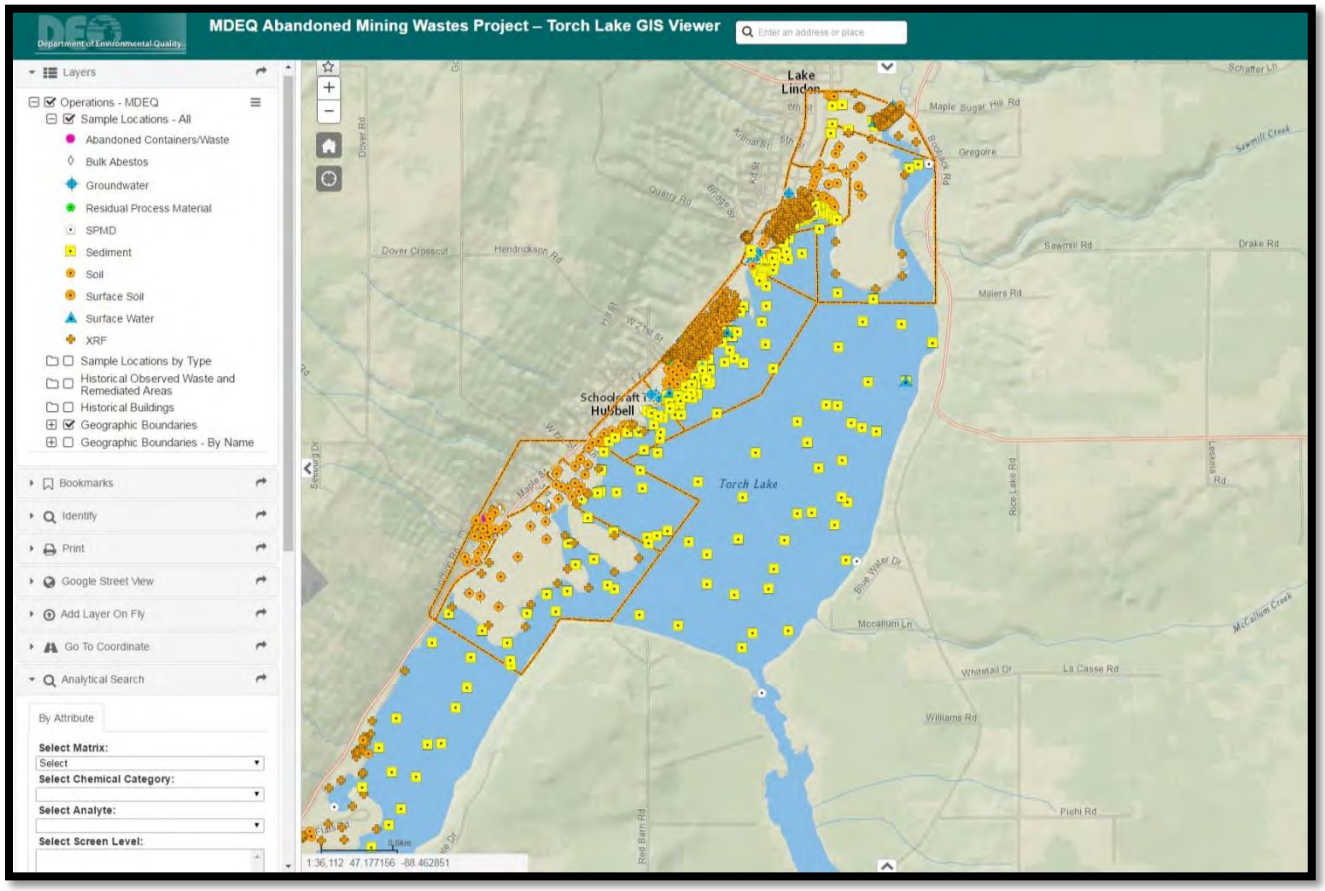
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

ABANDONED MINING WASTES PROJECT – TORCH LAKE

GIS VIEWER



USER GUIDE

SEPTEMBER 2016

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1.0 INTRODUCTION

The Abandoned Mining Wastes Project Data Viewer is operated by the Michigan Department of Environmental Quality (MDEQ). The purpose of the data viewer is to enhance stakeholder engagement through transparent information sharing.

The data viewer provides access to an enormous amount of highly technical information that may not be relevant to all stakeholders. To help make information easy to find GIS tools work with a comprehensive database. The intelligent links between maps, data and records make this application powerful yet easy to use for experienced and trained personnel.

The same information is also summarized on the Abandoned Mining Wastes web page and is available in traditional documents as well as it is anticipated that not all stakeholders will desire to utilize the data viewer.

When you access the data viewer what you need to do next is not intuitively obvious. Before you use the application it is recommended that you review the User Guide. The data viewer allows users to view, on an aerial photograph, information about environmental contamination along the western shore line of Torch Lake being investigated by the Michigan Department of environmental quality. Information includes: soil, sediment, and groundwater analytical results with comparisons to applicable regulatory cleanup criteria.

More information on the MDEQ Remediation can be found here:
http://www.michigan.gov/deq/0,4561,7-135-3311_4109---,00.html

The internet address for the Abandoned Mining Wastes Project is:
http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846_76560---,00.html

Access the MDEQ Abandoned Mining Wastes Project – Torch Lake Data Viewer at
https://gis.westoncloud.net/MDEQ/#/-88.4250/47.1850/12

SYSTEM REQUIREMENTS

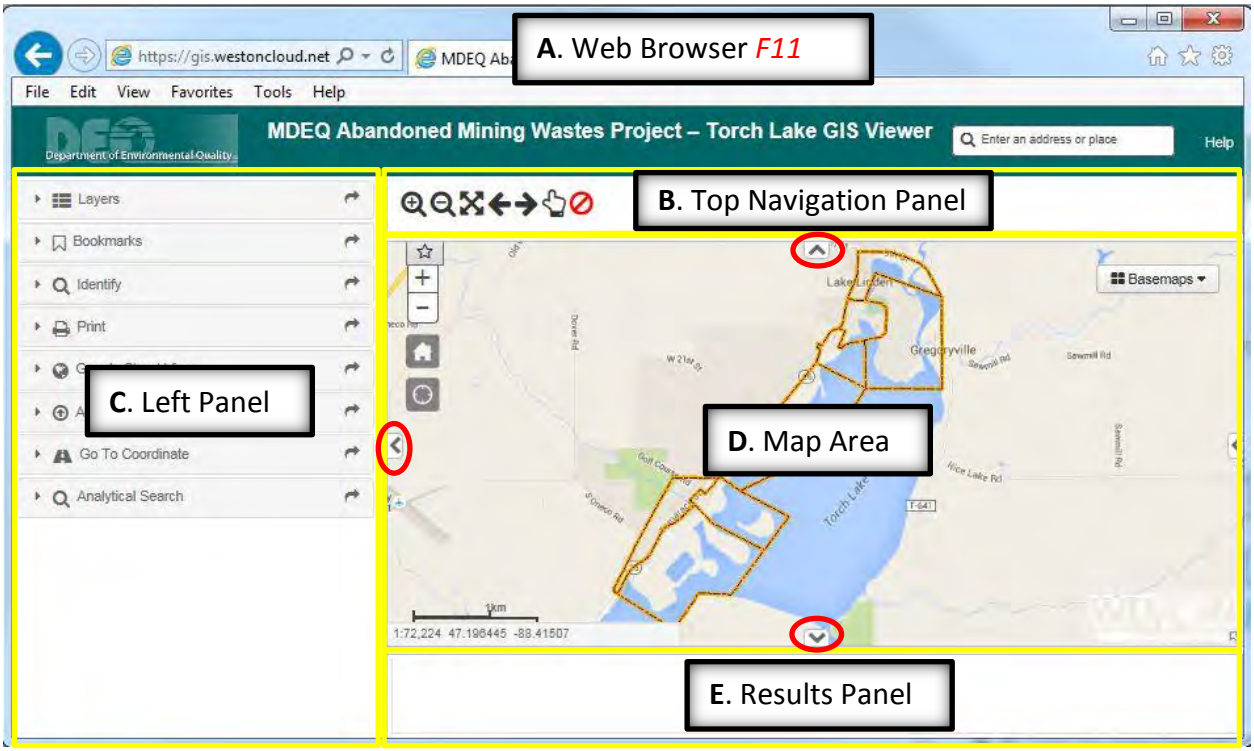
In order to use the web-based data viewer you need access to the internet. The website was designed and tested using Microsoft Internet Explorer 11. Other contemporary web browsers can be used. However, some screens may look differently and some procedures may need to be modified. The speed at which maps are drawn and data is queried is in part a function of the speed of your internet connection and the computer equipment you are using.

CONTACT US

If you have and questions, comments, contributions or concerns please contact us.

1. DEQ Project Manager: Amy Keranen, keranena@michigan.gov, 906-337-0389

2.0 PARTS OF THE DISPLAY



There are five main components to the display. Each is separated by a yellow line in the figure above. Below is a brief description of each component with more detail described in later sections of this user guide.

A. Web Browser: The uppermost display area is occupied by various web browser elements. These can be removed by pressing the F11. To bring the web browser components back, press F11 again.

B. Top Navigation Panel: The next banner from the top contains additional buttons for navigating around the map area. By default this panel is hidden. To unhide, click on the arrow button located at the top of the 'Map Area'.

C. Left Panel: This is where many of the map tools can be found and where different map layers can be turned on and off. Each tool is accessed by clicking on the arrow button on the left side of each tool to expand the tool.

D. Map Area: Sample locations and other Project related items are displayed here on a variety of different background basemaps.

E. Results Panel: The results of the 'Analytical Search' tool are displayed here.

RESIZING THE PANELS

Each panel surrounding the map area can be hidden by clicking on the respective arrow button (see red ovals on the figure above). To unhide, click on the arrow button again.

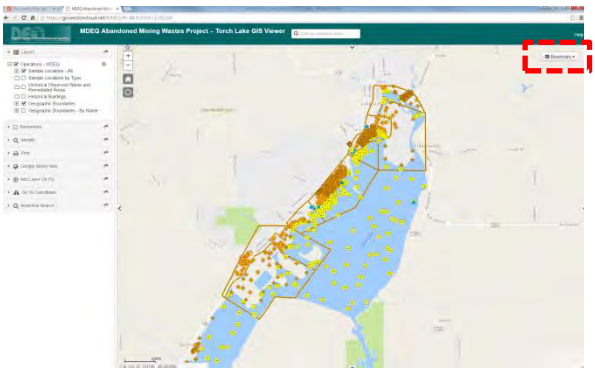
To customize the size of each panel, move the cursor over the border pane until the cursor arrow changes to the resize arrow (typically displayed as ↔ but may differ based on individual computer settings). After the arrow changes, click and hold the left mouse button and move the mouse to drag the pane to the desired location and size.

Occasionally the website my stop or 'freeze up'.
To resume using the site press the **F5** key.

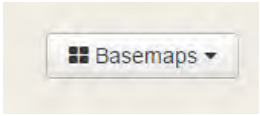
This intervention will restart the application. The reset goes back to the startup screen and will require reentering the options you had selected prior to the reset.

3.0 MAP AREA – BASEMAP OPTIONS

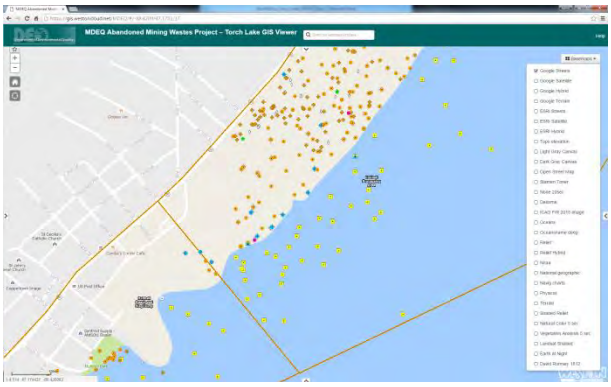
There are several base maps that can be selected.



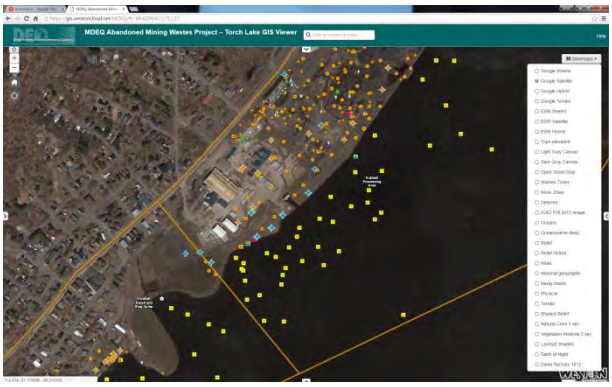
The map to the left shows the location of the Basemaps selection button.



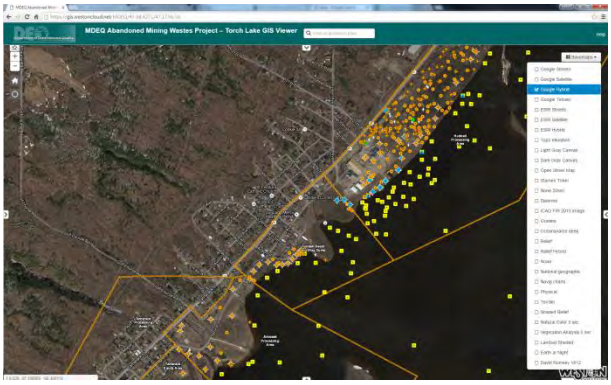
The following are examples of the different base maps that can be selected:



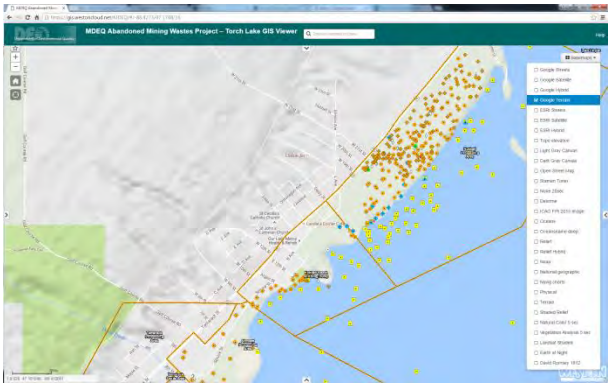
Google Streets (© Google)



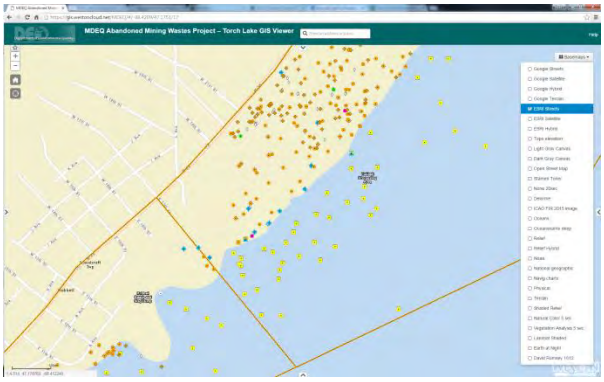
Google Satellite (© Google)



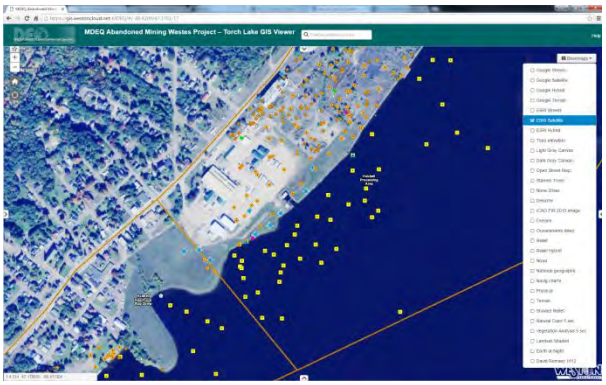
Google Hybrid (Google Satellite with street names labeled) (© Google)



