Stericycle
Environmental Solutions

December 23, 2015

Mr. David Slayton
Michigan Department of Environmental Quality
Permits and Corrective Action Unit
Hazardous Waste Section
PO Box 30241
Lansing, MI 48909

Subject: **Corrective Measure Study Work Plan**
Petro-Chem Processing Group of Nortru, LLC
Detroit, MI MID 980 615 298

Dear Mr. Slayton:

Pursuant to Part VI.K of the Petro-Chem Processing Group of Nortru, LLC Operating License, the draft Corrective Measure Study Work Plan is enclosed for your review. As requested in the October 27, 2015 letter from MDEQ, the enclosed work plan includes additional field work to address data gaps identified in the Corrective Action Investigation Report.

If you have any questions, please contact me at 425-227-6170.

Sincerely,

Andy Maloy
Director, EH&S Risk Management

cc: Jeffrey Davis, Stericycle
Ed Burk, Stericycle
Kellie Wing, Bureau Veritas

CMS Work Plan
Nortru, LLC
Petro-Chem Processing Group Facility
421 Lycaste Street, Detroit, MI

December 23, 2015

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

John A. Maloy
Director, EH&S Risk Management

Corrective Measures Study Work Plan

Petro-Chem Processing Group of Nortru, LLC
421 Lycaste Street
Detroit, Michigan 48214

December 23, 2015
Project No. 11013-000191.00

Prepared for
Stericycle Environmental Solutions, Inc.
Petro-Chem Processing Group of Nortru, LLC
421 Lycaste Street
Detroit, Michigan 48214

Move Forward with Confidence

Bureau Veritas North America, Inc.
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TABLE OF CONENTS

1.0 INTRODUCTION 1
1.1 SITE DESCRIPTION 1
1.2 HISTORIC INVESTIGATIONS 1

2.0 ADDITIONAL SUBSURFACE INVESTIGATION 3

3.0 CORRECTIVE MEASURE OBJECTIVES 8

4.0 CORRECTIVE MEASURE TECHNOLOGIES/ALTERNATIVES 12
4.1 TECHNOLOGIES TO BE CONSIDERED 12
4.2 EVALUATION OF POTENTIAL CORRECTIVE MEASURES 13

5.0 PROPOSED TREATABILITY OR PILOT STUDIES 14

6.0 OUTLINE FOR THE CMS REPORT 15

7.0 PROJECT MANAGEMENT 16
7.1 MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY 16
7.2 PETRO-CHEM PROCESSING GROUP OF NORTRU, LLC 16
7.3 BUREAU VERITAS NORTH AMERICA, INC. 16

8.0 PROJECT SCHEDULE 17

Figures

1 Site location map
2 Site layout
3 Proposed boring locations

Tables

1 Summary of Relevant Exposure Pathways in Soils
2 Summary of Relevant Exposure Pathways in Groundwater

1.0 INTRODUCTION

This Corrective Measures Study (CMS) Work Plan has been prepared on behalf of Stericycle Environmental Solutions, Inc. (Stericycle) and Petro-Chem Processing Group of Nortru, LLC (Petro-Chem). The purpose of this work plan is to develop and evaluate corrective measure alternatives to support the selection and implementation of remedial measures for soil and groundwater at the Petro-Chem facility (the site) located at 421 Lycaste Street in Detroit, Michigan (Figure 1).

1.1 SITE DESCRIPTION

Petro-Chem is a Resource Conservation and Recovery Act (RCRA) – Hazardous Waste Management Facility, which is permitted to store, treat, transfer, and recycle hazardous wastes. The Petro-Chem facility, located at 421 Lycaste Street in Detroit Michigan, is on an estimated 8-acre parcel in an industrial and residential area approximately 0.5 miles north of the Detroit River (Figure 1).

An Amoco refinery once operated on parts of the site and Petro-Chem currently operates a fuel blending and solvent recycling plant. Spent solvents, rags, fuel sludges, and tank bottoms are processed and are either cleaned and recycled, or sold as fuel to cement kilns. Materials that cannot be recycled are sent offsite for incineration.

As shown on Figure 2, the Petro-Chem treatment, storage, and disposal facility (TSDF) contains several buildings including a two-story office building, laboratory, maintenance office, container management building, electrical room, technical center, and an employee locker room and restroom facilities. A driveway on the east side of the facility is used for incoming and outgoing traffic at the facility. Other facility features include an employee and visitor parking area, aboveground storage tanks (ASTs), a drum storage area, and support facilities. The facility is enclosed by a 6-foot-high chain-link security fence topped with barbed wire.

1.2 HISTORIC INVESTIGATIONS

Several investigations of soil and groundwater conditions at the site have been conducted. The previous site investigations include:

- Summary of Concrete and Soil Sampling in Eight Container Management Units (Tetra Tech, 2008)
- RFI Report (Bureau Veritas, 2011)

- Various Semi-Annual Monitoring Reports (Bureau Veritas, 2009 to 2015)
- Amended Corrective Action Investigation Report (Bureau Veritas, 2015).

The primary contaminants of concern (COCs) associated with historical activities conducted at the site include volatile organic compounds (VOCs). The CMS will evaluate the potential COCs in more detail.

There are currently 10 groundwater monitoring wells associated with the site. The results from the most recent monitoring event were described in the 2015 1st Semi-Annual Environmental Monitoring Report (Bureau Veritas, 2015).

