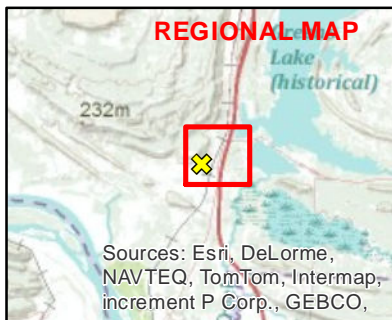




- LEGEND**
- Source Point
 - Operations Areas



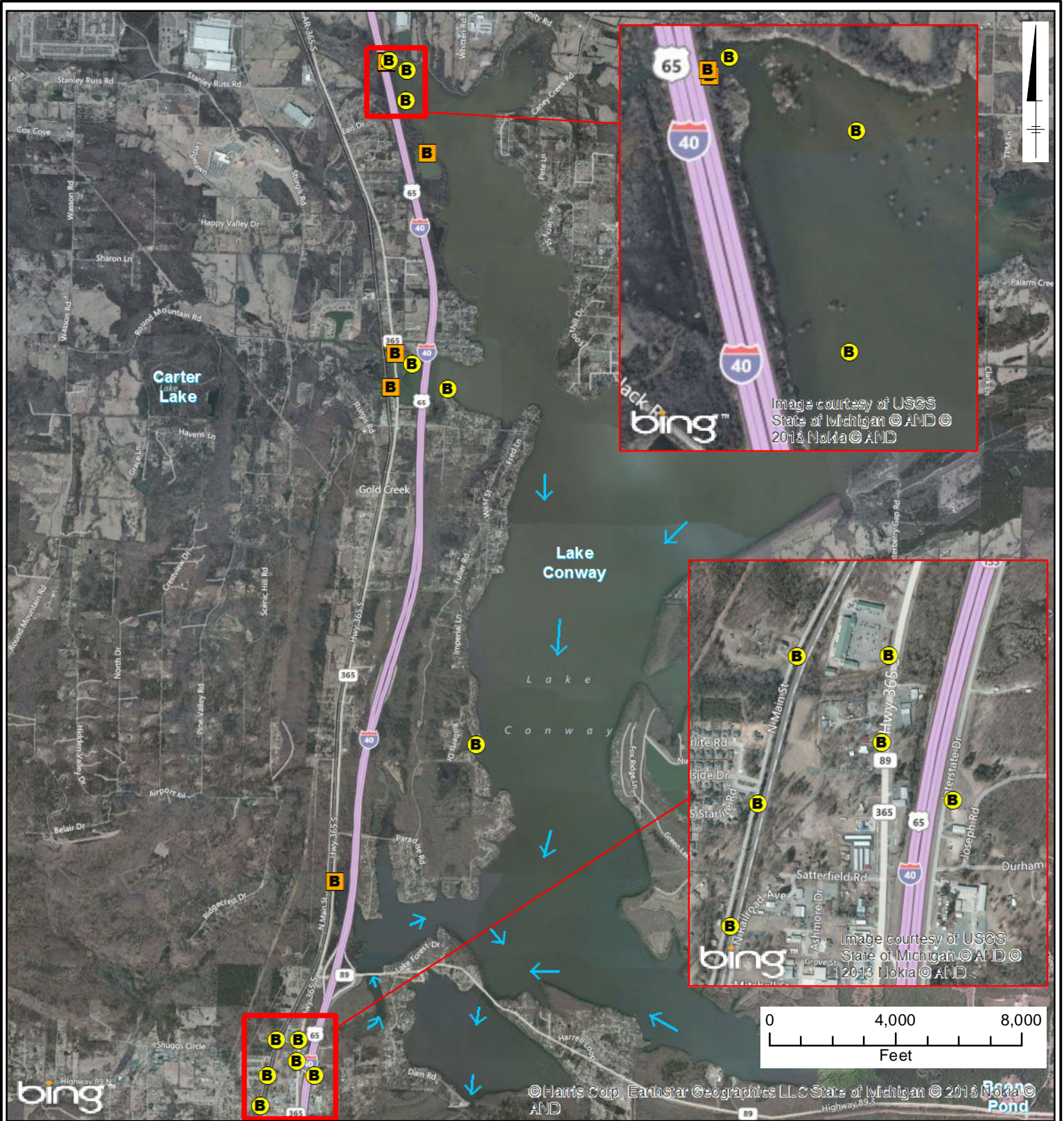
**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

SITE LOCATION MAP

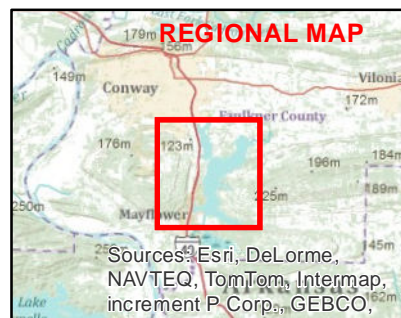
Map Date: 10/10/2013



**FIGURE
 1-1**



- LEGEND**
- B Background Sediment Sample
 - B Background Soil Sample
 - Approximate Surface Water Flow Direction



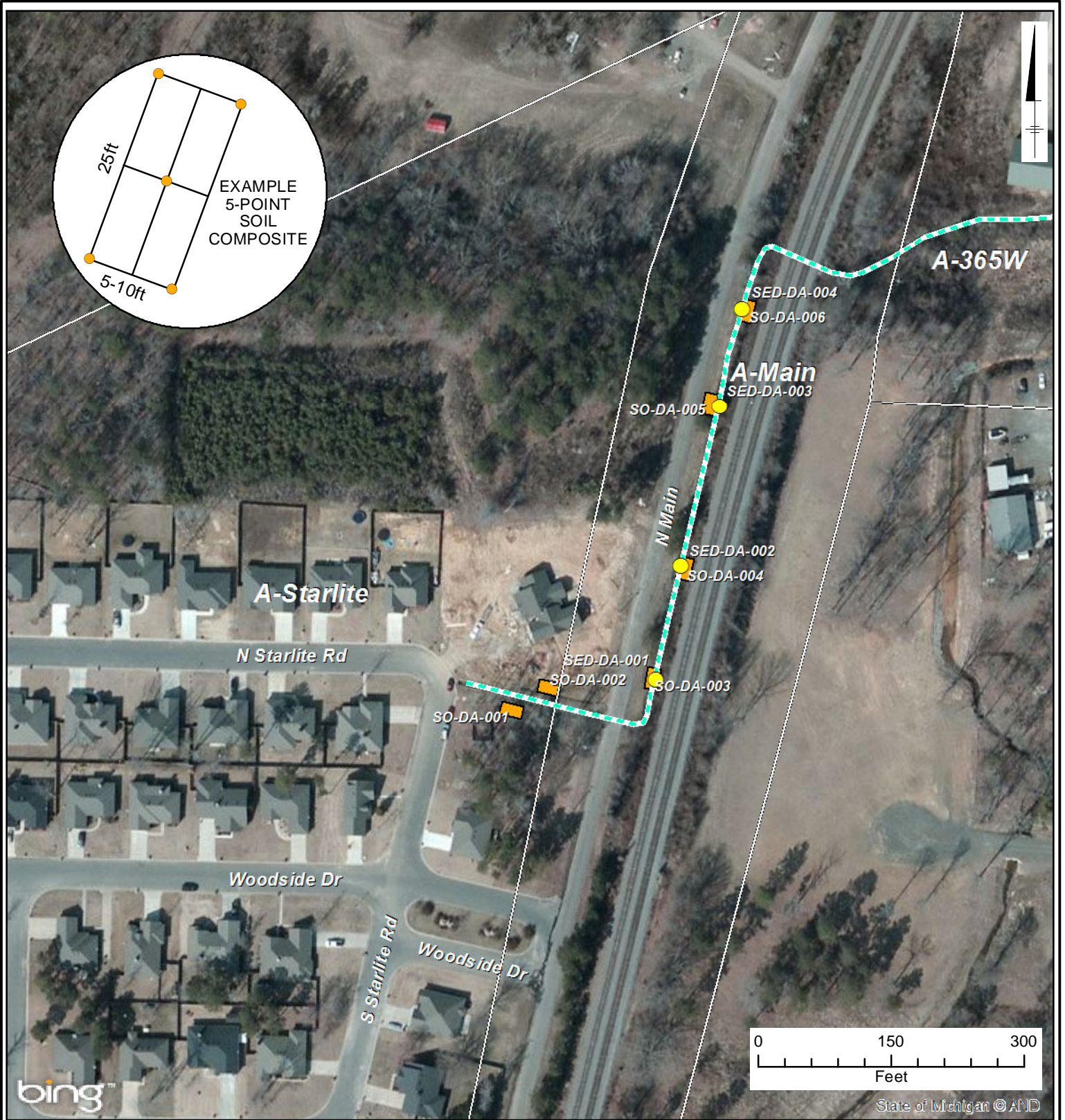
**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**BACKGROUND SOIL AND SEDIMENT
 SAMPLE LOCATIONS IN LAKE CONWAY
 AND DRAINAGE WAYS**



**FIGURE
1-2**

Map Date: 10/10/2013



- LEGEND**
- Sediment Sample
 - Soil Sample
 - - - Drainage Path
 - Operations Areas

NOTE:
 1. Surface soil samples were collected as five-point composite samples at locations shown. Example composite grid layout shown for illustrative purposes only; see Table 2-1 for actual sample grid dimensions at each location.

Map Date: 10/10/2013

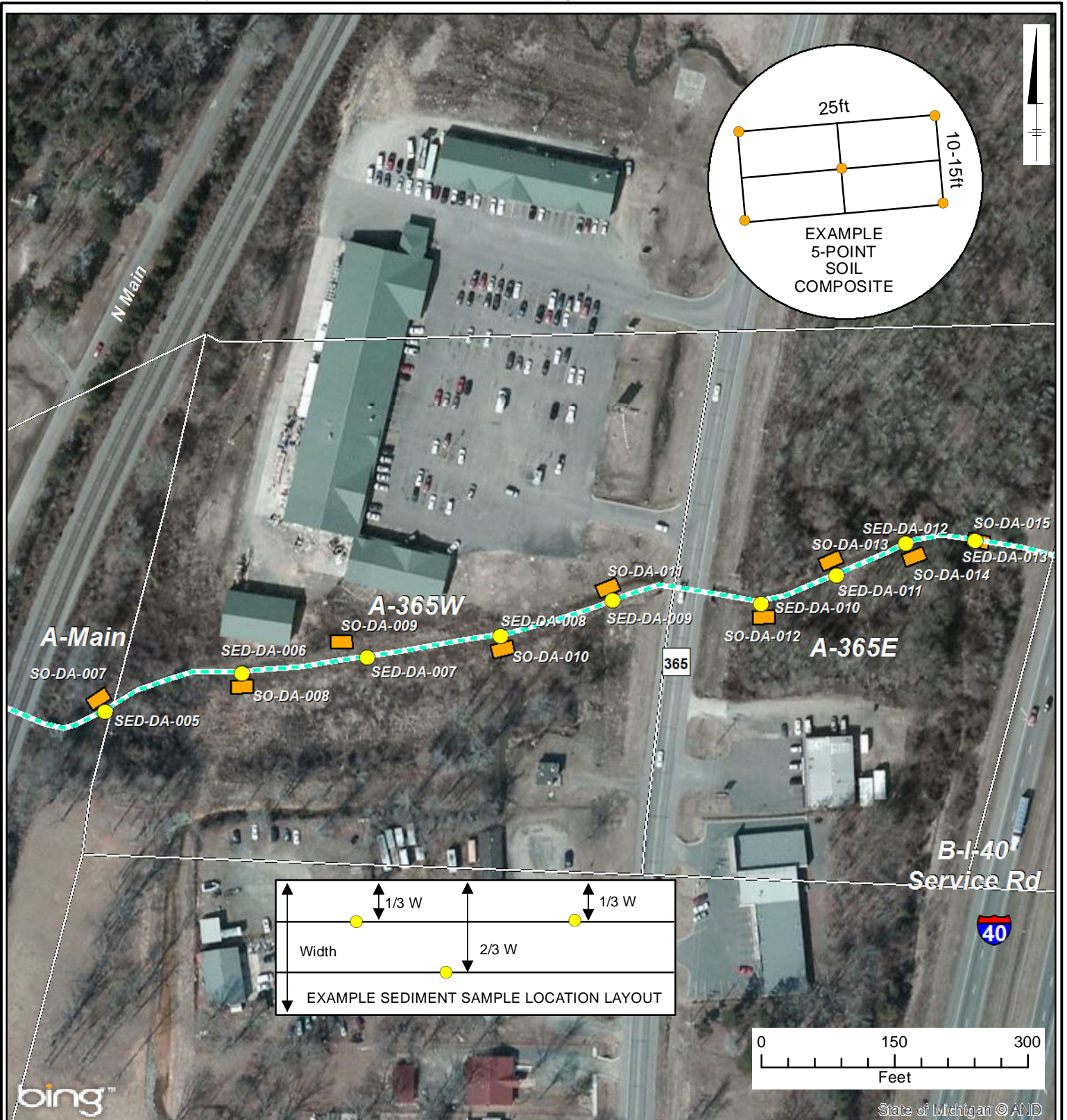


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL AND SEDIMENT SAMPLE
 LOCATIONS IN A-MAIN**



**FIGURE
 2-1**



LEGEND

- Sediment Sample
- Soil Sample
- Drainage Path
- Operations Areas

NOTE:
 1. Surface soil samples were collected as five-point composite samples at locations shown. Example composite grid layout shown for illustrative purposes only; see Table 2-1 for actual sample grid dimensions at each location.

Map Date: 10/10/2013

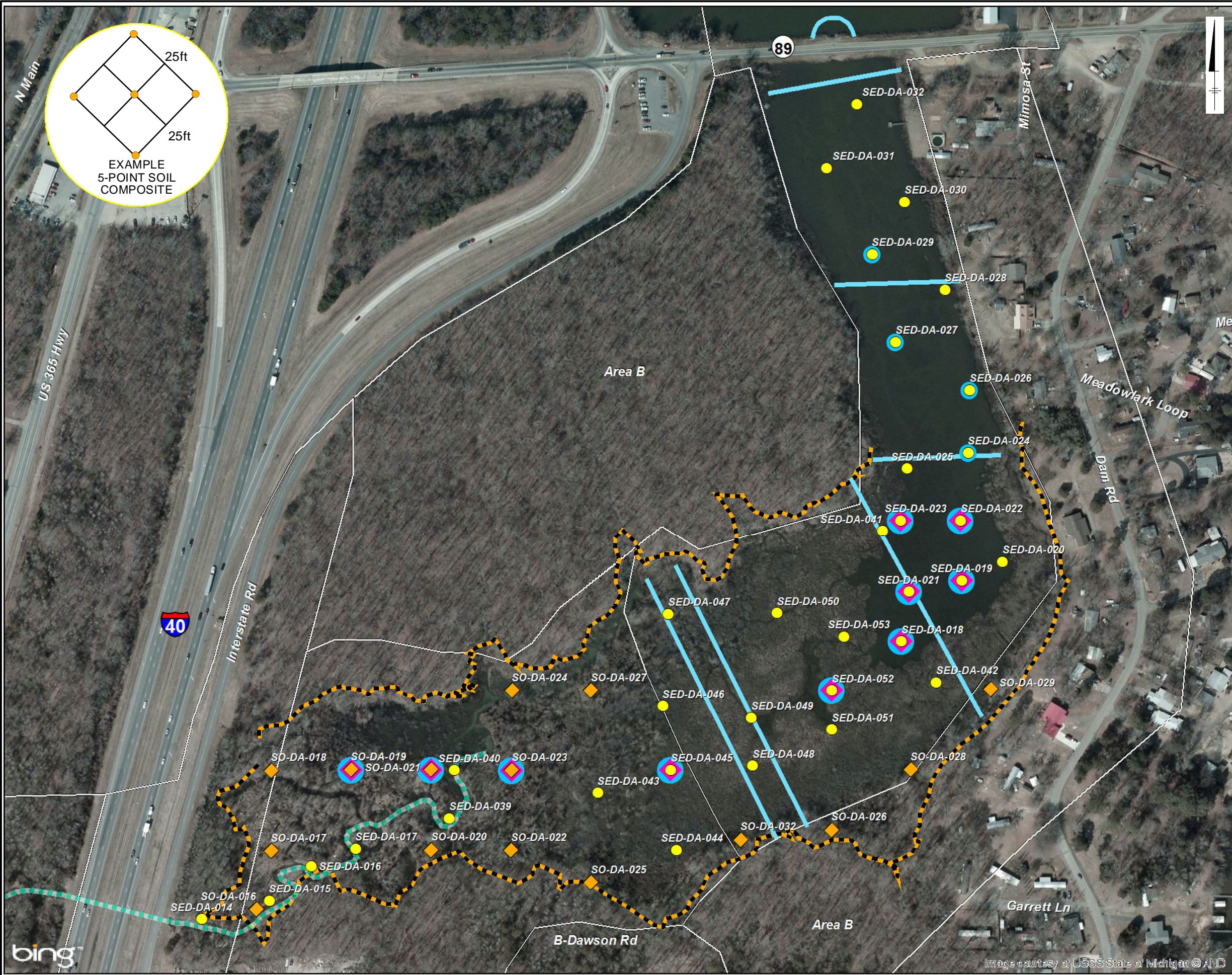
REGIONAL MAP

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO,

**MAYFLOWER PIPELINE INCIDENT RESPONSE
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 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

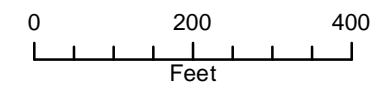
**SOIL AND SEDIMENT SAMPLE
 LOCATIONS IN A-365E & A-365W**

**FIGURE
 2-2**



- LEGEND**
- Sediment Sample
 - ◆ Soil Sample
 - ◆ Dart Sample Location
 - Deep Core Sample Location
 - ▭ Operations Areas
 - Approximate Oil Extent
 - Drainage Path
 - Approximate location of containment boom during sampling activities

- NOTES:**
1. Surface soil samples were collected as five-point composite samples at locations shown. Example composite grid layout shown for illustrative purposes only; see Table 2-1 for actual sample grid dimensions at each location.
 2. Extent of oiling along shoreline delineating by ARCADIS and The Response Group during response efforts in Dawson Cove (April 2013).

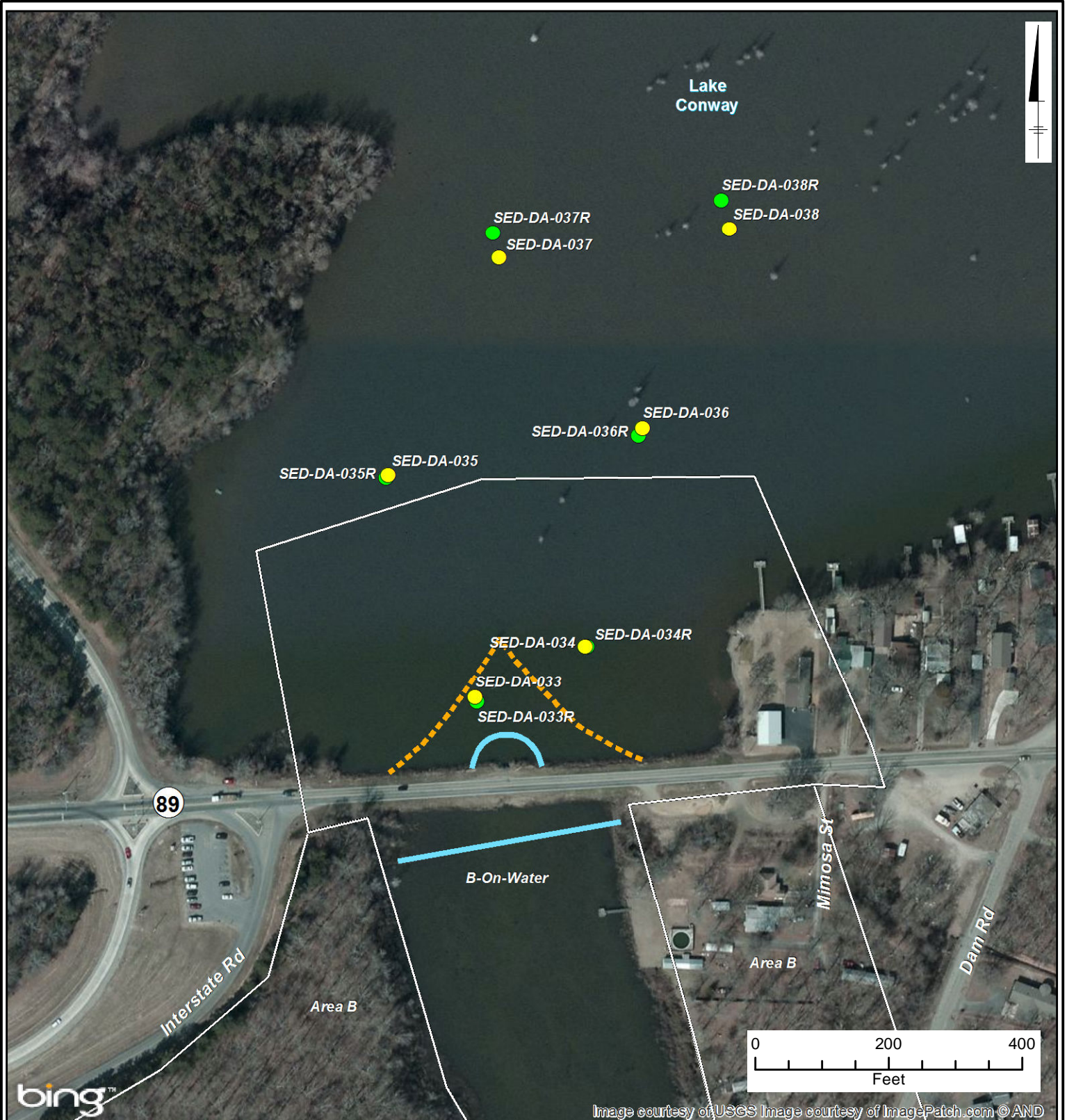


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
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**SOIL AND SEDIMENT SAMPLE
 LOCATIONS IN DAWSON COVE**



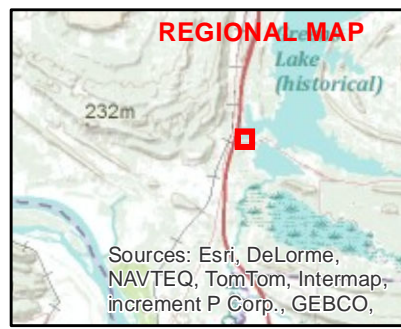
**FIGURE
 2-3**



Legend

- Sediment Sample Location
- Re-sampled Sediment Location
- Approximate location of containment boom during sampling activities
- Approximate locations of turbidity curtain during sampling activities
- Operations Areas

Map Date: 1/3/2014

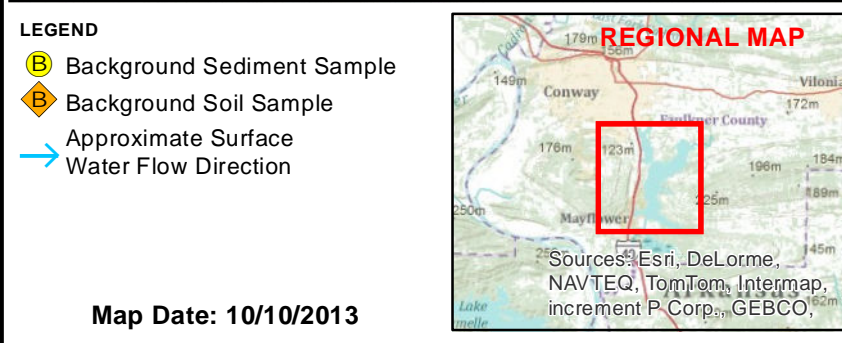
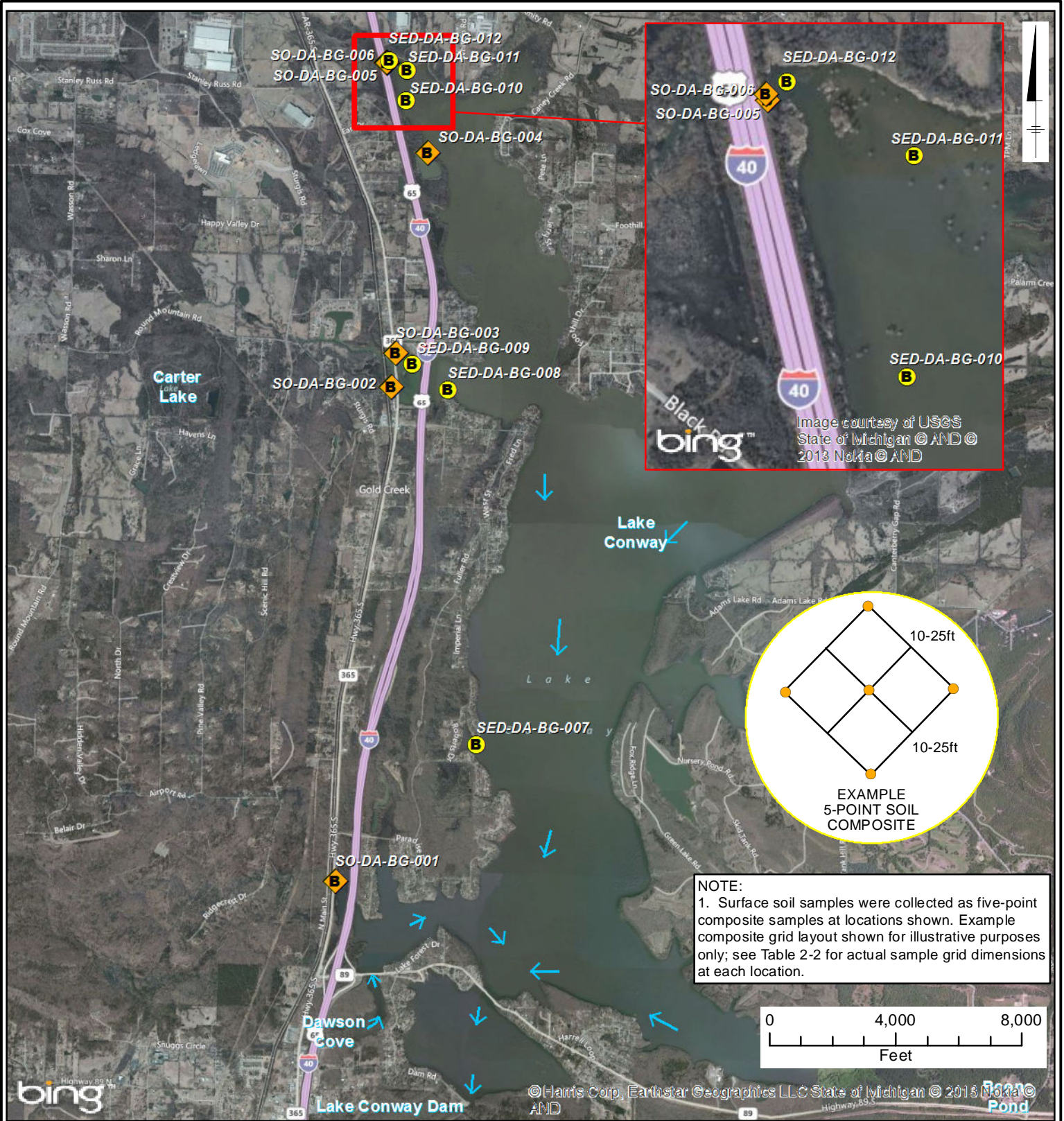


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLE LOCATIONS
 IN LAKE CONWAY**