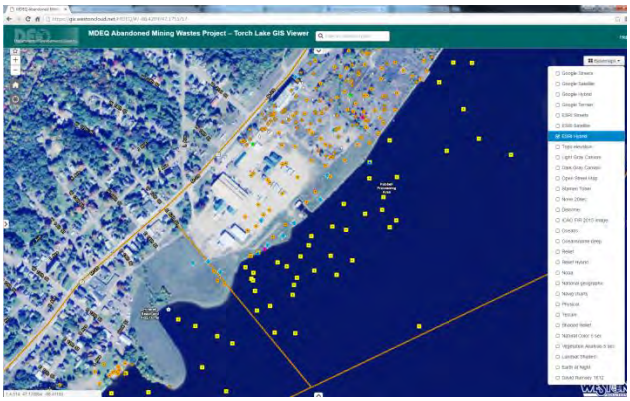
Google Terrain (© Google)



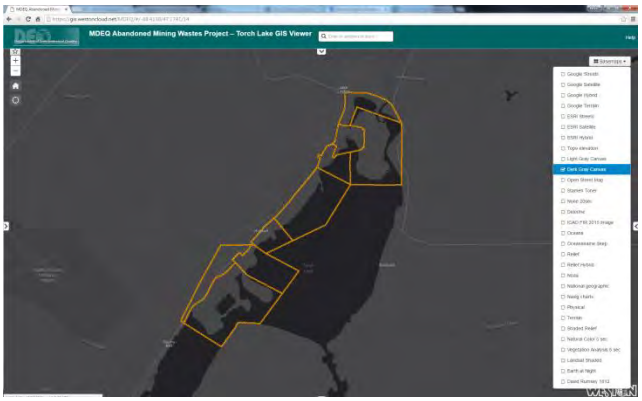
ESRI Streets (sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community)



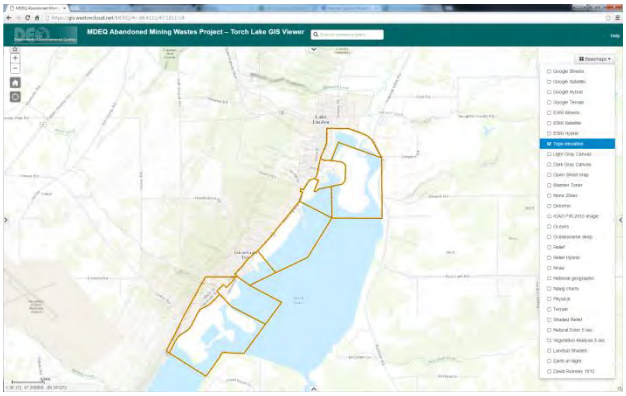
ESRI Satellite(sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)



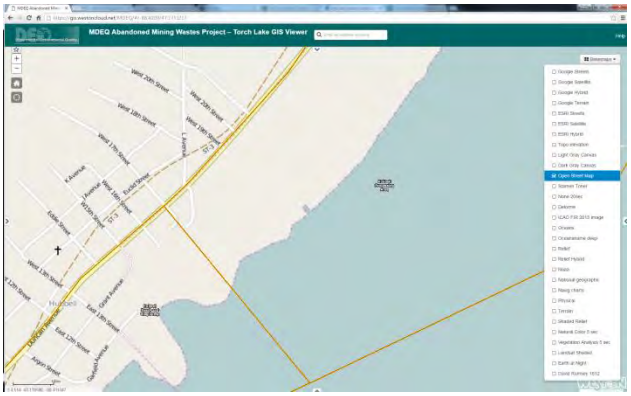
ESRI Hybrid (sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)



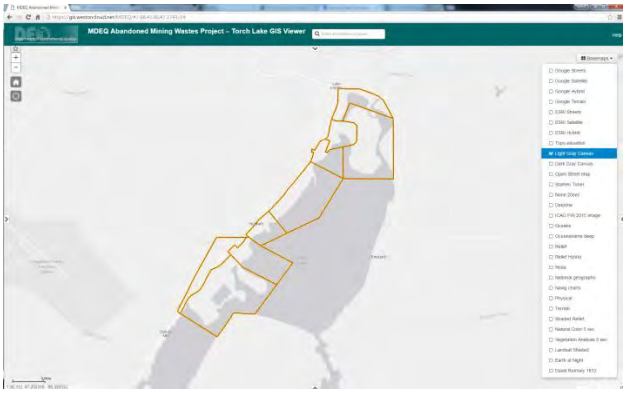
Dark Gray Canvas (sources: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



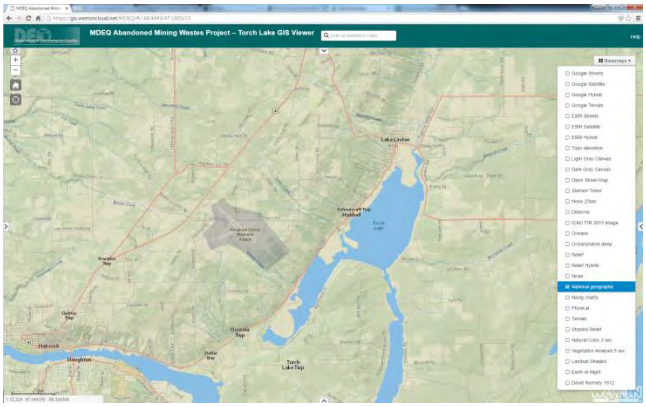
Topo Elevation (sources: USGS, NGA, NASA, CGIAR, GEBCO,N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA and the GIS User Community)



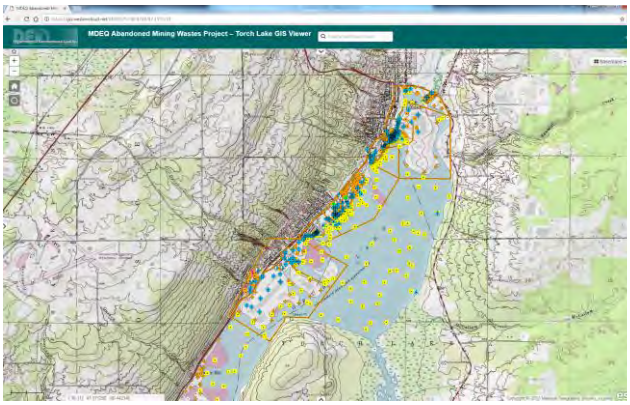
Open Street Map (© OpenStreetMap contributors)



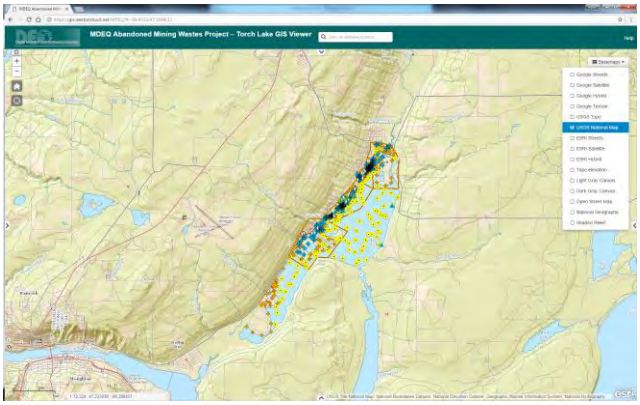
Light Gray Canvas (sources: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community)



National Geographic World Map (sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.)



USGS Topo (sources: © 2013 National Geographic Society, i-cubed)



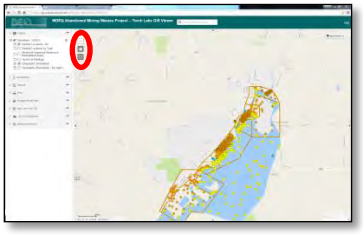
USGS National Map (sources: National Boundaries Dataset, 3D Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line)

4.0 MAP AREA – NAVIGATION

ZOOMING

There are six ways to zoom the map:

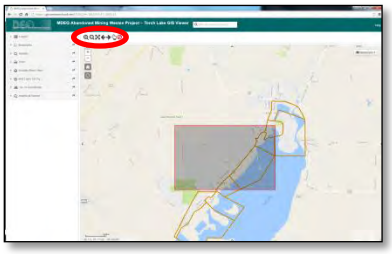
1. The button located in the upper left corner of the map area controls the zoom level. Clicking on the + zooms in on the map and clicking on the – zooms the map out.



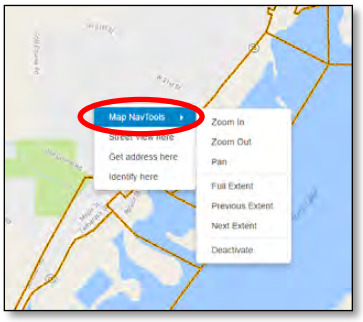
2. The scroll wheel of a mouse can be used to zoom. Rolling the wheel away from the user zooms the map in. Rolling the wheel toward the user causes the display to zoom out.

3. Use the + and – keys in the numeric keypad to increase (+) or decrease (-) the zoom in effect.

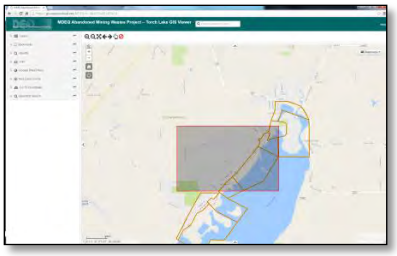
4. Open up the top navigation panel and select either or then click on the map area and while continuing to hold down the mouse button draw a box around the area you wish to zoom on.



5. Right-clicking on your mouse within the map area will open up a menu. Hoover over 'Map NavTools' and another menu will open up. Select 'Zoom In' or 'Zoom Out' and draw a box around the area you wish to zoom on.



6. Holding down SHIFT, clicking on the map and dragging a box around and area will zoom into that area



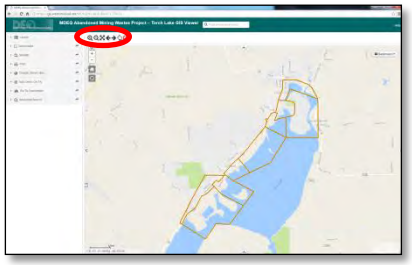
PANNING

There are four ways to pan (move what is in the viewing area) the map.

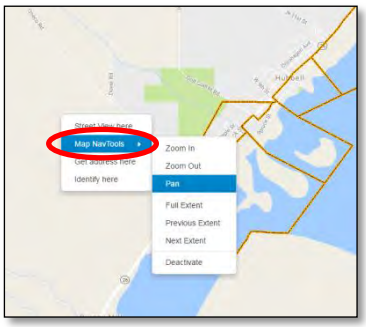
1. Left click on your mouse and hold the button until the cursor arrow changes to the 'move' arrows. While continuing to hold the mouse button, move the map to the desired location.

2. Use the arrow buttons on your keyboard to pan left, right, up, and down.

3. Open up the top navigation panel and select the icon. Then click on the map area and while continuing to hold down the mouse button draw a box around the area you wish to zoom on.

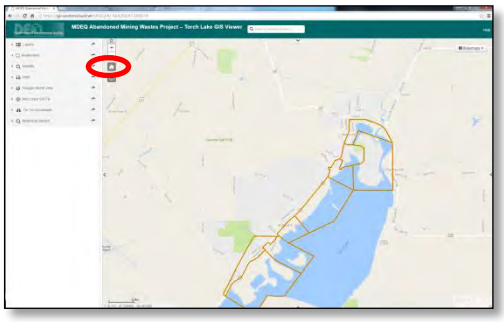


4. Right-clicking on your mouse within the map area will open up a menu. Hoover over 'Map NavTools' and another menu will open up. Select 'Pan' and then move the map to the desired location while continuing to hold down the left mouse button.

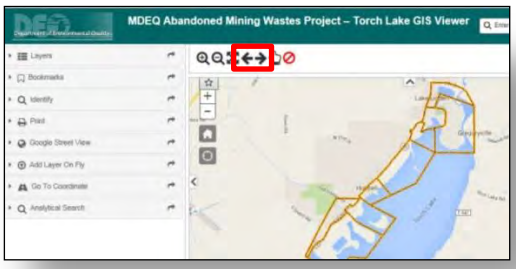


ADDITIONAL NAVIGATION TOOLS

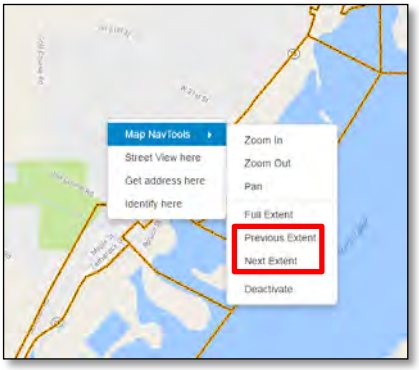
- Default Extent: Clicking on the button located in the upper left corner of the Map Area takes you back to the default map extent centering on the Project area.



- Previous and Next Extent: accessed through the top navigation pane or by 'right-clicking' within the Map Area.



-or-



5.0 LEFT PANEL - LAYERS

To access the Layers tool where you can toggle various layers on and off, click on the arrow button circled red on Figure 1 below. This opens the tool and exposes the layer table of content. Clicking on the box with the plus sign, which is circled red on Figure 2, will expand the layer list. Clicking on a box with the plus sign next to a layer as show on Figure 3 will expand the layer to show the layer's legend or a description of each of the symbols used in that layer.

Individual layers are turned on and off by clicking on the check box as highlighted on Figure 4 below.

Figure 5 shows how clicking on the folder icon (circled red) will expose sub-layers.

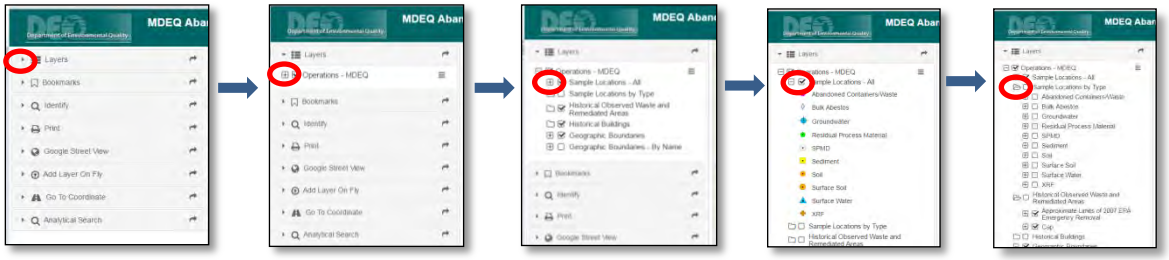


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

LAYER LIST

- **Sample Locations – All**
  - This layer shows the sample locations symbolized based on the following sample types:
    - Abandoned Containers/Waste
    - Bulk Asbestos
    - Groundwater
    - Residual Process Material
    - SPMD (semi-permeable membrane device)
    - Sediment
    - Soil
    - Surface Soil
    - Surface Water
    - XRF (x-ray fluorescence)

- **Sample Locations by Type**
  - Contains the same sample locations as above, however, sample locations can be turned on/off based on sample type.