2.0 SUBSURFACE INVESTIGATION

To provide additional data regarding the nature and extent of contamination, field studies will be conducted to meet the following objectives:

- Evaluate the potential for COCs originating offsite to impact groundwater quality in the vicinity of the site.
- Evaluate the nature and extent of contamination west of the SBS Blending Building.
- Evaluate the nature and extent of contamination near the northwest corner of the site, near Soil Boring BSG-24.
- Evaluate the presence of Non-Aqueous Phase Liquids (NAPL) in areas where Soil Saturation Screening Levels are exceeded in select soil samples.

To meet the first three objectives, soil borings will be drilled at the locations shown on Figure 3. Soil and groundwater samples will be collected and evaluated as described in more detail below. The presence of NAPL will be evaluated in two locations (i.e., near Soil Borings BSB-12 and BSB-24) by installing monitoring wells designed to intercept the saturated/unsaturated zone interface. The wells will be installed at the locations shown on Figure 4. Additional details regarding the assessment of NAPL are provided below.

Technical Approach

- Verify access from the western offsite property owner to conduct work on the private property.
- Contact MISS-DIG to locate and mark on the ground surface subsurface utility lines in the site area at least 72 hours prior to initiating any subsurface work onsite or offsite.
- Conduct further onsite and offsite characterization of the horizontal and vertical extent of soil and groundwater contamination by drilling of soil borings and collecting soil and groundwater samples for chemical analysis. This will be accomplished by using direct-push technology.
- Subsurface investigation activities will include drilling eight soil borings to a maximum depth of 20 feet below ground surface. Figure 3 shows proposed boring locations.
- Two permanent monitoring wells will be installed to evaluate the presence of NAPL in two locations where Soil Saturation Screening Levels in soil were exceeded. Figure 4 shows

proposed monitoring well locations.

Soil Sampling

- All boring locations will be identified prior to the start of field activities.

- Continuous soil samples will be collected until the water table is encountered or the maximum proposed depth is achieved.

- A boring log will be completed for each location by the site geologist and will include relevant information necessary to the assessment of the subsurface geology.

- Soil collected in each 5-foot acetate liner will be field-screened using a hand-held PID at each 2-foot interval.

- A minimum of two soil samples per boring, including the soil sample exhibiting the highest PID reading above the water table and the soil sample from just above the water table will be collected and analyzed for volatile organic compounds (VOCs) in accordance with RRD Operational Memorandum No. 2, Attachments 4 (*Sample Preservation, Sample Handling, and Holding Time Specifications*) and 6 (*Sampling Methods for Volatile Organic Compounds*). Sixteen soil samples, 1 soil duplicate, 1 equipment blank, and 1 trip blank (per cooler) will be collected and analyzed. One sample will be submitted as a MS/MSD every ten samples collected for each media.

    - Soil samples intended for VOC analysis will be collected and submitted to the laboratory in accordance RRD Operational Memorandum No. 2, Attachment 6 (*Sampling Methods for Volatile Organic Compounds*), dated October 22, 2004, using USEPA Method 5035.

    - Samples will be stored in the field on ice. Appropriate COC documentation will be maintained for the samples. COC documentation will include the sample number, date and time of collection, depth, location, number of containers, requested analyses, and sample handling sequence. A trip blank will be prepared and transported with the samples for appropriate QA/QC documentation.

    - Samples will be packed on ice and transferred to the laboratory for analysis.

    - Soil samples will be analyzed in accordance with the USEPA document *EPA SW-846 - Test Methods for Evaluating Solid Waste* and Table 1 of Operational Memo GEN-8, Revision 8. Soil samples will be analyzed for VOCs using USEPA Method 5035/8260B.

    - Appropriate QA/QC documentation will be provided with each batch of samples. Quality control replicates, laboratory spikes, and control blanks will be analyzed according to

standard protocols.

Groundwater Sampling

- Groundwater samples will be collected using temporary monitoring wells.

- Groundwater samples will be collected using a peristaltic pump and placed in appropriate containers. Eight groundwater samples, 1 duplicate, 1 field blank, 1 equipment blank, and 1 trip blank (per cooler) will be collected and analyzed for VOCs in accordance with RRD Operational Memorandum No. 2, Attachments 4 (*Sample Preservation, Sample Handling, and Holding Time Specifications*) and 6 (*Sampling Methods for Volatile Organic Compounds*). One sample will be submitted as a MS/MSD every ten samples collected for each media.

    - Groundwater samples intended for VOCs analysis will be placed into 40-mL glass containers pre-preserved with hydrochloric acid.

    - Samples collected for analysis will be stored in the field on ice. Appropriate COC documentation will be maintained for all samples. COC documentation will include the sample number, date and time of collection, depth, location, number of containers, requested analyses, and sample handling sequence. Trip blanks will be prepared and follow the samples for appropriate QA/QC documentation.

    - Groundwater samples will be packed on ice and transferred to the laboratory for analysis.

    - Groundwater samples will be analyzed in accordance with the USEPA document *EPA SW-846 - Test Methods for Evaluating Solid Waste* and Table 1 of Operational Memo GEN-8, Revision 8. Groundwater samples will be analyzed for VOCs using USEPA Method 5035/8260B.

    - Appropriate QA/QC documentation will be provided with each batch of samples. Quality control replicates, laboratory spikes, and control blanks will be analyzed.

Monitoring Well Installation

- Permanent monitoring wells will be installed using a 66DT Geoprobe® drill rig, or similar equipment.