ARCADIS

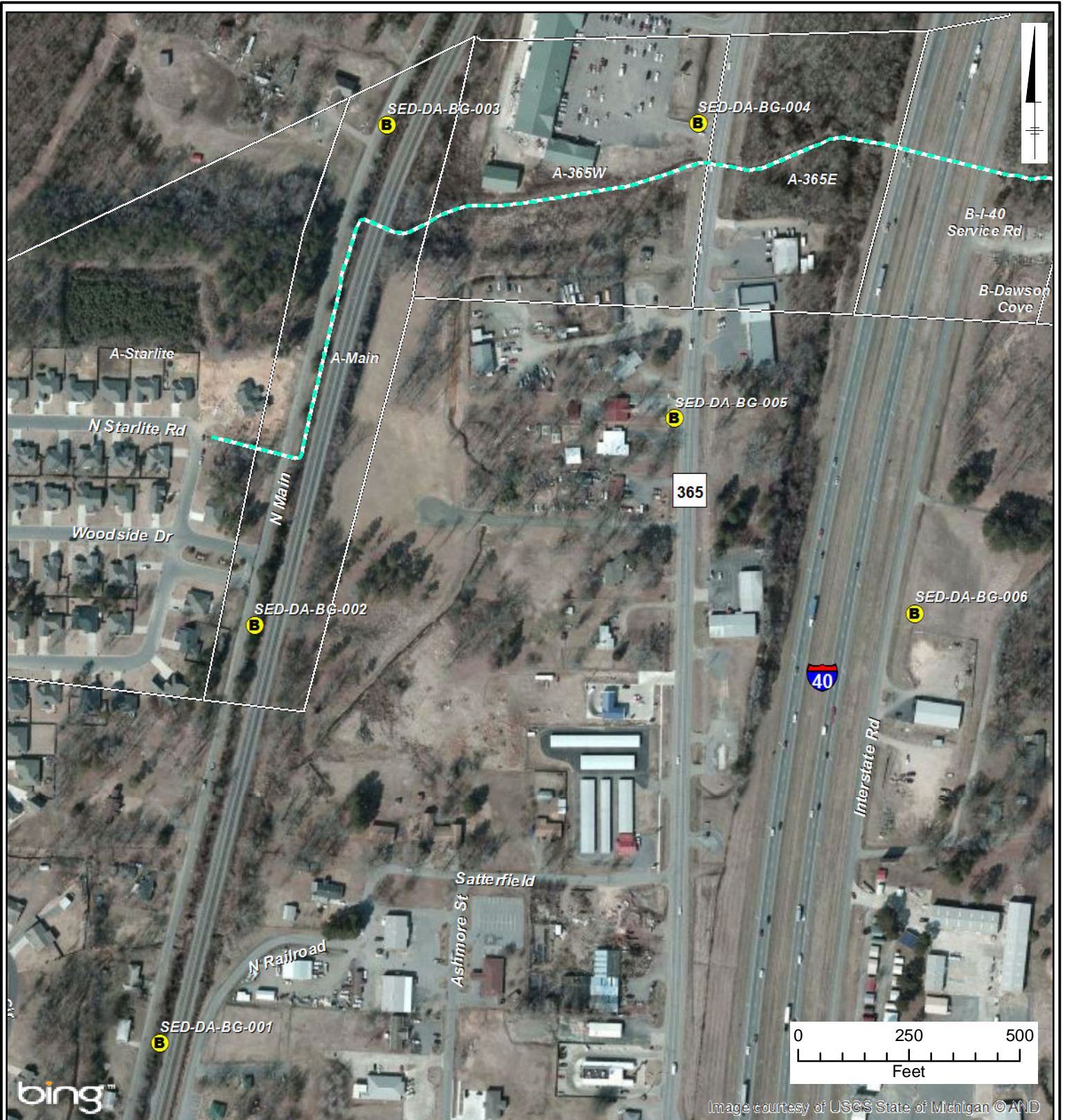
FIGURE
2-4




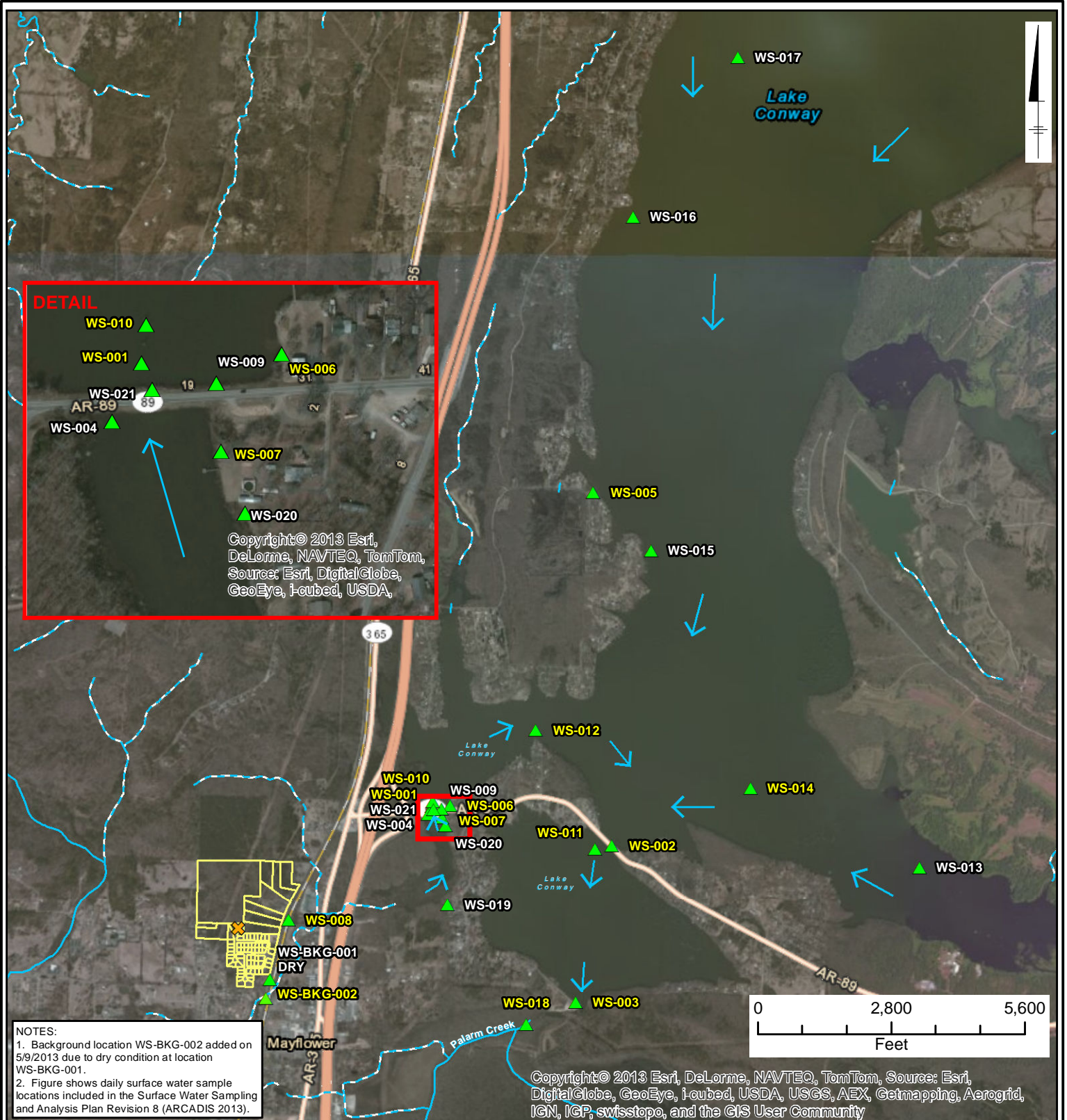
**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**BACKGROUND SOIL AND SEDIMENT
 SAMPLE LOCATIONS IN LAKE CONWAY**

**FIGURE
 2-5**



<p>LEGEND</p> <ul style="list-style-type: none"> B Background Sediment Sample - - - Drainage Path Operations Areas <p>Map Date: 10/10/2013</p>	<p style="text-align: center; color: red; font-weight: bold;">REGIONAL MAP</p> <p style="font-size: small;">Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO,</p>	<p>MAYFLOWER PIPELINE INCIDENT RESPONSE EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY DOWNSTREAM AREAS DATA ASSESSMENT REPORT</p> <hr/> <p>BACKGROUND SEDIMENT SAMPLE LOCATIONS UPSTREAM OF DRAINAGE WAY</p> <hr/> <div style="display: flex; justify-content: space-between; align-items: center;">  <div style="text-align: right;"> <p>FIGURE 2-6</p> </div> </div>
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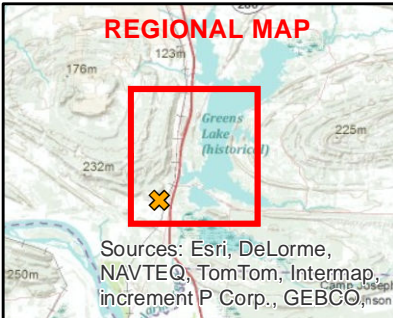
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NOTES:
 1. Background location WS-BKG-002 added on 5/9/2013 due to dry condition at location WS-BKG-001.
 2. Figure shows daily surface water sample locations included in the Surface Water Sampling and Analysis Plan Revision 8 (ARCADIS 2013).


- LEGEND**
- ▲ Surface Water Sample Location
 - WS-001** Daily Sampling Location ID
 - ✕ Source Point
 - Parcel Boundary
 - Stream/River: Intermittent
 - ~ Stream/River: Perennial
 - Approximate Surface Water Flow Direction

Map date: 1/3/2014

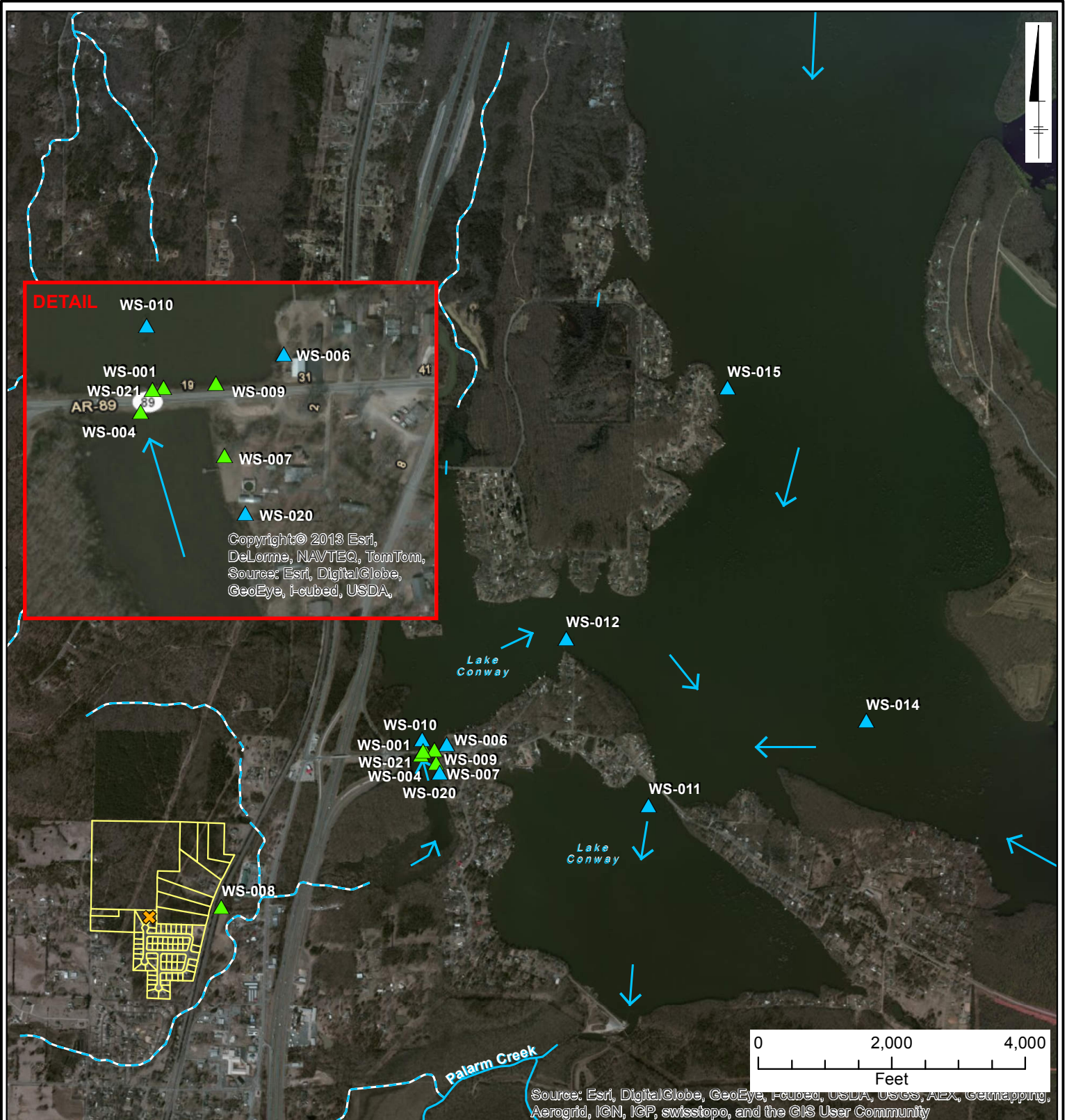


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**HISTORICAL AND DAILY
 SURFACE WATER SAMPLE LOCATIONS**



**FIGURE
 2-7**



LEGEND

- ▲ Surface Water Sample
- ▲ Locations Accessed by Foot
- ▲ Surface Water Sample
- ▲ Locations Accessed by Boat
- ✕ Source Point
- Parcel Boundary
- Approximate Surface Water Flow Direction
- Stream/River: Intermittent
- Stream/River: Perennial

Map date: 1/17/2014



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
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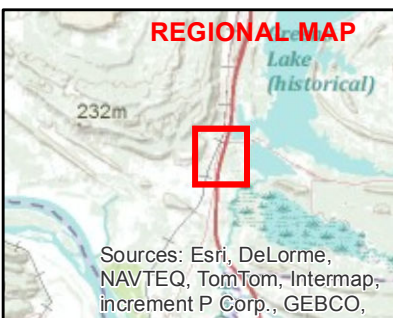
**WEEKLY SURFACE WATER
 SAMPLE LOCATIONS**

ARCADIS

**FIGURE
 2-8**



- LEGEND**
- ▲ One-time Surface Water Sample
 - - - Drainage Path
 - Approximate location of containment boom during sampling activities
 - Operations Areas



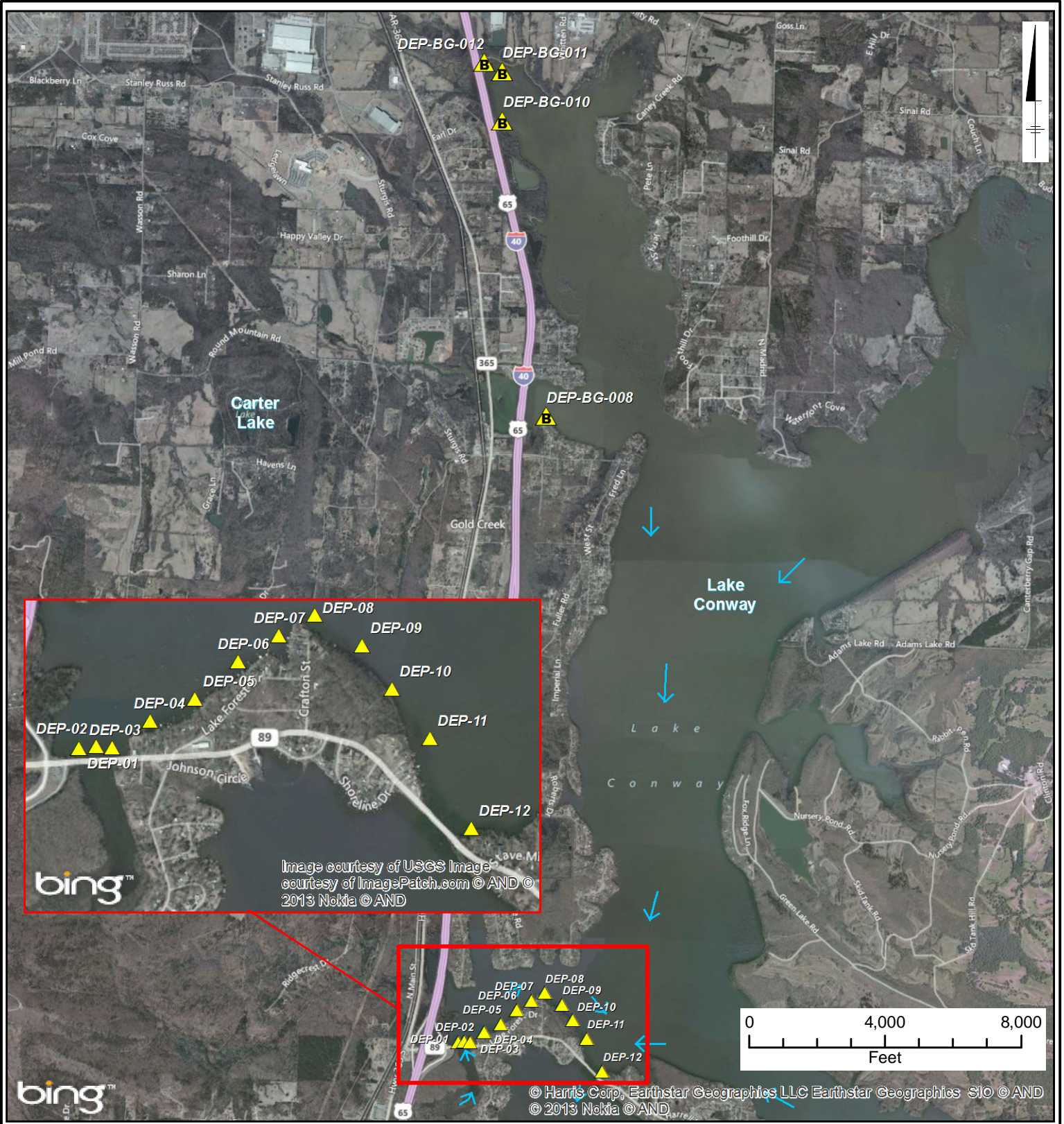
**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**DARSF SURFACE
 WATER SAMPLE LOCATIONS**



**FIGURE
 2-9**

Map Date: 1/7/2014



- LEGEND**
- ▲ Depositional Layer Assessment Locations
 - ▲ Background Depositional Layer Assessment Locations
 - Approximate Surface Water Flow Direction



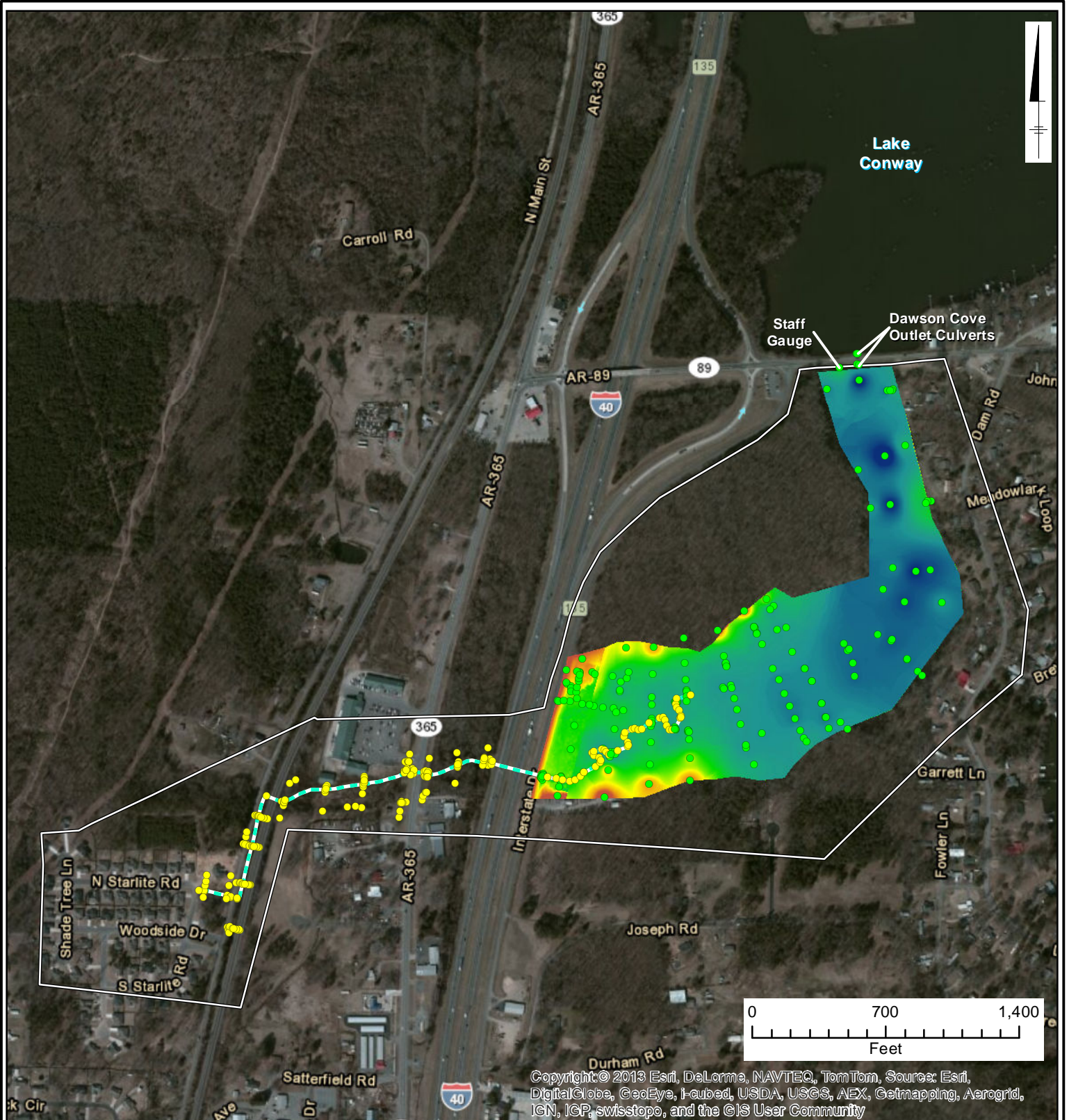
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 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**LAKE CONWAY DEPOSITIONAL
 LAYER ASSESSMENT LOCATIONS**

Map Date: 1/3/2014



**FIGURE
 2-10**

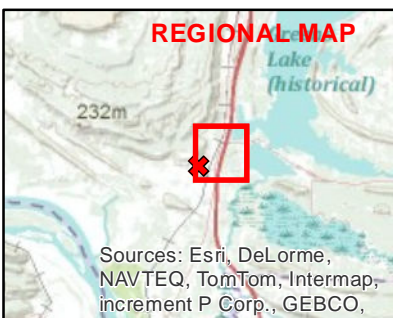


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- LEGEND**
- Survey Point Used In Interpolation
 - Survey Point
 - - - Drainage Path
 - Study Area
- Elevation in Feet**
- █ 279.6
 - █ 257.9

NOTE:
 1. Survey data collected during field activities interpolated by the Inverse Distance Weighting (IDW) method using an optimized power term to develop a digital elevation model (DEM) for the area shown.

Map Date: 10/10/2013

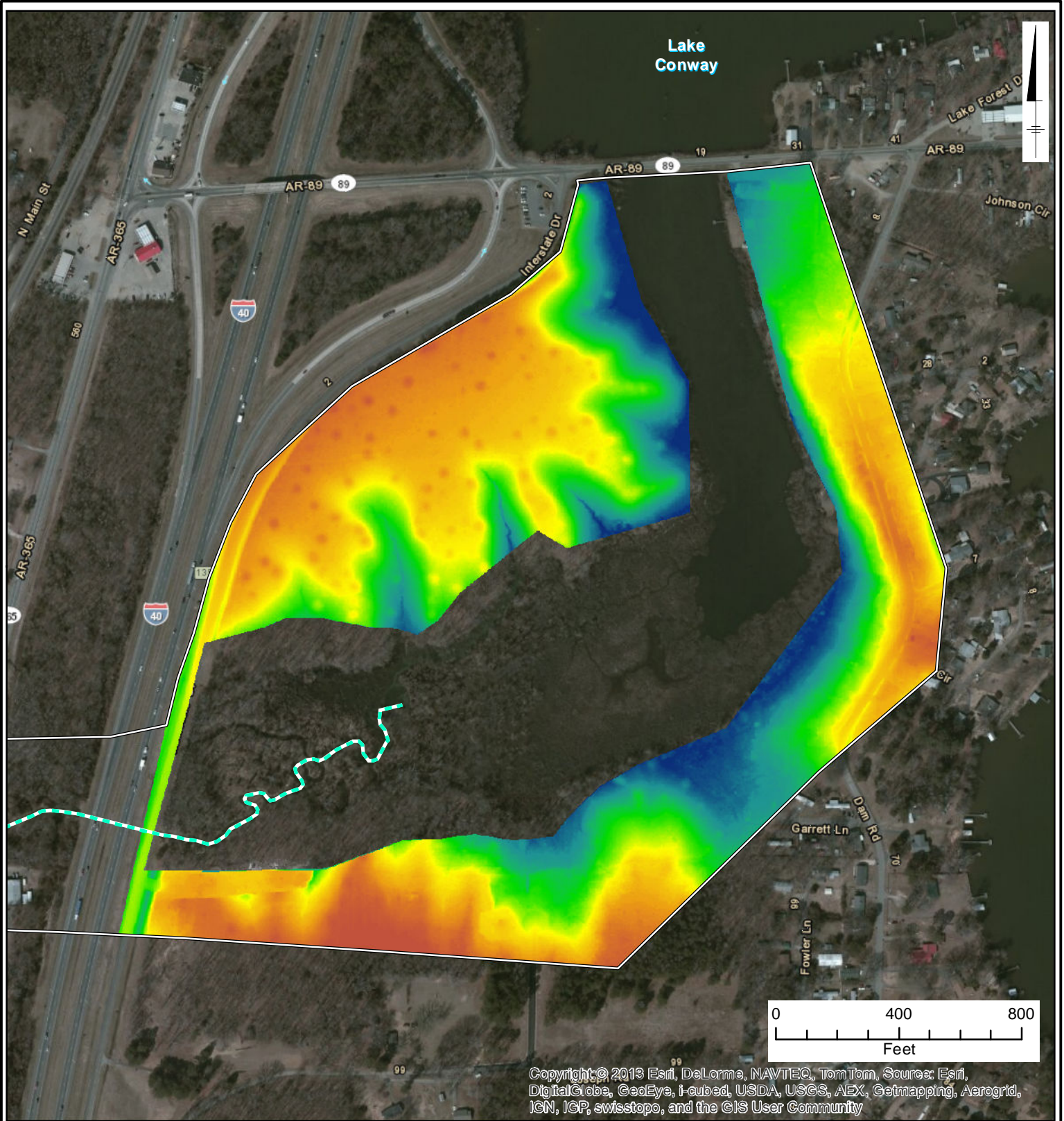


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

SITE LOCATION TOPOGRAPHIC SURVEY



**FIGURE
3-1**



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LEGEND

- Drainage Path
- Study Area

Elevation in Feet

287.2
260.7

NOTE:
 1. Topographic data from LIDAR dataset obtained from the United States Department of Agriculture (USDA) and supplemented by field survey information.

Map Date: 10/10/2013

REGIONAL MAP

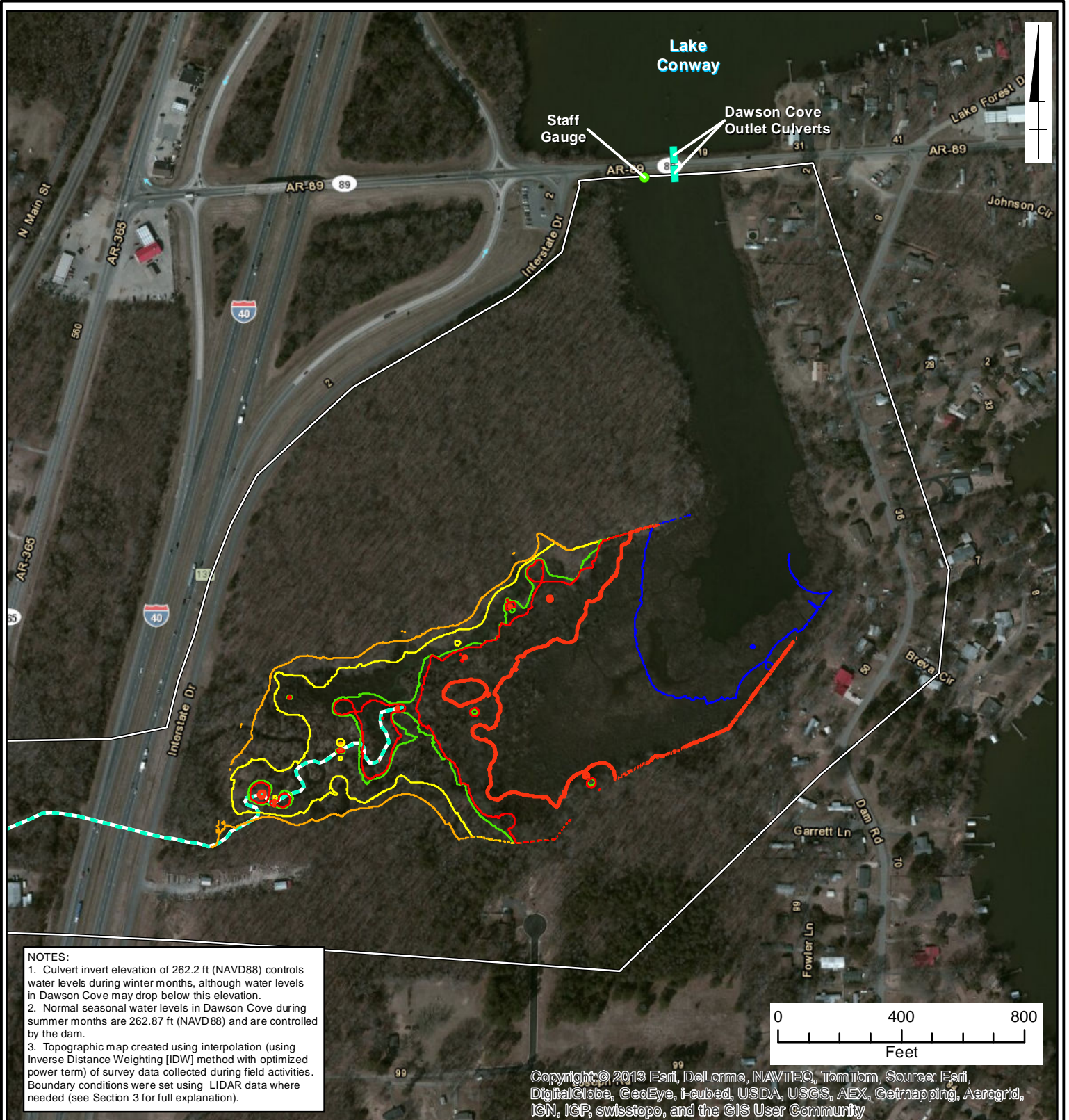
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO,

**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

LIDAR DATA IN DAWSON COVE AREA

ARCADIS

FIGURE 3-2



NOTES:
 1. Culvert invert elevation of 262.2 ft (NAVD88) controls water levels during winter months, although water levels in Dawson Cove may drop below this elevation.
 2. Normal seasonal water levels in Dawson Cove during summer months are 262.87 ft (NAVD88) and are controlled by the dam.
 3. Topographic map created using interpolation (using Inverse Distance Weighting [IDW] method with optimized power term) of survey data collected during field activities. Boundary conditions were set using LIDAR data where needed (see Section 3 for full explanation).