- **Historical Observed Waste and Remediated Area**
    - Contains two sub-layers
        - Approximate Limits of 2007 EPA Emergency Removal
            - Based on *Letter Report for Lake Linden Emergency Response Site, Lake Linden, Houghton County, Michigan – November 2007.* Prepared by WESTON.
        - Cap
            - Extent of remedial clay and vegetative cap based on files provided by MDEQ and approximations based on ground observations

- **Historical Mining Era Buildings and Structures**
    - This layer is based on files provided by Michigan Technological University in the following reports:
        - *Building Narratives, Maps, and Documentation, Torch Lake Industrial Waterfront, Phase 1: From North end of Torch Lake to Hubbell Heach* [sic] *C&H Lake Linden Operations Area of the Abandoned Mining Wastes – Torch Lake non-Super Fund* [sic] *Project, Task 3: Historical Archive Research & Mapping – July 2014.* Prepared by Michigan Tech
        - *C&H Smelting Works, Addendum Report to Phase 1 of Task 3, Historical Archive Research and Mapping from the North End of Torch Lake to Hubbell Beach, C&H Lake Linden Operations Area – October 2014.* Prepared by Michigan Tech
        - *Tamarack Area Facilities, Task 3 – Phase 2 Report, Historical Archive Research and Mapping from Hubbell Beach through Tamarack City, C&H Historic Properties of Torch Lake – October 2014.* Prepared by Michigan Tech
    - A summary of the historical operations contained within the layer is from Table 3-1 of the CHLL Site Investigation Report (WESTON March 2016) and Table 3-1 of the CHTC Site Investigation Report (WESTON March 2016)

- **Geographic Boundaries**
    - Work on the Project is being conducted in phases based on prioritization of geographic areas. Currently investigative work has been completed along the north and northwest areas of Torch Lake referred to as Calumet and Hecla Lake Linden Operations Area (CHLL). The second phase of work continued south along the western side of Torch Lake in Calumet and Hecla Tamarack City Operations Area (CHTC). Activities are currently being planned for the next areas south in what will be called QMQC.
        - CHLL sub-geographic areas include:
            - Torch Lake Backwater Area
            - Tamarack Sands Area
            - Lake Linden Recreation Area

    - Lake Linden Processing Area
    - Hubbell Processing Area
    - Hubbell Beach and Slag Dump
- CHTC sub-geographic areas include:
    - Ahmeek Processing Area
    - Tamarack Processing Area
    - Tamarack Sands Area

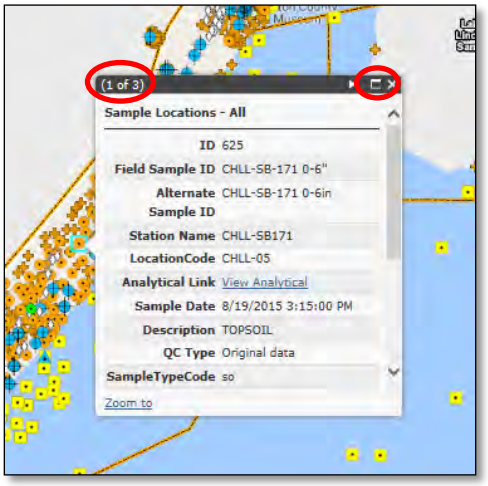
6.0 MAP AREA – INTERACTING WITH LAYERS

IDENTIFICATION POPUPS

Clicking on a point or polygon will open up a popup window containing a table with information from the database tied to that point.

The image below is an example of a popup window for a soil sample point. Note that more rows can be viewed by using the scroll bar on the right or by expanding the window by clicking on the button.

Note: In many locations there are multiple samples collected at the same point, for example various depth intervals collected from a single boring. The number of records is shown on the top left corner of the window. The example below shows there are three records at the point clicked and the window is displaying the 1st of 3 records. Clicking on the arrow button located near the top right corner, cycles to the next record.



Below describes the information contained within the **Sample Locations** popup window:

- **ID** – Unique identifier assigned to each sample in the database
- **Field Sample ID** – Sample identifier assigned by the sample collector
- **Alternate Sample ID** – Sample identified striped of special characters (&, ‘,” etc.)
- **Station Name** – Sample location name
- **Location Code** – The Geographic Boundary in which the sample was collected
  - CHLL-01 = Torch Lake Backwater Area
  - CHLL-02 = Tamarack Sands Area
  - CHLL-03 = Lake Linden Recreation Area
  - CHLL-04 = Lake Linden Processing Area
  - CHLL-05 = Hubbell Processing Area
  - CHLL-06 = Hubbell Beach and Slag Dump

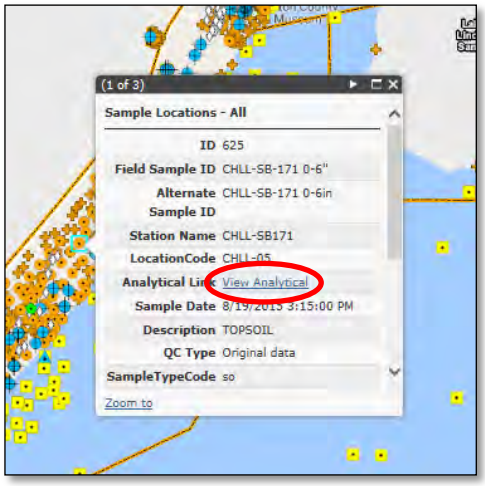
- CHTC-01 = Ahmeek Processing Area
- CHTC-02 = Tamarack Processing Area
- CHTC-03 = Tamarack Sands Area

- **Analytical Link** – Hyperlink that opens a new window containing laboratory results. More detail on this feature is provided in next section.
- **Sample Date** – The date the sample was collected
- **Description** – Soil or sediment description as provide on the sampling boring logs contained within the CHLL or CHTC SI Reports.
- **QC Type** – Describes the sample as a primary sample or field duplicate
  - Field duplicate
  - Primary sample
- **Sample Type** – Describes the sample as the following:
  - Bulk Asbestos
  - Abandoned Containers
  - Groundwater
  - Residual Process Material
  - Sediment
  - Soil
  - SPMD (semi-permeable membrane device)
  - Surface Soil
  - Surface Water
  - Waste
  - Waste Pile
  - XRF
- **Sample Matrix** – Describes the media of the sample as the following:
  - Asbestos – bulk
  - Groundwater
  - Sediment
  - Soil
  - Surface Water
  - Waste – TCLP (Toxicity characteristic leaching procedure)
- **Sample Top** – Upper depth interval of sample
- **Sample Bottom** – Lower depth interval of sample
- **Location_LL_LX** – Longitude
- **Location_LL_LY** – Latitude
- **Location_CX** – Easting (Michigan GeoRef, NAD83 meters)
- **Location_CY** – Northing (Michigan GeoRef, NAD83 meters)
- **GeoData** – Required database field

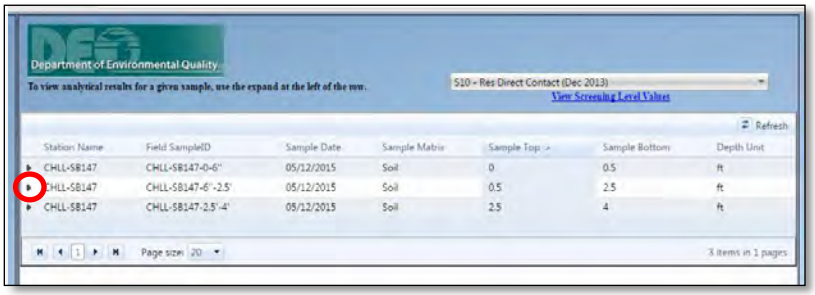
ANALTICAL LINK – VIEW ANALYTICAL (FROM SAMPLE POINT)

Analytical results can be viewed on a point by point basis.

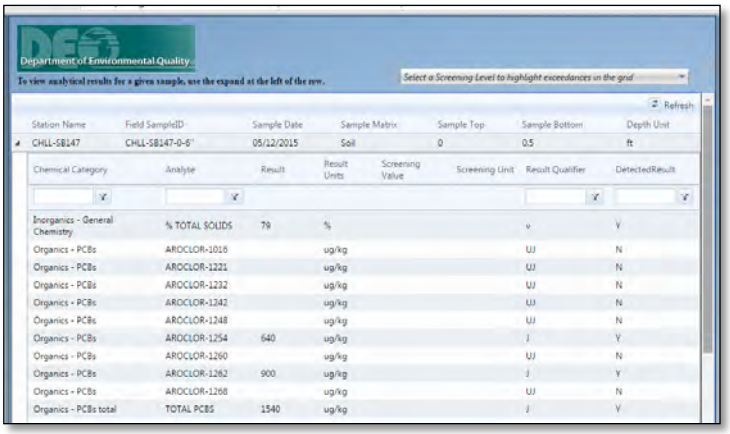
1. Click on a sample point to open up the sample information popup window
2. Then click on the View Analytical hyperlink as shown below.



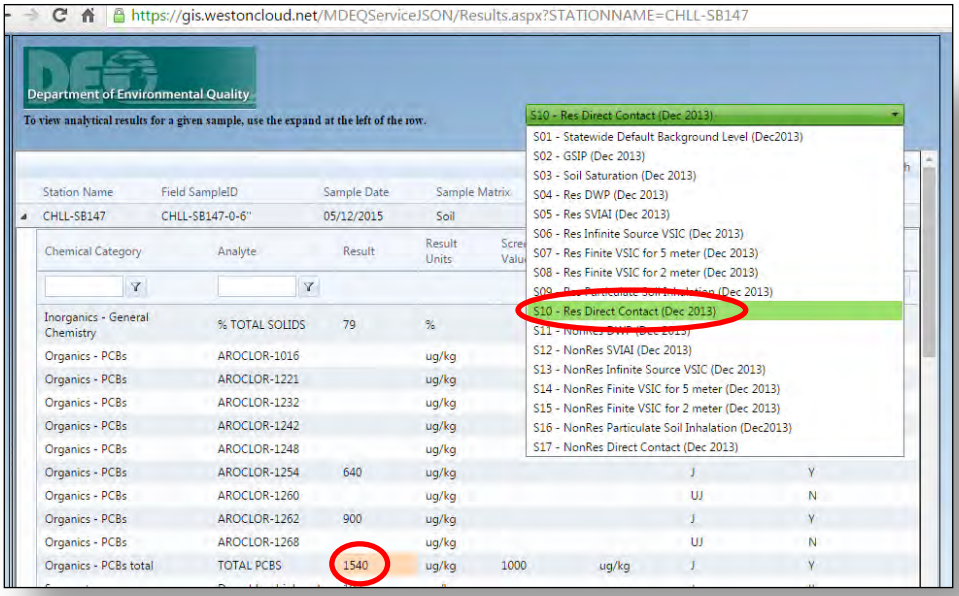
3. This opens a new window listing all the samples collected at the station clicked.



4. Clicking on the arrow left of the Station Name (circled above) will expand the window to make the results visible as shown below.



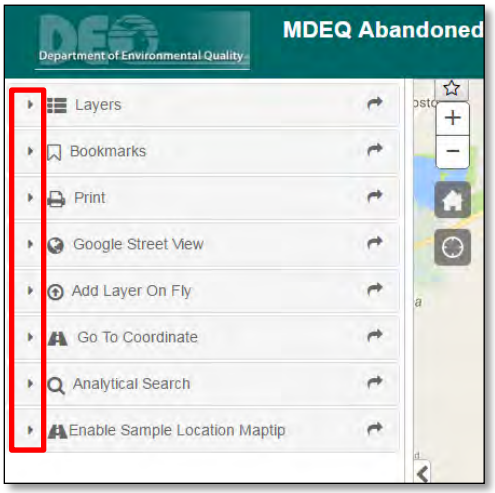
5. The upper right contains a drop-down menu for selecting a screening level to apply to the results. The list is dynamic to the sample matrix meaning if the sample matrix is soil, you will only see soil screening levels. See Section 9.0 for a list of screening levels by sample matrix.



6. In the example above, selecting "S10-Res Direct Contact (Dec 2013)" populates the Screening Value column with 1,000 ug/kg for TOTAL PCBs. The individual Aroclors were left blank because screening level values to not exist for those analytes. Because the value of TOTAL PCBS (1,540 ug/kg) is greater than the selected screening value, the results is highlighted.

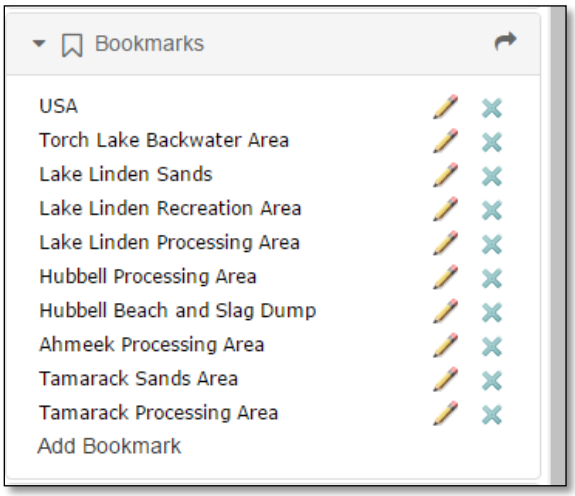
7.0 LEFT PANEL – ADDITIONAL TOOLS

EACH OF THE TOOLS DISCUSSED IN MORE DETAIL BELOW ARE ACCESSED FROM THE LEFT PANEL. TO OPEN EACH TOOL CLICK ON THE ARROW BUTTON JUST LEFT OF THE TOOL NAME.



BOOKMARKS

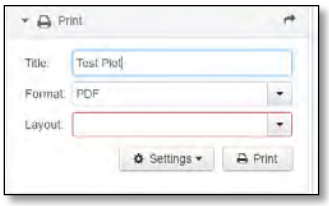
- Bookmarks are saved shortcuts to a position in the map.
- Preset bookmarks have been created for each of the Geographic Boundary areas.
- Clicking on one of the bookmark names takes you to that location.
- New bookmarks can be created by
    a. Zoom or pan to area of interest
    b. Click “Add Bookmark”
    c. Give the bookmark a name
- The file is saved in your temporary internet files and may or may not be retained the next time you open your browser.
- You can rename a bookmark by clicking on the pencil symbol



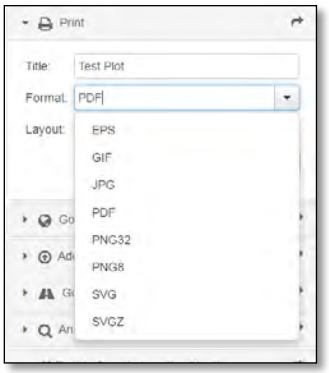
PRINT

The PRINT tool allows you to export your map view along with a legend and customized title to various file formats with multiple layouts to select from.

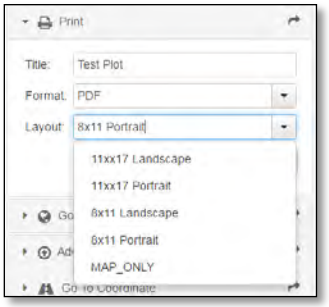
1) Open the print tool and enter the map title:



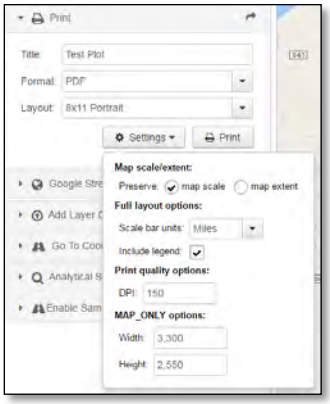
2) Select file format of your choice:



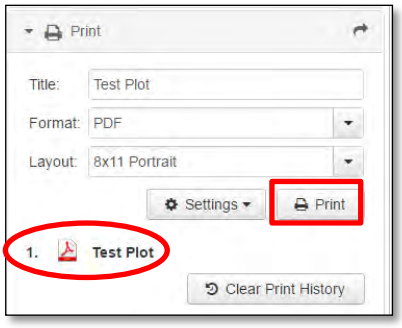
3) Select paper size and layout orientation. The MAP_ONLY option does not create a legend:



4) The 'Settings' button allows you to change the scale and scale bar options, print quality settings, and output size:

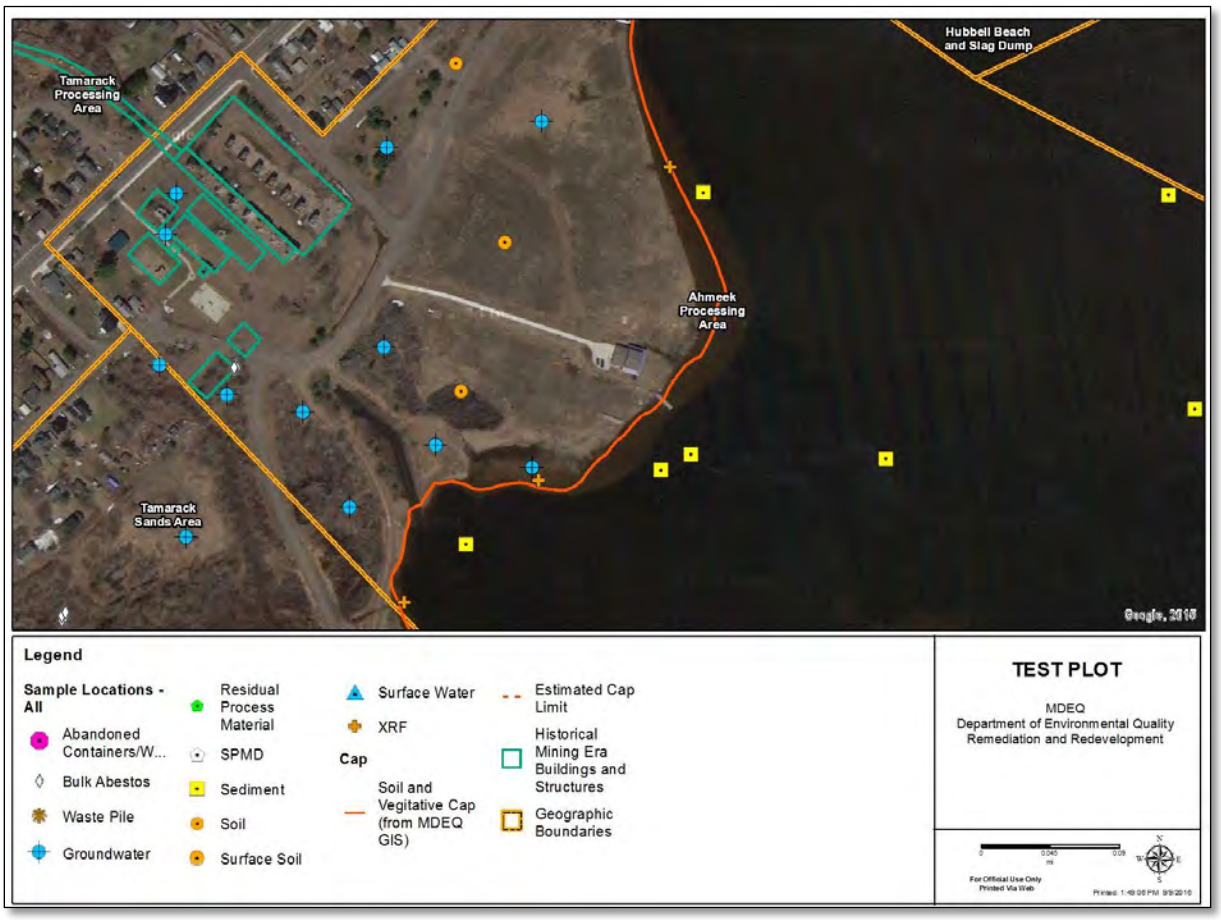


5) Click on the ‘Print’ button to export.