- Monitoring wells will be constructed using 2-inch diameter polyvinyl chloride (PVC) well screen and casing. A five-foot-long section of No. 10 slot screen will be used to construct the well unless otherwise noted, or required. The annular void between the well screen and the borehole will be filled with coarse-grained, silica sand filter pack (from the bottom of the well

to a vertical position of approximately 2 feet above the well screen). A 1-foot-deep granular bentonite seal will be placed immediately above the filter pack. The remaining borehole annulus, from the granular bentonite seal to within 2 feet of surface grade, will be filled with a cement/bentonite slurry. At grade the wells will be protected by 4 inch stick up well covers set in 2' x 2' x 6" concrete pads.

- Monitoring wells will be secured with padlocks and expanding seals to prevent unauthorized access. Padlocks will be keyed alike.

- The newly installed monitoring wells will be developed using purge development techniques. Well development will occur until the groundwater is essentially sediment free. Development water will be stored onsite in 55-gallon drums pending proper disposal.

- Decontamination procedures between each soil boring will be completed in accordance with accepted industry standards. Drilling tools and sampling equipment will be thoroughly decontaminated before and during use utilizing a high-temperature/high-pressure wash and/or a detergent solution wash and clean water rinse, as appropriate.

- Soil cuttings and rinsate investigation-derived waste (IDW) generated during subsurface investigation activities will be stored in 55-gallon drums in an onsite area pending proper disposal within 90 to 120 days.

    - All field IDW will be stored in properly labeled MDOT approved 55-gallon drums and stored onsite pending proper disposal. Soil waste will be stored separately from liquid waste.

    - Drums of soil cuttings and rinsates generated during the field activities will be managed by Petro-Chem in accordance with their Operating License.

    - Disposal activities will be coordinated and scheduled with PSC.

NAPL Assessment

NAPL represents a COC source area that must be properly assessed and managed. Contaminant concentrations that exceed Soil Saturation Screening Levels for soil and water solubility for groundwater may be interpreted as a positive indication of NAPL. NAPLs are potentially present at the site based on the presence of soil contamination at concentrations exceeding Soil Saturation Screening Levels.

Visual identification of the presence of NAPL in the field will be logged. Visual observations may include the following: stained or otherwise discolored soils; NAPL-saturated soils; the presence of sheens in the saturated zone; and the presence of NAPL, or NAPL staining, on drilling equipment, and high PID readings.

The following field classifications will be used to document the absence/presence of NAPL in site soil samples:

- **No evidence of NAPL** – No visual evidence of NAPL.
- **Evidence of NAPL** – Soils exhibit signs of being stained, drilling and/or sampling equipment stained or sheens noted.
- **Zone of potentially mobile NAPL** – Soils are either saturated with NAPL or exhibit signs of NAPL ganglia. Soils are discolored and readily stain sampling and drilling equipment.
- **Zone of mobile NAPL –** NAPL is present as free phase liquid or soils are visibly saturated with NAPL. NAPL readily flows from the soil with little or no agitation.

The following procedures may be used to identify NAPL in groundwater samples:

- Collect water samples using a disposable bailer and look for iridescent sheen.
- Look for irregular blobs of free product, if a floating layer of NAPL was intercepted.
- Look for small black particles that sink to the bottom of the water sample, this may indicate the following:
    - Presence of DNAPL
    - Weathered LNAPL
- Collect a sample of water and seal the container. Place container in the sun and let it sit undisturbed. Look to see if there are phase separations in the sample.

3.0 CORRECTIVE MEASURE OBJECTIVES

The purpose of the CMS is to develop corrective measure alternatives that may be implemented at the site to address releases of hazardous wastes. These alternatives will be evaluated in a CMS report with the general objective of protecting human health and the environment from exposure to impacted soil and groundwater. The corrective measure alternatives will be evaluated for their effectiveness to meet the following remedial action objectives:

- Minimize future potential human health risks due to ingestion and direct contact with soil and groundwater.
- Reduce the potential future movement of the COCs in the vadose zone to groundwater.
- Prevent human exposure by inhalation of indoor air concentrations above applicable risk criteria.

The selected corrective measure alternatives will reduce the mass of COCs in soil and groundwater beneath the site. Achieving the remedial action objectives will be evaluated in the CMS Report.

POTENTIAL RECEPTORS AND PATHWAYS ANALYSIS

Media with potential migration pathways and known impacts are the soil and groundwater. MDEQ Part 201 Rules provide generic cleanup criteria for residential and nonresidential possible land uses and vapor intrusion exposure pathways. Rule 714 outlines Groundwater Volatilization Indoor Air Inhalation Criteria (GVIIC), and Rule 724 outlines Soil Volatilization Indoor Air Inhalation Criteria (SVIIC) through ambient or indoor air volatilization. The purpose of this section is to evaluate exposure risk by assessing viable routes of migration and potential receptors to known contamination from constituents of concern (COCs) identified at the facility.

Each potential exposure pathway in soil is summarized and evaluated in Table 1.