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Legend

- Outlet Culvert
- Staff Gauge
- Drainage Path
- Study Area

Contour Elevations

- 261 ft
- 262.2 ft
- 262.87 ft
- 263 ft
- 264 ft
- 265 ft

Map Date: 10/10/2013

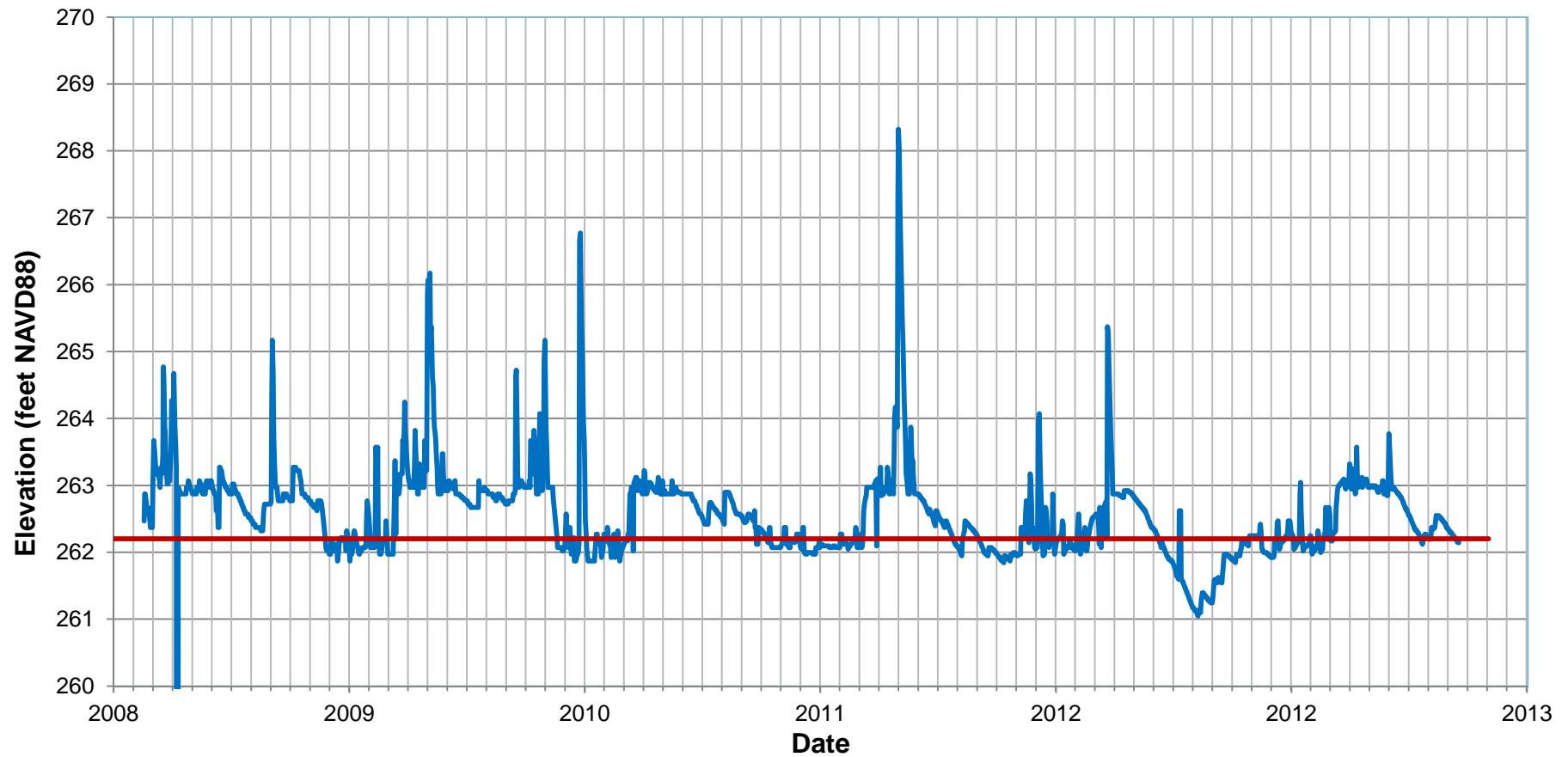
REGIONAL MAP

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO,

**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**TOPOGRAPHIC MAP OF
 DAWSON COVE AREA**

**FIGURE
 3-3**



— Lake Conway Peak Daily Water Elevation
 — Dawson Cove Invert Elevation

Notes:

1. Water elevation data are available from February 18, 2008 through September 16, 2013. The data are provided by Lake Manager, Mr. Matthew Horton (Arkansas Game and Fish Commission [AGFC], District 10 Lake Manager).
2. Water surface elevations are recorded at the gauge located near the AGFC Mayflower Enforcement Training Center.
3. Lake Conway levels on April 9 and 10, 2008 were reported as 236.12 feet and 236.02 feet (NAVD88). No additional information related to this data point is available at this time.

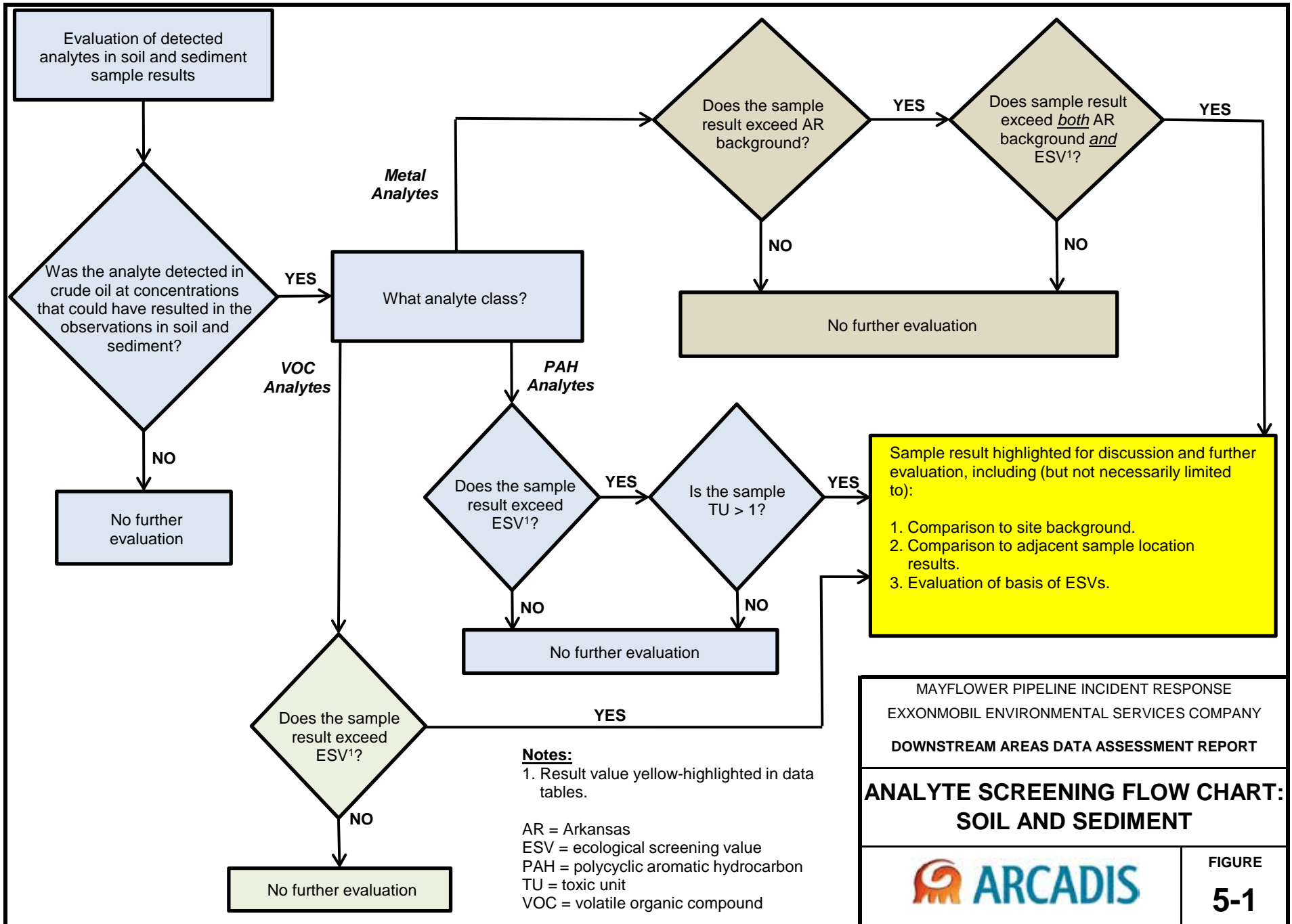
MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

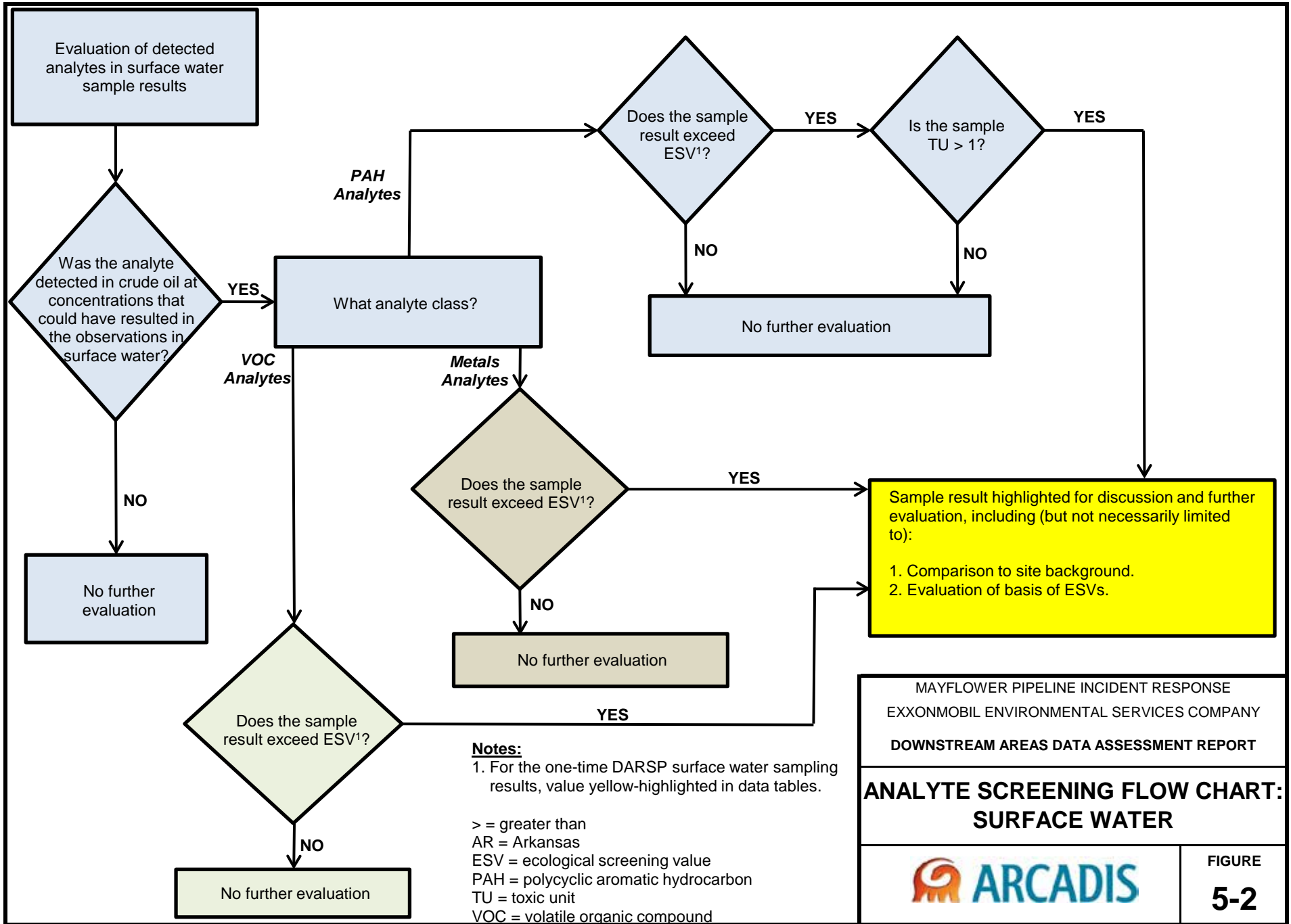
**Lake Conway Peak Daily Water
 Elevation Data**



FIGURE

3-4





SO-DA-BG-006	
Total HMW PAHs (Long List)	207
Total LMW PAHs (Long List)	136

SO-DA-BG-005	
Total HMW PAHs (Long List)	74.2
Total LMW PAHs (Long List)	196

SO-DA-BG-003	
Total HMW PAHs (Long List)	994
Total LMW PAHs (Long List)	353

SO-DA-BG-002	
Total HMW PAHs (Long List)	32.1
Total LMW PAHs (Long List)	67.8

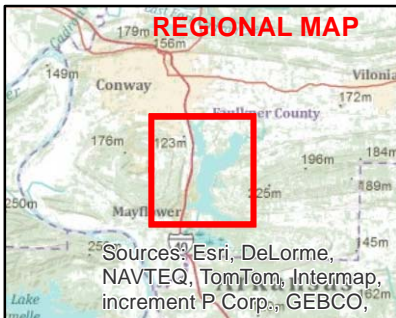
SO-DA-BG-001	
Total HMW PAHs (Long List)	168
Total LMW PAHs (Long List)	109

SO-DA-BG-004	
Total HMW PAHs (Long List)	348
Total LMW PAHs (Long List)	142



NOTES:
 1. All background data are from surface samples that were collected at depths of 0-0.5 foot below ground surface.
 2. Polycyclic Aromatic Hydrocarbon (PAH) concentrations are presented in micrograms per kilogram ($\mu\text{g}/\text{kg}$).
 3. PAH summations are based on the Long List of PAHs (Table 5-3).
 4. No PAH summations are above Ecological Screening Values.

- LEGEND**
- B Background Sediment Sample
 - S Background Soil Sample
 - Approximate Surface Water Flow Direction



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL BACKGROUND SAMPLING
 RESULTS: PAHs**



**FIGURE
 5-3.1**

Map Date: 10/11/2013

SO-DA-BG-006	
Nickel	50.9
Selenium	2.39
Silver	0.709

SO-DA-BG-005	
Nickel	30.6
Selenium	2.50
Silver	0.624

SO-DA-BG-003	
Nickel	17.2
Selenium	2.08 J
Silver	0.540 J

SO-DA-BG-002	
Nickel	11.5

SO-DA-BG-001	
Nickel	7.93
Selenium	1.13 J
Silver	0.219 J

SED-DA-BG-012
SED-DA-BG-011
SED-DA-BG-010

SO-DA-BG-004	
Nickel	10.8

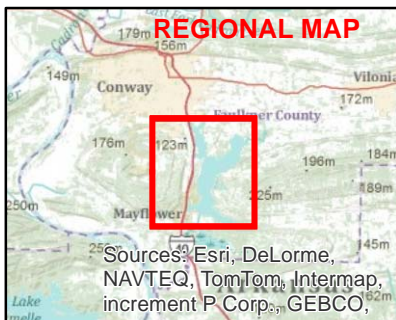
SED-DA-BG-009
SED-DA-BG-008

SED-DA-BG-007



NOTES:
 1. All background data are from surface samples that were collected at depths of 0-0.5 foot below ground surface.
 2. Metals concentrations are presented in milligrams per kilogram.
 3. Yellow highlighted cells identify concentrations above the Arkansas Background and Ecological Screening Values.
 4. Only detected concentrations of nickel, selenium, and silver are shown.

- LEGEND**
- B Background Sediment Sample
 - S Background Soil Sample
 - Approximate Surface Water Flow Direction



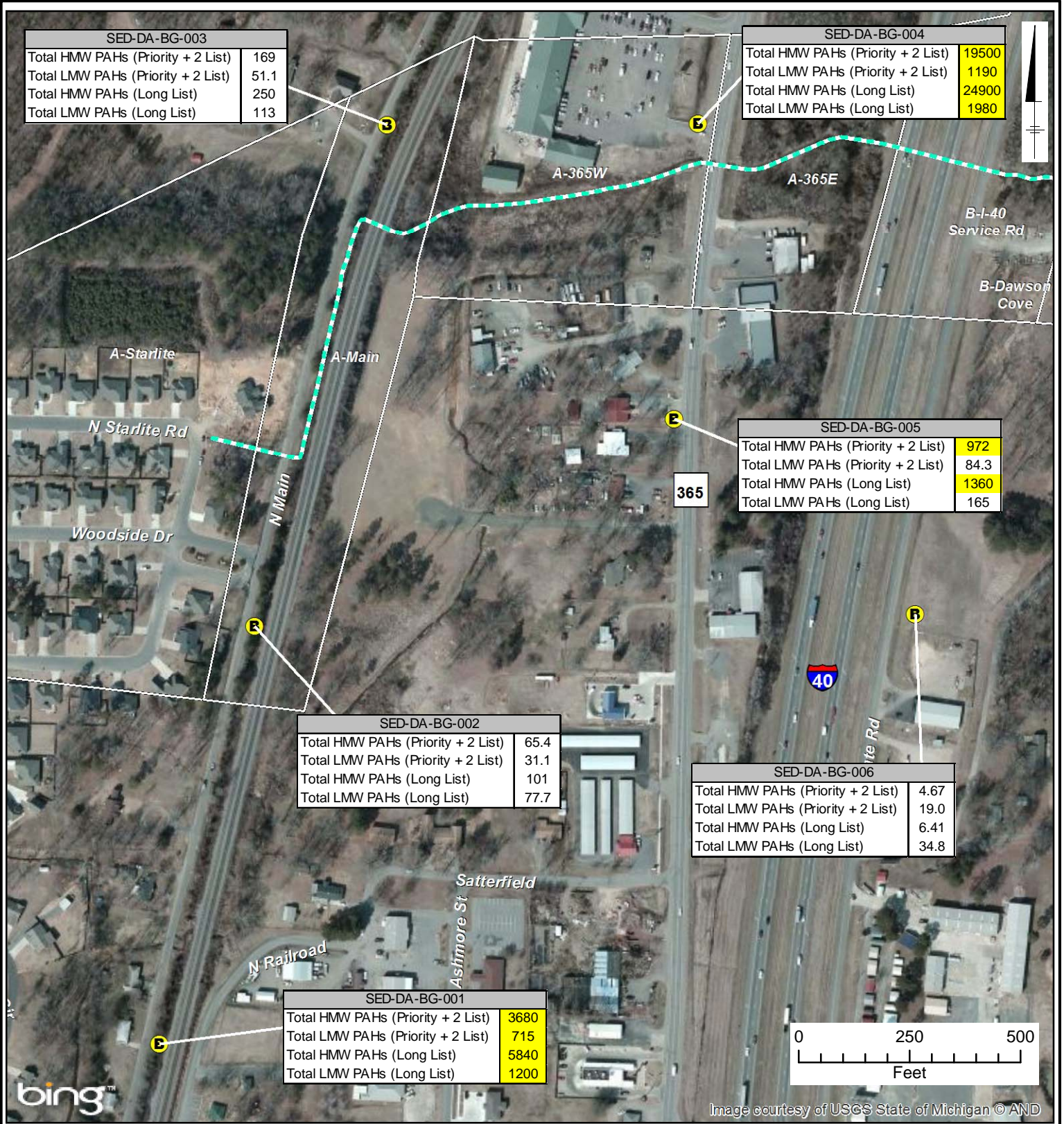
**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL BACKGROUND SAMPLING
 RESULTS: METALS**



**FIGURE
 5-3.2**

Map Date: 10/10/2013



LEGEND

- B Background Sediment Sample
- Drainage Path
- Operations Areas

NOTES:


- All background data are from surface samples that were collected at depths of 0-0.5 foot below sediment surface.
- Polycyclic Aromatic Hydrocarbon (PAH) concentrations are presented in micrograms per kilogram ($\mu\text{g}/\text{kg}$).
- PAH summations are based on the Priority+2 List and the Long List of PAHs (Table 5-3).

Map Date: 10/11/2013

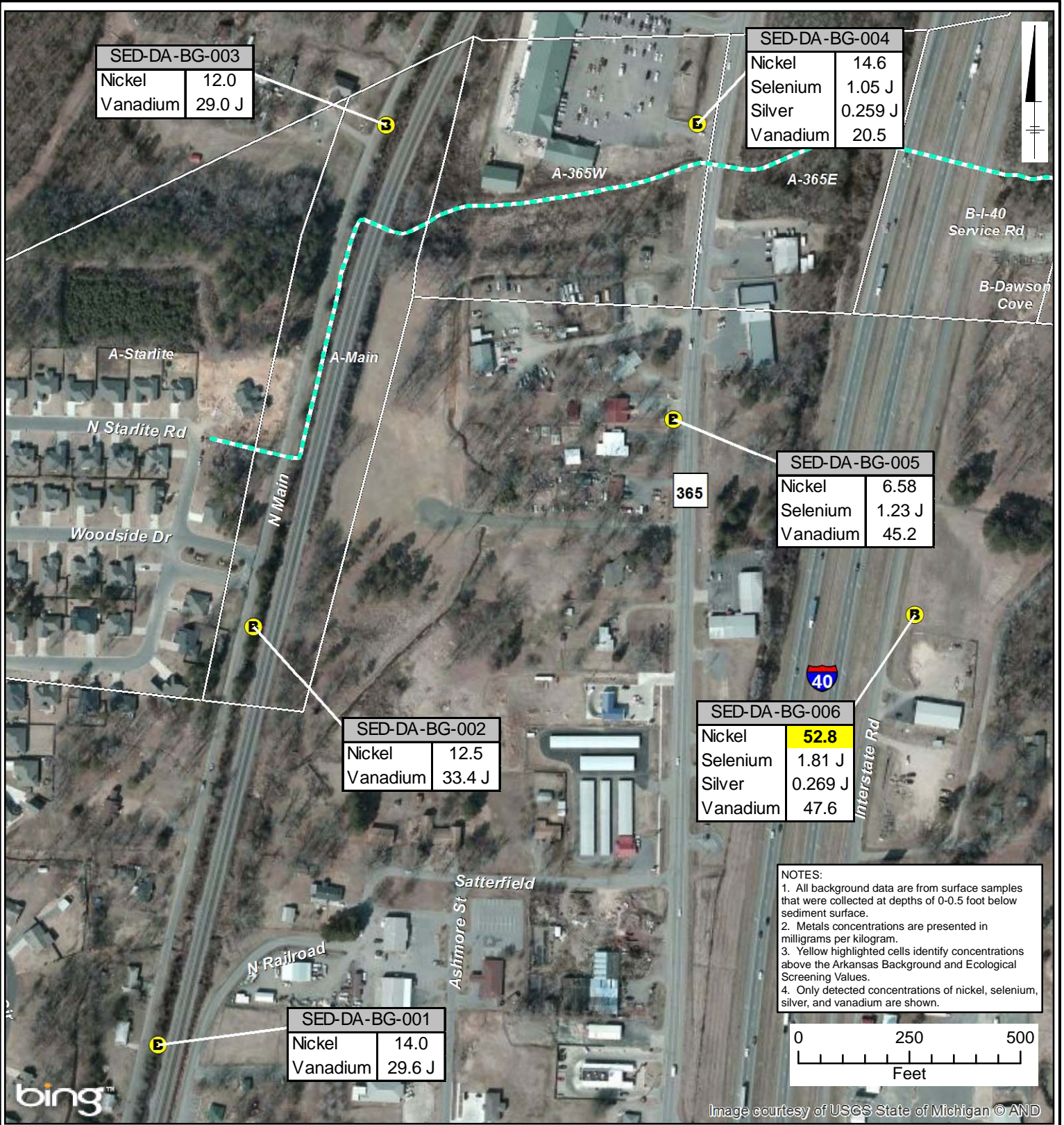


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**DRAINAGE WAY SEDIMENT BACKGROUND
 SAMPLING RESULTS: PAHs**



**FIGURE
5-4.1**



LEGEND


- ⓑ Background Sediment Sample
- Drainage Path
- ▭ Operations Areas



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**DRAINAGE WAY SEDIMENT BACKGROUND
 SAMPLING RESULTS: METALS**

FIGURE 5-4.2



Map Date: 10/10/2013

SED-DA-BG-012	
Total HMW PAHs (Priority + 2 List)	901
Total LMW PAHs (Priority + 2 List)	164
Total HMW PAHs (Long List)	2150
Total LMW PAHs (Long List)	1460

SED-DA-BG-011	
Total HMW PAHs (Priority + 2 List)	653
Total LMW PAHs (Priority + 2 List)	182
Total HMW PAHs (Long List)	1140
Total LMW PAHs (Long List)	626



SED-DA-BG-010	
Total HMW PAHs (Priority + 2 List)	477
Total LMW PAHs (Priority + 2 List)	150
Total HMW PAHs (Long List)	1140
Total LMW PAHs (Long List)	668

SED-DA-BG-009	
Total HMW PAHs (Priority + 2 List)	124
Total LMW PAHs (Priority + 2 List)	67.1
Total HMW PAHs (Long List)	548
Total LMW PAHs (Long List)	227

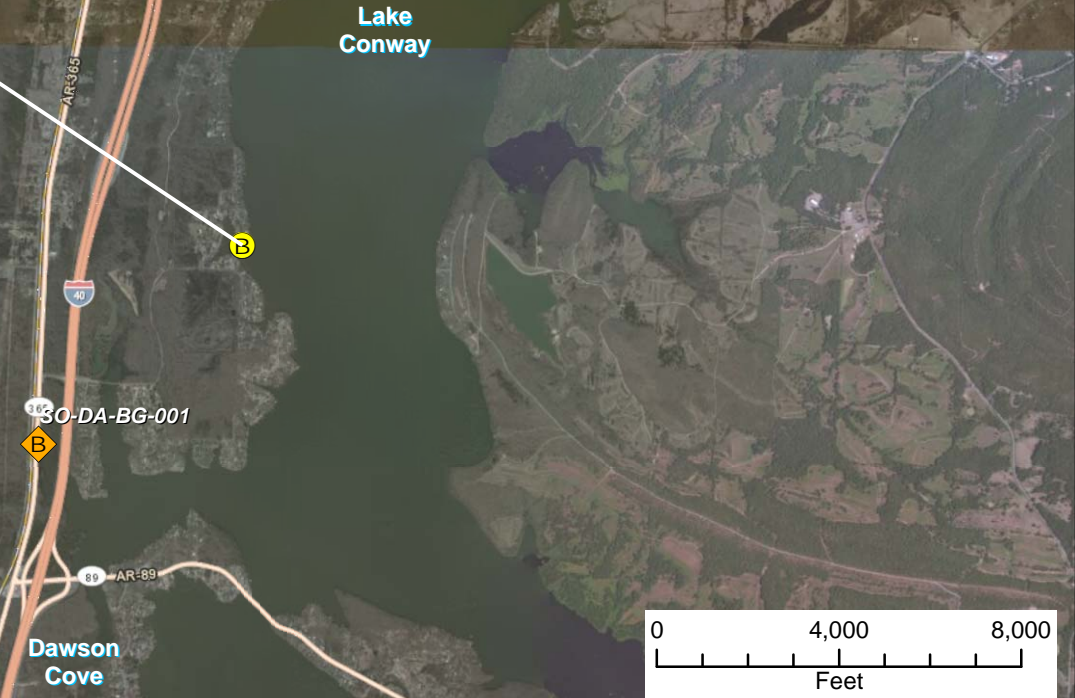
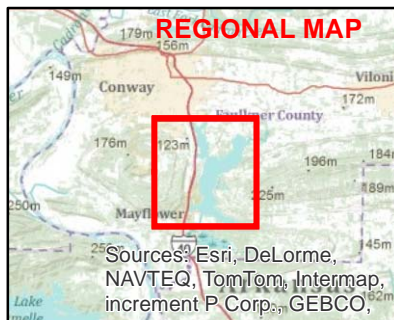
SED-DA-BG-008	
Total HMW PAHs (Priority + 2 List)	220
Total LMW PAHs (Priority + 2 List)	118
Total HMW PAHs (Long List)	1210
Total LMW PAHs (Long List)	303

SED-DA-BG-007	
Total HMW PAHs (Priority + 2 List)	525
Total LMW PAHs (Priority + 2 List)	155
Total HMW PAHs (Long List)	1440
Total LMW PAHs (Long List)	398

NOTES:
 1. All background data are from surface samples that were collected at depths of 0-0.5 foot below ground surface.
 2. Polycyclic Aromatic Hydrocarbon (PAH) concentrations are presented in micrograms per kilogram ($\mu\text{g}/\text{kg}$).
 3. PAH summations are based on the Long List of PAHs (Table 5-3).
 4. Yellow highlighted cells identify concentrations above the Ecological Screening Values.