6) Open the file by clicking on the file name (example “Test Plot”)

Below is an example of a map printed to 8x11 Portrait and titled “Test Plot”



GOOGLE STREET VIEW

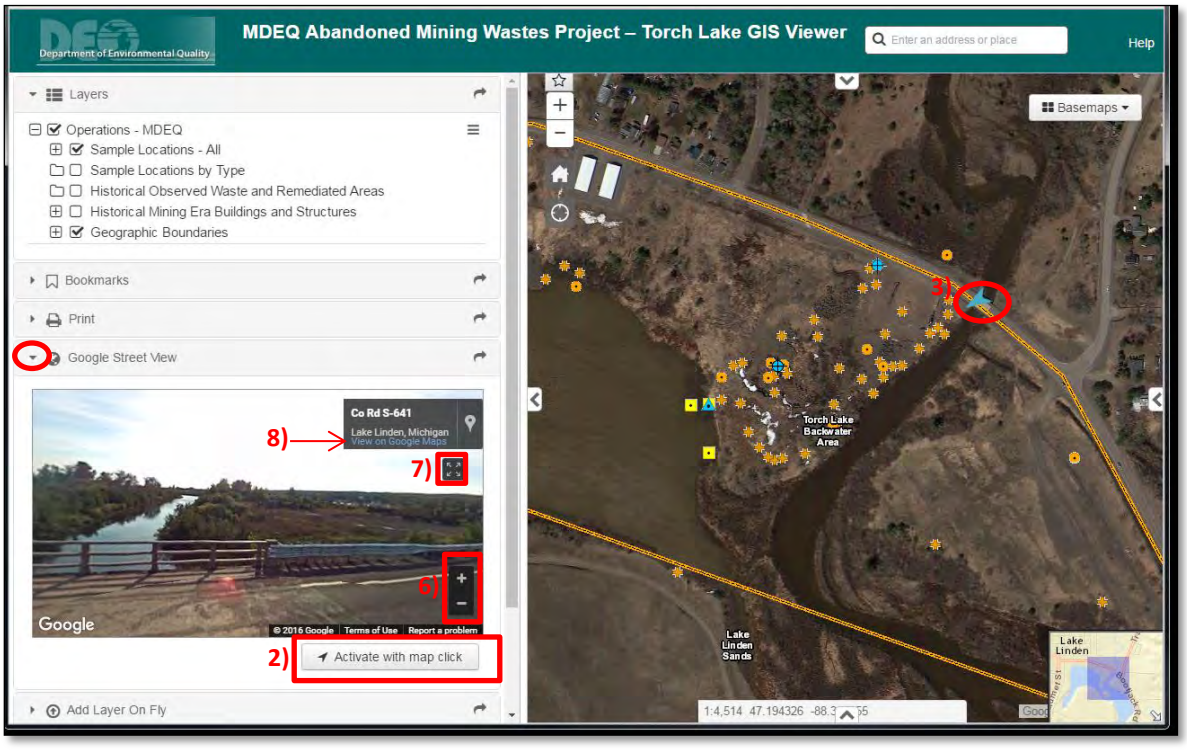
Where available, Google Street View can be opened within the data viewer for an on the ground perspective.

1) Open the Google Street View buy clicking on the expand arrow.
2) Click on the “Activate with map click” button
3) Click within the Map Pane. If street view is available, an arrow will be shown on the map and street view will appear in the left pane.

➡ Tip: Street View is only available along major roads and some residential streets.

4) Within the Google Street View window, you can pan the image by clicking and holding the left mouse button and then moving the mouse. The arrow in the Map Pane shows the direction you are viewing.
5) Double-clicking the mouse button advances the street view further down the street if available.
6) The +/- button zooms the Street View
7) The button expands the window to fill your screen. Hit escape to go back.
8) The “View on Google Maps” link opens up the full version of Google Maps in a new browser window

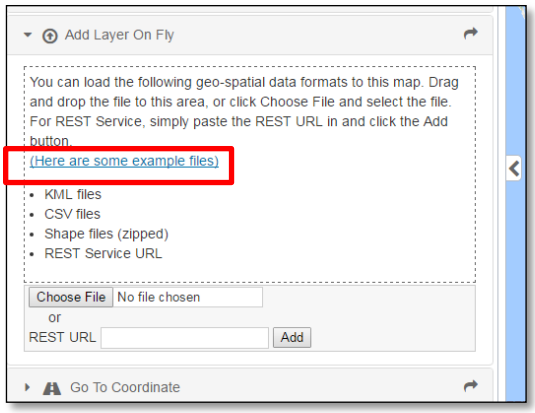
➡ TIP: The Google Street View window can be expanded by clicking and dragging the window pane between the Left Panel and the Map Area



ADD LAYER ON FLY

This tool allows the following goe-spatial data formats to be added to the map:

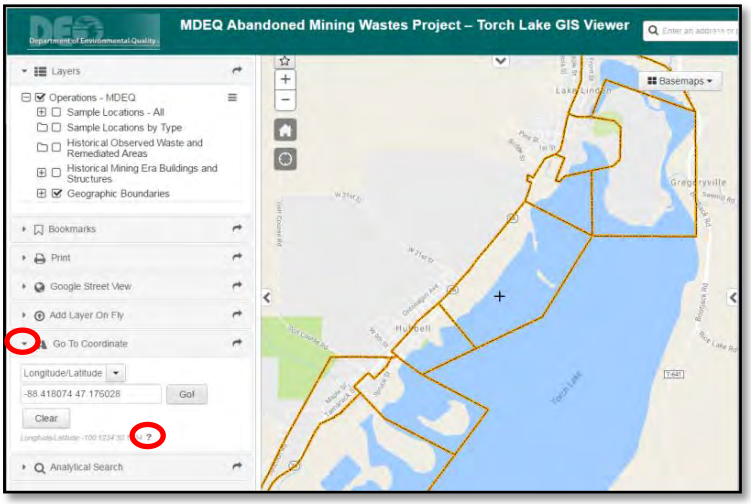
- **KML files** – (Keyhole Markup Language)
  - Common file type developed for use with Google Earth
- **CSV files** – (comma separated values file)
  - Must contain a column titled “Lat” and a column titled “Long” containing latitude and longitude values in decimal degrees
- **Shape files** – a popular GIS software file format
  - Each shape file contains four separate files with the following extensions: .dbf, .prj, .shp, and .shx.
  - To load a shapefile all four files must be contained in a single .zip file.
- **REST Service URLs –** Representational State Transfer, which are primarily used to build Web services



TIP: To see working example files of each file type, click on the blue hyperlink displayed on the tool.

GO TO COORDINATE

The GO TO COORDINATE tool pans the map view to the specific coordinates you enter.



1) Open the tool by clicking the expand arrow

2) Select the coordinate system.
- Longitude/Latitude:
- UTM: Universal Transverse Mercator System
- MGRS: Military Grid Rerference System

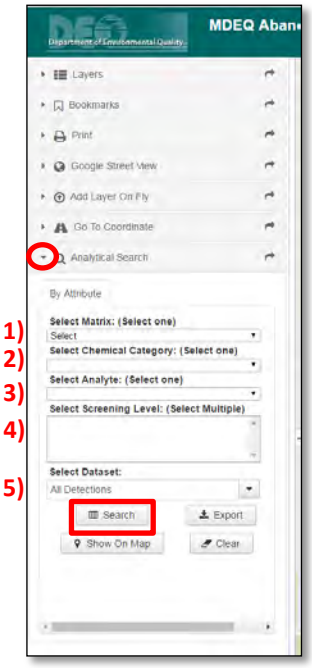
3) Enter the coordinates

4) A “+“ symbol will appear at the position entered.

TIP: Click on the **?** button near the bottom of the tool for more information on acceptable input format

8.0 LEFT PANEL – ANALYTICAL SEARCH TOOL

The Analytical Search Tool allows the user to query laboratory and XRF results. The results can then be compared to various screening levels and the results shown on a table. The results of the query can also be highlighted in the map area.



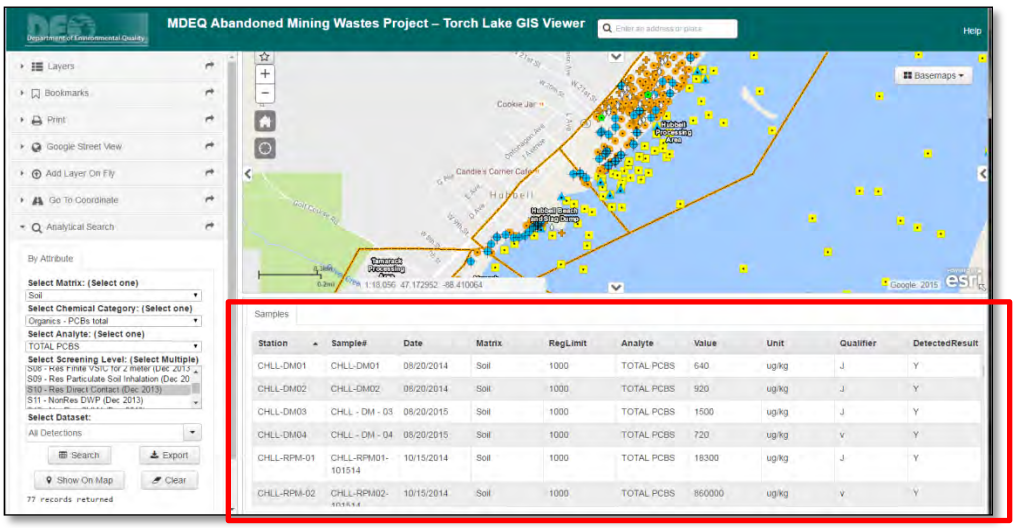
The tool is accessed by clicking on the expand arrow just left of the tool name (circled red)

The user then sets the query by the following steps:

1) selecting the sample matrix,
2) selecting the chemical category,
3) selecting the analyte,
4) selecting one or more screening levels,
5) selecting the dataset of
   - All Results,
   - All Detections, or
   - All Exceedances of the selected screening level

The query is executed by clicking on the Search button and the results appear in the Results Pane as shown below.

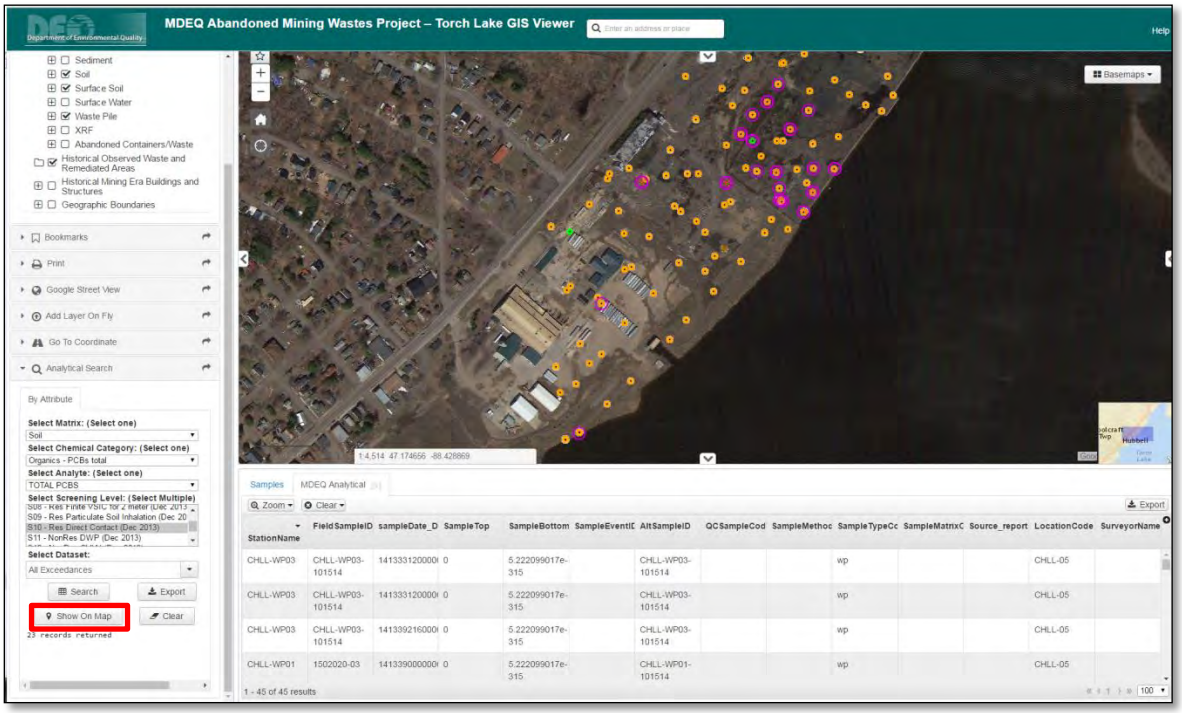
Note: The selections outlined above are dynamic which means that



TIP: The Results Pane can be expanded by clicking and dragging the window pane between the Map Area and the Results Pane

SHOW RESULTS ON MAP

After the results appear in the Results Pane, click on the Show On Map button to highlight the sample locations. Highlights appear as purple rings around the sample location.



TIP: Clicking on a record within the Results Pane will pan the map to the selected location and turn the purple ring to cyan.

ANALYTIC SEARCH RESULTS - ADDITIONAL FUNCTIONS

- The Export button exports the results from the Results Pane to .csv file that can be opened in Microsoft Excel or other spreadsheet software.
- The Clear button removes results from the Results Pane.
- Values within the Results Pane can be sorted in ascending or descending order by clicking any of the column headers.

9.0 ANALYTICAL SEARCH TOOL SELECTION OPTIONS

The following lists the options available in the drop down menus within the **Analytical Search Tool**. The drop-down menus are dynamic which means the options available are dependent upon what is selected in the menu above it. For example, if 'Inorganics – Metals' is selected for the chemical category, the list of Analytes will only include inorganic - metals. Likewise, only soil screening levels are available if soil is selected as the matrix.