Table 1
Summary of Relevant Exposure Pathways in Soils

Exposure Pathway	Description	Relevant	Applicable
Soil			
Drinking Water Protection	This pathway involves contaminants that may leach to groundwater in an aquifer, or groundwater that is not in an aquifer but that may transport contaminants into an aquifer. The drinking water exposure pathway does not appear to be relevant because the shallow perched water bearing zone at the Facility is present in granular fill and peat across the site in a lens that is less than or equal to 5 feet thick at depths of 7 to 12 feet bgs. The uppermost water-bearing zone is directly underlain by a dry, silty clay that is present to a minimum depth of 30 feet bgs. Regional soil boring data suggest that the homogeneous clay with a permeability of $8.5x10^{-9}$ cm/sec exists at depths up to 105 feet bgs. Regionally, lacustrine deposits are known to be present at depths up to 500 feet bgs. Drinking water in the Detroit area is provided by the regional publicly operated treatment works—Detroit Water and Sewerage Department (DWSD). DWSD obtains water from the Great Lakes and their connecting waters, not from groundwater. The main pumping station for DWSD is located northwest and upstream of the Facility.	**YES**	**NO**
Groundwater /Surface Water Interface (GSI) Protection	This pathway involves contaminants that may leach to groundwater that is hydraulically connected to a surface water body. This pathway is not relevant because there are no surface water bodies in the direction of groundwater flow and the onsite storm sewers discharge to the municipal wastewater treatment plant, DWSD. There is no known direct pathway from the perched uppermost water-bearing zone at the facility to the Detroit River, which is the nearest surface water body. The Detroit River is located southeast of and not directly downgradient from the Facility. The measured groundwater flow velocity at the Facility is $1.6x10^{-6}$ cm/sec.	**YES**	**NO**
Groundwater Contact Protection	This pathway involves contaminants that may leach to groundwater that has the potential to collect in a utility excavation or any subsurface excavation.	**YES**	**YES**
Direct Contact	This pathway involves long-term ingestion and dermal exposure to contaminated soil and is relevant for this property. It should be noted that the majority of the property is covered with pavement; therefore, minimizing dermal exposure to contamination.	**YES**	**YES**
Soil Volatilization to Indoor Air Inhalation Criteria (SVIIC)	This pathway involves potential exposure to volatile indoor air contaminants from vapor intrusion resulting from soil contamination.	**YES**	**YES**
Soil Volatilization to Ambient Air Inhalation Criteria (SVAIC)	This pathway involves potential exposure to volatile outdoor air contaminants from vapor intrusion resulting from soil contamination.	**YES**	**YES**

Each potential exposure pathway in groundwater is summarized and evaluated in Table 2.

Table 2
Summary of Relevant Exposure Pathways in Groundwater

Exposure Pathway	Description	Relevant	Applicable
Groundwater			
Drinking Water	This pathway involves contaminants that may leach to groundwater in an aquifer, or groundwater that is not in an aquifer but that may transport contaminants into an aquifer. The drinking water exposure pathway does not appear to be relevant because the shallow perched water bearing zone at the Facility is present in granular fill and peat across the site in a lens that is less than or equal to 5 feet thick at depths of 7 to 12 feet bgs. The uppermost water-bearing zone is directly underlain by a persistent, dry, silty clay that is present to a minimum depth of 30 feet bgs. Regional soil boring data suggest that the homogeneous clay with a permeability of $8.5x10^{-9}$ cm/sec exists at depths up to 105 feet bgs. Regionally, lacustrine deposits are known to be present at depths up to 500 feet bgs. Drinking water in the Detroit area is provided by the regional publicly operated treatment works, DWSD. DWSD obtains water from the Great Lakes and their connecting waters, not from groundwater. The main pumping station for DWSD is located northwest and upstream of the Facility.	**YES**	**NO**
GSI	This pathway involves contaminants that may leach to groundwater that is hydraulically connected to a surface water body. This pathway is not relevant because there are no surface water bodies in the direction of groundwater flow and the onsite storm sewers discharge to the municipal wastewater treatment plant, DWSD. There is no known direct pathway from the perched uppermost water-bearing zone at the facility to the Detroit River, which is the nearest receiving surface water body. The Detroit River is located southeast of and not directly downgradient from the Facility. The measured groundwater flow velocity at the Facility is $1.6x10^{-6}$ cm/sec.	**YES**	**NO**
Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIIC)	This pathway is relevant for volatile contaminants in groundwater if and when a habitable structure overlies the contaminated area and vapor intrusion is possible from the uppermost water-bearing zone at the Facility.	**YES**	**YES**
Groundwater Contact Protection	This pathway involves contaminants in groundwater that has the potential to collect in a utility excavation or any subsurface excavation.	**YES**	**YES**
Flammability and Explosivity Screening Level	This screening level involves contaminants in groundwater that have the potential for explosive vapor levels to accumulate in a building or utility systems.	**YES**	**YES**

CONSTITUENTS OF POTENTIAL CONCERN

Constituents of potential concern include, but are not limited to, methyl *tert*-butyl ether (MTBE), tetrachloroethene (PCE), and xylenes for the site. In the CMS Report, an additional review of the data will be conducted to further evaluate the COCs for the site.

4.0 CORRECTIVE MEASURE TECHNOLOGIES/ALTERNATIVES

The following subsections describe the technologies to be considered and evaluation criteria that will be used in the CMS Report.

