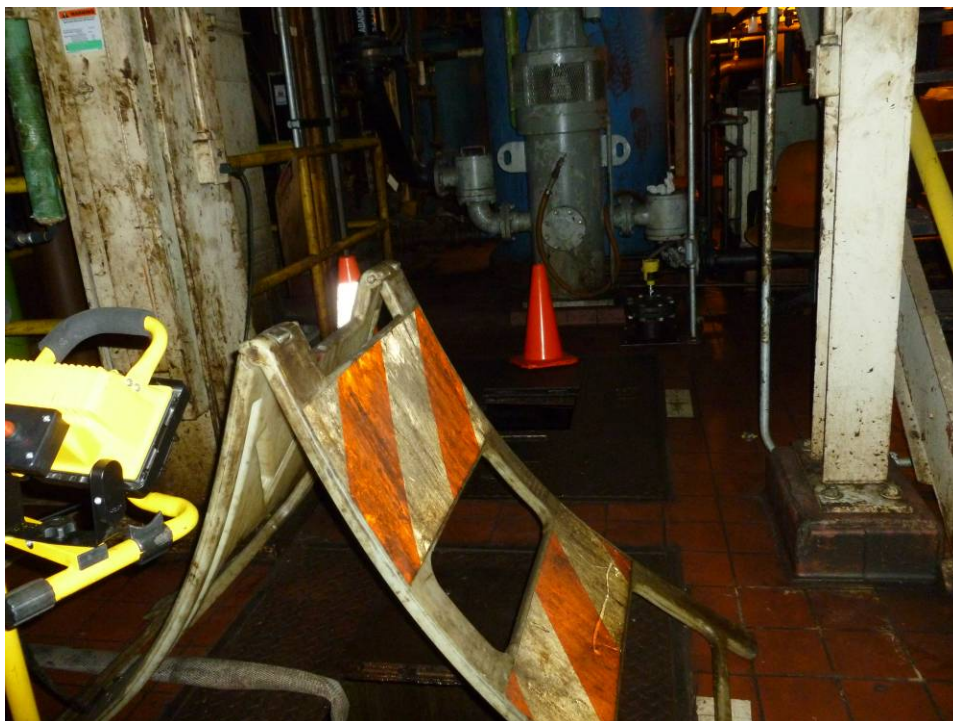
Photograph 123. (AOI-34) Less Than 90-Day Hazardous Waste Storage Area. Note proximity of substation west of the HW Storage Area.



Photograph 124. (AOI-34) Less Than 90-Day Hazardous Waste Storage Area. Water control valves located in southeast corner of HW Storage Area.



Photograph 125. (AOI-33) Wastewater Treatment Plant. Floor drain located in the southwest area of the WWTP. Note, evidence of release to floor drain.



Photograph 126. (AOI-33) Wastewater Treatment Plant. Photo taken on main level of WWTP, facing south. Note two sumps in foreground.



Photograph 127. (AOI-29) Former railroad spur. Gate 8 is believed to be the entry point of a former railroad spur to the Site. Located in the northeast area of the Site, northeast of the WWTP.



Photograph 128. (AOI-29) Former railroad spur. Gate 8, believed to be the entrance of the former railroad spur, is located in the northeast area of the photo. Components of the Detroit Edison Substation (AOI-38) are located to the south of Gate 8.



Photograph 129. (AOI-38) Detroit Edison Substation. Located east of the WWTP.



Photograph 130. Neighboring commercial properties located to the south of the Site.



Photograph 131. Livonia Fire Department Station located to the west of the Site on Middlebelt Road.



Photograph 132. Truck Scale located at the south side of the Site. Note neighboring commercial properties to the south and Middlebelt Road entrance straight ahead.