Select Matrix:

Asbestos – bulk
Groundwater
Sediment
Soil
Surface Water
Surface Water – SPMD (SPMD = Semi-permeable membrane device)
Waste – TCLP (TCLP = Toxicity characteristic leaching procedure)

Select Chemical Category:

Asbestos
Inorganics – Cyanide
Inorganics – General Chemistry (*list GC*)
Inorganics – Metals
Inorganics – XRF (XRF = X-ray Fluoresence:
Note this is a screening instrument and not laboratory quality level results)
Oil and Grease
Organics - PCB Congeners
Organics – PCBs (Aroclors)
Organics – PCBs total
Organics – SVOCs (semi-volatile organic compounds)
Organics – VOCs (volatile organic compounds)
Other – General Chemistry

Select Analyte:

See **Table 1** for a list of analytes that were analyzed in one or more sample for each matrix. The list is sorted by chemical category and shows what analytes are available in the tool based on the matrix and chemical category selection.

Select Screening Level:

Below is a list of the available applicable regulatory criteria and screening levels for use in evaluating risk to human health and the environment. Exposure pathways are evaluated based on media type (i.e. soil, groundwater, etc.), land use, and availability to potential receptors (i.e. residents, biota, etc.). The screening levels in the tool become available based on the sample matrix that is selected. The regulatory criteria and screening levels are risk based numbers, however, just because a result may exceed a particular screening level does not necessarily mean that a risk is present. The exposure pathway must be complete to demonstrate a risk is present.

Links to the various regulatory programs explaining how the criteria and screening levels were developed and used are found at the bottom of this section (see TIPS).

For more specific details on the exposure assessments for the CHLL and CHTC project areas see Section 4 of the *Site Investigation Report for Abandoned Mining Wastes Torch Lake Non-Superfund Site, Calumet and Hecla – Lake Linden Operations, Houghton County, Michigan* (Weston March 2016) and Section 4 of the *Site Investigation Report for Abandoned Mining Wastes Torch Lake Non-Superfund Site, Calumet and Hecla – Tamarack City Operations, Houghton County, Michigan* (Weston March 2016).

If **Asbestos** is selected:

Asbestos (1%)

National Emissions Standard for Hazardous Air Pollutants

S09 – Res Particulate Soil Inhalation (Dec 2013)

MDEQ Part 201 Residential Particulate Soil Inhalation Criteria

S16 – NonRes Particulate Soil Inhalation (Dec2013)

MDEQ Part 201 Nonresidential Particulate Soil Inhalation Criteria

If **Groundwater** is selected:

GW01 – Res Drinking Water (Dec 2013)

MDEQ Part 201 Residential Drinking Water Criteria

GW02 – NonRes Drinking Water (Dec 2013)

MDEQ Part 201 Nonresidential Drinking Water Criteria

GW03 – GSI (Dec 2013)

MDEQ Part 201 Groundwater Surface Water Interface Criteria

GW04 – Res GVIAI (Dec 2013)

MDEQ Part 201 Residential Groundwater Volatilization to Indoor Air Inhalation Criteria

GW05 – NonRes GVIAI (Dec 2013)

MDEQ Part 201 Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria

GW06 – Water Solubility

MDEQ Part 201 Water Solubility

GW07 – Flammability and Explosivity Screening Level

MDEQ Part 201 Water Solubility

If **Sediment** is selected:

SED1 – Ecological Screening Levels (Region 5 2003)

U.S. EPA Region 5 RCRA Ecological Screening Levels dated August 22, 2003

SED2 – TEC

Threshold Effect Concentrations from Appendix A of MDEQ RRD Op Memo No.4 Attachment 3, Interim Final August 2, 2006

SED3 – PEC

Probable Effect Concentrations from Appendix B of MDEQ RRD Op Memo No.4 Attachment 3, Interim Final August 2, 2006

If **Soil** is selected:

S01 – Statewide Default Background Level (Dec 2013)

MDEQ Part 201 Statewide Default Background Level

S02 – GSIP (Dec 2013)

MDEQ Part 201 Groundwater Surface Water Interface Protection Criteria

S03 – Soil Saturation (Dec 2013)

MDEQ Part 201 Soil Saturation Concentration Screening Levels

S04 – Res DWP (Dec 2013)

MDEQ Part 201 Residential Drinking Water Protection Criteria

S05 – Res SVIAI (Dec 2013)
MDEQ Part 201 Residential Soil Volatilization to Indoor Air Inhalation Criteria
S06 – Res Infinite Source VSIC (Dec 2013)
MDEQ Part 201 Residential Infinite Source Volatile Soil Inhalation Criteria
S07 – Res Finite VSIC for 5 meter (Dec 2013)
MDEQ Part 201 Residential Finite Volatile Soil Inhalation Criteria for 5 Meter Source Thickness
S08 – Res Finite VSIC for 2 meter (Dec 2013)
MDEQ Part 201 Residential Finite Volatile Soil Inhalation Criteria for 2 Meter Source Thickness
S09 – Res Particulate Soil Inhalation (Dec 2013)
MDEQ Part 201 Residential Particulate Soil Inhalation Criteria
S10 – Res Direct Contact (Dec 2013)
MDEQ Part 201 Residential Direct Contact Criteria
S11 – NonRes DWP (Dec 2013)
MDEQ Part 201 Nonresidential Drinking Water Criteria
S12 – NonRes SVIAI (Dec 2013)
MDEQ Part 201 Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria
S13 – NonRes Infinite Source VSIC (Dec 2013)
MDEQ Part 201 Nonresidential Infinite Source Volatile Soil Inhalation Criteria
S14 – NonRes Finite VSIC for 5 meter (Dec 2013)
MDEQ Part 201 Nonresidential Finite Volatile Soil Inhalation Criteria for 5 Meter Source Thickness
S15 – NonRes Finite VSIC for 2 meter (Dec 2013)
MDEQ Part 201 Nonresidential Finite Volatile Soil Inhalation Criteria for 2 Meter Source Thickness
S16 – NonRes Particulate Soil Inhalation (Dec 2013)
MDEQ Part 201 Nonresidential Particulate Soil Inhalation Criteria
S17 – NonRes Direct Contact (Dec 2013)
MDEQ Part 201 Nonresidential Direct Contact Criteria

If **Surface Water** is selected:
SW – Res Drinking Water (Dec 2013)
U.S. EPA Region 5 RCRA Ecological Screening Levels dated August 22, 2003
SW – Rule 57 HCV Drink (June 2011)
MDEQ State-wide Rule 57 Water Quality Value, Human Cancer Value, drinking water source, dated Feburary 27, 2014
SW – Rule 57 HNV Drink (June 2011)
MDEQ State-wide Rule 57 Water Quality Value, Human Noncancer Value, drinking water source, dated Feburary 27, 2014
SW – Rule 57 WV (June 2011)
MDEQ State-wide Rule 57 Water Quality Value, Wildlife Value, dated Feburary 27, 2014

If **Surface Water – SPMD** is selected:
No screening levels are available.

If **Waste – TCLP** is selected:
No screening levels are available.

TIP: Additional guidance on MDEQ Part 201 cleanup criteria and screening levels can be found at http://www.michigan.gov/deq/0,4561,7-135-3311_4109-251790--,00.html and http://www.michigan.gov/deq/0,4561,7-135-3311_4109_4215-101581--,00.html

Guidance on MDEQ Rule 57 Water Quality Values can be found at http://www.michigan.gov/deq/0,4561,7-135-3313_3681_3686_3728-11383--,00.html

RRD Operational Memorandum No. 4, Attachment 3 – Sediments can be found here: http://www.michigan.gov/documents/deq/deq-rrd-OpMemo_4Attach3Sediments_250004_7.pdf

USEPA Region 5 Ecological Screening Levels can be found here: https://www3.epa.gov/region5/waste/cars/esl.htm

TABLE 1

Table 1: Abandoned Mining Waste Project - Analyte List

Sample Matrix	Chemical Category	Analyte	CAS Number
Asbestos - bulk	Asbestos	ASBESTOS	ASB
		ASBESTOS-AMOSITE	--
		ASBESTOS-CHRYSOTILE	ASB-C
Groundwater	Field Param	Conductivity (field measure)	--
		DO (field measure)	--
		pH (field measure)	--
		Temperature (field measure)	--
	Inorganics - Cyanide	CYANIDE	57-12-5
	Inorganics - Metals	ALUMINUM	7429-90-5
		ANTIMONY	7440-36-0
		ARSENIC	7440-38-2
		BARIUM	7440-39-3
		BERYLLIUM	7440-41-7
		BORON	7440-42-8
		CADMIUM	7440-43-9
		CALCIUM	7440-70-2
		CHROMIUM	7440-47-3
		COBALT	7440-48-4
		COPPER	7440-50-8
		IRON	7439-89-6
		LEAD	7439-92-1
		LITHIUM	7439-93-2
		MAGNESIUM	7439-95-4
		MANGANESE	7439-96-5
		MERCURY	7439-97-6
		MOLYBDENUM	7439-98-7
		NICKEL	7440-02-0
		Potassium	7440-09-7
		SELENIUM	7782-49-2
		SILVER	7440-22-4
		SODIUM	7440-23-5
		STRONTIUM	7440-24-6
		THALLIUM	7440-28-0
		TITANIUM METAL POWDER	7440-32-6
		VANADIUM	7440-62-2
		ZINC	7440-66-6
	Organics - PCB Congeners	PCB 001	--
		PCB 003	--
		PCB 008	--
		PCB 011	--
		PCB 016	--
		PCB 017	--
		PCB 018	--
		PCB 022	--
		PCB 025	--
		PCB 026	--
		PCB 027	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Organics - PCB Congeners	PCB 028	--
		PCB 031	--
		PCB 032	--
		PCB 033	--
		PCB 037	--
		PCB 040	--
		PCB 042	--
		PCB 044	--
		PCB 045	--
		PCB 047	--
		PCB 048	--
		PCB 049	--
		PCB 052	--
		PCB 056	--
		PCB 060	--
		PCB 063	--
		PCB 064	--
		PCB 066	--
		PCB 070	--
		PCB 071	--
		PCB 074	--
		PCB 077	--
		PCB 081	--
		PCB 082	--
		PCB 083	--
		PCB 084	--
		PCB 087	--
		PCB 090	--
		PCB 091	--
		PCB 092	--
		PCB 095	--
		PCB 097	--
		PCB 099	--
		PCB 100	--
		PCB 101	--
		PCB 105	--
		PCB 110	--
		PCB 114	--
		PCB 118	--
		PCB 123	--
		PCB 126	--
		PCB 128	--
		PCB 130	--
		PCB 132	--
		PCB 134	--
		PCB 135	--
		PCB 136	--
		PCB 137	--
		PCB 138	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Organics - PCB Congeners	PCB 141	--
		PCB 144	--
		PCB 146	--
		PCB 149	--
		PCB 151	--
		PCB 153	--
		PCB 156	--
		PCB 157	--
		PCB 158	--
		PCB 160	--
		PCB 163	--
		PCB 167	--
		PCB 170	--
		PCB 171	--
		PCB 172	--
		PCB 174	--
		PCB 175	--
		PCB 177	--
		PCB 178	--
		PCB 179	--
		PCB 180	--
		PCB 182	--
		PCB 183	--
		PCB 185	--
		PCB 187	--
		PCB 189	--
		PCB 190	--
		PCB 193	--
		PCB 194	--
		PCB 195	--
		PCB 196	--
		PCB 198	--
		PCB 199 (201)	--
		PCB 200 (199)	--
		PCB 201 (200)	--
		PCB 203	--
		PCB 205	--
		PCB 206	--
		PCB 207	--
		Total PCB Congeners	TPCBC
	Organics - PCBs	AROCLOR-1016	12674-11-2
		AROCLOR-1221	11104-28-2
		AROCLOR-1232	11141-16-5
		AROCLOR-1242	53469-21-9
		AROCLOR-1248	12672-29-6
		AROCLOR-1254	11097-69-1
		AROCLOR-1260	11096-82-5
		AROCLOR-1262	37324-23-5
		AROCLOR-1268	11100-14-4

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Organics - PCBs total	TOTAL PCBS	TPCB
	Organics - Pesticides	4,4'-DDD	72-54-8
		4,4'-DDE	72-55-9
		4,4'-DDT	50-29-3
		Aldrin	309-00-2
		alpha-BHC	319-84-6
		alpha-Chlordane	5103-71-9
		beta-BHC	319-85-7
		delta-BHC	319-86-8
		Dieldrin	60-57-1
		Endosulfan I	959-98-8
		Endosulfan II	33213-65-9
		Endosulfan sulfate	1031-07-8
		Endrin	72-20-8
		Endrin aldehyde	7421-93-4
		Endrin ketone	53494-70-5
		gamma-BHC (Lindane)	58-89-9
		gamma-Chlordane	5103-74-2
		Heptachlor	76-44-8
		Heptachlor epoxide	1024-57-3
		Methoxychlor	72-43-5
		Toxaphene	8001-35-2
	Organics - SVOCs	1,1'-BIPHENYL	92-52-4
		1,2,4,5-TETRACHLOROBENZENE	95-94-3
		1,2,4-Trichlorobenzene (SVOC)	120-82-1
		2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1
		2,4,5-TRICHLOROPHENOL	95-95-4
		2,4,6-TRICHLOROPHENOL	88-06-2
		2,4-DICHLOROPHENOL	120-83-2
		2,4-DIMETHYLPHENOL	105-67-9
		2,4-DINITROPHENOL	51-28-5
		2,4-DINITROTOLUENE	121-14-2
		2,6-DINITROTOLUENE	606-20-2
		2-CHLOROANILINE	95-51-2
		2-CHLORONAPHTHALENE	91-58-7
		2-CHLOROPHENOL	95-57-8
		2-METHYLNAPHTHALENE (SVOC)	91-57-6S
		2-METHYLPHENOL	95-48-7
		2-NITROANILINE	88-74-4
		2-NITROPHENOL	88-75-5
		3 & 4-METHYLPHENOL	108,394,106,445
		3,3'-DICHLOROBENZIDINE	91-94-1
		3-NITROANILINE	99-09-2
		4,6-DINITRO-2-METHYLPHENOL	534-52-1
		4-BROMOPHENYL PHENYL ETHER	101-55-3
		4-CHLORO-3-METHYLPHENOL	59-50-7
		4-CHLOROPHENYL PHENYL ETHER	7005-72-3
		4-METHYLPHENOL	106-44-5
		4-NITROPHENOL	100-02-7

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Organics - SVOCs	ACENAPHTHENE	83-32-9
		ACENAPHTHYLENE	208-96-8
		ACETOPHENONE	98-86-2
		ANILINE	62-53-3
		ANTHRACENE	120-12-7
		ATRAZINE	1912-24-9
		AZOBENZENE	103-33-3
		BENZALDEHYDE	100-52-7
		BENZO(A)ANTHRACENE	56-55-3
		BENZO(A)PYRENE	50-32-8
		BENZO(B)FLUORANTHENE	205-99-2
		BENZO(G,H,I)PERYLENE	191-24-2
		BENZO(K)FLUORANTHENE	207-08-9
		BENZYL ALCOHOL	100-51-6
		BIS(2-CHLOROETHOXY)METHANE	111-91-1
		BIS(2-CHLOROETHYL)ETHER	111-44-4
		BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7
		BUTYL BENZYL PHTHALATE	85-68-7
		CAPROLACTAM	105-60-2
		CARBAZOLE	86-74-8
		CHLOROPHENOLS	58-90-2
		CHOLESTANE	Cholestane
		CHRYSENE	218-01-9
		DIBENZO(A,H)ANTHRACENE	53-70-3
		DIBENZOFURAN	132-64-9
		DIETHYL PHTHALATE	84-66-2
		DIMETHYL PHTHALATE	131-11-3
		DIMETHYLPHYLAMINE	121-69-7
		DI-N-BUTYLPHTHALATE	84-74-2
		DI-N-OCTYLPHTHALATE	117-84-0
		DOCOSANE	Docosane
		EICOSANE	Eicosane
		FLUORANTHENE	206-44-0
		FLUORENE	86-73-7
		HEPTADECANE	Heptadecane
		HEPTYL-PENTADECANE	Heptyl-pentadec
		HEXACHLORO-1,3-BUTADIENE	87-68-3
		HEXACHLOROBENZENE	118-74-1
		HEXACHLOROCYCLOPENTADIENE	77-47-4
		HEXACHLOROETHANE (SVOC)	67-72-1
		HEXACOSANE	Hexacosane
		HEXADECANE	Hexadecane
		INDENO(1,2,3-CD)PYRENE	193-39-5
		ISOPHORONE	78-59-1
		METHYL-TRIDECANE	Methyl-tridecan
		NAPHTHALENE (SVOC)	91-20-3S
		NITROBENZENE	98-95-3
		N-METHYLANILINE	100-61-8
		N-NITROSODIMETHYLAMINE	67-75-9