4.1 TECHNOLOGIES TO BE CONSIDERED

The following list of corrective measure technologies may be addressed in the CMS Report:

- No Action – No remedial action would be implemented.
- Institutional Controls – Implement site-specific institutional controls such as erecting fences, preparing deed restrictions, or posting notices or warnings at the facility.
- Groundwater Use Restriction – Restrict the use of groundwater or the installation of new groundwater wells at the facility and/or at nearby properties.
- Soil Vapor Extraction – Reduce the overall mass of COCs in vadose zone soil and reduce the potential for future movement of COCs from soil to groundwater.
- In-Situ Enhanced Bioaugmentation – Introduce cultured microorganisms, an organic source, or nutrients into the subsurface to promote the biodegradation of soil and groundwater contaminants.
- Pump and Treat – Extract groundwater for aboveground treatment and manage treated groundwater.
- Monitored Natural Attenuation – Rely on natural processes to decrease contaminant concentrations and achieve remediation objectives. Progress is monitored via groundwater sampling.
- In-Situ Thermal Treatment – Apply heat to contaminated soil and/or groundwater in the ground. The heat destroys or volatilizes organic compounds and can be used in conjunction with a vacuum extraction system.
- In-Well Treatment (Air Stripping/Sparging) – Inject air into groundwater, which enables volatile organic compounds to volatilize. This is used in conjunction with a vacuum extraction system.
- In-Situ Chemical Reduction – Inject chemically reductive additives into the groundwater to degrade organic compounds.

- Soil Excavation – Excavate high-concentration soil to remove the source and reduce the potential for future movement of COCs from soil to groundwater.

4.2 EVALUATION OF POTENTIAL CORRECTIVE MEASURES

The proposed corrective measures technologies, which could be compose of a single alternative or a combination of alternatives listed above, will be initially screened to eliminate infeasible technologies given site-specific conditions. Using information from the Corrective Action Investigation, technologies with limitations will be excluded from further evaluation. The process of the initial screening will be documented in the CMS Report. The technologies that pass the initial screening step in the CMS Report will be assembled into specific alternatives to meet the corrective action objectives. Each alternative will be evaluated by the four corrective action standards listed below:

- Be protective of human health and the environment.
- Attain media cleanup standards.
- Control the source(s) of releases in order to reduce or eliminate, to the extent practicable, further releases of hazardous wastes (including hazardous constituents) that may pose a threat to human health and the environment.
- Comply with applicable standards for management of wastes.

Proposed corrective measure alternatives that meet the corrective action standards will also be evaluated with respect to the five remedy selection decision criteria listed below:

- Long-Term Reliability and Effectiveness
- Short-Term Effectiveness
- Reduction of Toxicity, Mobility, and/or Volume
- Ease and Efficiency of Implementation
- Cost

5.0 PROPOSED TREATABILITY OR PILOT STUDIES

Pilot studies or bench scale studies will be completed as necessary to aid in the evaluation of appropriate corrective measures alternatives.

6.0 OUTLINE FOR THE CMS REPORT

The general sections to be included in the CMS report are as follows;

- Introduction
- Description of Current Conditions
- Corrective Action Objectives
- Identification and Screening of Corrective Measure Technologies
- Corrective Measure Alternative Development
- Evaluation of Corrective Measure Alternatives
- Recommended Corrective Measure Alternative and Rationale

7.0 PROJECT MANAGEMENT

The various responsibilities of key project personnel are presented in this section.

7.1 MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

The MDEQ Project Manager, David Slayton, has oversight responsibility for the work conducted as outlined in the Operating License for the facility.

7.2 PETRO-CHEM PROCESSING GROUP OF NORTRU, LLC

Mr. Andy Maloy, Director of Corrective Action, is the contact for Stericycle and will oversee the assessment and remediation activities at the facility.

7.3 BUREAU VERITAS NORTH AMERICA, INC.

Bureau Veritas is contracted to Stericycle to assist with the CMS. The Bureau Veritas project team and the role of each team member is listed below.

- Ms. Kellie Wing, Senior Project Manager, will be the principal in charge and Project Manager (PM) for Bureau Veritas.
- Mr. Stephen Kulpanowski, Senior Project Manager, will be the senior technical reviewer for this project.

Additional Bureau Veritas staff will provide support throughout the CMS process.

8.0 PROJECT SCHEDULE

The tentative project schedule is as follows:

Task	Deadline
Subsurface Investigation	Within 60 days of CMS Work Plan approval
Determine need for Pilot Studies	Within 160 days of completing Subsurface Investigation
CMS Final Report	Within 120 days of completing Pilot Studies
CMS Progress Reports	Within 90 days of initiating the CMS and every 90 days thereafter

FIGURES

(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, BELLE ISLE(1980), MICHIGAN)