- LEGEND**
-  Background Sediment Sample
 -  Background Soil Sample

Map Date: 10/11/2013

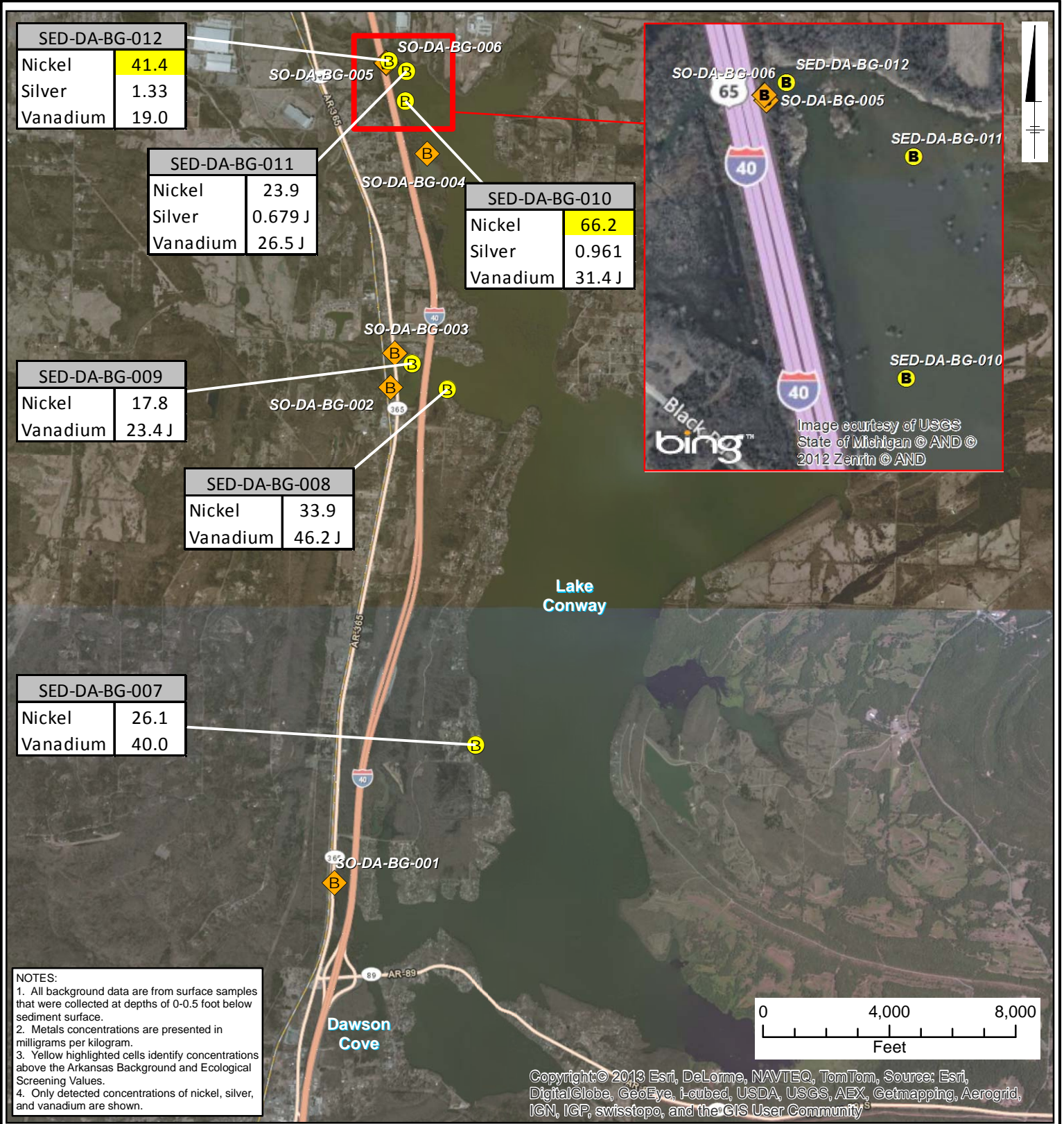


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

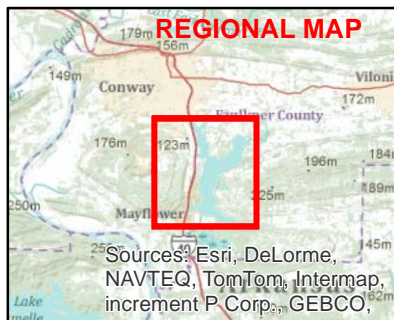
**LAKE CONWAY SEDIMENT BACKGROUND
 SAMPLING RESULTS: PAHs**



**FIGURE
 5-5.1**



- LEGEND**
- Ⓟ Background Sediment Sample
 - Ⓛ Background Soil Sample



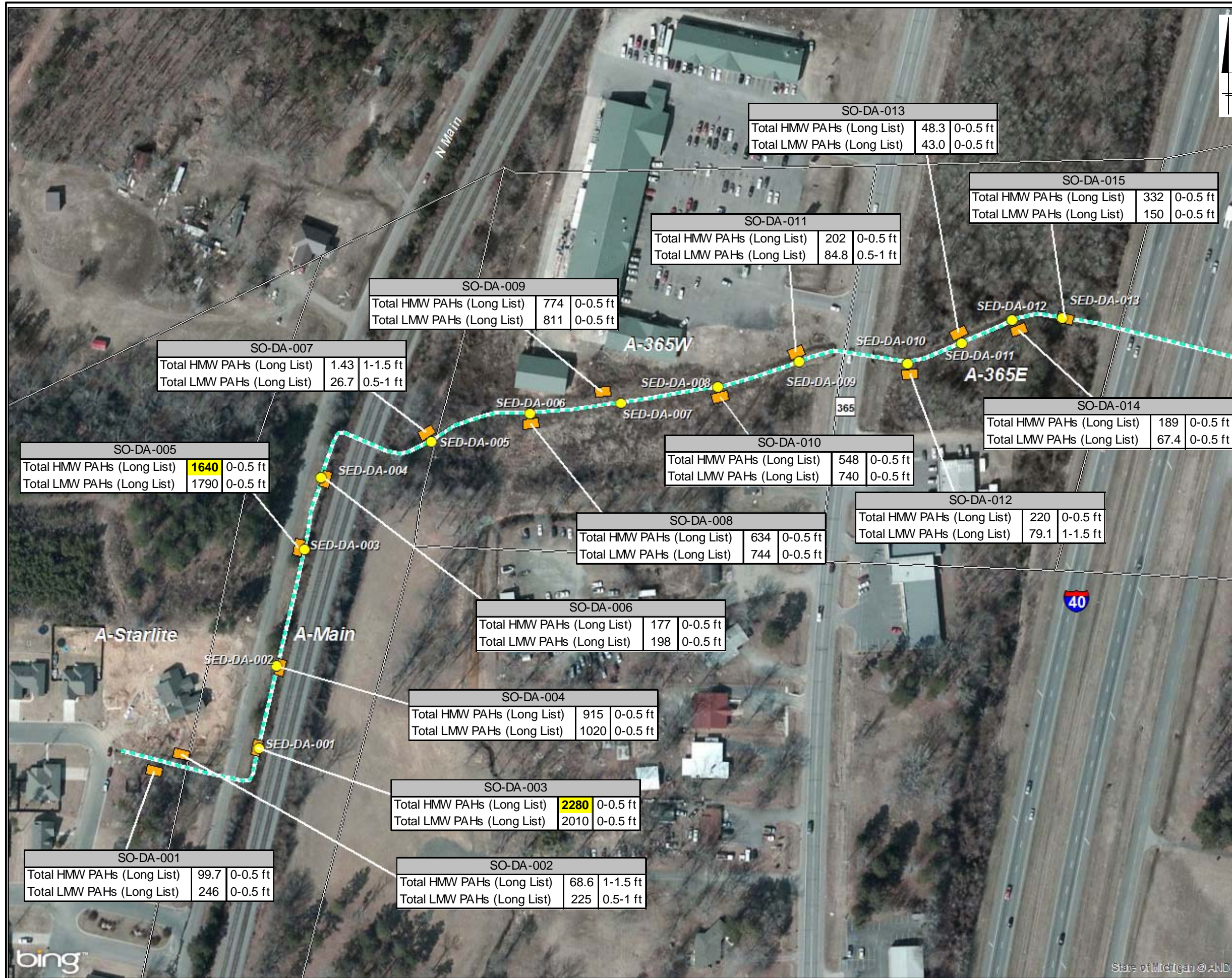
**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**LAKE CONWAY SEDIMENT BACKGROUND
 SAMPLING RESULTS: METALS**

Map Date: 10/11/2013



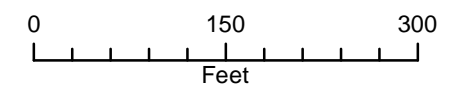
FIGURE
5-5.2



- LEGEND**
- Sediment Sample
 - Soil Sample
 - - - Drainage Path
 - Operations Areas

NOTES:

1. Data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
2. Polycyclic Aromatic Hydrocarbon concentrations are presented in micrograms per kilogram (µg/kg).
3. Yellow highlighted cells identify concentrations above the Ecological Screening Values.
4. PAH summations are based on the Long List of PAHs (Table 5-3).

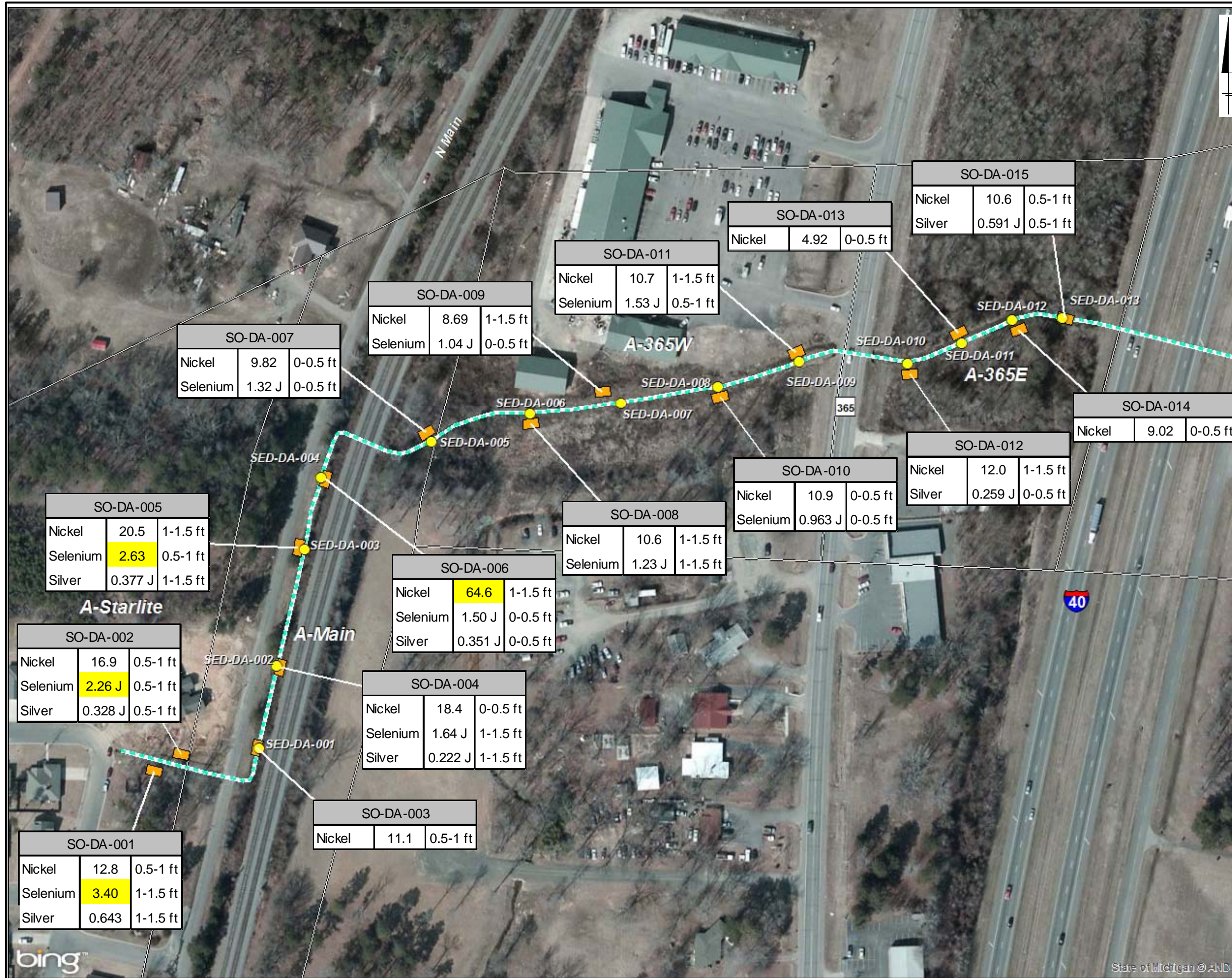


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL SAMPLING RESULTS IN DRAINAGE
 WAYS: PAHs**



**FIGURE
 6-1.1**

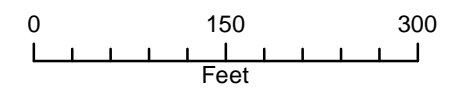


LEGEND

- Sediment Sample
- Soil Sample
- - - Drainage Path
- Operations Areas

NOTE:

1. Metals were analyzed in cores collected from 0-1.5 feet bgs; data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
2. Only detected concentrations of nickel, selenium, and silver are shown.
3. Metals concentrations are presented in milligrams per kilogram.
4. Yellow highlighted cells identify concentrations above the Arkansas Background and Ecological Screening Values.

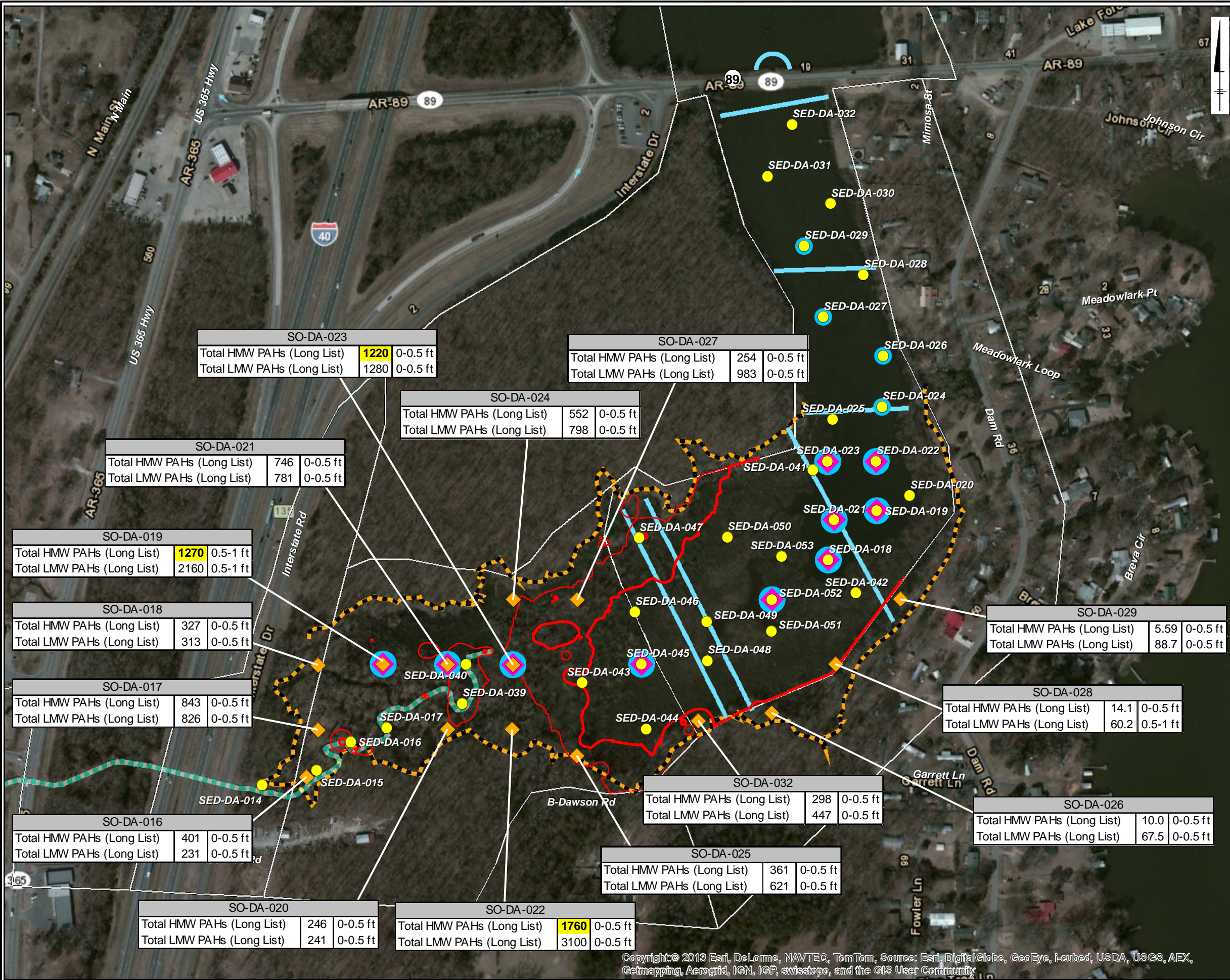


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL SAMPLING RESULTS IN DRAINAGE
 WAYS: METALS**



**FIGURE
 6-1.2**



LEGEND

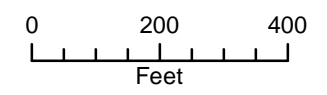
- Sediment Sample
- ◆ Soil Sample
- ◇ Dart Sample Location
- Deep Core Sample Location
- ▭ Operations Areas
- ▬ Approximate Oil Extent
- ▬ Drainage Path
- ▬ Approximate location of containment boom during sampling activities

Contour Elevation

- 262.2 ft
- 262.87 ft

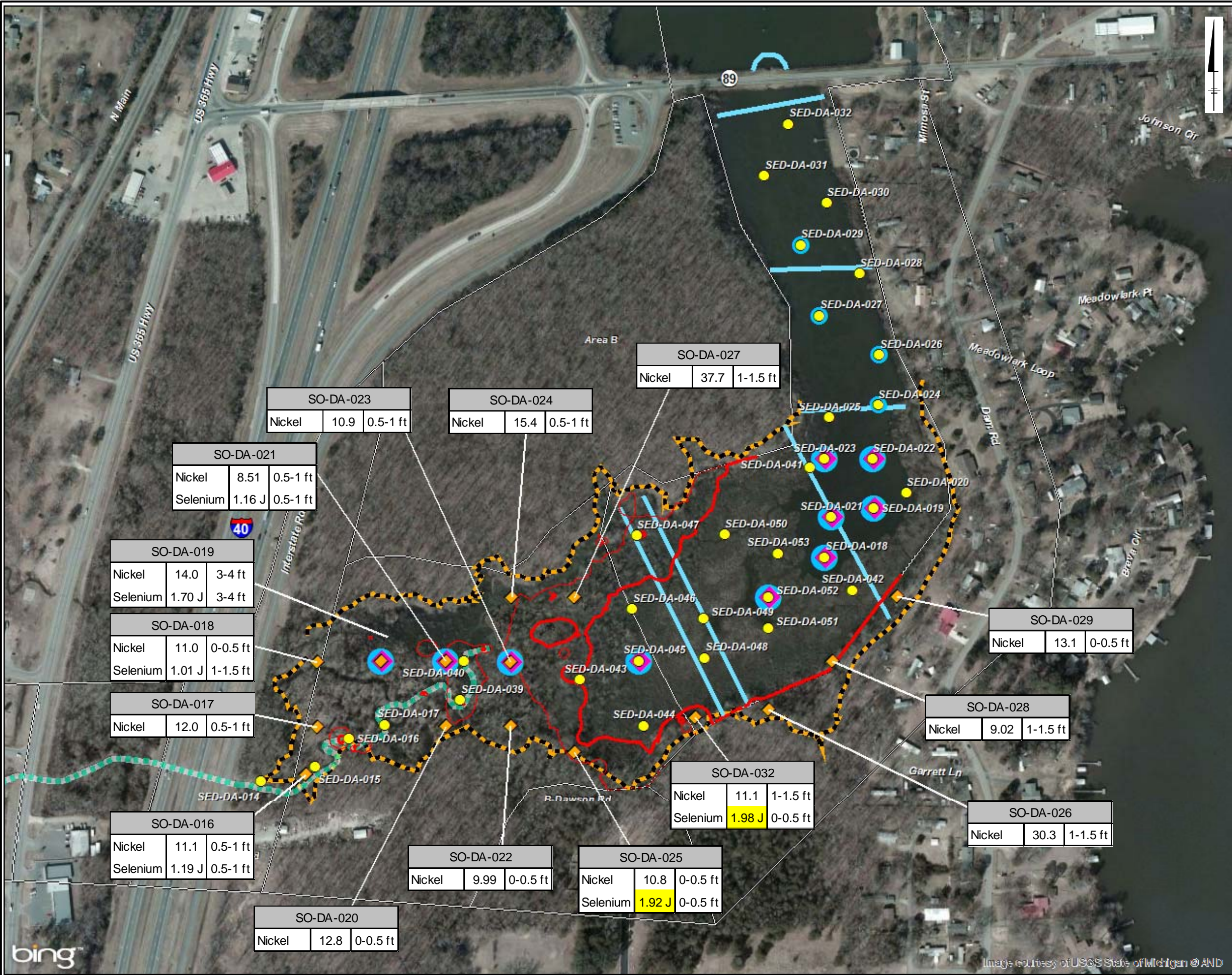
NOTES:

1. Data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
2. Polycyclic Aromatic Hydrocarbon concentrations are presented in micrograms per kilogram (µg/kg).
3. Yellow highlighted cells identify concentrations above the Ecological Screening Values.
4. PAH summations are based on the Long List of PAHs (Table 5-3).



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL SAMPLING RESULTS IN DAWSON COVE:
 PAHS**



LEGEND

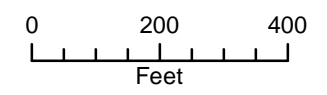
- Sediment Sample
- Soil Sample
- Dart Sample Location
- Deep Core Sample Location
- Operations Areas
- Approximate Oil Extent (Source: ARCADIS, May 2013)
- Drainage Path
- Approximate location of containment boom during sampling activities

Contour Elevation

- 262.2 ft
- 262.87 ft

NOTE:

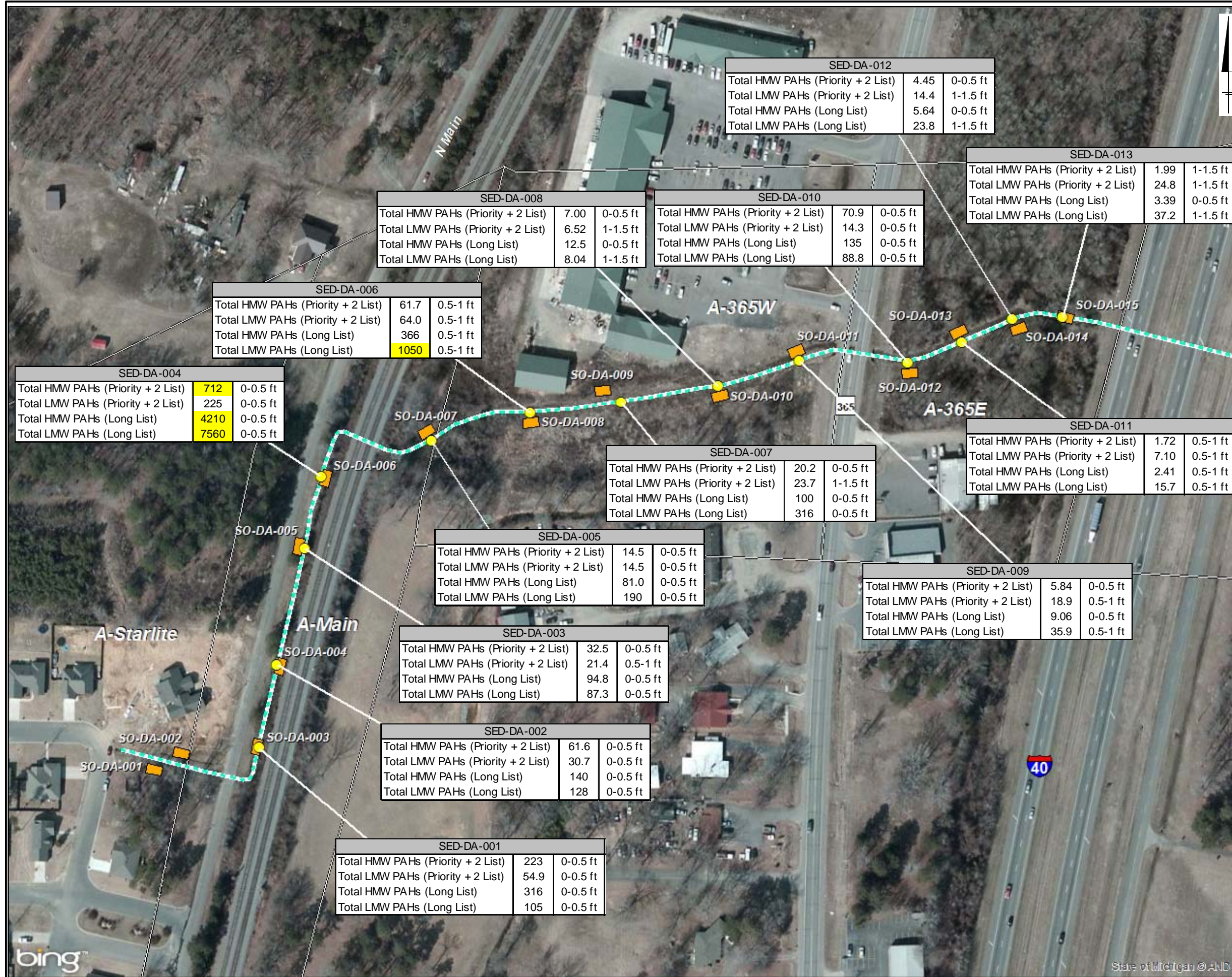
- Metals were analyzed in cores collected from 0-1.5 feet bgs; data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
- Metals concentrations are presented in milligrams per kilogram.
- Yellow highlighted cells identify concentrations above the Arkansas Background and Ecological Screening Values.
- Only detected concentrations of nickel, selenium, and silver are shown.



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SOIL SAMPLING RESULTS IN DAWSON COVE:
 METALS**

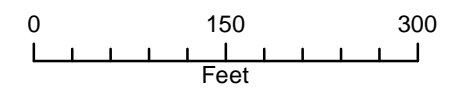




- LEGEND**
- Sediment Sample
 - Soil Sample
 - Drainage Path
 - Operations Areas

NOTES:

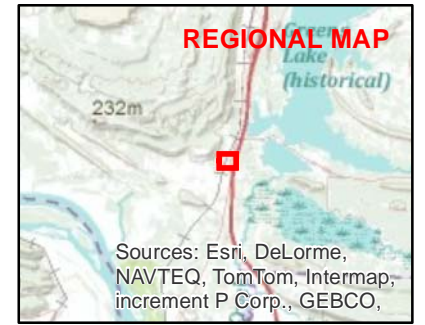
1. Data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
2. Polycyclic Aromatic Hydrocarbon concentrations are presented in micrograms per kilogram (µg/kg).
3. Yellow highlighted cells identify concentrations above the Ecological Screening Values.
4. PAH summations are based on the Priority+2 List and the Long List of PAHs (Table 5-3).



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

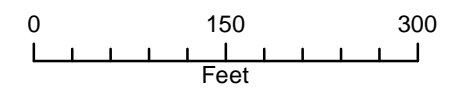
**SEDIMENT SAMPLING RESULTS IN
 DRAINAGE WAYS: PAHs**





- LEGEND**
- Sediment Sample
 - Soil Sample
 - - - Drainage Path
 - Operations Areas

NOTES:
 1. Total Polycyclic Aromatic Hydrocarbon Toxic Unit values are unitless.
 2. All data are from surface samples that were collected at depths of 0-0.5 foot below sediment surface.

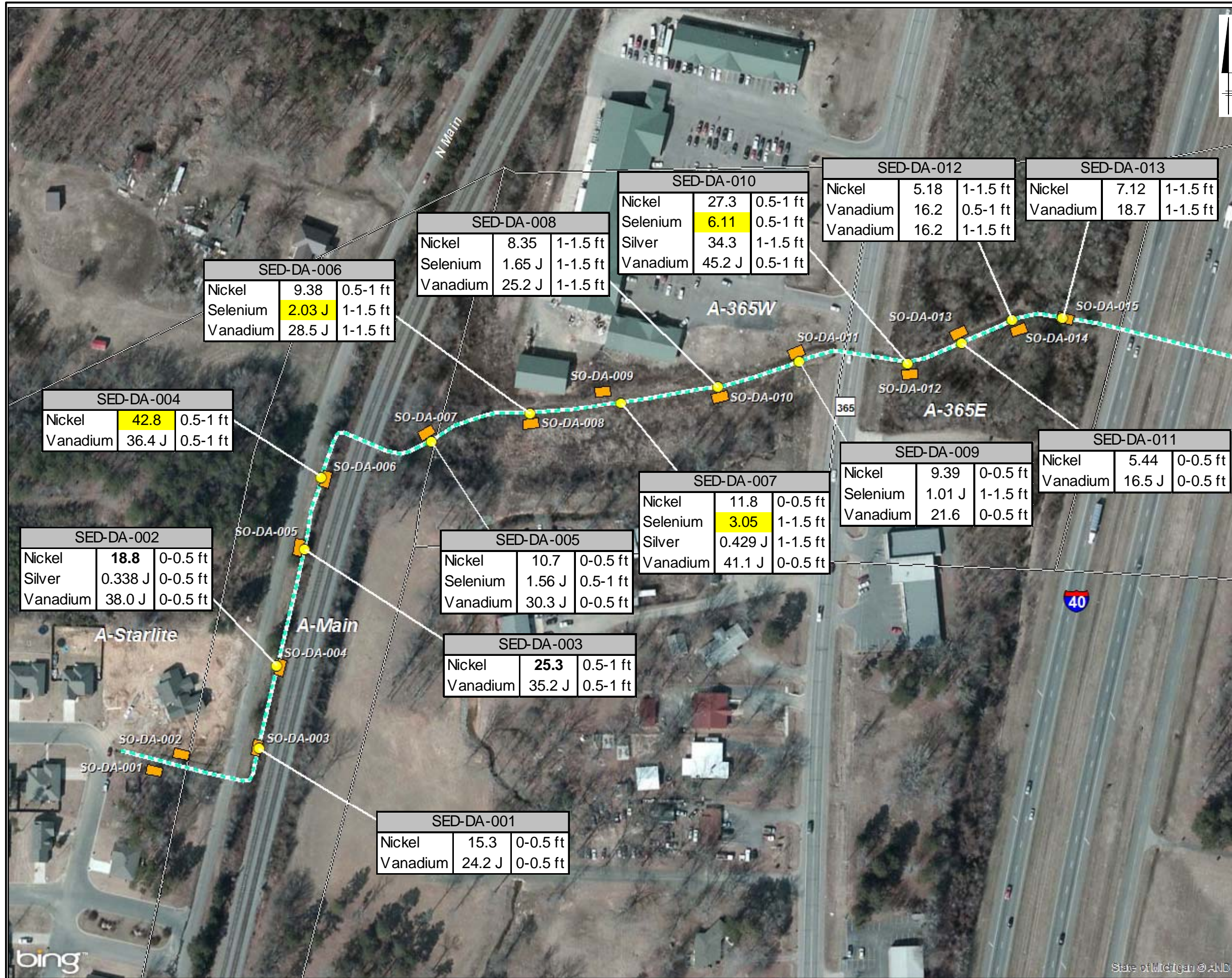


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 DRAINAGE WAYS: TOXIC UNIT**



**FIGURE
 7-1.2**

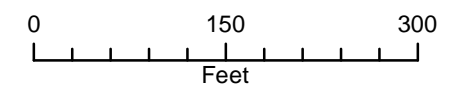


LEGEND

- Sediment Sample
- Soil Sample
- - - Drainage Path
- Operations Areas

NOTES:

- Metals were analyzed in cores collected from 0-1.5 feet bgs; data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
- Metals concentrations are presented in milligrams per kilogram.
- Yellow highlighted cells identify concentrations above the Arkansas Background and Ecological Screening Values.
- Only detected concentrations of nickel, selenium, silver, and vanadium are shown.