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Organics - SVOCs	N-NITROSO-DI-N-PROPYLAMINE	621-64-7
		N-NITROSODIPHENYLAMINE	86-30-6
		P-CHLOROANILINE	106-47-8
		PENTACHLOROPHENOL	87-86-5
		PHENANTHRENE	85-01-8
		PHENOL	108-95-2
		P-NITROANILINE	100-01-6
		PYRENE	129-00-0
		PYRIDINE	110-86-1
		TETRAMETHYL-PENTADECANE	Tetramethyl-pen
		TETRAMETHYLUREA	632-22-4
	Organics - VOCs	1,1,1,2-TETRACHLOROETHANE	630-20-6
		1,1,1-TRICHLOROETHANE	71-55-6
		1,1,2,2-TETRACHLOROETHANE	79-34-5
		1,1,2-TRICHLOROETHANE	79-00-5
		1,1-DICHLOROETHANE	75-34-3
		1,1-DICHLOROETHYLENE	75-35-4
		1,2,3-TRICHLOROBENZENE	87-61-6
		1,2,3-TRICHLOROPROPANE	96-18-4
		1,2,3-TRIMETHYLBENZENE	526-73-8
		1,2,4-Trichlorobenzene (VOC)	120-82-1
		1,2,4-TRIMETHYLBENZENE	95-63-6
		1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8
		1,2-DIBROMOETHANE	106-93-4
		1,2-DICHLOROBENZENE	95-50-1
		1,2-DICHLOROETHANE	107-06-2
		1,2-DICHLOROPROPANE	78-87-5
		1,3,5-TRIMETHYLBENZENE	108-67-8
		1,3-DICHLOROBENZENE	541-73-1
		1,4-DICHLOROBENZENE	106-46-7
		1,4-DIOXANE	123-91-1
		2-BUTANONE (MEK)	78-93-3
		2-HEXANONE	591-78-6
		2-METHYLNAPHTHALENE (VOC)	91-57-6V
		2-PROPANONE (ACETONE)	67-64-1
		4-METHYL-2-PENTANONE (MIBK)	108-10-1
		ACRYLONITRILE	107-13-1
		BENZENE	71-43-2
		BROMOBENZENE	108-86-1
		BROMOCHLOROMETHANE	74-97-5
		BROMODICHLOROMETHANE	75-27-4
		BROMOFORM	75-25-2
		BROMOMETHANE	74-83-9
		CARBON DISULFIDE	75-15-0
		CARBON TETRACHLORIDE	56-23-5
		CHLORINATED FLUOROCARBON (FREON 113)	76-13-1
		CHLOROBENZENE	108-90-7
		CHLOROETHANE	75-00-3
		CHLOROFORM	67-66-3

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Organics - VOCs	CHLOROMETHANE	74-87-3
		CIS-1,2-DICHLOROETHYLENE	156-59-2
		CIS-1,3-DICHLOROPROPYLENE	10061-01-5
		CYCLOHEXANE	110-82-7
		DIBROMOCHLOROMETHANE	124-48-1
		DIBROMOMETHANE	74-95-3
		DICHLORODIFLUOROMETHANE (CFC-12)	75-71-8
		DIETHYL ETHER	60-29-7
		DIISOPROPYL ETHER	108-20-3
		ETHYLBENZENE	100-41-4
		ETHYLTERTIARYBUTYLETHER	637-92-3
		HEXACHLOROETHANE (VOC)	67-72-1
		ISOPROPYLBENZENE	98-82-8
		M,P-XYLENE	1330-20-7
		M,P-XYLENE_(MP OR TOTAL?)	1330-20-7MP
		METHYL ACETATE	79-20-9
		METHYL IODIDE	74-88-4
		METHYLCYLOHEXANE	108-87-2
		METHYLENE CHLORIDE	75-09-2
		METHYLTERTBUTYLETHER	1634-04-4
		NAPHTHALENE (VOC)	91-20-3V
		N-BUTYLBENZENE	104-51-8
		N-PROPYLBENZENE	103-65-1
		O-XYLENE	95-47-6
		P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6
		SEC-BUTYLBENZENE	135-98-8
		STYRENE	100-42-5
		TERT-BUTYLBENZENE	98-06-6
		TERTIARY BUTYL ALCOHOL	75-65-0
		TERTIARYAMYLMETHYLETHER	994-05-8
		TETRACHLOROETHYLENE	127-18-4
		TETRAHYDROFURAN	109-99-9
		TOLUENE	108-88-3
		TRANS-1,2-DICHLOROETHYLENE	156-60-5
		TRANS-1,3-DICHLOROPROPYLENE	10061-02-6
		TRANS-1,4-DICHLORO-2-BUTENE	110-57-6
		TRICHLOROETHYLENE	79-01-6
		TRICHLOROFLUOROMETHANE (CFC-11)	75-69-4
		VINYL CHLORIDE	75-01-4
		XYLENE - TOTAL	--
	Other - General Chemistry	AMMONIA	7664-41-7
		Chloride	--
		COD	COD
		NITROGEN	7727-37-9
		Sulfate	--
		TOC	7440-44-0
		TOTAL KJELDAHL NITROGEN	TKN
		TOTAL PHOSPHORUS	7723-14-0
	Surrogate	2-Fluorobiphenyl	321-60-8

Sample Matrix	Chemical Category	Analyte	CAS Number
Groundwater	Surrogate	Bromofluorobenzene	460-00-4
		Decachlorobiphenyl	2051-24-3
		Dibromofluoromethane	1868-53-7
		Nitrobenzene-d5	4165-60-0
		p-Terphenyl-d14	4165-60-0
		Tetrachloro-m-xylene	877-09-8
		Toluene-d8	2037-26-5
Sediment	DRO/ORO	Diesel Range Org(C10-C20)	--
		Oil Range Organics (C20-C34)	--
	Inorganics - Cyanide	CYANIDE	57-12-5
	Inorganics - General Chemi	% TOTAL SOLIDS	SOLIDS
	Inorganics - Metals	ALUMINUM	7429-90-5
		ANTIMONY	7440-36-0
		ARSENIC	7440-38-2
		BARIUM	7440-39-3
		BERYLLIUM	7440-41-7
		CADMIUM	7440-43-9
		CALCIUM	7440-70-2
		CHROMIUM	7440-47-3
		COBALT	7440-48-4
		COPPER	7440-50-8
		IRON	7439-89-6
		LEAD	7439-92-1
		LITHIUM	7439-93-2
		MAGNESIUM	7439-95-4
		MANGANESE	7439-96-5
		MERCURY	7439-97-6
		MOLYBDENUM	7439-98-7
		NICKEL	7440-02-0
		Potassium	7440-09-7
		SELENIUM	7782-49-2
		SILVER	7440-22-4
		SODIUM	7440-23-5
		THALLIUM	7440-28-0
		TITANIUM METAL POWDER	7440-32-6
		VANADIUM	7440-62-2
		ZINC	7440-66-6
	Organics - PCB Congeners	PCB 001	--
		PCB 003	--
		PCB 008	--
		PCB 011	--
		PCB 016-032	--
		PCB 017	--
		PCB 018	--
		PCB 022	--
		PCB 025	--
		PCB 026	--
		PCB 027	--
		PCB 028	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Sediment	Organics - PCB Congeners	PCB 031	--
		PCB 033	--
		PCB 037-042	--
		PCB 040	--
		PCB 044	--
		PCB 045	--
		PCB 047	--
		PCB 048	--
		PCB 049	--
		PCB 052	--
		PCB 056-060	--
		PCB 063	--
		PCB 064	--
		PCB 066-095	--
		PCB 070	--
		PCB 071	--
		PCB 074	--
		PCB 077-110	--
		PCB 081-087	--
		PCB 082	--
		PCB 083	--
		PCB 084	--
		PCB 090-101	--
		PCB 091	--
		PCB 092	--
		PCB 097	--
		PCB 099	--
		PCB 100	--
		PCB 105	--
		PCB 114	--
		PCB 118	--
		PCB 123-149	--
		PCB 126-178	--
		PCB 128	--
		PCB 130	--
		PCB 132	--
		PCB 134	--
		PCB 135-144	--
		PCB 136	--
		PCB 136-163	--
		PCB 137	--
		PCB 141	--
		PCB 146	--
		PCB 151	--
		PCB 153	--
		PCB 156	--
		PCB 157-201	--
		PCB 158-160	--
		PCB 167	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Sediment	Organics - PCB Congeners	PCB 169	--
		PCB 170-190	--
		PCB 171	--
		PCB 172	--
		PCB 174	--
		PCB 175	--
		PCB 177	--
		PCB 179	--
		PCB 180	--
		PCB 182-187	--
		PCB 183	--
		PCB 185	--
		PCB 189	--
		PCB 193	--
		PCB 194	--
		PCB 195	--
		PCB 196-203	--
		PCB 198	--
		PCB 199	--
		PCB 200	--
		PCB 205	--
		PCB 206	--
		PCB 207	--
		Total PCB Congeners	TPCBC
	Organics - PCBs	AROCLOR-1016	12674-11-2
		AROCLOR-1221	11104-28-2
		AROCLOR-1232	11141-16-5
		AROCLOR-1242	53469-21-9
		AROCLOR-1248	12672-29-6
		AROCLOR-1254	11097-69-1
		AROCLOR-1260	11096-82-5
		AROCLOR-1262	37324-23-5
		AROCLOR-1268	11100-14-4
	Organics - PCBs total	TOTAL PCBS	TPCB
	Organics - SVOCs	1,1'-BIPHENYL	92-52-4
		1,2,4,5-TETRACHLOROBENZENE	95-94-3
		1,2,4-Trichlorobenzene (SVOC)	120-82-1
		1-METHYL-NAPHTHALENE	1-Methyl-naphth
		2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1
		2,4,5-TRICHLOROPHENOL	95-95-4
		2,4,6-TRICHLOROPHENOL	88-06-2
		2,4-DICHLOROPHENOL	120-83-2
		2,4-DIMETHYLPHENOL	105-67-9
		2,4-DINITROPHENOL	51-28-5
		2,4-DINITROTOLUENE	121-14-2
		2,6-DINITROTOLUENE	606-20-2
		2-CHLORONAPHTHALENE	91-58-7
		2-CHLOROPHENOL	95-57-8
		2-METHYLNAPHTHALENE (SVOC)	91-57-6S

Sample Matrix	Chemical Category	Analyte	CAS Number
Sediment	Organics - SVOCs	2-METHYLPHENOL	95-48-7
		2-NITROANILINE	88-74-4
		2-NITROPHENOL	88-75-5
		3 & 4-METHYLPHENOL	108,394,106,445
		3,3'-DICHLOROBENZIDINE	91-94-1
		3-NITROANILINE	99-09-2
		4,6-DINITRO-2-METHYLPHENOL	534-52-1
		4-BROMOPHENYL PHENYL ETHER	101-55-3
		4-CHLORO-3-METHYLPHENOL	59-50-7
		4-CHLOROPHENYL PHENYL ETHER	7005-72-3
		4-METHYLPHENOL	106-44-5
		4-NITROPHENOL	100-02-7
		ACENAPHTHENE	83-32-9
		ACENAPHTHYLENE	208-96-8
		ACETOPHENONE	98-86-2
		ANTHRACENE	120-12-7
		ATRAZINE	1912-24-9
		AZOBENZENE	103-33-3
		BENZALDEHYDE	100-52-7
		BENZO(A)ANTHRACENE	56-55-3
		BENZO(A)PYRENE	50-32-8
		BENZO(B)FLUORANTHENE	205-99-2
		BENZO(G,H,I)PERYLENE	191-24-2
		BENZO(K)FLUORANTHENE	207-08-9
		Benzoic acid	65-85-0
		BENZYL ALCOHOL	100-51-6
		BIS(2-CHLOROETHOXY)METHANE	111-91-1
		BIS(2-CHLOROETHYL)ETHER	111-44-4
		Bis(2-chloroisopropyl)ether	39638-32-9
		BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7
		BUTYL BENZYL PHTHALATE	85-68-7
		CAPROLACTAM	105-60-2
		CARBAZOLE	86-74-8
		CHLOROPHENOLS	58-90-2
		CHRYSENE	218-01-9
		DIBENZO(A,H)ANTHRACENE	53-70-3
		DIBENZOFURAN	132-64-9
		DIETHYL PHTHALATE	84-66-2
		DIMETHYL PHTHALATE	131-11-3
		DIMETHYL-NAPHTHALENE ISOMER1	Dimethyl-napht1
		DIMETHYL-NAPHTHALENE ISOMER2	Dimethyl-napht2
		DIMETHYL-NAPHTHALENE ISOMER3	Dimethyl-napht3
		DIMETHYL-OCTANE	Dimethyl-octane
		DIMETHYL-UNDECANE	Dimethyl-undeca
		DI-N-BUTYLPHTHALATE	84-74-2
		DI-N-OCTYLPHTHALATE	117-84-0
		DOCOSANE	Docosane
		EICOSANE	Eicosane
		FLUORANTHENE	206-44-0

Sample Matrix	Chemical Category	Analyte	CAS Number
Sediment	Organics - SVOCs	FLUORENE	86-73-7
		HENEICOSANE	Heneicosane
		HEPTADECANE	Heptadecane
		HEXACHLORO-1,3-BUTADIENE	87-68-3
		HEXACHLOROBENZENE	118-74-1
		HEXACHLOROCYCLOPENTADIENE	77-47-4
		HEXACHLOROETHANE (SVOC)	67-72-1
		INDENO(1,2,3-CD)PYRENE	193-39-5
		ISOPHORONE	78-59-1
		METHYLETHYL-NAPHTHALENE	Methylethyl-nap
		METHYL-TRIDECANE	Methyl-tridecan
		NAPHTHALENE (SVOC)	91-20-3S
		NITROBENZENE	98-95-3
		N-NITROSODIMETHYLAMINE	67-75-9
		N-NITROSO-DI-N-PROPYLAMINE	621-64-7
		N-NITROSODIPHENYLAMINE	86-30-6
		NONADECANE	Nonadecane
		OCTADECANE	Octadecane
		P-CHLOROANILINE	106-47-8
		PENTACHLOROPHENOL	87-86-5
		PHENANTHRENE	85-01-8
		PHENOL	108-95-2
		P-NITROANILINE	100-01-6
		PROPYL-TRIDECANE	Propyl-tridecan
		PYRENE	129-00-0
		TETRAMETHYL-BENZENE	Tetramethyl-ben
		TETRAMETHYL-HEXADECANE	Tetramethyl-hex
		TETRAMETHYL-PENTADECANE	Tetramethyl-pen
		TRIMETHYL-NAPHTHALENE	Trimethyl-napht
		UNDECANE	Undecane
	Organics - VOCs	1,1,1,2-TETRACHLOROETHANE	630-20-6
		1,1,1-TRICHLOROETHANE	71-55-6
		1,1,2,2-TETRACHLOROETHANE	79-34-5
		1,1,2-TRICHLOROETHANE	79-00-5
		1,1-DICHLOROETHANE	75-34-3
		1,1-DICHLOROETHYLENE	75-35-4
		1,2,3-TRICHLOROBENZENE	87-61-6
		1,2,3-TRICHLOROPROPANE	96-18-4
		1,2,3-TRIMETHYLBENZENE	526-73-8
		1,2,4-Trichlorobenzene (VOC)	120-82-1
		1,2,4-TRIMETHYLBENZENE	95-63-6
		1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8
		1,2-DIBROMOETHANE	106-93-4
		1,2-DICHLOROBENZENE	95-50-1
		1,2-DICHLOROETHANE	107-06-2
		1,2-Dichloroethene (total)	12DCE
		1,2-DICHLOROPROPANE	78-87-5
		1,3,5-TRIMETHYLBENZENE	108-67-8
		1,3-DICHLOROBENZENE	541-73-1