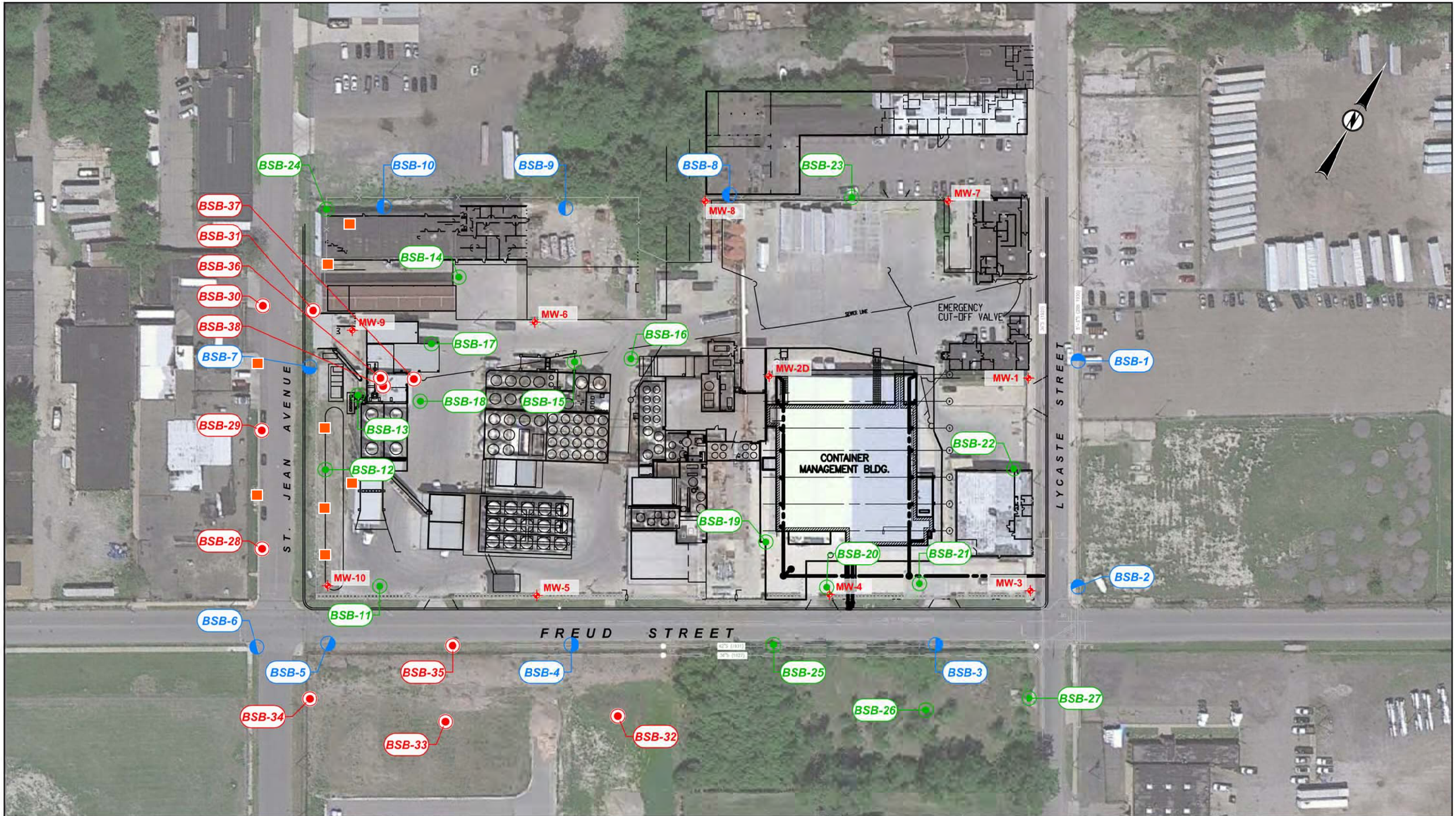
CHECK BY	KLW
DRAWN BY	JL
DATE	January 7, 2014
SCALE	AS SHOWN
CAD NO.	109200.02_A
PRJ NO.	11013-000191.00

SITE LOCATION MAP

PETRO–CHEM PROCESSING GROUP
421 LYCASTE STREET
DETROIT, MICHIGAN

BUREAU VERITAS

FIGURE
1



LEGEND

MW-# MONITORING WELL

BSB-# 2014 SOIL BORING

BSB-# 2013 SOIL BORING

BSB-# 2010 SOIL BORING

SCALE IN FEET

0 50 100 200

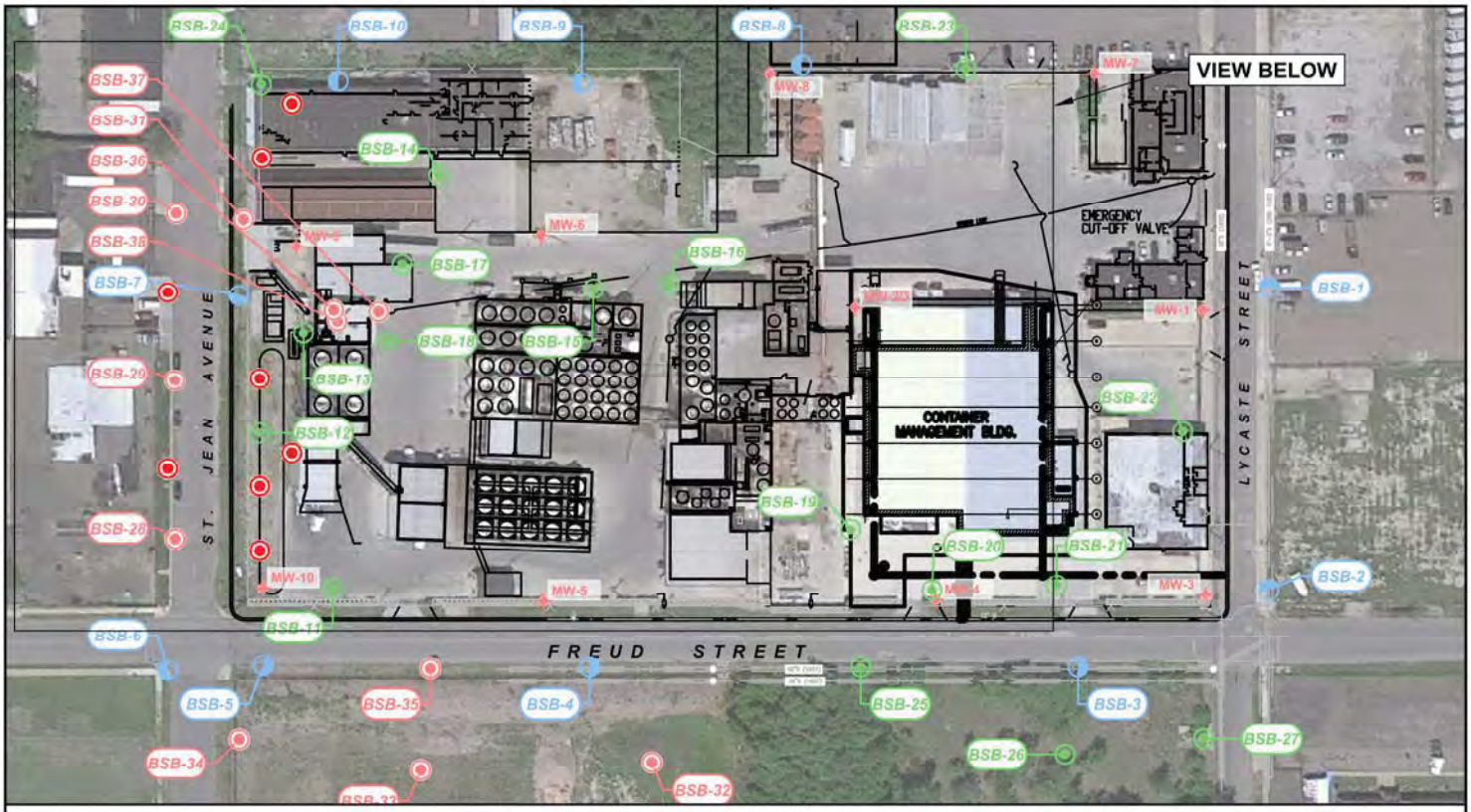
CHECK BY	KW
DRAWN BY	JL
DATE	1/13/2015
SCALE	AS SHOWN
CAD NO.	191.00.002b
PRJ NO.	11013-000191.00