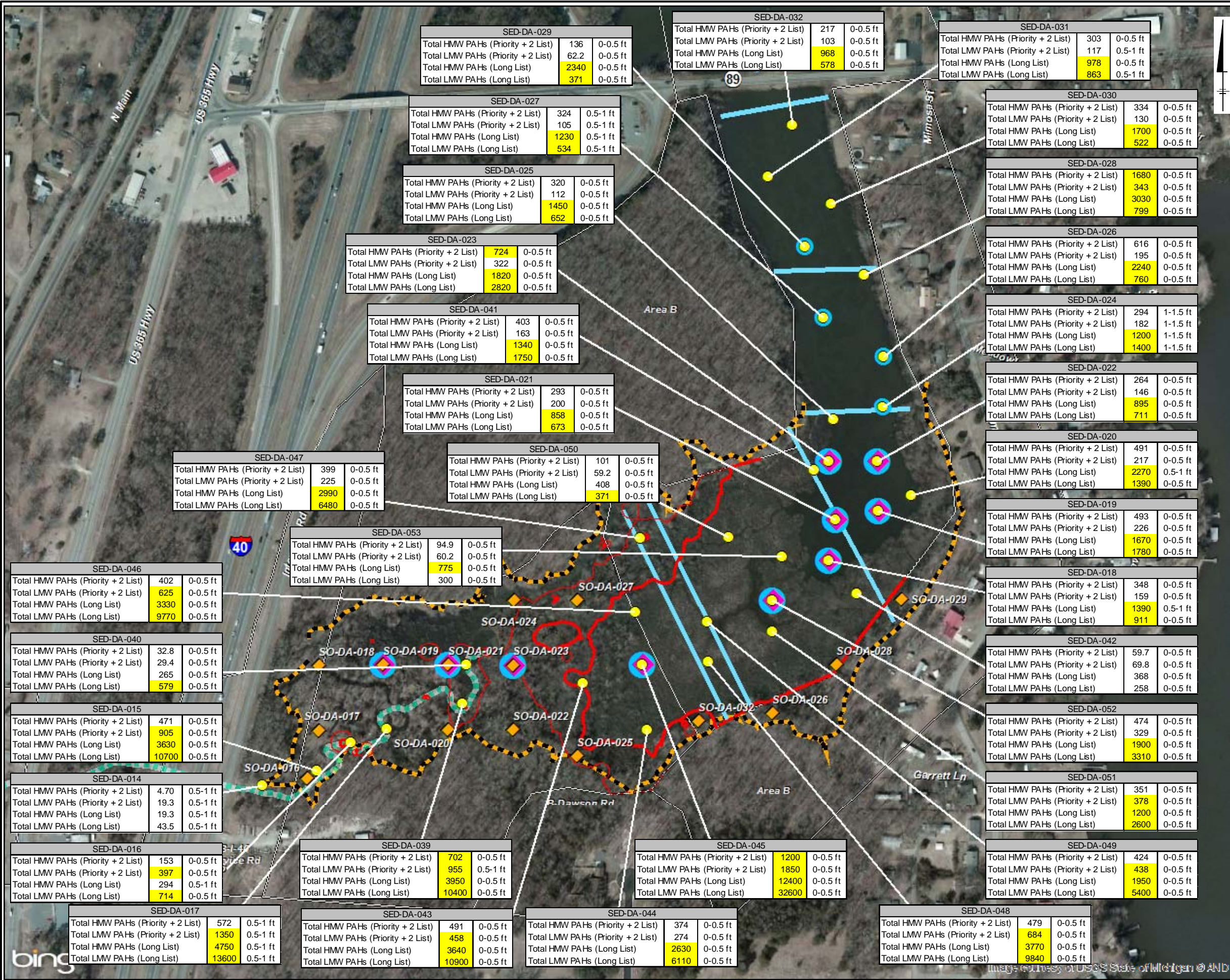


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 DRAINAGE WAYS: METALS**

ARCADIS

**FIGURE
 7-1.3**



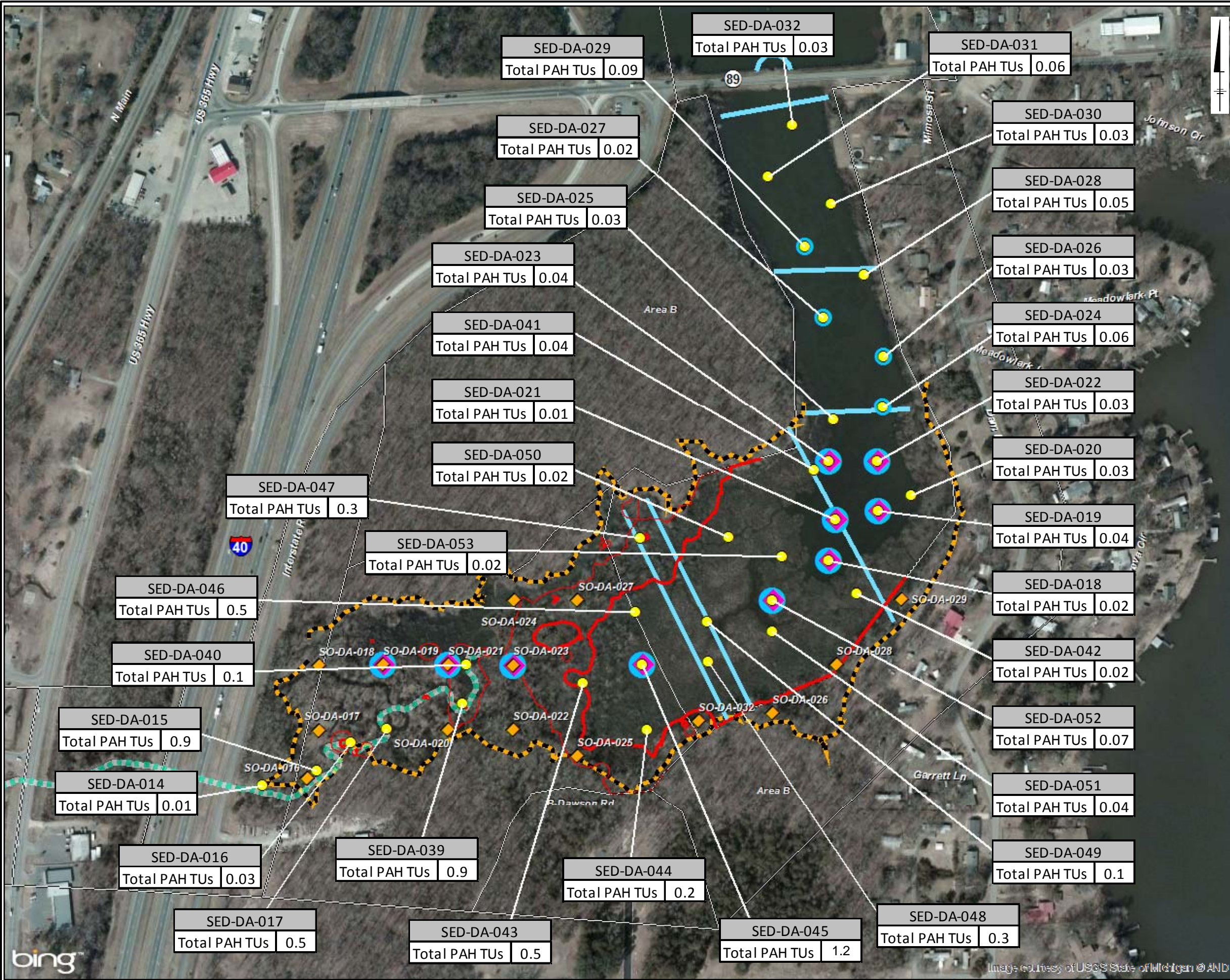
- LEGEND**
- Sediment Sample
 - ◆ Soil Sample
 - ◇ Dart Sample Location
 - Deep Core Sample Location
 - ▭ Operations Areas
 - ▬ Approximate Oil Extent
 - ▬ Drainage Path
 - ▬ Approximate location of containment boom during sampling activities
- Contour Elevation**
- 262.2 ft
 - 262.87 ft

- NOTES:**
1. Data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
 2. Polycyclic Aromatic Hydrocarbon concentrations are presented in micrograms per kilogram (µg/kg).
 3. Yellow highlighted cells identify concentrations above the Ecological Screening Values.
 4. PAH summations are based on the Priority+2 List and the Long List of PAHs (Table 5-3).

**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 DAWSON COVE: PAHs**

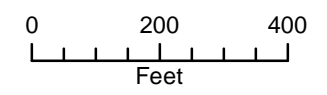




- LEGEND**
- Sediment Sample
 - ◆ Soil Sample
 - ◇ Dart Sample Location
 - Deep Core Sample Location
 - ▭ Operations Areas
 - ▬ Approximate Oil Extent
 - ▬ Drainage Path
 - ▬ Approximate location of containment boom during sampling activities
- Contour Elevation**
- 262.2 ft
 - 262.87 ft

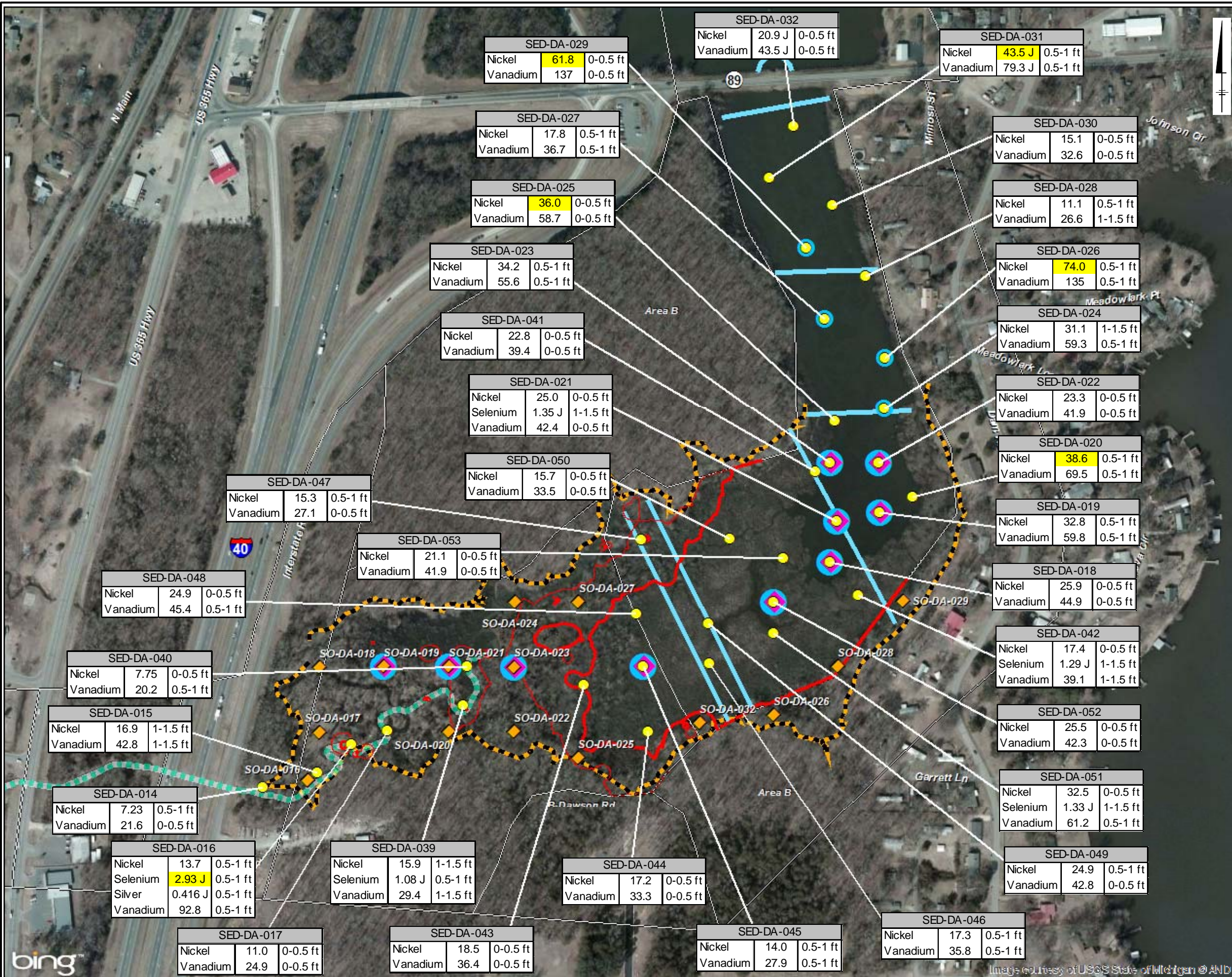
NOTES:

- Total Polycyclic Aromatic Hydrocarbon Toxic Unit values are unitless.
- All data are from surface samples that were collected at depths of 0-0.5 foot below sediment surface.



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 DAWSON COVE: TOXIC UNIT**



LEGEND

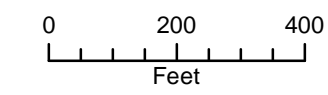
- Sediment Sample
- ◆ Soil Sample
- ◆ Dart Sample Location
- Deep Core Sample Location
- Operations Areas
- Approximate Oil Extent (Source: ARCADIS, May 2013)
- Drainage Path
- Approximate location of containment boom during sampling activities

Contour Elevation

- 262.2 ft
- 262.87 ft

NOTES:

1. Metals were analyzed in cores collected from 0-1.5 feet bgs; data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
2. Metals concentrations are presented in milligrams per kilogram.
3. Yellow highlighted cells identify concentrations above the Arkansas Background and Ecological Screening Values.
4. Only detected concentrations of nickel, selenium, silver, and vanadium are shown.



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 DAWSON COVE: METALS**

ARCADIS

**FIGURE
 7-2.3**

SED-DA-037		
Total HMW PAHs (Priority + 2 List)	492	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	113	0-0.5 ft
Total HMW PAHs (Long List)	1490	0-0.5 ft
Total LMW PAHs (Long List)	332	0.5-1 ft

SED-DA-037R		
Total HMW PAHs (Priority + 2 List)	332	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	150	0-0.5 ft
Total HMW PAHs (Long List)	1530	0-0.5 ft
Total LMW PAHs (Long List)	389	0-0.5 ft

SED-DA-035		
Total HMW PAHs (Priority + 2 List)	169	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	84.2	0-0.5 ft
Total HMW PAHs (Long List)	1660	0-0.5 ft
Total LMW PAHs (Long List)	375	0-0.5 ft

SED-DA-035R		
Total HMW PAHs (Priority + 2 List)	204	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	95.9	0-0.5 ft
Total HMW PAHs (Long List)	1200	0-0.5 ft
Total LMW PAHs (Long List)	205	0-0.5 ft

SED-DA-033		
Total HMW PAHs (Priority + 2 List)	118	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	76.3	0-0.5 ft
Total HMW PAHs (Long List)	832	0-0.5 ft
Total LMW PAHs (Long List)	270	0-0.5 ft

SED-DA-033R		
Total HMW PAHs (Priority + 2 List)	67.1	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	38.7	0-0.5 ft
Total HMW PAHs (Long List)	395	0-0.5 ft
Total LMW PAHs (Long List)	104	0-0.5 ft

SED-DA-038		
Total HMW PAHs (Priority + 2 List)	462	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	122	0-0.5 ft
Total HMW PAHs (Long List)	1620	0-0.5 ft
Total LMW PAHs (Long List)	379	0-0.5 ft

SED-DA-038R		
Total HMW PAHs (Priority + 2 List)	430	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	196	0-0.5 ft
Total HMW PAHs (Long List)	1860	0-0.5 ft
Total LMW PAHs (Long List)	508	0-0.5 ft

SED-DA-036		
Total HMW PAHs (Priority + 2 List)	291	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	81.3	0-0.5 ft
Total HMW PAHs (Long List)	1540	0-0.5 ft
Total LMW PAHs (Long List)	280	0-0.5 ft

SED-DA-036R		
Total HMW PAHs (Priority + 2 List)	229	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	100	0-0.5 ft
Total HMW PAHs (Long List)	1420	0-0.5 ft
Total LMW PAHs (Long List)	269	0-0.5 ft

SED-DA-034		
Total HMW PAHs (Priority + 2 List)	237	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	67.2	0-0.5 ft
Total HMW PAHs (Long List)	1370	0-0.5 ft
Total LMW PAHs (Long List)	252	0-0.5 ft

SED-DA-034R		
Total HMW PAHs (Priority + 2 List)	203	0-0.5 ft
Total LMW PAHs (Priority + 2 List)	96.1	0-0.5 ft
Total HMW PAHs (Long List)	1130	0-0.5 ft
Total LMW PAHs (Long List)	206	0-0.5 ft

- NOTES:**
- Data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded (i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
 - Polycyclic Aromatic Hydrocarbon concentrations are presented in micrograms per kilogram ($\mu\text{g}/\text{kg}$).
 - Yellow highlighted cells identify concentrations above the Ecological Screening Values.
 - PAH summations are based on the Priority+2 List and the Long List of PAHs (Table 5-3).
 - As requested by ADEQ, the six Lake Conway sediment locations were re-sampled on November 19 and 20, 2013 (SED-DA-033R through SED-DA-038R).

- LEGEND**
- Sediment Sample Location
 - Re-sampled Sediment Location
 - Approximate location of containment boom during sampling activities
 - - - Turbidity Curtain
 - Operations Areas

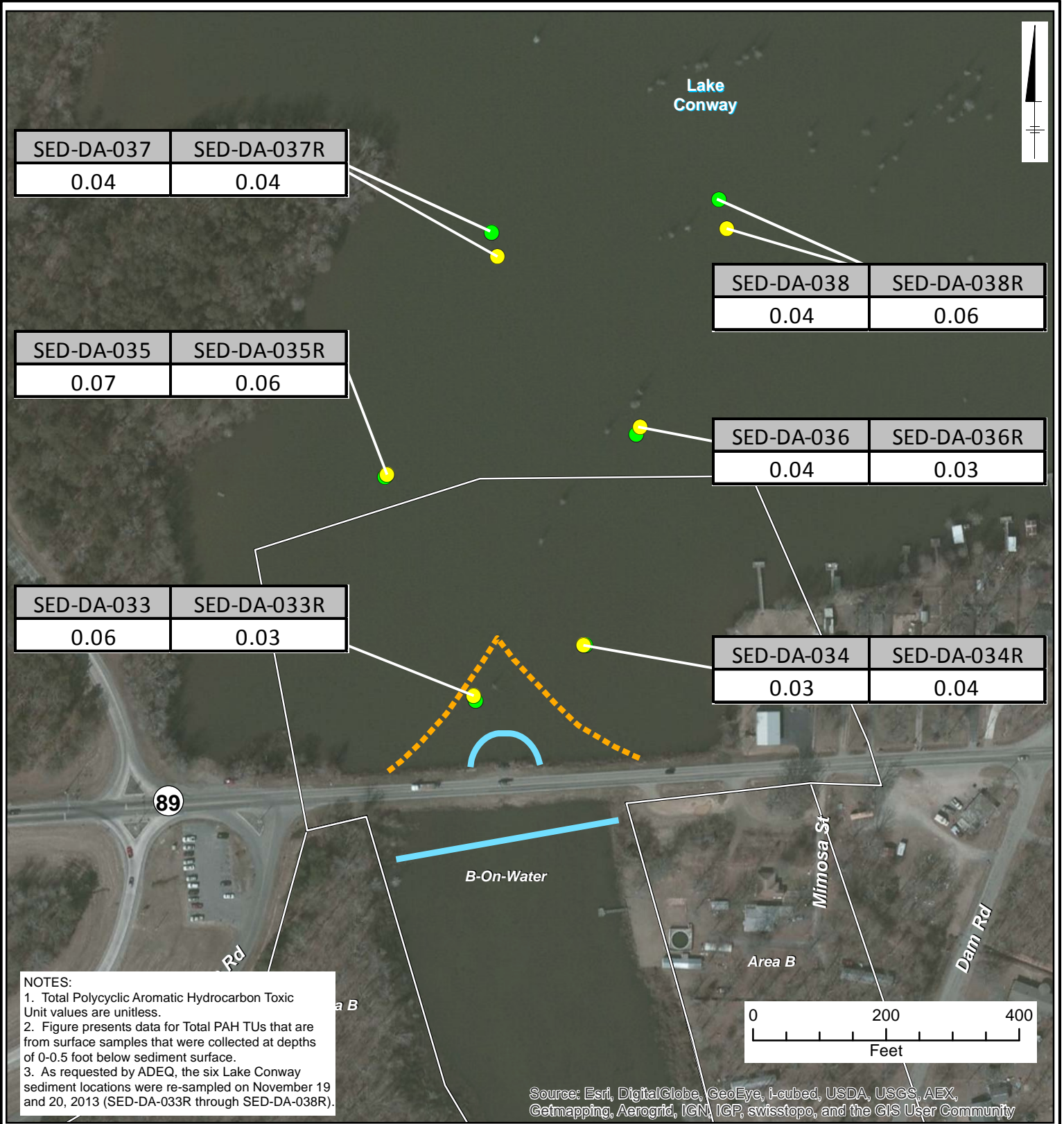


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 LAKE CONWAY: PAHS**

**FIGURE
7-3.1**

Map Date: 1/6/2014



NOTES:
 1. Total Polycyclic Aromatic Hydrocarbon Toxic Unit values are unitless.
 2. Figure presents data for Total PAH TUs that are from surface samples that were collected at depths of 0-0.5 foot below sediment surface.
 3. As requested by ADEQ, the six Lake Conway sediment locations were re-sampled on November 19 and 20, 2013 (SED-DA-033R through SED-DA-038R).

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND


- Sediment Sample Location
- Re-sampled Sediment Location
- Approximate location of containment boom during sampling activities
- - - Turbidity Curtain
- Operations Areas

Map Date: 1/8/2014



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 LAKE CONWAY: TOXIC UNIT**



**FIGURE
 7-3.2**



SED-DA-037		
Nickel	22.5 J	0.5-1 ft
Vanadium	52.9 J	0.5-1 ft
SED-DA-037R		
Nickel	19.1	0-0.5 ft
Vanadium	32.5	0.5-1 ft

Lake Conway

SED-DA-038		
Nickel	30.8 J	0-0.5 ft
Selenium	3.24 J	0-0.5 ft
Vanadium	59.3 J	0-0.5 ft
SED-DA-038R		
Nickel	23.1	0-0.5 ft
Vanadium	33.7	1-1.5 ft

SED-DA-035		
Nickel	31.0	0-0.5 ft
Selenium	2.89 J	0-0.5 ft
Vanadium	67.2	0-0.5 ft
SED-DA-035R		
Nickel	25.4	0-0.5 ft
Vanadium	52.2	0-0.5 ft

SED-DA-036		
Nickel	19.4 J	0-0.5 ft
Vanadium	38.6 J	1-1.5 ft
SED-DA-036R		
Nickel	15.0	0-0.5 ft
Vanadium	26.3	0-0.5 ft

SED-DA-033		
Nickel	17.3	0-0.5 ft
Vanadium	36.4	0-0.5 ft
SED-DA-033R		
Nickel	14.4	0-0.5 ft
Vanadium	29.9	0-0.5 ft

SED-DA-034		
Nickel	24.0	0-0.5 ft
Vanadium	46.7	0-0.5 ft
SED-DA-034R		
Nickel	17.0	0-0.5 ft
Vanadium	33.0	0-0.5 ft

NOTES:

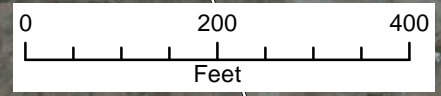
1. Metals were analyzed in cores collected from 0-1.5 feet bgs; data boxes present maximum detections for each analyte at each location, and the associated sample depth interval at which the maximum detection was recorded i.e., 0-0.5 foot, 0.5-1.0 foot, or 1.0-1.5 feet).
2. Metals concentrations are presented in milligrams per kilogram.
3. Yellow highlighted cells identify concentrations above the Arkansas Background and Ecological Screening Values.
4. Only detected concentrations of nickel, selenium, silver, and vanadium are shown.
5. As requested by ADEQ, the six Lake Conway sediment locations were re-sampled on November 19 and 20, 2013 (SED-DA-033R through SED-DA-038R).

B-On-Water

Mimosa St

Dam Rd

Area B



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Sediment Sample Location
 - Re-sampled Sediment Location
 - Approximate location of containment boom during sampling activities
 - - - Turbidity Curtain
 - Operations Areas
- Map Date: 1/3/2014**

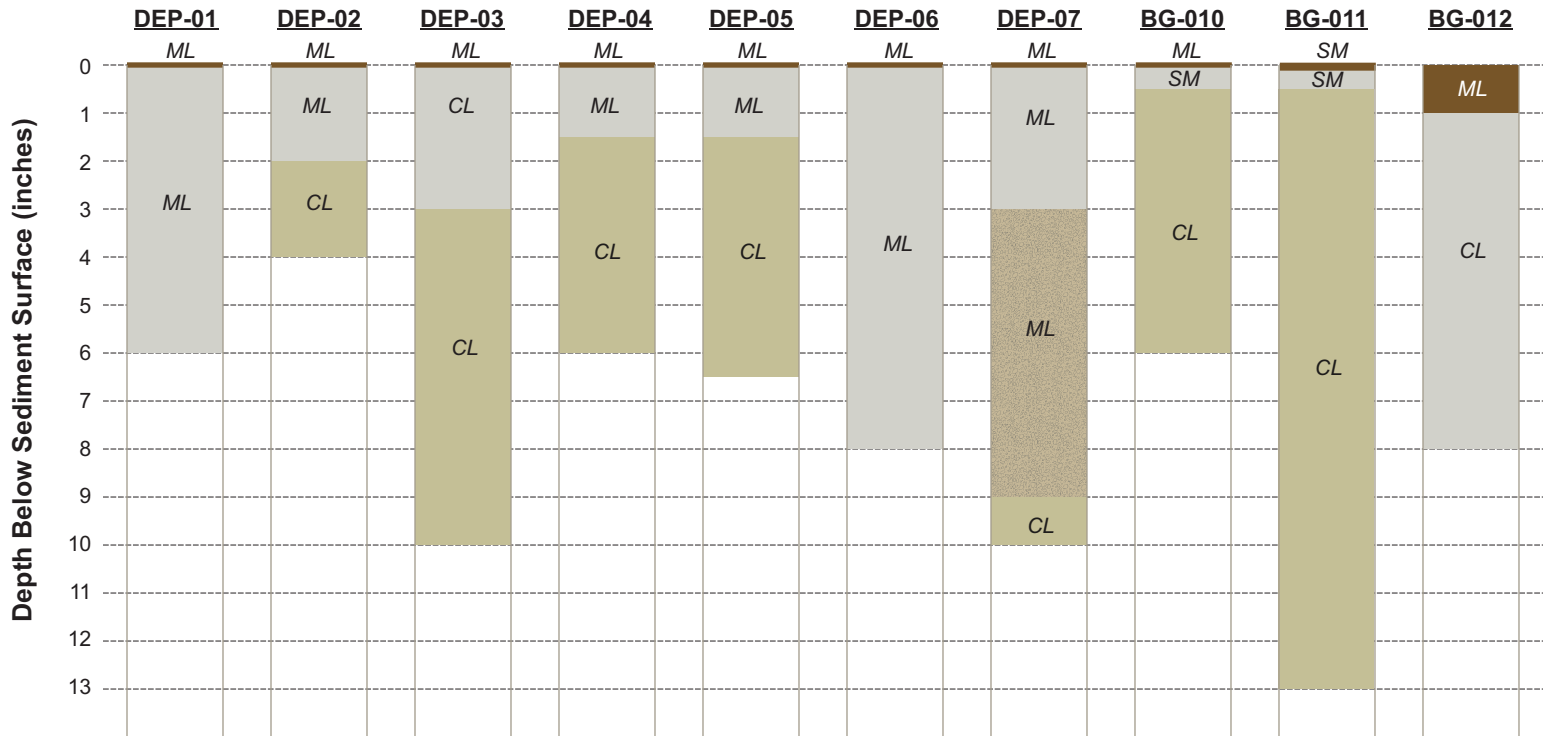


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**SEDIMENT SAMPLING RESULTS IN
 LAKE CONWAY: METALS**



**FIGURE
 7-3.3**



USCS Soil Group Symbol:

CL = Inorganic clay of low plasticity, lean clay

ML = Inorganic silt

SM = Silty sand

Color Legend:

 = Surface Sediment Layer (Silt)

 = Subsurface Observation of Gray Sediment (Silt, Clay or Silty Sand)

 = Subsurface Observation of Brown Sediment (Silty Sand)

 = Subsurface Observation of Brown Sediment (Clay)

 = Subsurface Observation of Brown Sediment (Silt)

Notes:

1. All sediments described in the field using the Unified Soil Classification System (USCS).

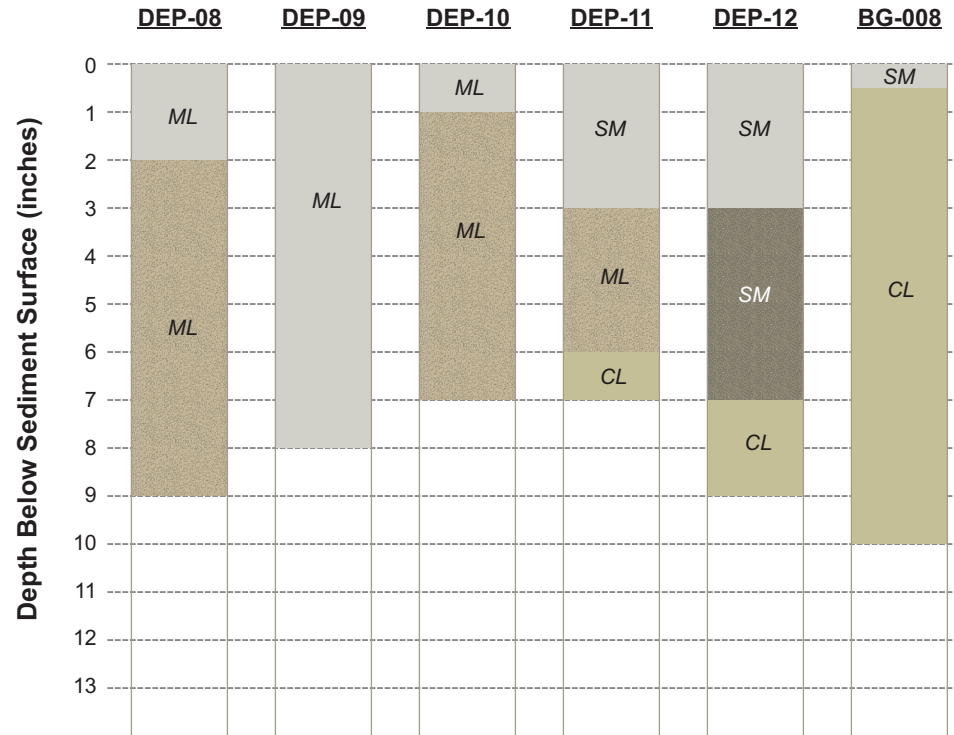
2. All sediment colors depicted are approximate representations of colors observed during field sampling.

MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

**LAKE CONWAY
 DEPOSITIONAL LAYER ASSESSMENT:
 CORE PROFILES WITH SURFACE BROWN LAYER**



FIGURE
7-4.1



USCS Soil Group Symbol:

CL = Inorganic clay of low plasticity, lean clay

ML = Inorganic silt

SM = Silty sand

Color Legend:

 = Surface Sediment Layer (Silt)

 = Subsurface Observation of Gray Sediment (Silt, Clay or Silty Sand)

 = Subsurface Observation of Brown Sediment (Silty Sand)

 = Subsurface Observation of Brown Sediment (Clay)

 = Subsurface Observation of Brown Sediment (Silt)

Notes:

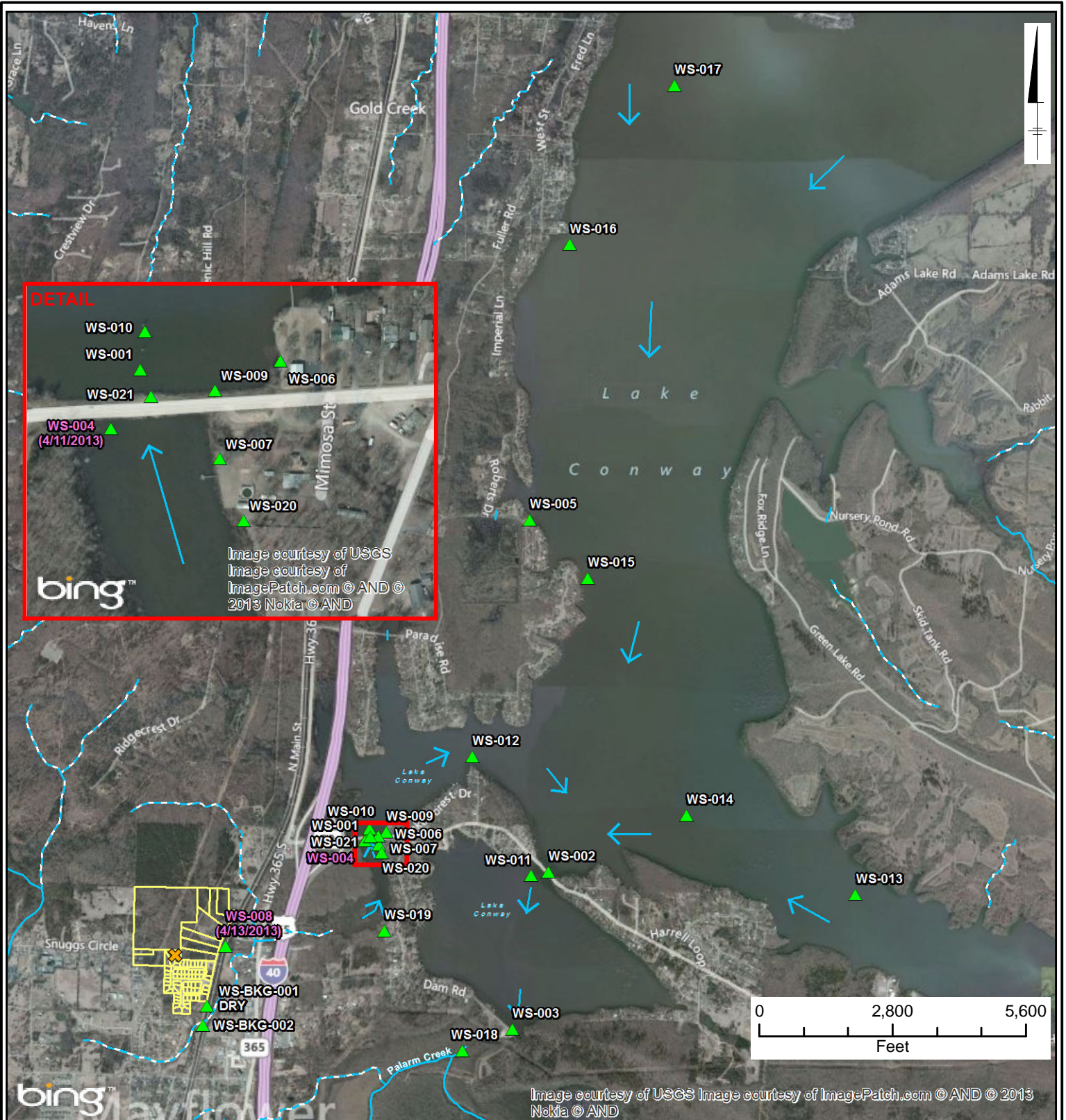
1. All sediments described in the field using the Unified Soil Classification System (USCS).
2. All sediment colors depicted are approximate representations of colors observed during field sampling.

MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

**LAKE CONWAY
 DEPOSITIONAL LAYER ASSESSMENT:
 CORE PROFILES WITHOUT SURFACE
 BROWN LAYER**



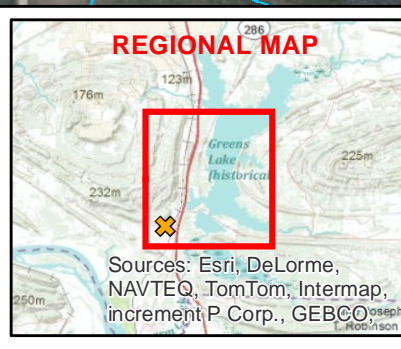
FIGURE
7-4.2



LEGEND Map date: 1/3/2014

- ▲ Surface Water Sample Location
- WS-001 VOC Above Ecological Screening Value (ESV)
- (4/2/2013) Most Recent Date Above ESV
- ✘ Source Point
- Parcel Boundary
- Stream/River: Intermittent
- Stream/River: Perennial
- Approximate Surface Water Flow Direction

VOC Volatile Organic Compounds
 *Evaluation based on the data collected between March 29 and October 31, 2013. No VOC exceedances above ESV at any sample location since April 13, 2013.



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**DAILY SURFACE WATER
 SAMPLE LOCATIONS WITH
 VOC CONCENTRATION ABOVE ESV**

ARCADIS

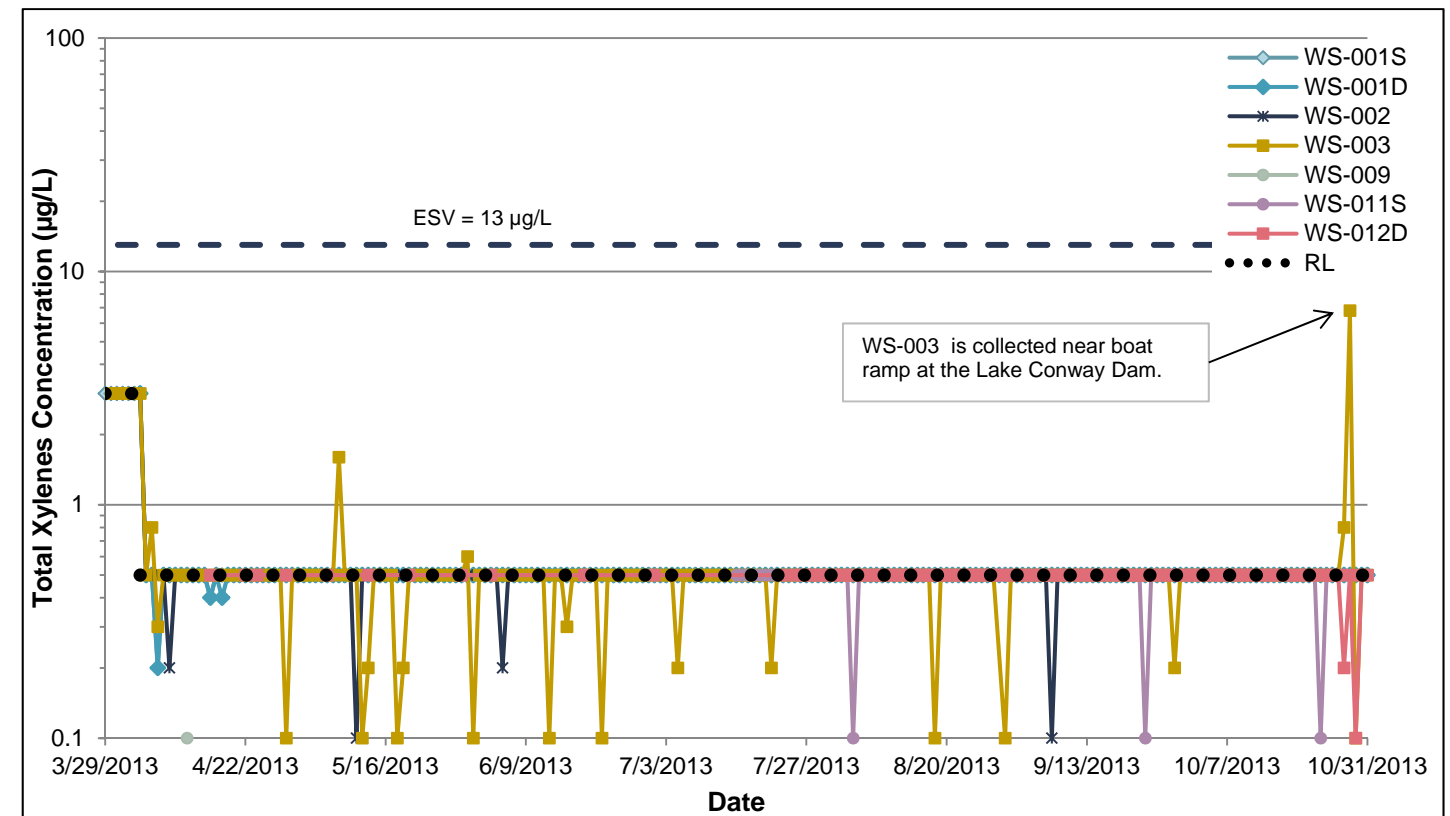
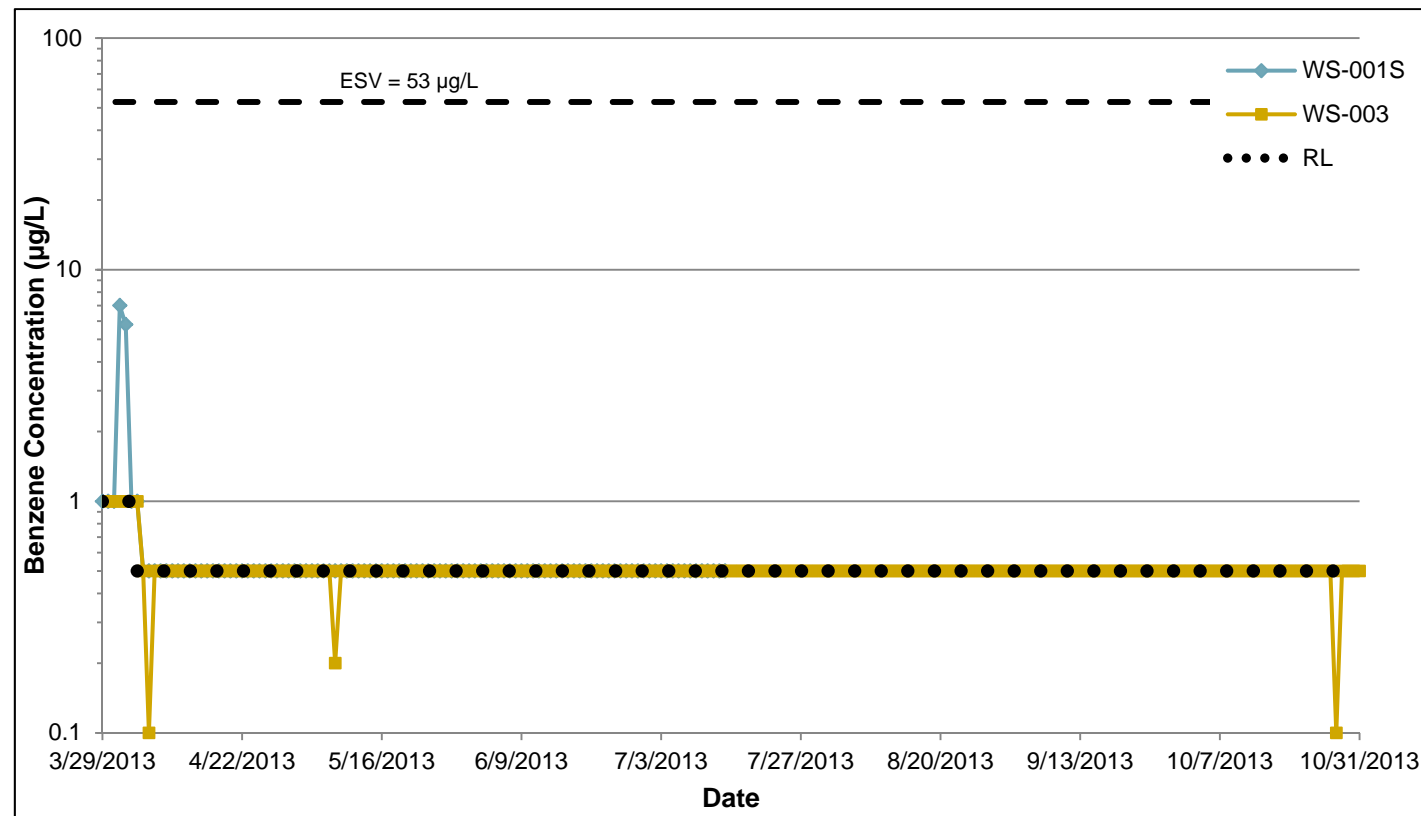
**FIGURE
 8-1**

VOCs Detected < 1% of Samples				
Analyte <i>shading = not detected in crude oil</i>	Total Samples	Total Detections	Detection Frequency (%)	Last Date Detected
1,1-Dichloroethene	1864	11	0.6%	10/15/13
1,2,4-Trimethylbenzene	1864	15	0.8%	10/28/13
1,2-Dichloroethane	1864	1	0.1%	10/23/13
1,3,5-Trimethylbenzene	1864	5	0.3%	10/28/13
2-Butanone	1864	1	0.1%	07/08/13
Benzene	1864	6	0.3%	10/28/13
Bromoform (Tribromomethane)	1864	1	0.1%	10/23/13
Diethyl Ether (Ethyl ether)	1842	1	0.1%	05/08/13
Ethylbenzene	1864	6	0.3%	10/28/13
Methylene Chloride (Dichloromethane)	1864	2	0.1%	08/20/13
n-Propylbenzene	1864	1	0.1%	05/08/13
Tetrahydrofuran	1842	3	0.2%	06/19/13
Trichloroethene	1864	5	0.3%	10/23/13

VOCs Detected ≥ 1% of Samples					
Analyte <i>shading = not detected in crude oil</i>	Total Samples	Total Detections	Detection Frequency (%)	Detected Concentration Range (µg/L)	Ecological Screening Value (ESV) (µg/L)
Acetone	1864	82	4%	3.0 - 16.0	1500
p-Isopropyltoluene (Cymene)	1864	31	2%	0.1 - 22.0	85
Toluene	1864	131	7%	0.1 - 15.0	175
Total Xylenes	1864	46	2%	0.1 - 6.8	13

µg/L = micrograms per liter
 RL = reporting limit
 USEPA = U.S. Environmental Protection Agency
 VOC = volatile organic compound
 WS-001D = deep sample
 WS-001S = shallow sample

No detected VOC concentrations above ESV at any location within Lake Conway.
 The graphs below show benzene and total xylenes concentrations with time for the locations that had at least one detection.



1. Evaluation based on the following locations in Lake Conway: WS-001S, WS-001D, WS-002, WS-003, WS-006S, WS-006D, WS-009, WS-010S, WS-010D, WS-011S, WS-011D, WS-012S, WS-012D, WS-018S, WS-018D, and WS-021.
2. No benzene detections above RLs at locations WS-001D, WS-002, WS-006S, WS-006D, WS-009, WS-010S, WS-010D, WS-011S, WS-011D, WS-012S, WS-012D, WS-018S, WS-018D, and WS-021. The reporting limit was 1.0 µg/L from March 29 to April 4, 2013 and has been 0.5 µg/L since April 5, 2013.
3. No total xylene detections above RLs at locations WS-006S, WS-006D, WS-010S, WS-010D, WS-011D, WS-012S, WS-018S, WS-018D, and WS-021. The reporting limit was 3.0 µg/L from March 29 to April 4, 2013 and has been 0.5 µg/L since April 5, 2013.
4. Naphthalene was not detected when analyzed with VOCs (USEPA 8260) and therefore was not reported in this figure; naphthalene was analyzed with the polycyclic aromatic hydrocarbons (USEPA 8270 selective ion monitoring) and is reported with Figures 8-4 through 8-8.
5. Sampling at WS-001S and WS-006S was discontinued on July 14, 2013. Sampling at WS-009 and WS-021 was discontinued in April 2013.
6. VOC analyses were discontinued on October 31, 2013.

MAYFLOWER PIPELINE INCIDENT RESPONSE EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY DOWNSTREAM AREAS DATA ASSESSMENT REPORT	
EVALUATION OF VOCs IN LAKE CONWAY SURFACE WATER (MARCH 29 - OCTOBER 31, 2013)	
	FIGURE 8-2

VOCs Detected < 1% of Samples				
Analyte <i>shading = not detected in crude oil</i>	Total Samples	Total Detections	Detection Frequency (%)	Last Date Detected
1,2,3-Trichlorobenzene	523	2	0.4%	6/14/2013
2-Phenylbutane	514	1	0.2%	9/9/2013
Chloromethane	523	1	0.2%	6/19/2013
Tetrahydrofuran	514	1	0.2%	6/19/2013

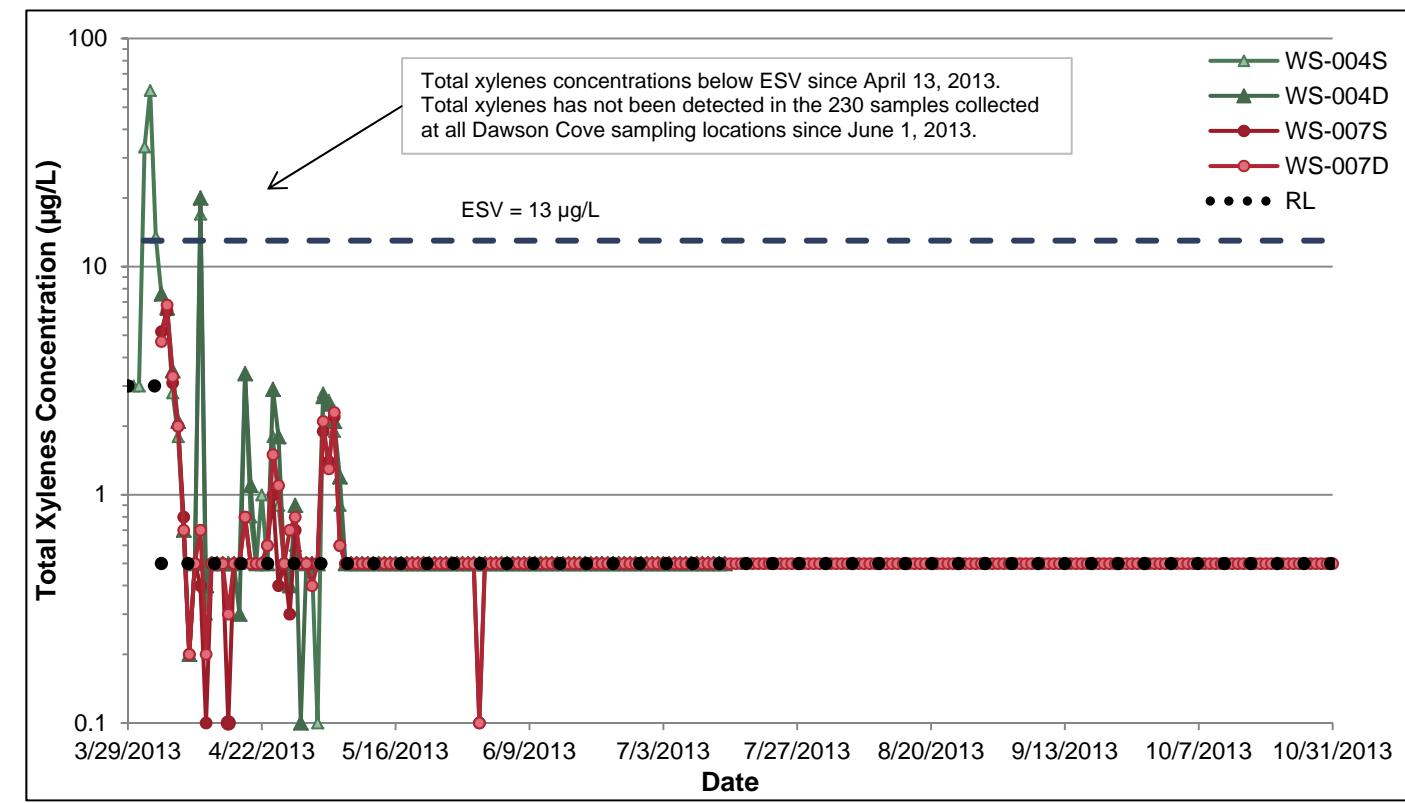
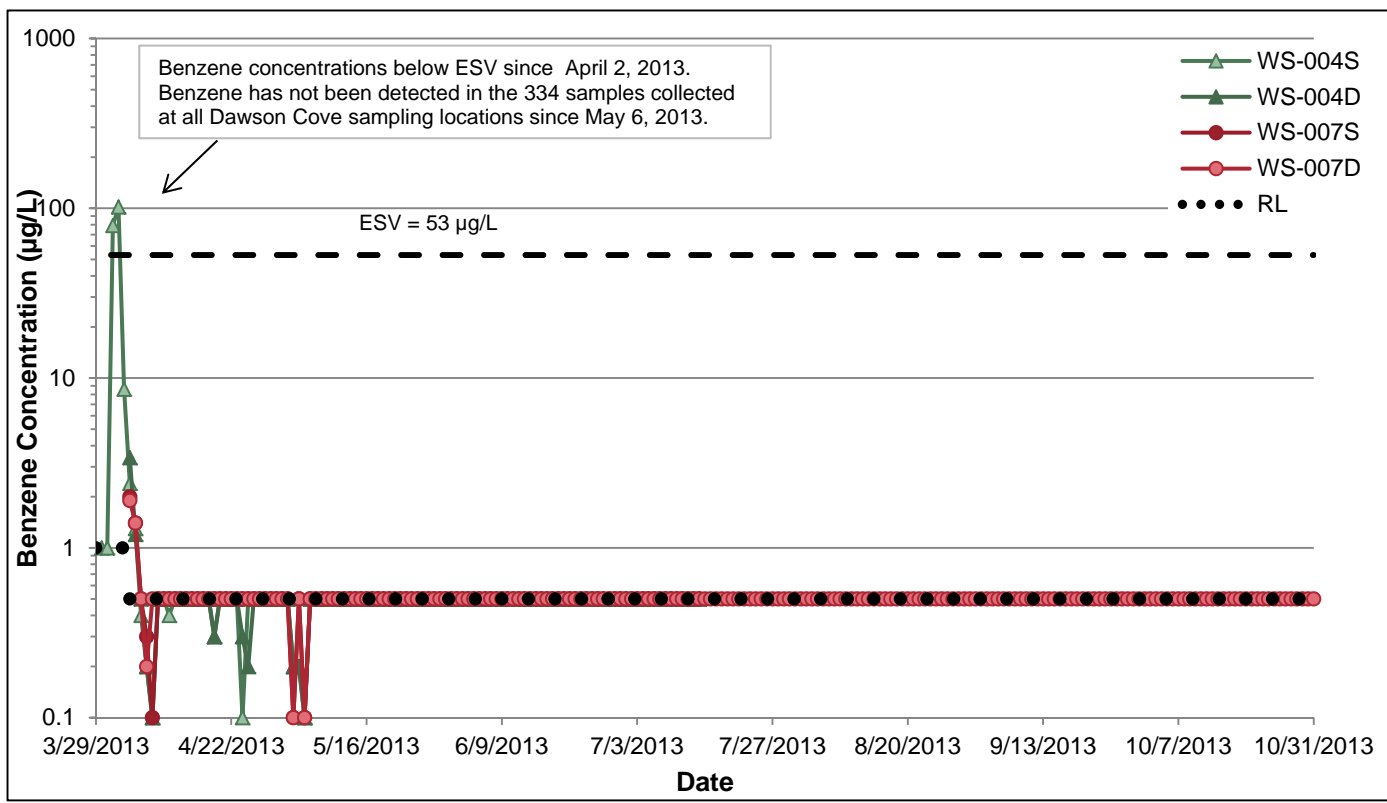
VOCs Detected ≥ 1% of Samples					
Analyte <i>shading = not detected in crude oil</i>	Total Samples	Total Detections	Detection Frequency (%)	Detected Concentration Range (µg/L)	Ecological Screening Value (ESV) (µg/L)
1,2,4-Trimethylbenzene	523	40	8%	0.1 - 5.9	33
1,3,5-Trimethylbenzene	523	78	15%	0.1 - 4.2	71
2-Butanone (MEK)	523	42	8%	1.0 - 6.1	14000
Acetone	523	376	72%	3.0 - 24	1500
Benzene	523	39	7%	0.1 - 102	53
Ethylbenzene	523	18	3%	0.1 - 6.0	453
Isopropylbenzene (Cumene)	523	12	2%	0.1 - 1.1	2.6
n-Propylbenzene	523	9	2%	0.1 - 0.3	128
p-Isopropyltoluene (Cymene)	523	24	5%	0.1 - 0.2	85
Toluene	523	324	62%	0.1 - 77.7	175
Xylene (Total)	523	84	16%	0.1 - 59.2	13

Benzene and Total Xylenes are the only VOCs that have been detected at concentrations above the associated ecological screening values.

o **Benzene** has only been detected above the ESV in 2 of the 523 samples analyzed through October 31, 2013 [see graph below]. Benzene has not been detected in any Dawson Cove samples since May 6, 2013.

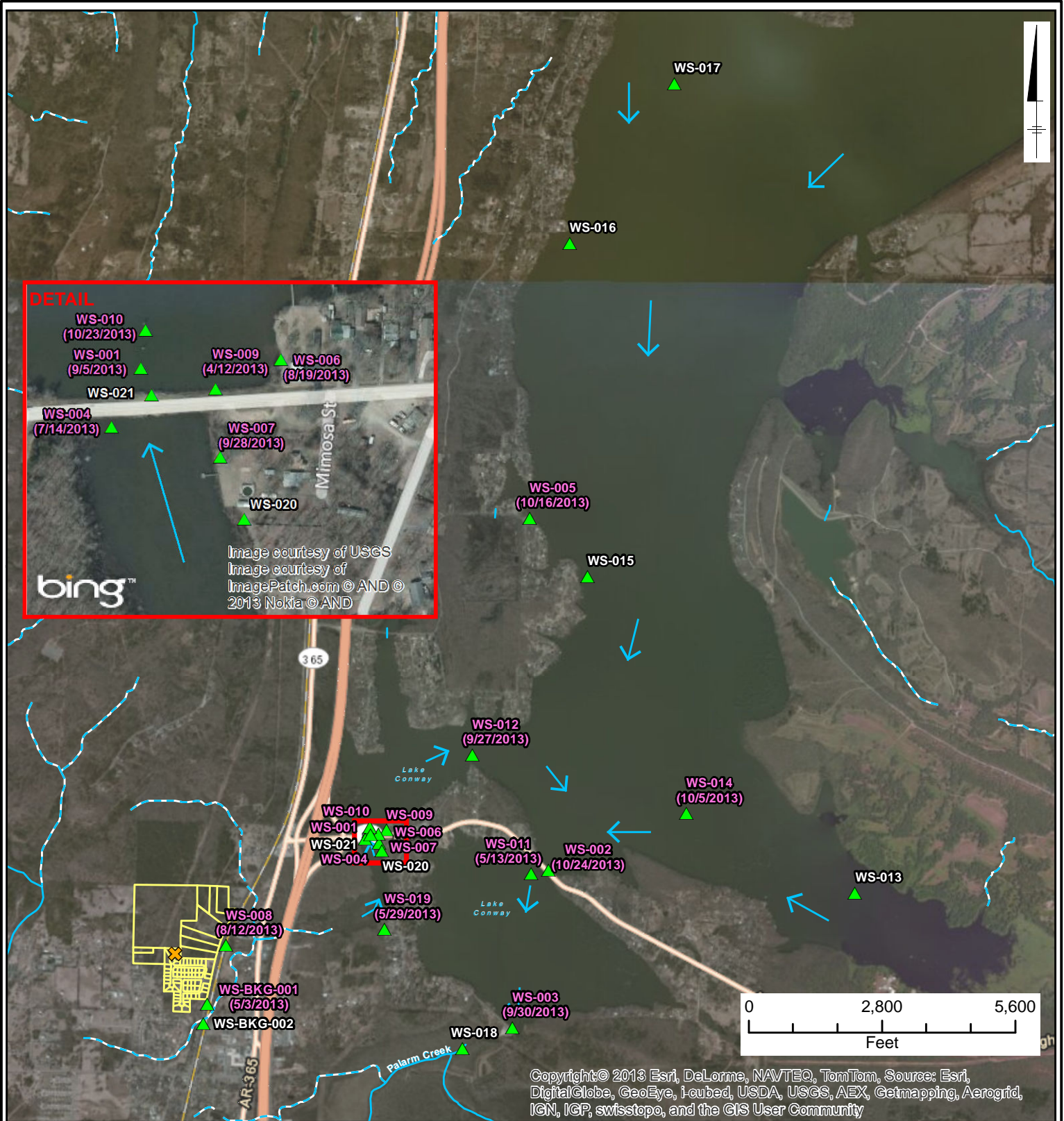
o **Total Xylenes** has been detected above the ESV in 5 of the 523 samples analyzed through October 31, 2013 [see graph below]. Total xylenes has not been detected in any Dawson Cove samples since June 1, 2013.

The graphs below show benzene and total xylenes concentrations with time for the locations that had at least one detection.



- Notes:**
- µg/L = micrograms per liter
 - RL = reporting limit
 - USEPA = U.S. Environmental Protection Agency
 - VOC = volatile organic compound
 - WS-004D = deep sample
 - WS-004S = shallow sample
- Evaluation based on the following locations in Dawson Cove: WS-004S, WS-004D, WS-007S, WS-007D, and WS-020.
 - No benzene detections above RLs at location WS-020. The reporting limit was 1.0 µg/L from March 29 to April 4, 2013 and has been 0.5 µg/L since April 5, 2013.
 - No total xylene detections above RLs at location WS-020. The reporting limit was 3.0 µg/L from March 29 to April 4, 2013 and has been 0.5 µg/L since April 5, 2013.
 - Naphthalene was not detected when analyzed with VOCs (USEPA 8260) and therefore was not reported in this figure; naphthalene was analyzed with the polycyclic aromatic hydrocarbons (USEPA 8270 selective ion monitoring) and is reported with Figures 8-4 through 8-8.
 - Sampling at WS-004S, WS-004D, and WS-007S was discontinued on July 14, 2013.
 - VOC analyses were discontinued on October 31, 2013.

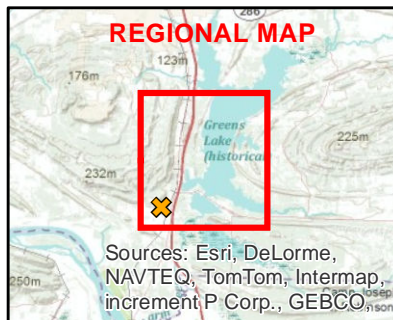
MAYFLOWER PIPELINE INCIDENT RESPONSE EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY DOWNSTREAM AREAS DATA ASSESSMENT REPORT	
EVALUATION OF VOCs IN DAWSON COVE SURFACE WATER (MARCH 29 - OCTOBER 31, 2013)	
	FIGURE 8-3



LEGEND Map date: 1/7/2014

- ▲ Surface Water Sample Location
- WS-001** PAH Above Environmental Screening Value (ESV)
(8/14/2013) Most Recent Date Above ESV
- ✘ Source Point
- Parcel Boundary
- Stream/River: Intermittent
- Stream/River: Perennial
- Approximate Surface Water Flow Direction

PAH Polycyclic aromatic hydrocarbon
 *Evaluation based on the data collected between March 29 and October 31, 2013.