Sample Matrix	Chemical Category	Analyte	CAS Number
Sediment	Organics - VOCs	1,4-DICHLOROBENZENE	106-46-7
		2-BUTANONE (MEK)	78-93-3
		2-HEXANONE	591-78-6
		2-METHYLNAPHTHALENE (VOC)	91-57-6V
		2-PROPANONE (ACETONE)	67-64-1
		4-METHYL-2-PENTANONE (MIBK)	108-10-1
		ACRYLONITRILE	107-13-1
		BENZENE	71-43-2
		BROMOBENZENE	108-86-1
		BROMOCHLOROMETHANE	74-97-5
		BROMODICHLOROMETHANE	75-27-4
		BROMOFORM	75-25-2
		BROMOMETHANE	74-83-9
		CARBON DISULFIDE	75-15-0
		CARBON TETRACHLORIDE	56-23-5
		CHLOROBENZENE	108-90-7
		CHLOROETHANE	75-00-3
		CHLOROFORM	67-66-3
		CHLOROMETHANE	74-87-3
		CIS-1,2-DICHLOROETHYLENE	156-59-2
		CIS-1,3-DICHLOROPROPYLENE	10061-01-5
		CYCLOHEXANE	110-82-7
		DIBROMOCHLOROMETHANE	124-48-1
		DIBROMOMETHANE	74-95-3
		DICHLORODIFLUOROMETHANE (CFC-12)	75-71-8
		DIETHYL ETHER	60-29-7
		DIISOPROPYL ETHER	108-20-3
		ETHYLBENZENE	100-41-4
		ETHYLTERTIARYBUTYLETHER	637-92-3
		HEXACHLOROETHANE (VOC)	67-72-1
		ISOPROPYLBENZENE	98-82-8
		M,P-XYLENE	1330-20-7
		M,P-XYLENE_(MP OR TOTAL?)	1330-20-7MP
		METHYL IODIDE	74-88-4
		METHYLENE CHLORIDE	75-09-2
		METHYLTERTBUTYLETHER	1634-04-4
		NAPHTHALENE (VOC)	91-20-3V
		N-BUTYLBENZENE	104-51-8
		N-PROPYLBENZENE	103-65-1
		O-XYLENE	95-47-6
		P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6
		SEC-BUTYLBENZENE	135-98-8
		STYRENE	100-42-5
		TERT-BUTYLBENZENE	98-06-6
		TERTIARY BUTYL ALCOHOL	75-65-0
		TERTIARYAMYLMETHYLETHER	994-05-8
		TETRACHLOROETHYLENE	127-18-4
		TETRAHYDROFURAN	109-99-9
		TOLUENE	108-88-3

Sample Matrix	Chemical Category	Analyte	CAS Number
Sediment	Organics - VOCs	TRANS-1,2-DICHLOROETHYLENE	156-60-5
		TRANS-1,3-DICHLOROPROPYLENE	10061-02-6
		TRANS-1,4-DICHLORO-2-BUTENE	110-57-6
		TRICHLOROETHYLENE	79-01-6
		TRICHLOROFLUOROMETHANE (CFC-11)	75-69-4
		VINYL CHLORIDE	75-01-4
		XYLENE - TOTAL	--
	Other - General Chemistry	Corrosivity-pH	CORROSIVITY
		PERCENT MOISTURE	MOIST
	Surrogate	2-Fluorobiphenyl	321-60-8
		Bromofluorobenzene	460-00-4
		Decachlorobiphenyl	2051-24-3
		Dibromofluoromethane	1868-53-7
		Nitrobenzene-d5	4165-60-0
		p-Terphenyl-d14	4165-60-0
		Tetrachloro-m-xylene	877-09-8
		Toluene-d8	2037-26-5
Soil	Asbestos	ASBESTOS	ASB
		ASBESTOS-AMOSITE	--
		ASBESTOS-CHRYSOTILE	ASB-C
	Inorganics - Cyanide	CYANIDE	57-12-5
	Inorganics - General Chemi	% TOTAL SOLIDS	SOLIDS
	Inorganics - Metals	ALUMINUM	7429-90-5
		ANTIMONY	7440-36-0
		ARSENIC	7440-38-2
		BARIUM	7440-39-3
		BERYLLIUM	7440-41-7
		CADMIUM	7440-43-9
		CALCIUM	7440-70-2
		CHROMIUM	7440-47-3
		Chromium, Hexavalent	18540-29-9T
		COBALT	7440-48-4
		COPPER	7440-50-8
		IRON	7439-89-6
		LEAD	7439-92-1
		LITHIUM	7439-93-2
		MAGNESIUM	7439-95-4
		MANGANESE	7439-96-5
		MERCURY	7439-97-6
		MOLYBDENUM	7439-98-7
		NICKEL	7440-02-0
		Potassium	7440-09-7
		SELENIUM	7782-49-2
		SILVER	7440-22-4
		SODIUM	7440-23-5
		STRONTIUM	7440-24-6
		THALLIUM	7440-28-0
		VANADIUM	7440-62-2
		ZINC	7440-66-6

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Inorganics - Metals XRF	ANTIMONY, XRF	7440-36-0X
		ARSENIC, XRF	7440-38-2X
		BARIUM, XRF	7440-39-3X
		CADMIUM, XRF	7440-43-9X
		CALCIUM, XRF	--
		CESIUM, XRF	--
		CHROMIUM, XRF	7440-47-3X
		COBALT, XRF	7440-48-4X
		COPPER, XRF	7440-50-8X
		IRON, XRF	7439-89-6X
		LEAD, XRF	7439-92-1X
		MANGANESE, XRF	7439-96-5X
		MERCURY, XRF	7439-97-6X
		MOLYBDENUM, XRF	7439-98-7X
		NICKEL, XRF	7440-02-0X
		PALLADIUM , XRF	--
		POTASSIUM, XRF	--
		RUBIDIUM, XRF	--
		SCANDIUM, XRF	--
		SELENIUM, XRF	7782-49-2X
		SILVER, XRF	7440-22-4X
		STRONTIUM, XRF	7440-24-6X
		SULFUR, XRF	--
		TELLURIUM, XRF	--
		THORIUM, XRF	--
		TIN, XRF	--
		TITANIUM, XRF	--
		TUNGSTEN, XRF	--
		URANIUM, XRF	--
		VANADIUM, XRF	--
		ZINC, XRF	7440-66-6X
		ZIRCONIUM, XRF	--
	Oil and Grease	HEM Oil and Grease	--
	Organics - PCB Congeners	PCB 001	--
		PCB 003	--
		PCB 008	--
		PCB 011	--
		PCB 016-032	--
		PCB 017	--
		PCB 018	--
		PCB 022	--
		PCB 025	--
		PCB 026	--
		PCB 027	--
		PCB 028	--
		PCB 031	--
		PCB 033	--
		PCB 037-042	--
		PCB 040	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Organics - PCB Congeners	PCB 044	--
		PCB 045	--
		PCB 047	--
		PCB 048	--
		PCB 049	--
		PCB 052	--
		PCB 056-060	--
		PCB 063	--
		PCB 064	--
		PCB 066-095	--
		PCB 070	--
		PCB 071	--
		PCB 074	--
		PCB 077-110	--
		PCB 081-087	--
		PCB 082	--
		PCB 083	--
		PCB 084	--
		PCB 090-101	--
		PCB 091	--
		PCB 092	--
		PCB 097	--
		PCB 099	--
		PCB 100	--
		PCB 105	--
		PCB 114	--
		PCB 118	--
		PCB 123-149	--
		PCB 126-178	--
		PCB 128	--
		PCB 130	--
		PCB 132	--
		PCB 134	--
		PCB 135-144	--
		PCB 136	--
		PCB 136-163	--
		PCB 137	--
		PCB 141	--
		PCB 146	--
		PCB 151	--
		PCB 153	--
		PCB 156	--
		PCB 157-201	--
		PCB 158-160	--
		PCB 167	--
		PCB 169	--
		PCB 170-190	--
		PCB 171	--
		PCB 172	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Organics - PCB Congeners	PCB 174	--
		PCB 175	--
		PCB 177	--
		PCB 179	--
		PCB 180	--
		PCB 182-187	--
		PCB 183	--
		PCB 185	--
		PCB 189	--
		PCB 193	--
		PCB 194	--
		PCB 195	--
		PCB 196-203	--
		PCB 198	--
		PCB 199	--
		PCB 200	--
		PCB 205	--
		PCB 206	--
		PCB 207	--
		Total PCB Congeners	TPCBC
	Organics - PCBs	AROCLOR-1016	12674-11-2
		AROCLOR-1221	11104-28-2
		AROCLOR-1232	11141-16-5
		AROCLOR-1242	53469-21-9
		AROCLOR-1248	12672-29-6
		AROCLOR-1254	11097-69-1
		AROCLOR-1260	11096-82-5
		AROCLOR-1262	37324-23-5
		AROCLOR-1268	11100-14-4
	Organics - PCBs total	TOTAL PCBS	TPCB
	Organics - Pesticides	4,4'-DDD	72-54-8
		4,4'-DDE	72-55-9
		4,4'-DDT	50-29-3
		Aldrin	309-00-2
		alpha-BHC	319-84-6
		alpha-Chlordane	5103-71-9
		beta-BHC	319-85-7
		delta-BHC	319-86-8
		Dieldrin	60-57-1
		Endosulfan I	959-98-8
		Endosulfan II	33213-65-9
		Endosulfan sulfate	1031-07-8
		Endrin	72-20-8
		Endrin aldehyde	7421-93-4
		Endrin ketone	53494-70-5
		gamma-BHC (Lindane)	58-89-9
		gamma-Chlordane	5103-74-2
		Heptachlor	76-44-8
		Heptachlor epoxide	1024-57-3

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Organics - Pesticides	Methoxychlor	72-43-5
		Toxaphene	8001-35-2
	Organics - SVOCs	1,1'-BIPHENYL	92-52-4
		1,2,4,5-TETRACHLOROBENZENE	95-94-3
		1,2,4-Trichlorobenzene (SVOC)	120-82-1
		1,2-Diphenylhydrazine	122-66-7
		2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1
		2,4,5-TRICHLOROPHENOL	95-95-4
		2,4,6-TRICHLOROPHENOL	88-06-2
		2,4-DICHLOROPHENOL	120-83-2
		2,4-DIMETHYLPHENOL	105-67-9
		2,4-DINITROPHENOL	51-28-5
		2,4-DINITROTOLUENE	121-14-2
		2,6-Dichlorophenol	87-65-0
		2,6-DINITROTOLUENE	606-20-2
		2-CHLORONAPHTHALENE	91-58-7
		2-CHLOROPHENOL	95-57-8
		2-METHYLNAPHTHALENE (SVOC)	91-57-6S
		2-METHYLPHENOL	95-48-7
		2-NITROANILINE	88-74-4
		2-NITROPHENOL	88-75-5
		3 & 4-METHYLPHENOL	108,394,106,445
		3,3'-DICHLOROBENZIDINE	91-94-1
		3-NITROANILINE	99-09-2
		4,6-DINITRO-2-METHYLPHENOL	534-52-1
		4-BROMOPHENYL PHENYL ETHER	101-55-3
		4-CHLORO-3-METHYLPHENOL	59-50-7
		4-CHLOROPHENYL PHENYL ETHER	7005-72-3
		4-METHYLPHENOL	106-44-5
		4-NITROPHENOL	100-02-7
		ACENAPHTHENE	83-32-9
		ACENAPHTHYLENE	208-96-8
		ACETOPHENONE	98-86-2
		ANTHRACENE	120-12-7
		ATRAZINE	1912-24-9
		AZOBENZENE	103-33-3
		BENZALDEHYDE	100-52-7
		BENZO(A)ANTHRACENE	56-55-3
		BENZO(A)PYRENE	50-32-8
		BENZO(B)FLUORANTHENE	205-99-2
		BENZO(G,H,I)PERYLENE	191-24-2
		BENZO(K)FLUORANTHENE	207-08-9
		Benzoic acid	65-85-0
		BENZYL ALCOHOL	100-51-6
		BIS(2-CHLOROETHOXY)METHANE	111-91-1
		BIS(2-CHLOROETHYL)ETHER	111-44-4
		Bis(2-chloroisopropyl)ether	39638-32-9
		BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7
		BUTYL BENZYL PHTHALATE	85-68-7

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Organics - SVOCs	CAPROLACTAM	105-60-2
		CARBAZOLE	86-74-8
		CHLOROPHENOLS	58-90-2
		CHRYSENE	218-01-9
		DIBENZO(A,H)ANTHRACENE	53-70-3
		DIBENZOFURAN	132-64-9
		DIETHYL PHTHALATE	84-66-2
		DIMETHYL PHTHALATE	131-11-3
		DI-N-BUTYLPHTHALATE	84-74-2
		DI-N-OCTYLPHTHALATE	117-84-0
		FLUORANTHENE	206-44-0
		FLUORENE	86-73-7
		HEXACHLORO-1,3-BUTADIENE	87-68-3
		HEXACHLOROBENZENE	118-74-1
		HEXACHLOROCYCLOPENTADIENE	77-47-4
		HEXACHLOROETHANE (SVOC)	67-72-1
		INDENO(1,2,3-CD)PYRENE	193-39-5
		ISOPHORONE	78-59-1
		NAPHTHALENE (SVOC)	91-20-3S
		NITROBENZENE	98-95-3
		N-NITROSODIMETHYLAMINE	67-75-9
		N-NITROSO-DI-N-PROPYLAMINE	621-64-7
		N-NITROSODIPHENYLAMINE	86-30-6
		P-CHLOROANILINE	106-47-8
		PENTACHLOROPHENOL	87-86-5
		PHENANTHRENE	85-01-8
		PHENOL	108-95-2
		P-NITROANILINE	100-01-6
		PYRENE	129-00-0
	Organics - VOCs	1,1,1,2-TETRACHLOROETHANE	630-20-6
		1,1,1-TRICHLOROETHANE	71-55-6
		1,1,2,2-TETRACHLOROETHANE	79-34-5
		1,1,2-TRICHLOROETHANE	79-00-5
		1,1-DICHLOROETHANE	75-34-3
		1,1-DICHLOROETHYLENE	75-35-4
		1,2,3-TRICHLOROBENZENE	87-61-6
		1,2,3-TRICHLOROPROPANE	96-18-4
		1,2,3-TRIMETHYLBENZENE	526-73-8
		1,2,4-Trichlorobenzene (VOC)	120-82-1
		1,2,4-TRIMETHYLBENZENE	95-63-6
		1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8
		1,2-DIBROMOETHANE	106-93-4
		1,2-DICHLOROBENZENE	95-50-1
		1,2-DICHLOROETHANE	107-06-2
		1,2-DICHLOROPROPANE	78-87-5
		1,3,5-TRIMETHYLBENZENE	108-67-8
		1,3-DICHLOROBENZENE	541-73-1
		1,4-DICHLOROBENZENE	106-46-7
		2-BUTANONE (MEK)	78-93-3