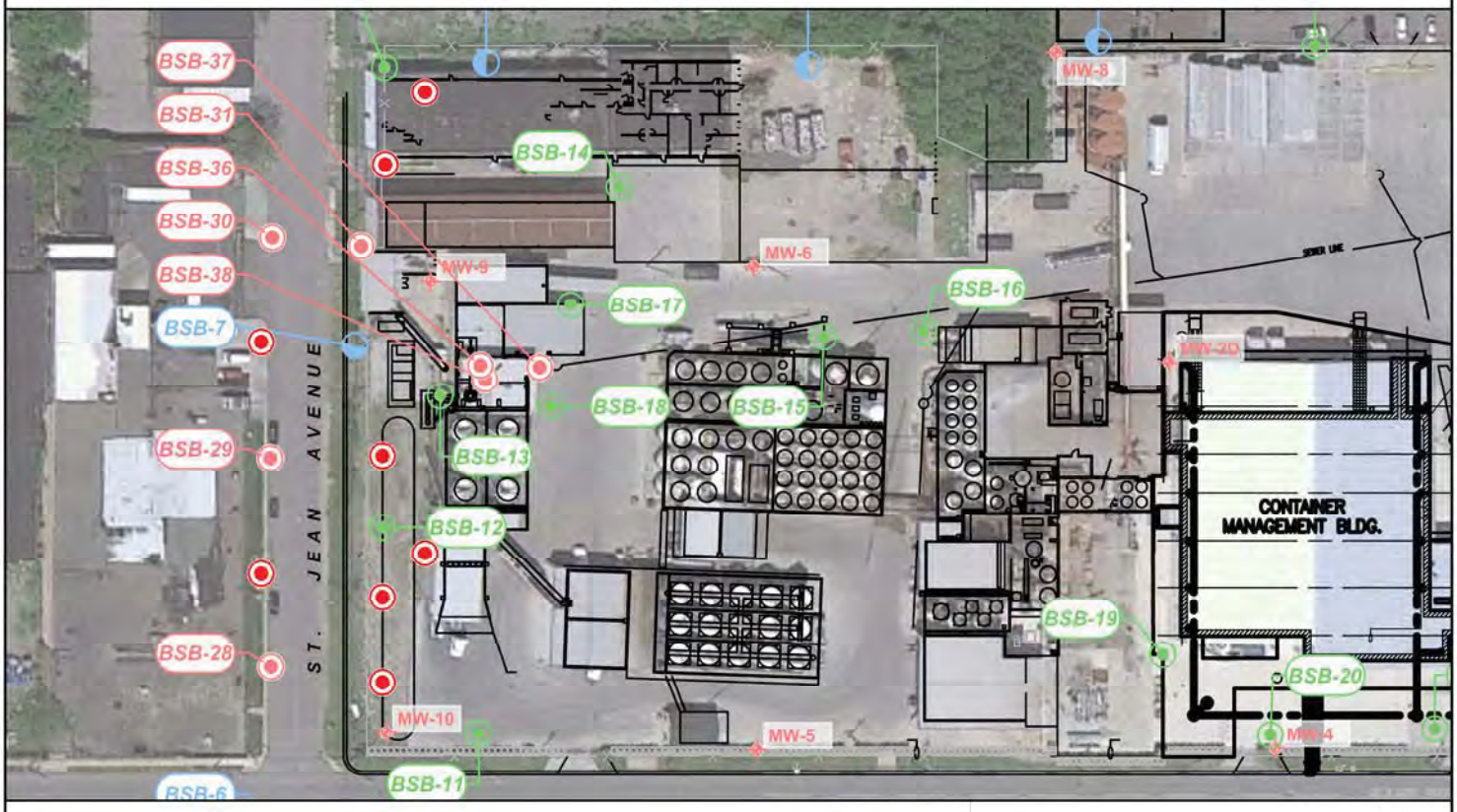
BORING LOCATIONS

PETRO-CHEM PROCESSING GROUP
421 LYCASTE STREET
DETROIT, MICHIGAN

BUREAU VERITAS

FIGURE 2





LEGEND

MONITORING WELL
2014 SOIL BORING
2013 SOIL BORING
2010 SOIL BORING
PROPOSED SOIL BORING LOCATION

SCALE IN FEET

0 60 120 240

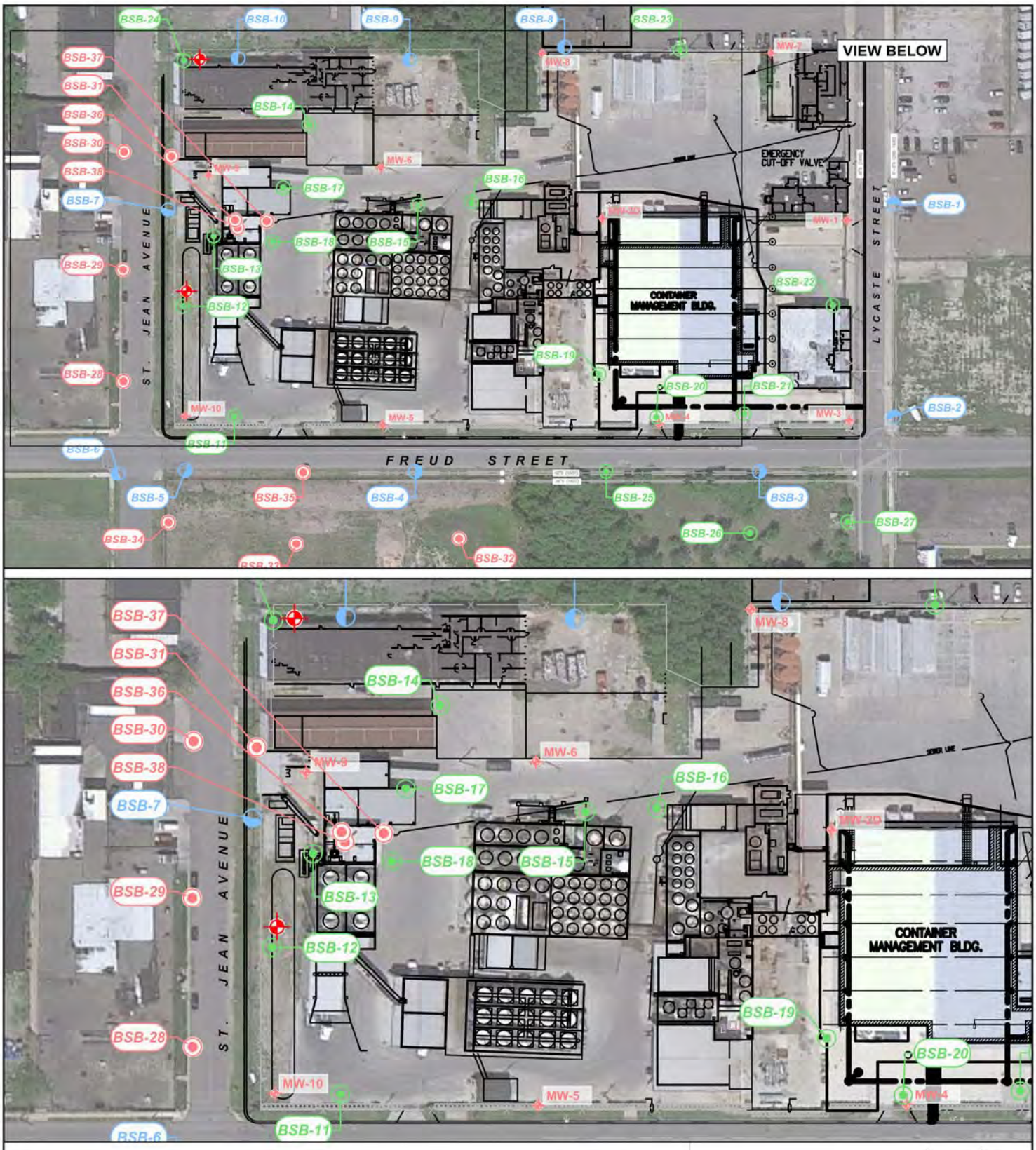
CHECK BY	KW
DRAWN BY	JL
DATE	11/24/2015
SCALE	AS SHOWN
CAD NO.	11.15.255.00sb
PRJ NO.	11015-000255.00

PROPOSED BORING LOCATIONS

PETRO-CHEM PROCESSING GROUP
421 LYCASTE STREET
DETROIT, MICHIGAN

BUREAU VERITAS

FIGURE 3



LEGEND

MONITORING WELL
2014 SOIL BORING
2013 SOIL BORING
2010 SOIL BORING
PROPOSED MONITORING WELL LOCATION

ABOVE INSET MAP SCALE: 1" = 160'

SCALE IN FEET

0 60 120 240

CHECK BY	KW
DRAWN BY	JL
DATE	12/18/2015
SCALE	AS SHOWN
CAD NO.	11.15.255.00mw
PRJ NO.	11015-000255.00

PROPOSED MONITORING WELL LOCATIONS

PETRO-CHEM PROCESSING GROUP
421 LYCASTE STREET
DETROIT, MICHIGAN

BUREAU VERITAS

FIGURE 4