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**DAILY SURFACE WATER SAMPLE
 LOCATIONS WITH PAH
 CONCENTRATION ABOVE ESV**

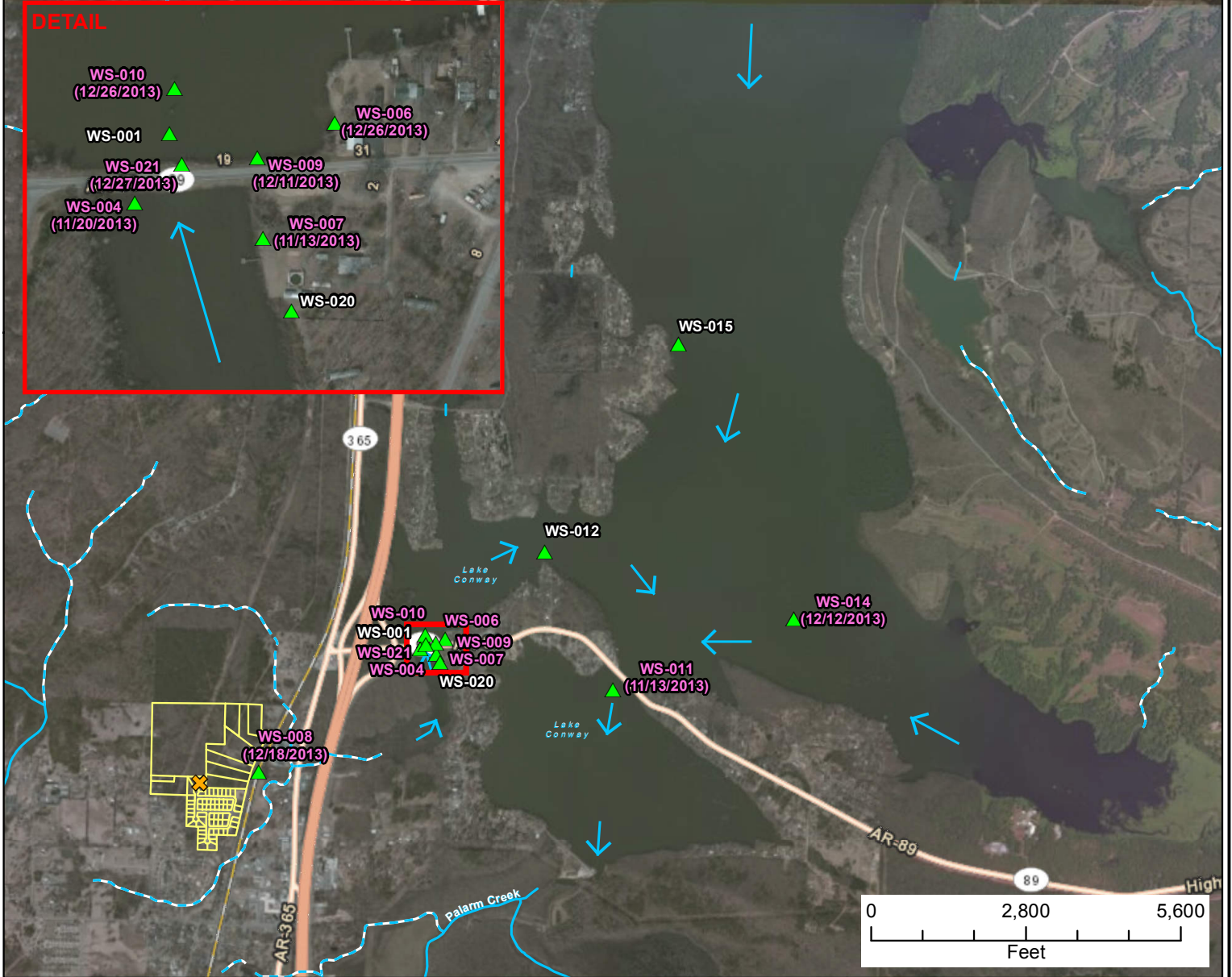
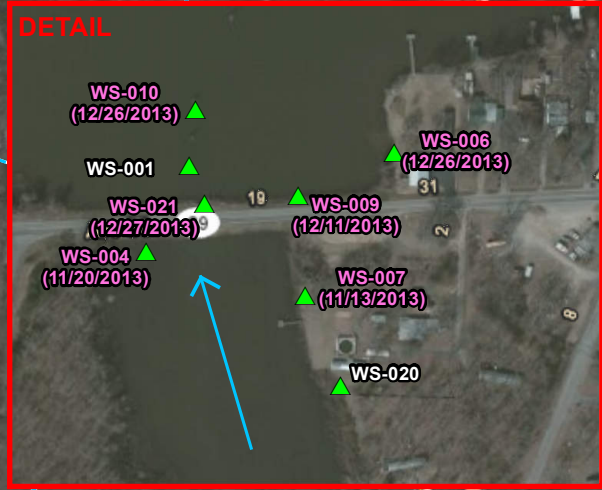
ARCADIS

FIGURE 8-4

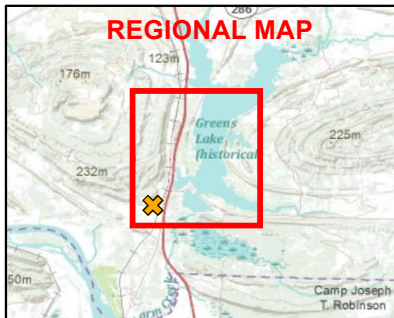
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
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 Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



DETAIL



- LEGEND** Map date: 1/17/2014
- ▲ Surface Water Sample Location
 - WS-010 PAH Above Ecological Screening Value (ESV)
 - (12/26/2013) Most Recent Date Above ESV
 - ✕ Source Point
 - Parcel Boundary
 - Stream/River: Intermittent
 - Stream/River: Perennial
 - ➔ Approximate Surface Water Flow Direction



**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**

**WEEKLY SURFACE WATER SAMPLE
 LOCATIONS WITH PAH CONCENTRATION
 ABOVE ESV (NOVEMBER 1-DECEMBER 31, 2013)**



FIGURE
8-5

PAH Polycyclic aromatic hydrocarbon
 *Evaluation based on the data collected between November 1 and December 31, 2013.

PAHs with No Detections Above ESV							
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					
		Total Samples	Total Detections	Detection Frequency (%)	Maximum (µg/L)	Maximum Location	Maximum Date
1-Methylnaphthalene	2.1	470	0	0%	--	--	--
2-Methylnaphthalene	4.7	470	3	0.6%	0.012	WS-014S	7/21/2013
Acenaphthene	17	474	1	0.2%	0.16	WS-005	7/4/2013
Acenaphthylene	4840	474	0	0%	--	--	--
Anthracene	0.012	474	0	0%	--	--	--
Benzo(a)Anthracene	0.018	474	2	0.4%	0.016	WS-014S	12/12/2013
Benzo(b)Fluoranthene	9.07	474	9	2%	0.079	WS-014S	12/12/2013
Benzo(g,h,i)Perylene	7.64	474	7	1%	0.14	WS-014S	12/12/2013
Benzo(k)Fluoranthene	--	474	3	0.6%	0.08	WS-014S	12/12/2013
Chrysene	--	474	4	0.8%	0.022	WS-005	5/17/2013
Dibenz(a,h)Anthracene	--	474	4	0.8%	0.13	WS-014S	12/12/2013
Fluoranthene	39.8	474	6	1%	0.060	WS-005	5/17/2013
Fluorene	3	474	0	0%	--	--	--
Indeno[1,2,3-cd]Pyrene	4.31	474	6	1%	0.13	WS-014S	12/12/2013
Naphthalene	62	474	45	9%	0.17	WS-005	7/11/2013
Phenanthrene	0.4	474	0	0%	--	--	--

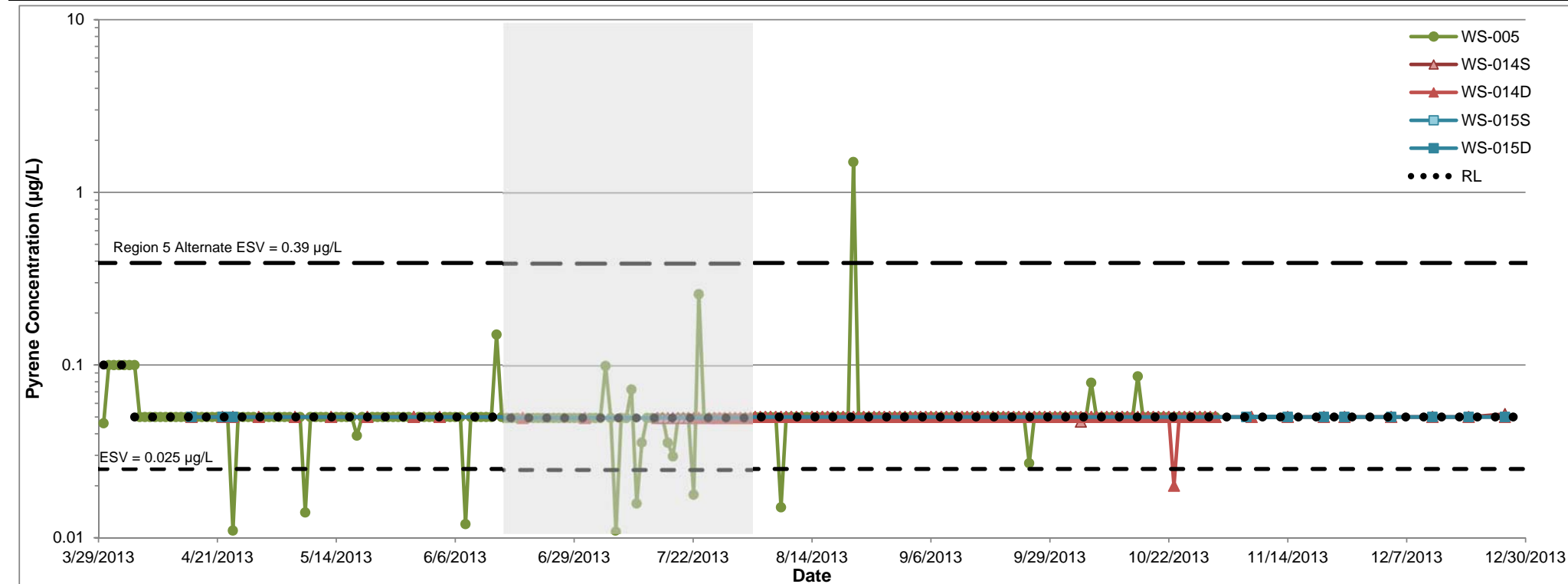
Notes:

-- = no criteria available or not applicable
 ESV = Ecological screening value
 µg/L = micrograms per liter
 PAH = polycyclic aromatic hydrocarbon
 RL = reporting limit
 RCRA = Resource Conservation and Recovery Act
 USEPA = U.S. Environmental Protection Agency
 WS-014D = deep sample
 WS-014S = shallow sample

1. Evaluation based on the following background locations in Lake Conway: WS-005, WS-014S, WS-14D, WS-015S, and WS-015D.
2. Sampling at WS-005 was discontinued on October 31, 2013.
3. Weekly surface water sampling started from November 1, 2013.

PAHs with Detections Above ESV in Daily Samples but, No Detections Above ESV in Weekly Samples																
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					Recent Daily Sampling Results (10/1/2013 - 10/31/2013)					Weekly Sampling Results (11/1/2013 - 12/31/2013)				
		Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Maximum (µg/L)	Maximum Location	Maximum Date
Pyrene	0.025	474	22	5%	0.011-1.5	14	93	4	4%	0.02-0.086	3	32	0	--	--	--

PAHs with Detections Above ESV in Weekly Samples																	
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					Recent Daily Sampling Results (10/1/2013 - 10/31/2013)					Weekly Sampling Results (11/1/2013 - 12/31/2013)					
		Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Above ESV	Maximum (µg/L)	Maximum Location	Maximum Date
Benzo(a)Pyrene	0.015	474	5	1%	0.011-0.077	3	93	1	1%	0.018	1	32	1	1	0.077	WS-014S	12/12/2013



o **Benzo(a)Pyrene:** During the entire monitoring period, benzo(a)pyrene was detected above the ESV in three samples. For weekly sampling results, there was one detected concentration above the ESV at WS-014S on December 12, 2013. Benzo(a)pyrene has not been detected in any weekly background samples collected since December 12, 2013.

o **Pyrene:** For the entire monitoring period, there were fourteen detected concentrations above the ESV. The ESV of 0.025 µg/L is from Region 3 and is based on a value identified in 1999 by the Canadian Council of Ministers of the Environment (CCME). There was one detected concentration of pyrene on August 22, 2013 above the alternate ESV of 0.39 µg/L established by USEPA Region 5 as a RCRA Interim Criterion (USEPA 2003). There are no detected concentrations in weekly samples.

█ = Approximate timeframe with no flow through Dawson Cove culverts to Lake Conway

MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

EVALUATION OF PAHs IN BACKGROUND
 SURFACE WATER (MARCH 30 - DECEMBER 31, 2013)

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FIGURE 8-6

PAHs with No Detections Above ESV							
Analyte	ESV (µg/L)	All Sampling Results (3/29/2013 - 12/31/2013)					
		Total Samples	Total Detections	Detection Frequency (%)	Maximum (µg/L)	Maximum Location	Maximum Date
1-Methylnaphthalene	2.1	1920	19	1%	0.069	WS-003	5/8/2013
2-Methylnaphthalene	4.7	1920	34	2%	0.13	WS-003	5/8/2013
Acenaphthene	17	1942	4	0.2%	0.083	WS-002	7/4/2013
Acenaphthylene	4840	1942	6	0.3%	0.054	WS-012D	9/27/2013
Benzo(b)Fluoranthene	9.07	1942	73	4%	0.91	WS-006S	7/8/2013
Benzo(g,h,i)Perylene	7.64	1942	27	1%	0.27	WS-006S	7/8/2013
Benzo(k)Fluoranthene	--	1942	28	1%	0.48	WS-006S	7/8/2013
Chrysene	--	1942	66	3%	0.60	WS-006S	7/8/2013
Dibenz(a,h)Anthracene	--	1942	13	0.7%	0.23	WS-006S	7/8/2013
Fluoranthene	39.8	1942	78	4%	0.64	WS-006S	7/8/2013
Fluorene	3	1942	4	0.2%	0.22	WS-006S	7/8/2013
Indeno[1,2,3-cd]Pyrene	4.31	1942	30	2%	0.33	WS-006S	7/8/2013
Naphthalene	62	1942	311	16%	0.56	WS-003	7/17/2013
Phenanthrene	0.4	1942	4	0.2%	0.071	WS-001D	9/5/2013

Notes:

-- = no criteria available
 ESV = Ecological screening value
 µg/L = micrograms per liter
 PAH = polycyclic aromatic hydrocarbon

RL = reporting limit
 RCRA = Resource Conservation and Recovery Act
 USEPA = U.S. Environmental Protection Agency
 WS-001D = deep sample

WS-001S = shallow sample

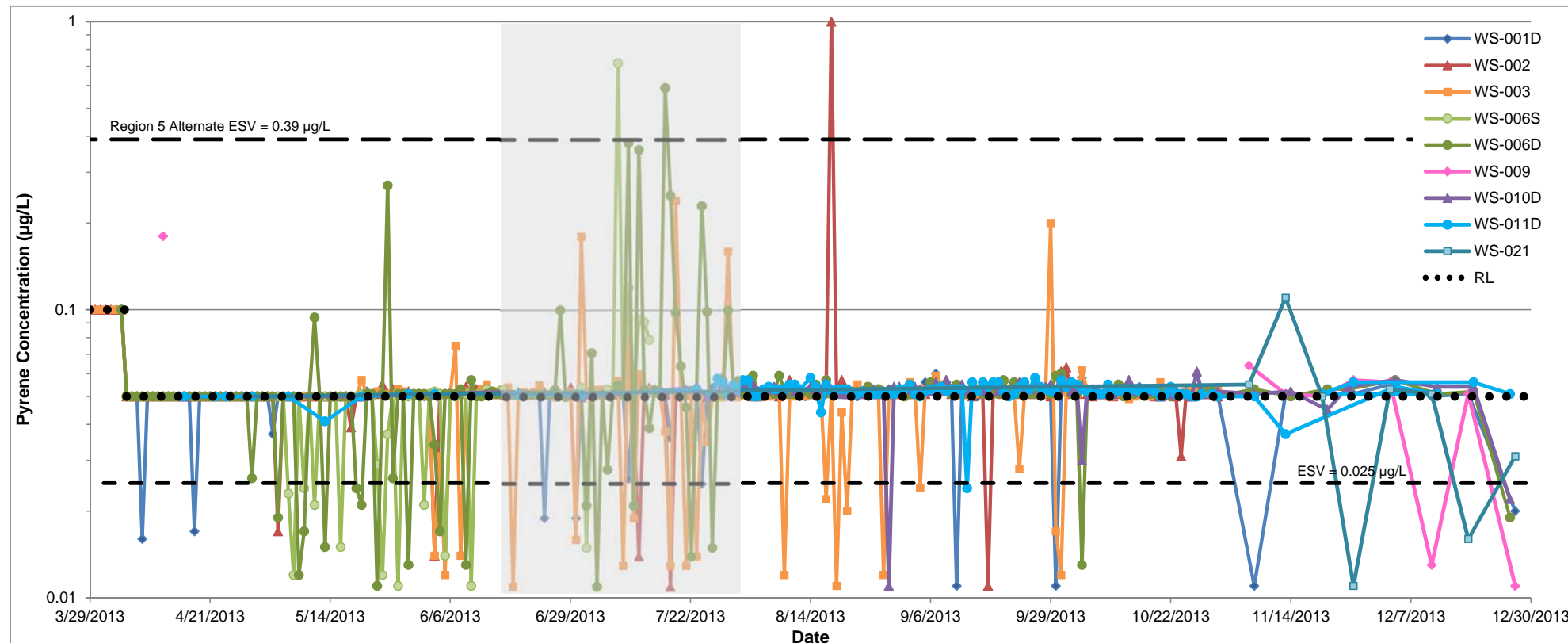
1. Evaluation based on the following locations in Lake Conway: WS-001S, WS-001D, WS-002, WS-003, WS-006S, WS-006D, WS-009, WS-010S, WS-010D, WS-011S, WS-011D, WS-012S, WS-012D, WS-018S, WS-018D, and WS-021.
2. No pyrene detections in weekly samples collected from WS-010S, WS-011S, and WS-012S.
3. Sampling at WS-001S and WS-006S was discontinued on July 14, 2013. Sampling at WS-009 and WS-021 was discontinued from April through October 2013. Sampling at WS-002, WS-003, WS-018S, and WS-018D was discontinued on October 31, 2013.
4. Weekly surface water sampling started from November 1, 2013.

Anthracene and Benzo(a)Anthracene were detected with concentrations above the ESV in daily samples.

- o **Anthracene:** There was only one detected concentration above the ESV in a daily sample collected at WS-010S (0.014 µg/L) on October 23, 2013. There are no detected concentrations in weekly samples.
- o **Benzo(a)Anthracene:** There were ten detected concentrations above ESV until September 30, 2013. There are no detected concentrations in recent daily samples. There is one detected concentration of 0.017 µg/L (WS-011D) in weekly samples.

PAHs with Detections Above ESV in Daily Samples but, No Detections Above ESV in Weekly Samples																
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					Recent Daily Sampling Results (10/1/2013 - 10/31/2013)					Weekly Sampling Results (11/1/2013 - 12/31/2013)				
		Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Maximum (µg/L)	Maximum Location	Maximum Date
Anthracene	0.012	1942	9	0.5%	0.013-0.23	8	338	1	0.3%	0.014	1	80	0	--	--	--
Benzo(a)Anthracene	0.018	1942	31	2%	0.011-0.51	10	338	0	0%	--	--	80	4	0.017	WS-011D	11/13/2013

PAHs with Detections Above ESV in Weekly Samples																	
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					Recent Daily Sampling Results (10/1/2013 - 10/31/2013)					Weekly Sampling Results (11/1/2013 - 12/31/2013)					
		Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Above ESV	Maximum (µg/L)	Maximum Location	Maximum Date
Benzo(a)Pyrene	0.015	1942	23	1%	0.011-0.51	15	338	0	0%	--	--	80	4	3	0.021	WS-009	12/11/2013
Pyrene	0.025	1942	135	7%	0.011-1.0	55	338	4	1%	0.012-0.031	2	80	14	5	0.11	WS-021	11/13/2013



Benzo(a)Pyrene and Pyrene had detected concentrations above the ESV in weekly samples collected between November 1 and December 31, 2013.

- o **Benzo(a)Pyrene:** There were three detected concentrations above the ESV in a weekly sample collected at WS-009 (0.021 µg/L) on December 11, 2013 and samples collected at WS-006D (0.017 µg/L) and WS-010D (0.019 µg/L) on December 26, 2013.
- o **Pyrene:** For the weekly samples, there were five detected concentration above the ESV of 0.025 µg/L. For the entire monitoring period, there were 54 detected concentrations (50 daily and 5 weekly samples) above the ESV. The maximum detected pyrene concentration of 1.0 µg/L in Lake Conway samples is less than the maximum of 1.5 µg/L detected pyrene concentration in a background sample. The ESV of 0.025 µg/L is from Region 3 and is based on a value identified in 1999 by the Canadian Council of Ministers of the Environment (CCME). There were three detected concentrations of pyrene above the alternate ESV of 0.39 µg/L established by USEPA Region 5 as a RCRA Interim Criterion (USEPA 2003). Locations WS-002, WS-003, WS-011, and WS-012 are not located adjacent to the Dawson Cove outlet.

■ = Approximate timeframe with no flow through Dawson Cove culverts to Lake Conway

MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

EVALUATION OF PAHs IN LAKE CONWAY
 SURFACE WATER (MARCH 29 - DECEMBER 31, 2013)

PAHs with No Detections Above ESV							
Analyte	ESV (µg/L)	All Sampling Results (3/29/2013 - 12/31/2013)					
		Total Samples	Total Detections	Detection Frequency (%)	Maximum (µg/L)	Maximum Location	Maximum Date
1-Methylnaphthalene	2.1	536	264	49%	0.50	WS-007D	4/5/2013
2-Methylnaphthalene	4.7	536	251	47%	0.47	WS-004S	5/5/2013
Acenaphthene	17	545	128	23%	0.76	WS-007D	7/20/2013
Acenaphthylene	4840	545	118	22%	2.7	WS-007D	7/20/2013
Benzo(g,h,i)Perylene	7.64	545	217	40%	6.1	WS-007D	6/26/2013
Benzo(k)Fluoranthene	--	545	215	39%	9.6	WS-007D	6/26/2013
Chrysene	--	545	313	57%	33	WS-007D	6/26/2013
Dibenz(a,h)Anthracene	--	545	105	19%	1.9	WS-007D	7/20/2013
Fluorene	3	545	185	34%	1.0	WS-007D	7/22/2013
Naphthalene	62	545	162	30%	0.93	WS-004S	4/2/2013

Notes:

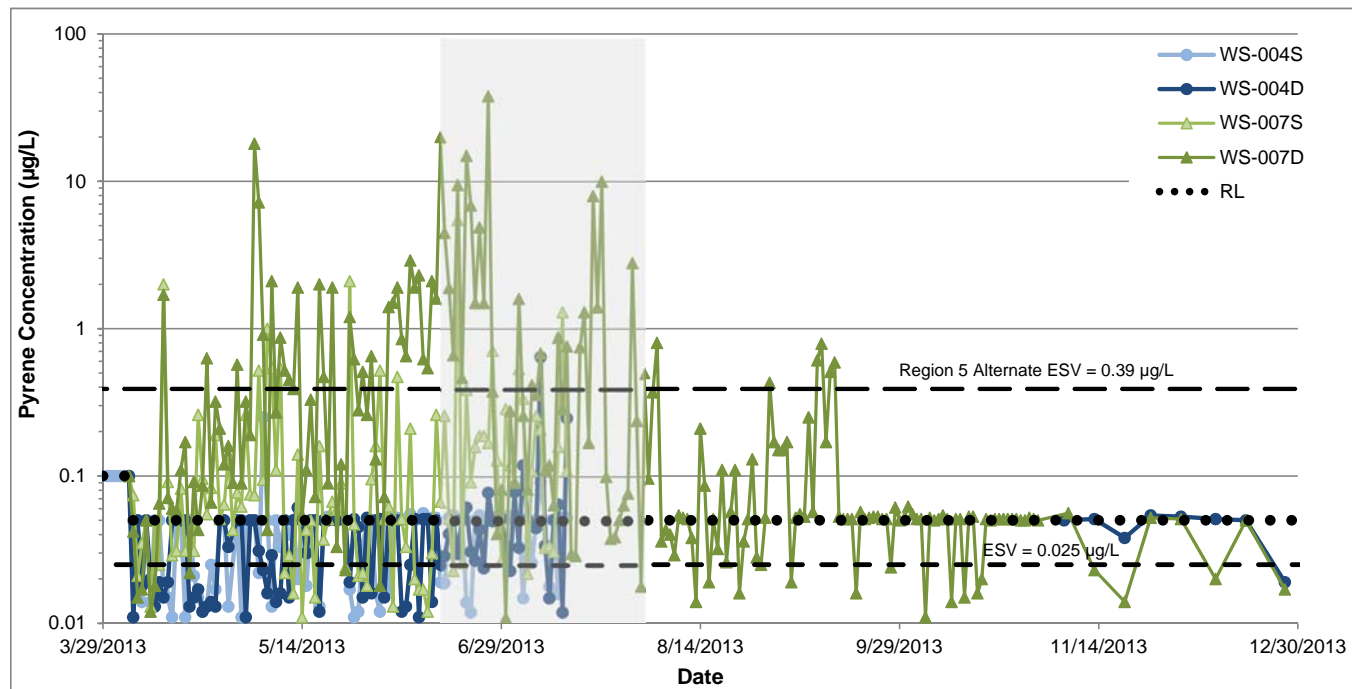
-- = no criteria available
 ESV = Ecological screening value
 µg/L = micrograms per liter
 PAH = polycyclic aromatic hydrocarbon
 RL = reporting limit

RCRA = Resource Conservation and Recovery Act
 USEPA = U.S. Environmental Protection Agency
 WS-004D = deep sample
 WS-004S = shallow sample

1. Evaluation based on the following locations in Dawson Cove: WS-004S, WS-004D, WS-007S, WS-007D, and WS-020.
2. No pyrene detections above RLs at location WS-020. The reporting limit was 0.1 µg/L from March 29 to April 4, 2013 and has been 0.05 µg/L since April 5, 2013.
3. Sampling at WS-004S and WS-007S was discontinued on July 14, 2013. Sampling at WS-004D was discontinued from July 15 through October 31, 2013. Sampling at WS-020 was discontinued from April through October 2013.
4. Weekly surface water sampling started from November 1, 2013.

PAHs with Detections Above ESV in Daily Samples but, No Detections Above ESV in Weekly Samples																
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					Recent Daily Sampling Results (10/1/2013 - 10/31/2013)					Weekly Sampling Results (11/1/2013 - 12/31/2013)				
		Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Maximum (µg/L)	Maximum Location	Maximum Date
Anthracene	0.012	545	193	36%	0.011-3.4	181	31	0	0%	--	--	24	0	--	--	--
Benzo(b)Fluoranthene	9.07	545	304	56%	0.011-31	6	31	4	13%	0.015-0.023	0	24	8	0.035	WS-007D	11/13/2013
Fluoranthene	39.8	545	329	60%	0.011-47	1	31	5	16%	0.011-0.022	0	24	8	0.031	WS-007D	12/11/2013
Indeno[1,2,3-cd]Pyrene	4.31	545	208	38%	0.011-6.7	3	31	2	6%	0.011-0.012	0	24	2	0.019	WS-020	12/18/2013
Phenanthrene	0.4	545	178	34%	0.031-8.7	34	31	0	0%	--	--	24	1	0.033	WS-020	11/13/2013

PAHs with Detections Above ESV in Weekly Samples																	
Analyte	ESV (µg/L)	All Sampling Results (3/30/2013 - 12/31/2013)					Recent Daily Sampling Results (10/1/2013 - 10/31/2013)					Weekly Sampling Results (11/1/2013 - 12/31/2013)					
		Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Detection Frequency (%)	Range (µg/L)	Above ESV	Total Samples	Total Detections	Above ESV	Maximum (µg/L)	Maximum Location	Maximum Date
Benzo(a)Anthracene	0.018	545	229	42%	0.011-10	168	31	0	0%	--	--	24	1	1	0.019	WS-007D	11/13/2013
Benzo(a)Pyrene	0.015	545	207	39%	0.011-9.0	173	31	0	0%	--	--	24	2	1	0.016	WS-007D	11/13/2013
Pyrene	0.025	545	365	68%	0.011-38	249	31	5	16%	0.011-0.02	0	24	9	1	0.038	WS-004D	11/20/2013



Pyrene and phenanthrene shown for illustration purposes. Similar trends observed for anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, fluoranthene, and indeno(1,2,3-cd)pyrene.
 = Approximate timeframe with no flow through Dawson Cove culverts to Lake Conway

Anthracene, benzo(b)fluoranthene, fluoranthene, indeno(1,2,3-cd)pyrene, and phenanthrene were detected above their respective ESVs in past daily samples but, have not been detected at concentrations above ESVs in recent daily samples collected in October 2013 or in weekly samples collected between November 1 and December 31, 2013.

- o **Anthracene** was detected above the ESV of 0.012 µg/L in 181 daily samples with a maximum concentration of 3.4 µg/L in a sample collected at WS-007D on September 28, 2013. Anthracene has not been detected in samples collected since September 29, 2013.
- o **Benzo(b)fluoranthene** was detected above the ESV of 9.07 µg/L in six daily samples with a maximum concentration of 31 µg/L in a sample collected at WS-007D on June 26, 2013. Benzo(b)fluoranthene has not been detected above the ESV in samples collected since July 23, 2013.
- o **Fluoranthene** was detected above the ESV of 39.8 µg/L in only one sample (47 µg/L) collected at WS-007D on June 26, 2013. Fluoranthene has not been detected above the ESV in samples collected since June 26, 2013.
- o **Indeno[1,2,3-cd]pyrene** was detected above the ESV of 4.31 µg/L in three daily samples with a maximum concentration of 6.7 µg/L in a sample collected at WS-007D on June 26, 2013. Indeno[1,2,3-cd]pyrene has not been detected above the ESV in samples collected since July 23, 2013.
- o **Phenanthrene** was detected above the ESV of 0.4 µg/L in 34 daily samples with a maximum concentration of 8.7 µg/L in a sample collected at WS-007D on June 26, 2013. Phenanthrene has not been detected above the ESV in samples collected since July 30, 2013.