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Organics - VOCs	2-HEXANONE	591-78-6
		2-METHYLNAPHTHALENE (VOC)	91-57-6V
		2-PROPANONE (ACETONE)	67-64-1
		4-METHYL-2-PENTANONE (MIBK)	108-10-1
		ACRYLONITRILE	107-13-1
		BENZENE	71-43-2
		BROMOBENZENE	108-86-1
		BROMOCHLOROMETHANE	74-97-5
		BROMODICHLOROMETHANE	75-27-4
		BROMOFORM	75-25-2
		BROMOMETHANE	74-83-9
		CARBON DISULFIDE	75-15-0
		CARBON TETRACHLORIDE	56-23-5
		CHLOROBENZENE	108-90-7
		CHLOROETHANE	75-00-3
		CHLOROFORM	67-66-3
		CHLOROMETHANE	74-87-3
		CIS-1,2-DICHLOROETHYLENE	156-59-2
		CIS-1,3-DICHLOROPROPYLENE	10061-01-5
		CYCLOHEXANE	110-82-7
		DIBROMOCHLOROMETHANE	124-48-1
		DIBROMOMETHANE	74-95-3
		DICHLORODIFLUOROMETHANE (CFC-12)	75-71-8
		DIETHYL ETHER	60-29-7
		DIISOPROPYL ETHER	108-20-3
		ETHYLBENZENE	100-41-4
		ETHYLTERTIARYBUTYLETHER	637-92-3
		HEXACHLOROETHANE (VOC)	67-72-1
		ISOPROPYLBENZENE	98-82-8
		M,P-XYLENE	1330-20-7
		METHYL IODIDE	74-88-4
		METHYLENE CHLORIDE	75-09-2
		METHYLTERTBUTYLETHER	1634-04-4
		NAPHTHALENE (VOC)	91-20-3V
		N-BUTYLBENZENE	104-51-8
		N-PROPYLBENZENE	103-65-1
		O-XYLENE	95-47-6
		P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6
		SEC-BUTYLBENZENE	135-98-8
		STYRENE	100-42-5
		TERT-BUTYLBENZENE	98-06-6
		TERTIARY BUTYL ALCOHOL	75-65-0
		TERTIARYAMYLMETHYLETHER	994-05-8
		TETRACHLOROETHYLENE	127-18-4
		TETRAHYDROFURAN	109-99-9
		TOLUENE	108-88-3
		TRANS-1,2-DICHLOROETHYLENE	156-60-5
		TRANS-1,3-DICHLOROPROPYLENE	10061-02-6
		TRANS-1,4-DICHLORO-2-BUTENE	110-57-6

Sample Matrix	Chemical Category	Analyte	CAS Number
Soil	Organics - VOCs	TRICHLOROETHYLENE	79-01-6
		TRICHLOROFLUOROMETHANE (CFC-11)	75-69-4
		VINYL CHLORIDE	75-01-4
		XYLENE - TOTAL	--
	Other - General Chemistry	PERCENT MOISTURE	MOIST
	Surrogate	2-Fluorobiphenyl	321-60-8
		Bromofluorobenzene	460-00-4
		Decachlorobiphenyl	2051-24-3
		Dibromofluoromethane	1868-53-7
		Nitrobenzene-d5	4165-60-0
		p-Terphenyl-d14	4165-60-0
		Tetrachloro-m-xylene	877-09-8
		Toluene-d8	2037-26-5
Surface Water	Field Param	Conductivity (field measure)	--
		DO (field measure)	--
		pH (field measure)	--
		Temperature (field measure)	--
		Turbidity (field measure)	--
	Inorganics - Cyanide	CYANIDE	57-12-5
	Inorganics - Metals	ALUMINUM	7429-90-5
		ANTIMONY	7440-36-0
		ARSENIC	7440-38-2
		BARIUM	7440-39-3
		BERYLLIUM	7440-41-7
		BORON	7440-42-8
		CADMIUM	7440-43-9
		CALCIUM	7440-70-2
		CHROMIUM	7440-47-3
		COBALT	7440-48-4
		COPPER	7440-50-8
		IRON	7439-89-6
		LEAD	7439-92-1
		LITHIUM	7439-93-2
		MAGNESIUM	7439-95-4
		MANGANESE	7439-96-5
		MERCURY	7439-97-6
		NICKEL	7440-02-0
		Potassium	7440-09-7
		SELENIUM	7782-49-2
		SILVER	7440-22-4
		SODIUM	7440-23-5
		THALLIUM	7440-28-0
		VANADIUM	7440-62-2
		ZINC	7440-66-6
	Organics - PCBs	AROCLOR-1016	12674-11-2
		AROCLOR-1221	11104-28-2
		AROCLOR-1232	11141-16-5
		AROCLOR-1242	53469-21-9
		AROCLOR-1248	12672-29-6

Sample Matrix	Chemical Category	Analyte	CAS Number
Surface Water	Organics - PCBs	AROCLOR-1254	11097-69-1
		AROCLOR-1260	11096-82-5
		AROCLOR-1262	37324-23-5
		AROCLOR-1268	11100-14-4
	Organics - PCBs total	TOTAL PCBS	TPCB
	Organics - SVOCs	1,1'-BIPHENYL	92-52-4
		1,2,4,5-TETRACHLOROBENZENE	95-94-3
		1,2,4-Trichlorobenzene (SVOC)	120-82-1
		2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1
		2,4,5-TRICHLOROPHENOL	95-95-4
		2,4,6-TRICHLOROPHENOL	88-06-2
		2,4-DICHLOROPHENOL	120-83-2
		2,4-DIMETHYLPHENOL	105-67-9
		2,4-DINITROPHENOL	51-28-5
		2,4-DINITROTOLUENE	121-14-2
		2,6-DINITROTOLUENE	606-20-2
		2-CHLORONAPHTHALENE	91-58-7
		2-CHLOROPHENOL	95-57-8
		2-METHYLNAPHTHALENE (SVOC)	91-57-6S
		2-METHYLPHENOL	95-48-7
		2-NITROANILINE	88-74-4
		2-NITROPHENOL	88-75-5
		3 & 4-METHYLPHENOL	108,394,106,445
		3,3'-DICHLOROBENZIDINE	91-94-1
		3-NITROANILINE	99-09-2
		4,6-DINITRO-2-METHYLPHENOL	534-52-1
		4-BROMOPHENYL PHENYL ETHER	101-55-3
		4-CHLORO-3-METHYLPHENOL	59-50-7
		4-CHLOROPHENYL PHENYL ETHER	7005-72-3
		4-METHYLPHENOL	106-44-5
		4-NITROPHENOL	100-02-7
		ACENAPHTHENE	83-32-9
		ACENAPHTHYLENE	208-96-8
		ACETOPHENONE	98-86-2
		ANTHRACENE	120-12-7
		ATRAZINE	1912-24-9
		BENZALDEHYDE	100-52-7
		BENZO(A)ANTHRACENE	56-55-3
		BENZO(A)PYRENE	50-32-8
		BENZO(B)FLUORANTHENE	205-99-2
		BENZO(G,H,I)PERYLENE	191-24-2
		BENZO(K)FLUORANTHENE	207-08-9
		Benzoic acid	65-85-0
		BENZYL ALCOHOL	100-51-6
		BIS(2-CHLOROETHOXY)METHANE	111-91-1
		BIS(2-CHLOROETHYL)ETHER	111-44-4
		Bis(2-chloroisopropyl)ether	39638-32-9
		BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7
		BUTYL BENZYL PHTHALATE	85-68-7

Sample Matrix	Chemical Category	Analyte	CAS Number
Surface Water	Organics - SVOCs	CAPROLACTAM	105-60-2
		CARBAZOLE	86-74-8
		CHLOROPHENOLS	58-90-2
		CHRYSENE	218-01-9
		DIBENZO(A,H)ANTHRACENE	53-70-3
		DIBENZOFURAN	132-64-9
		DIETHYL PHTHALATE	84-66-2
		DIMETHYL PHTHALATE	131-11-3
		DI-N-BUTYLPHTHALATE	84-74-2
		DI-N-OCTYLPHTHALATE	117-84-0
		FLUORANTHENE	206-44-0
		FLUORENE	86-73-7
		HEXACHLORO-1,3-BUTADIENE	87-68-3
		HEXACHLOROBENZENE	118-74-1
		HEXACHLOROCYCLOPENTADIENE	77-47-4
		HEXACHLOROETHANE (SVOC)	67-72-1
		INDENO(1,2,3-CD)PYRENE	193-39-5
		ISOPHORONE	78-59-1
		NAPHTHALENE (SVOC)	91-20-3S
		NITROBENZENE	98-95-3
		N-NITROSO-DI-N-PROPYLAMINE	621-64-7
		N-NITROSODIPHENYLAMINE	86-30-6
		P-CHLOROANILINE	106-47-8
		PENTACHLOROPHENOL	87-86-5
		PHENANTHRENE	85-01-8
		PHENOL	108-95-2
		P-NITROANILINE	100-01-6
		PYRENE	129-00-0
	Organics - VOCs	1,1,1,2-TETRACHLOROETHANE	630-20-6
		1,1,1-TRICHLOROETHANE	71-55-6
		1,1,2,2-TETRACHLOROETHANE	79-34-5
		1,1,2-TRICHLOROETHANE	79-00-5
		1,1-DICHLOROETHANE	75-34-3
		1,1-DICHLOROETHYLENE	75-35-4
		1,2,3-TRICHLOROBENZENE	87-61-6
		1,2,3-TRICHLOROPROPANE	96-18-4
		1,2,3-TRIMETHYLBENZENE	526-73-8
		1,2,4-Trichlorobenzene (VOC)	120-82-1
		1,2,4-TRIMETHYLBENZENE	95-63-6
		1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8
		1,2-DIBROMOETHANE	106-93-4
		1,2-DICHLOROBENZENE	95-50-1
		1,2-DICHLOROETHANE	107-06-2
		1,2-Dichloroethene (total)	12DCE
		1,2-DICHLOROPROPANE	78-87-5
		1,3,5-TRIMETHYLBENZENE	108-67-8
		1,3-DICHLOROBENZENE	541-73-1
		1,4-DICHLOROBENZENE	106-46-7
		1,4-DIOXANE	123-91-1

Sample Matrix	Chemical Category	Analyte	CAS Number
Surface Water	Organics - VOCs	2-BUTANONE (MEK)	78-93-3
		2-HEXANONE	591-78-6
		2-METHYLNAPHTHALENE (VOC)	91-57-6V
		2-PROPANONE (ACETONE)	67-64-1
		4-METHYL-2-PENTANONE (MIBK)	108-10-1
		ACRYLONITRILE	107-13-1
		BENZENE	71-43-2
		BROMOBENZENE	108-86-1
		BROMOCHLOROMETHANE	74-97-5
		BROMODICHLOROMETHANE	75-27-4
		BROMOFORM	75-25-2
		BROMOMETHANE	74-83-9
		CARBON DISULFIDE	75-15-0
		CARBON TETRACHLORIDE	56-23-5
		CHLORINATED FLUOROCARBON (FREON 113)	76-13-1
		CHLOROBENZENE	108-90-7
		CHLOROETHANE	75-00-3
		CHLOROFORM	67-66-3
		CHLOROMETHANE	74-87-3
		CIS-1,2-DICHLOROETHYLENE	156-59-2
		CIS-1,3-DICHLOROPROPYLENE	10061-01-5
		CYCLOHEXANE	110-82-7
		DIBROMOCHLOROMETHANE	124-48-1
		DIBROMOMETHANE	74-95-3
		DICHLORODIFLUOROMETHANE (CFC-12)	75-71-8
		DIETHYL ETHER	60-29-7
		DIISOPROPYL ETHER	108-20-3
		ETHYLBENZENE	100-41-4
		ETHYLTERTIARYBUTYLETHER	637-92-3
		HEXACHLOROETHANE (VOC)	67-72-1
		ISOPROPYLBENZENE	98-82-8
		M,P-XYLENE	1330-20-7
		M,P-XYLENE_(MP OR TOTAL?)	1330-20-7MP
		METHYL ACETATE	79-20-9
		METHYL IODIDE	74-88-4
		METHYLCYLOHEXANE	108-87-2
		METHYLENE CHLORIDE	75-09-2
		METHYLTERTBUTYLETHER	1634-04-4
		NAPHTHALENE (VOC)	91-20-3V
		N-BUTYLBENZENE	104-51-8
		N-PROPYLBENZENE	103-65-1
		O-XYLENE	95-47-6
		P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6
		SEC-BUTYLBENZENE	135-98-8
		STYRENE	100-42-5
		TERT-BUTYLBENZENE	98-06-6
		TERTIARY BUTYL ALCOHOL	75-65-0
		TERTIARYAMYLMETHYLETHER	994-05-8
		TETRACHLOROETHYLENE	127-18-4

Sample Matrix	Chemical Category	Analyte	CAS Number
Surface Water	Organics - VOCs	TETRAHYDROFURAN	109-99-9
		TOLUENE	108-88-3
		TRANS-1,2-DICHLOROETHYLENE	156-60-5
		TRANS-1,3-DICHLOROPROPYLENE	10061-02-6
		TRANS-1,4-DICHLORO-2-BUTENE	110-57-6
		TRICHLOROETHYLENE	79-01-6
		TRICHLOROFLUOROMETHANE (CFC-11)	75-69-4
		VINYL CHLORIDE	75-01-4
		XYLENE - TOTAL	--
	Other - General Chemistry	pH	PH
	Surrogate	2-Fluorobiphenyl	321-60-8
		Bromofluorobenzene	460-00-4
		Decachlorobiphenyl	2051-24-3
		Dibromofluoromethane	1868-53-7
		Nitrobenzene-d5	4165-60-0
		p-Terphenyl-d14	4165-60-0
		Tetrachloro-m-xylene	877-09-8
		Toluene-d8	2037-26-5
Surface Water - SPMD	Organics - PCB Congeners	PCB 017	--
		PCB 018	--
		PCB 022	--
		PCB 025	--
		PCB 026	--
		PCB 028	--
		PCB 031	--
		PCB 032	--
		PCB 033	--
		PCB 037-042	--
		PCB 040	--
		PCB 044	--
		PCB 045	--
		PCB 047	--
		PCB 049	--
		PCB 052	--
		PCB 056-060	--
		PCB 063	--
		PCB 064	--
		PCB 066-095	--
		PCB 070	--
		PCB 071	--
		PCB 074	--
		PCB 077a-110	--
		PCB 082	--
		PCB 084	--
		PCB 087	--
		PCB 090-101	--
		PCB 091	--
		PCB 092	--
		PCB 097	--

Sample Matrix	Chemical Category	Analyte	CAS Number
Surface Water - SPMD	Organics - PCB Congeners	PCB 099	--
		PCB 100	--
		PCB 105a	--
		PCB 118a	--
		PCB 126-178	--
		PCB 128	--
		PCB 130	--
		PCB 132	--
		PCB 135-144	--
		PCB 136	--
		PCB 137	--
		PCB 138a-163	--
		PCB 141	--
		PCB 146	--
		PCB 149	--
		PCB 151	--
		PCB 153	--
		PCB 156	--
		PCB 157	--
		PCB 158a	--
		PCB 167	--
		PCB 170	--
		PCB 171	--
		PCB 172	--
		PCB 174	--
		PCB 175	--
		PCB 177	--
		PCB 179	--
		PCB 180	--
		PCB 182-187	--
		PCB 183	--
		PCB 185	--
		PCB 190	--
		PCB 193	--
		PCB 194	--
		PCB 195	--
		PCB 196-203	--
		PCB 198	--
		PCB 199	--
		PCB 201	--
		PCB 205	--
		PCB 206	--
Waste - TCLP	Organics - PCBs total	TOTAL PCBS	TPCB
	Inorganics - Cyanide	CYANIDE	57-12-5
	Inorganics - General Chemi	Unionized Hydrogen Sulfide	18496-25-8
	Inorganics - Metals	ARSENIC	7440-38-2
		BARIUM	7440-39-3
		CADMIUM	7440-43-9
		CHROMIUM	7440-47-3

Sample Matrix	Chemical Category	Analyte	CAS Number
Waste - TCLP	Inorganics - Metals	LEAD	7439-92-1
		MERCURY	7439-97-6
		SELENIUM	7782-49-2
		SILVER	7440-22-4
	Organics - VOCs	1,1-DICHLOROETHYLENE	75-35-4
		1,2-DICHLOROETHANE	107-06-2
		2-BUTANONE (MEK)	78-93-3
		BENZENE	71-43-2
		CARBON TETRACHLORIDE	56-23-5
		CHLOROBENZENE	108-90-7
		CHLOROFORM	67-66-3
		TETRACHLOROETHYLENE	127-18-4
		TRICHLOROETHYLENE	79-01-6
		VINYL CHLORIDE	75-01-4