Benzo(a)anthracene, benzo(a)pyrene, and pyrene were detected above their respective ESVs in weekly samples collected between November 1 and December 31, 2013.

- o **Benzo(a)anthracene**: There was one detected concentration (0.019 µg/L) above the ESV of 0.018 µg/L on November 13, 2013.
- o **Benzo(a)pyrene**: There was one detected concentration (0.016 µg/L) above the ESV of 0.015 µg/L on November 13, 2013.
- o **Pyrene**: For the weekly samples, there was one detected concentration (0.038 µg/L) above the Region 3 ESV of 0.025 µg/L. For the entire monitoring period, there were 249 detected concentrations (248 daily and 1 weekly samples) above the Region 3 ESV (0.025 µg/L) which is based on a value identified in 1999 by the Canadian Council of Ministers of the Environment (CCME). Since September 14, 2013, there were no detected concentrations of pyrene above the alternate ESV of 0.39 µg/L established by USEPA Region 5 as a RCRA Interim Criterion (USEPA 2003).

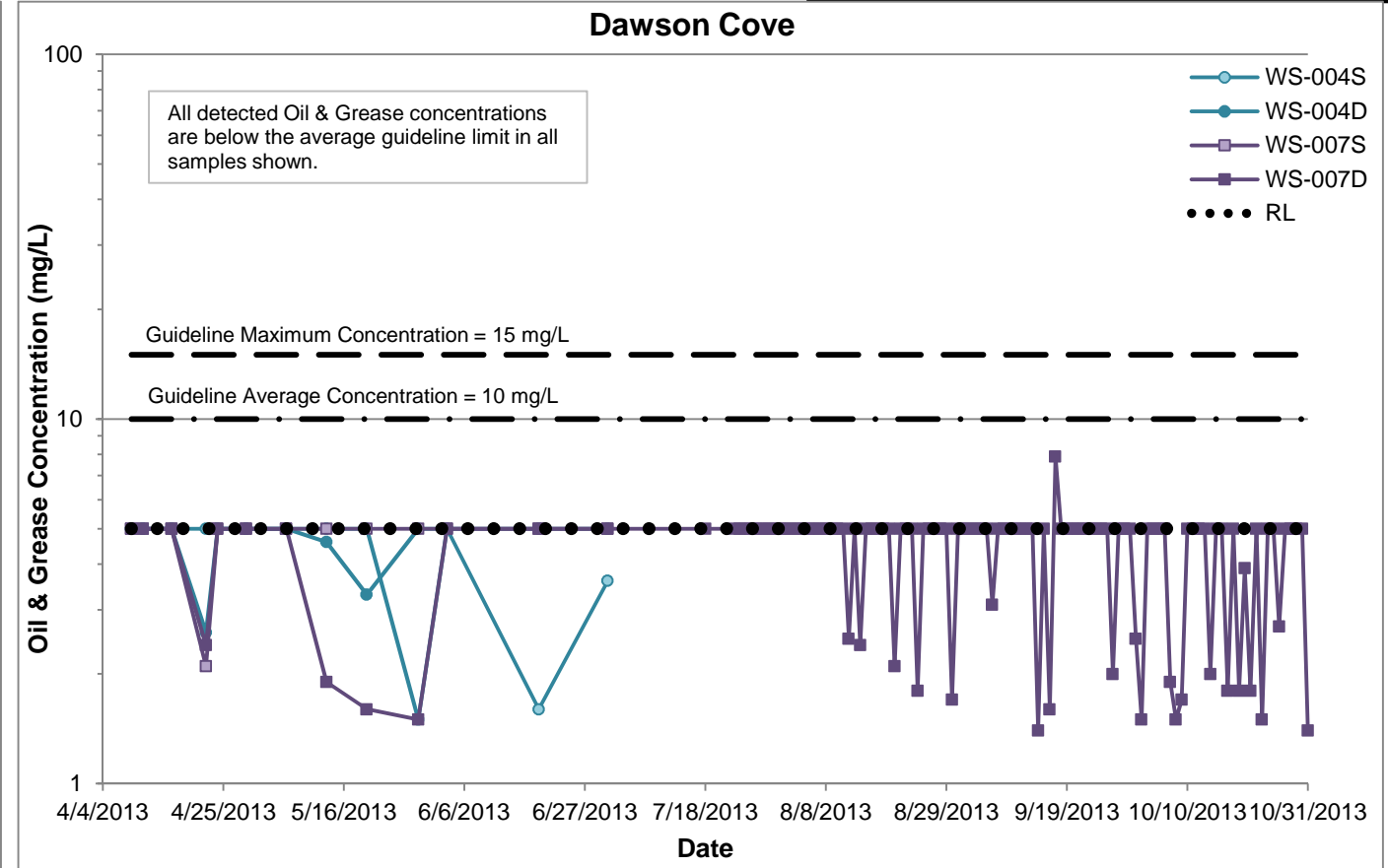
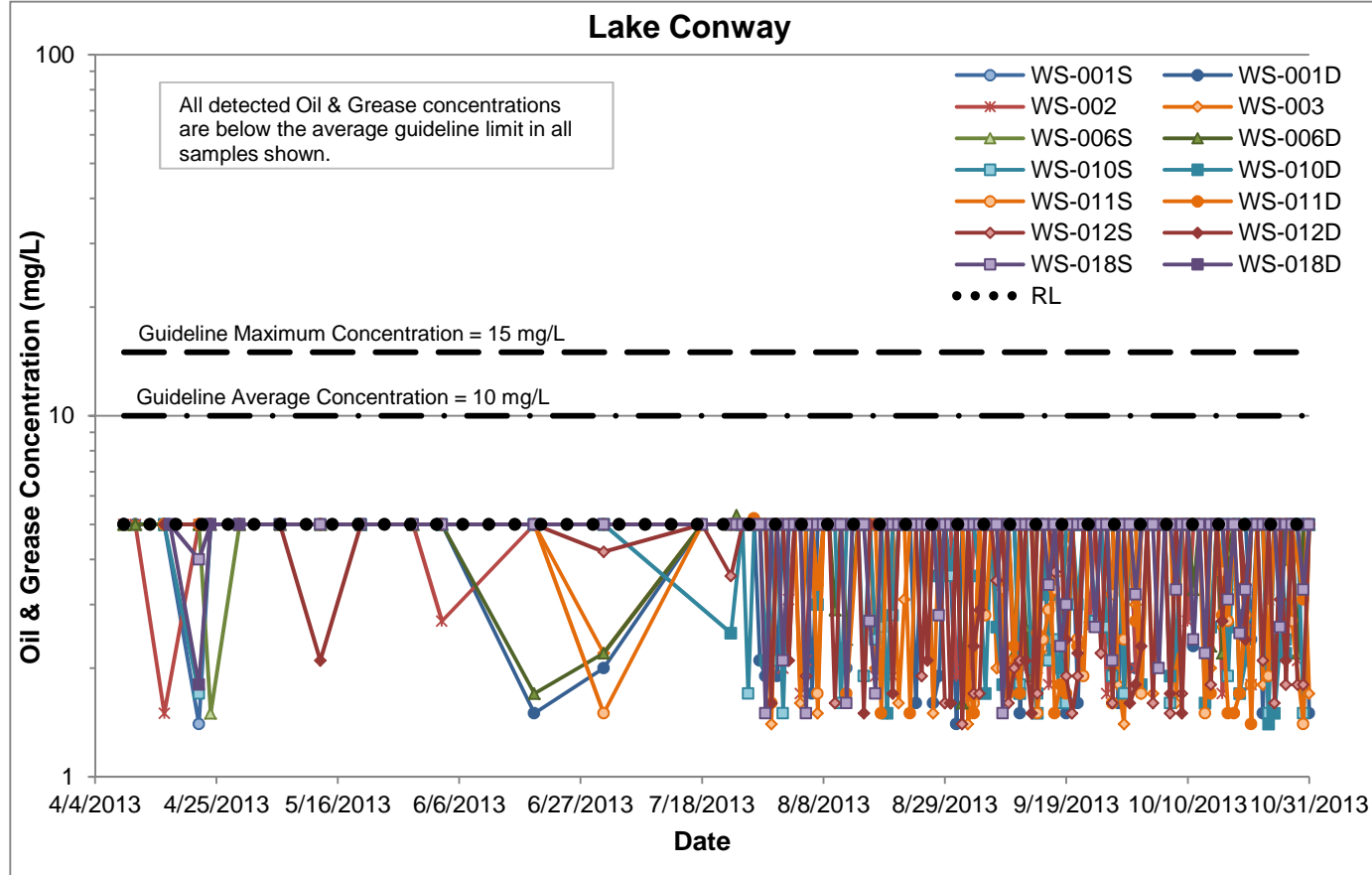
MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

EVALUATION OF PAHs IN DAWSON COVE
 SURFACE WATER (MARCH 29 - DECEMBER 31, 2013)

Summary of Oil & Grease Data

Analyte	All Sampling Results (4/9/2013 - 10/31/2013)						
	Total Samples	Total Detections	Detection Frequency (%)	Detection Range (mg/L)	Maximum Detected Concentration (mg/L)	Maximum Location	Maximum Date
Oil & Grease	1788	415	23%	1.4 - 10.1	10.1	WS-008	5/29/2013

There has been only one Oil & Grease concentration above the Guideline Average Concentration of 10 mg/L at WS-008 (10.1 mg/L) on May 29, 2013 (location in the drainage way along Main St, not graphed below). There have been no recent detected concentrations above the Guideline Average or Maximum Concentrations.



Notes:

mg/L = milligrams per liter
RL = reporting limit

WS-001D = deep sample
WS-001S = shallow sample

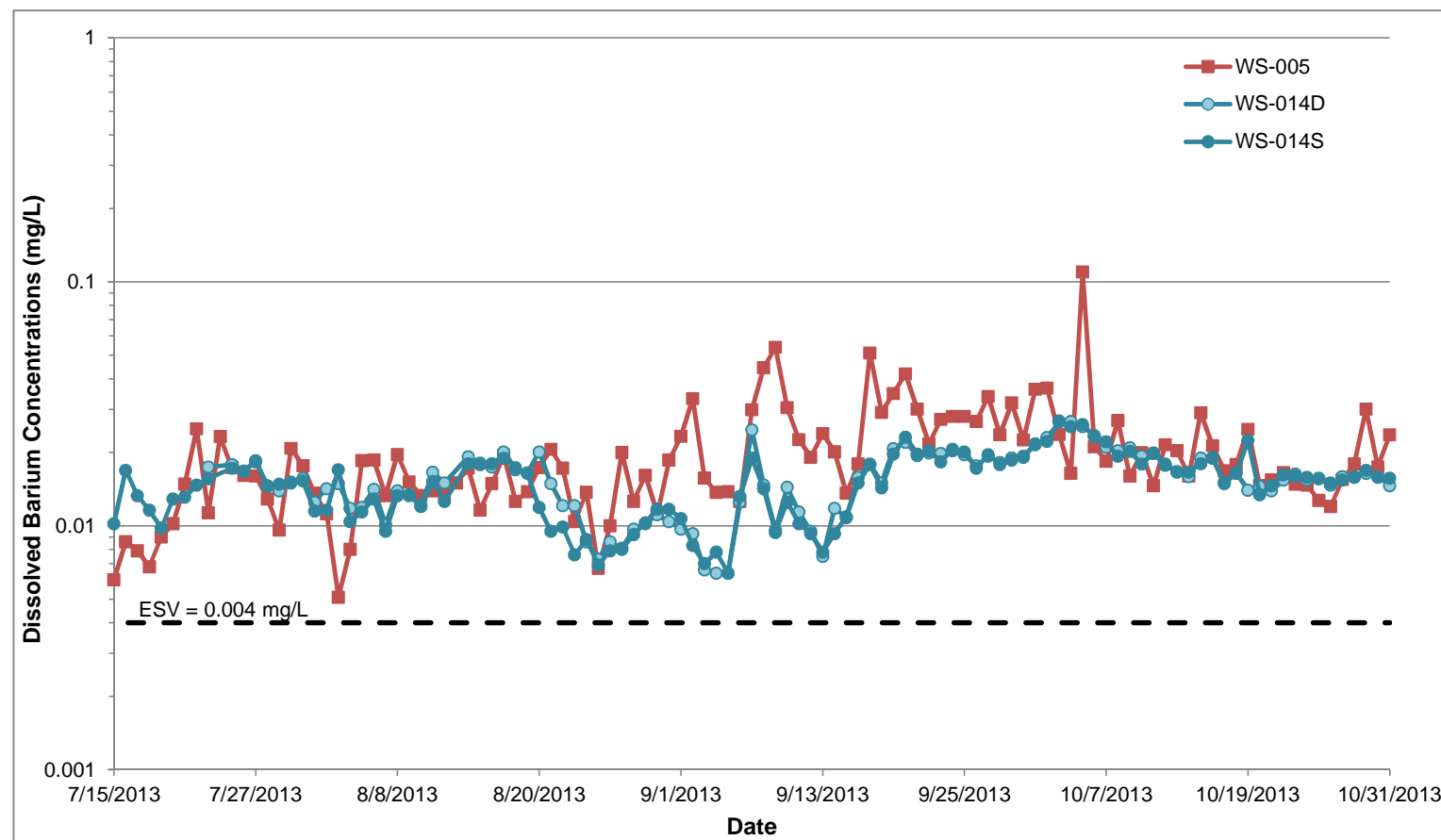
1. Graphs show Oil & Grease concentrations with time for locations that had more than one detection of Oil & Grease.
2. Lake Conway evaluation based on the locations WS-001S, WS-001D, WS-002, WS-003, WS-006S, WS-006D, WS-009, WS-010S, WS-010D, WS-011S, WS-011D, WS-012S, WS-012D, WS-018, and WS-021. Samples from WS-009 and WS-021 were not analyzed for Oil & Grease.
3. Dawson Cove evaluation based on the locations WS-004S, WS-004D, WS-007S, WS-007D, and WS-020. Samples from WS-020 were not analyzed for Oil & Grease.
4. No Oil & Grease detections above the RL of 5 mg/L at locations WS-BKG-001 and WS-BKG-002.
5. Evaluation based on data for surface water samples collected from April 9 through October 31, 2013.
6. Average and Maximum Guideline Concentrations are based on Arkansas Pollution Control and Ecology Commission Regulation No. 2.
7. Sampling at WS-001S, WS-004S, WS-004D, WS-006S, and WS-007S was discontinued on July 14, 2013. Sampling at WS-009 and WS-021 was discontinued in April 2013. There was no flow in WS-008 between June 19 and August 11, 2013, and therefore, the location was not sampled.
8. Oil & Grease analyses were discontinued on October 31, 2013.

MAYFLOWER PIPELINE INCIDENT RESPONSE EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY DOWNSTREAM AREAS DATA ASSESSMENT REPORT	
EVALUATION OF OIL & GREASE IN SURFACE WATER (APRIL 9 - OCTOBER 31, 2013)	
	FIGURE 8-9

Metals with No Dissolved Concentrations Detected Above ESV														
Analyte <i>shading = not detected in crude oil</i>	ESV* (mg/L)	All Dissolved Metals Sampling Results (7/15/2013 - 10/31/2013)					Total Metals Sampling Results (7/15/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (mg/L)	Maximum Location	Maximum Date
Arsenic	0.15	315	16	5%	0.0068-0.0103	0.0078	315	45	14%	0.0069	0.0084	0.017	WS-005	9/17/2013
Cadmium	0.00037	315	0	0%	--	--	315	1	0.3%	--	0.0048	--	WS-014S	9/13/2013
Calcium	116	--	--	--	--	--	315	315	100%	3.9	6.21	18.3	WS-005	10/5/2013
Chromium	0.0572	315	1	0.3%	--	0.0038	315	34	11%	0.0016	0.0025	0.067	WS-014S	10/11/2013
Magnesium	82	--	--	--	--	--	315	315	100%	2.00	2.81	6.62	WS-005	10/5/2013
Mercury	0.00077	315	1	0.3%	--	0.00077	315	4	1%	0.000067	0.00007	0.000079	WS-014S	9/28/2013
Nickel	0.049	314	14	4%	0.0015-0.0026	0.0017	315	77	24%	0.0015	0.0023	0.011	WS-014S	7/20/2013
Selenium	0.005	315	0	0%	--	--	315	0	0%	--	--	--	--	--
Silver	0.0003	315	0	0%	--	--	315	0	0%	--	--	--	--	--
Vanadium	0.02	315	0	0%	--	--	315	12	4%	0.0021	0.0027	0.005	WS-005	9/17/2013

*All ESVs are for dissolved metals, except for arsenic and mercury. ESVs for arsenic and mercury are for total metals.

Metal with Dissolved Concentrations Detected Above ESV														
Analyte <i>shading = not detected in crude oil</i>	ESV (mg/L)	Recent Dissolved Metals Sampling Results (10/1/2013 - 10/31/2013)					Recent Total Metals Sampling Results (10/1/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (mg/L)	Maximum Location	Maximum Date
Barium	0.004	93	93	100%	0.012-0.11	0.020	93	93	100%	0.019	0.037	0.139	WS-005	10/5/2013
Lead	0.00054	93	1	1%	--	0.0049	93	2	2%	0.0055	0.0055	0.0055	WS-005; WS-014S	10/31/2013



Between July 15 and October 31, 2013, dissolved barium concentrations in background surface water samples ranged from 0.0051 to 0.011 mg/L, above the ESV of 0.004 mg/L.


The Barium ESV is a secondary chronic value developed by the USEPA for the Great Lakes Water Quality Initiative, as cited in Suter and Tsao (1996). Suter and Tsao (1996) include a comment about this ESV: "Background water concentrations should be used as a check for these benchmarks [i.e., ESVs]. That is, because some of these benchmarks are quite conservative and because the measured concentrations in ambient water may include forms that are not bioavailable, benchmark concentrations may be lower than background water concentrations. If the background concentrations are valid and represent an uncontaminated state and if exposed site does not contain forms of the chemicals that are more bioavailable or toxic than the forms at background sites, then screening benchmarks lower than the background concentration should not be used."

Notes:

-- = no criterion available or not applicable
 ESV = Ecological screening value
 mg/L = milligrams per liter

USEPA = U.S. Environmental Protection Agency
 WS-014D = deep sample
 WS-014S = shallow sample

1. Evaluation based on the following background locations in Lake Conway: WS-005, WS-014S, and WS-14D.
2. Metals analyses were discontinued on October 31, 2013.

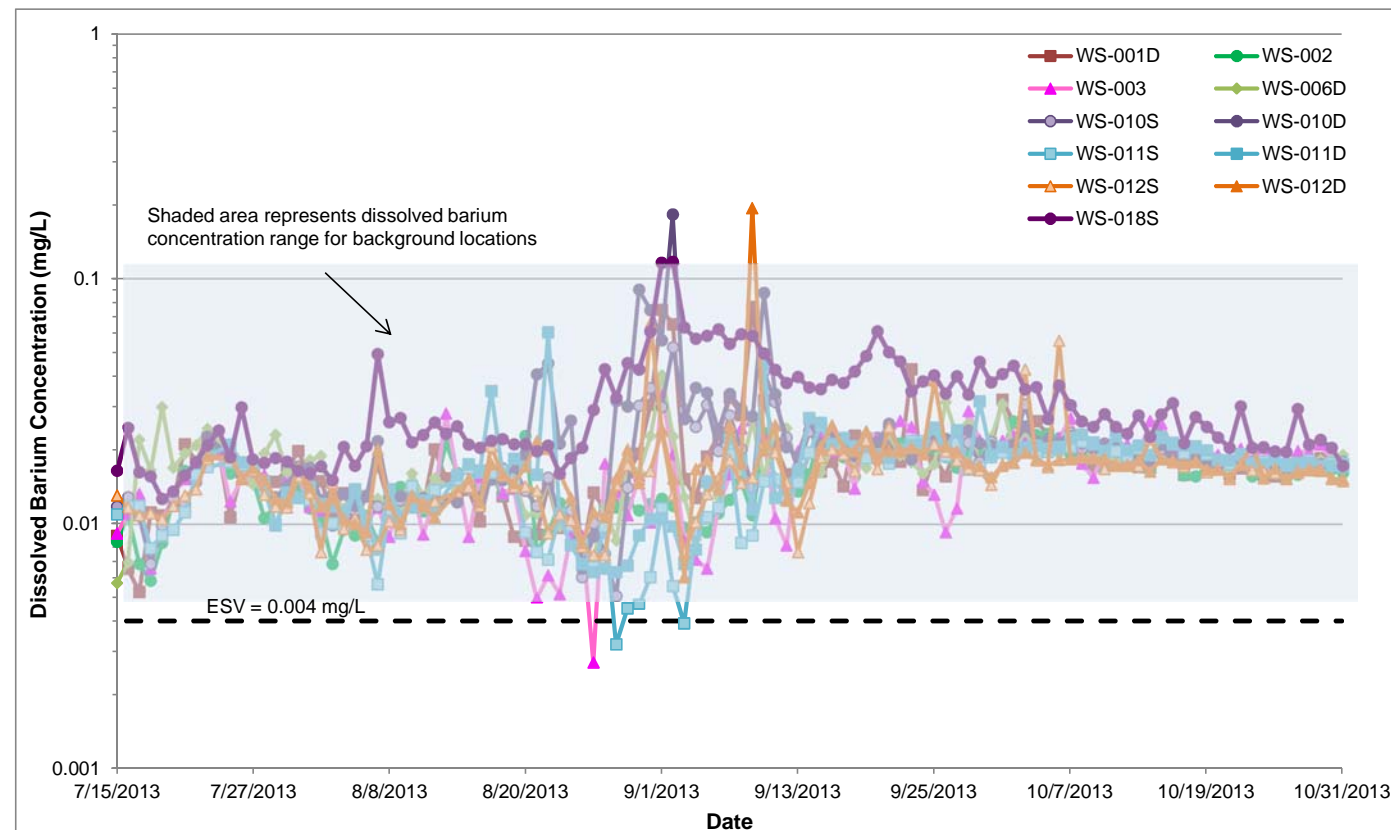
EXXONMOBIL PIPELINE COMPANY MAYFLOWER PIPELINE INCIDENT RESPONSE MAYFLOWER, ARKANSAS SURFACE WATER DATA EVALUATION EVALUATION OF METALS IN BACKGROUND SURFACE WATER (JULY 15 - OCTOBER 31, 2013)	
	FIGURE 8-10

Metals Not Detected in Crude Oil or with No Dissolved Concentrations Detected Above ESV														
Analyte <i>shading = not detected in crude oil</i>	ESV* (mg/L)	All Dissolved Metals Sampling Results (7/15/2013 - 10/31/2013)					Total Metals Sampling Results (7/15/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (mg/L)	Maximum Location	Maximum Date
Arsenic	0.15	1159	59	5%	0.0068-0.0102	0.0077	1159	196	17%	0.0069	0.0088	0.0316	WS-006D	7/21/2013
Calcium	116	--	--	--	--	--	1159	1159	100%	4.03	6.1	11.5	WS-006D	7/21/2013
Chromium	0.0572	1159	6	0.5%	0.0017-0.0091	0.0030	1159	72	6%	0.0016	0.048	0.0357	WS-006D	7/27/2013
Magnesium	82	--	--	--	--	--	1159	1159	100%	1.91	2.87	8.14	WS-006D	7/21/2013
Mercury	0.00077	1159	10	1%	0.000061-0.0011	0.00025	1159	24	2%	0.000062	0.000093	0.0002	WS-018S	7/23/2013
Nickel	0.049	1159	26	2%	0.0015-0.0078	0.0020	1159	215	19%	0.0015	0.0026	0.0216	WS-006D	7/27/2013
Selenium	0.005	1159	0	0%	--	--	1159	0	0%	--	--	--	--	--
Silver	0.0003	1159	0	0%	--	--	1159	5	0.4%	0.0021	0.0022	0.0024	WS-018S	7/25/2013
Vanadium	0.02	1159	1	0.1%	--	0.0073	1159	43	4%	0.002	0.012	0.0867	WS-006D	7/21/2013

*All ESVs are for dissolved metals, except for arsenic and mercury. ESVs for arsenic and mercury are for total metals.

Metals with No Recent Dissolved Concentrations Detected Above ESV														
Analyte <i>shading = not detected in crude oil</i>	ESV (mg/L)	Recent Dissolved Metals Sampling Results (10/1/2013 - 10/31/2013)					Recent Total Metals Sampling Results (10/1/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (mg/L)	Maximum Location	Maximum Date
Cadmium	0.00037	338	0	0%	--	--	338	0	0%	--	--	--	--	--

Metals with Dissolved Concentrations Detected Above ESV														
Analyte <i>shading = not detected in crude oil</i>	ESV (mg/L)	Recent Dissolved Metals Sampling Results (10/1/2013 - 10/31/2013)					Recent Total Metals Sampling Results (10/1/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (mg/L)	Maximum Location	Maximum Date
Barium	0.004	338	338	100%	0.015-0.056	0.020	338	338	100%	0.0229	0.038	0.118	WS-018S	10/13/2013
Lead	0.00054	338	5	1%	0.0048-0.0066	0.0056	338	13	4%	0.0047	0.0051	0.0058	WS-012S	10/31/2013



Barium, cadmium, and lead are the only metals that have dissolved concentrations above the ESV in Lake Conway samples.

- o **Barium** concentrations in the Lake Conway samples ranged from 0.0027 to 0.194 mg/L which is slightly higher than the range of dissolved barium, 0.0051 to 0.11 mg/L, detected in background surface water sample. Average barium concentrations in Lake Conway (0.020 mg/L) samples collected between October 1 and 31, 2013 is same as the background samples (0.020 mg/L) [see graph to left].
- o **Cadmium** was detected at a concentration of 0.0026 mg/L above the ESV of 0.00037 mg/L in one Lake Conway sample collected at WS-002 on August 11, 2013. Cadmium was not detected in any Lake Conway dissolved metal samples collected since August 11, 2013.
- o **Lead** was detected at concentrations above the ESV of 0.00054 mg/L in five Lake Conway dissolved samples collected on October 24, 2013. Lead was not detected in any Lake Conway dissolved metal samples collected since October 24, 2013.

Notes:
 -- = no criterion available or not applicable
 ESV = Ecological screening value
 mg/L = milligrams per liter
 WS-001D = deep sample
 WS-001S = shallow sample

1. Evaluation based on the following locations in Lake Conway: WS-001S, WS-001D, WS-002, WS-003, WS-006S, WS-006D, WS-010S, WS-010D, WS-011S, WS-011D, WS-012S, WS-012D, and WS-018S.
2. Sampling at WS-001S and WS-006S was discontinued on July 14, 2013.
3. Metals analyses were discontinued on October 31, 2013.

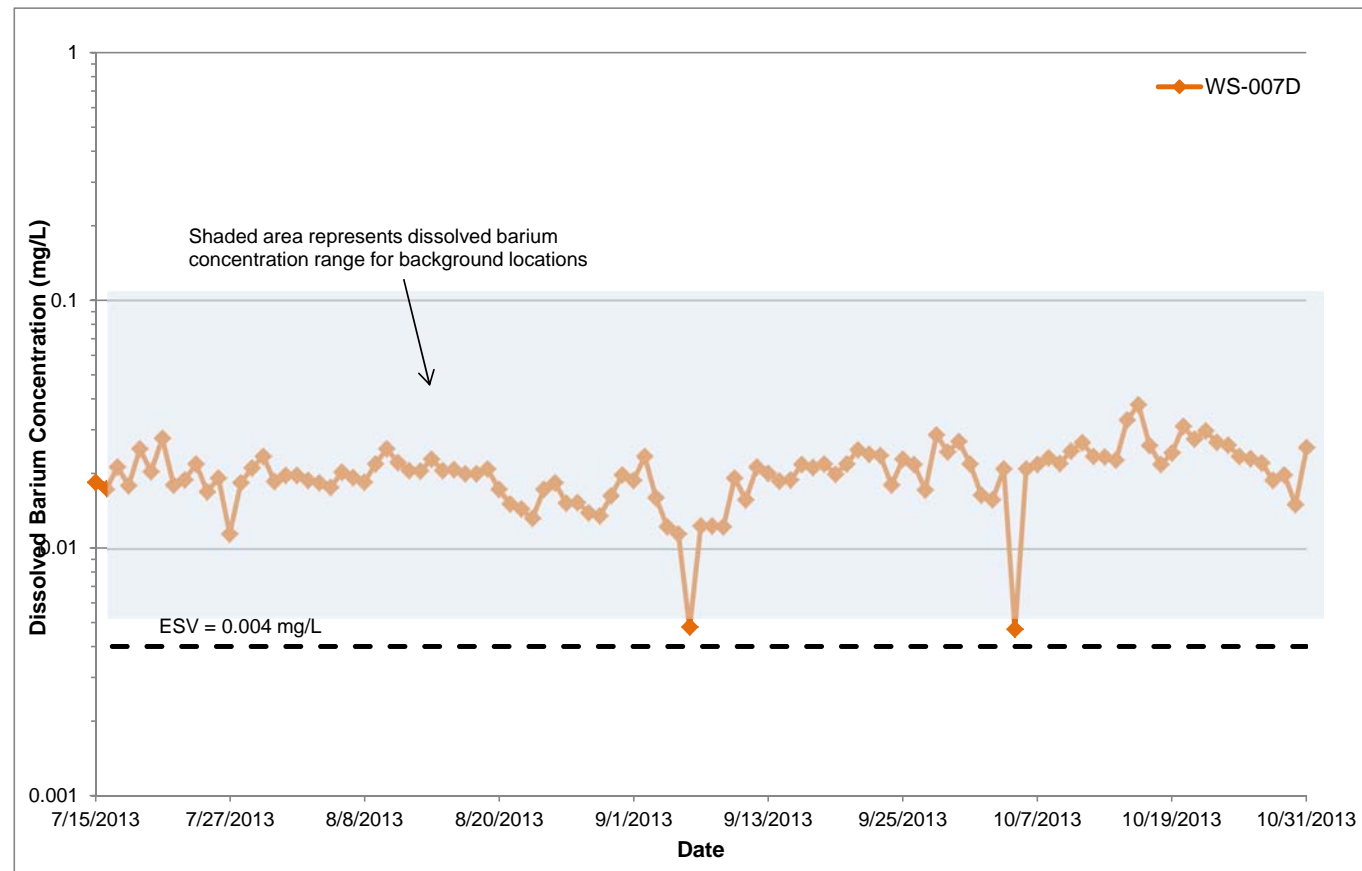
MAYFLOWER PIPELINE INCIDENT RESPONSE EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY DOWNSTREAM AREAS DATA ASSESSMENT REPORT	
EVALUATION OF METALS IN LAKE CONWAY SURFACE WATER (JULY 15 - OCTOBER 31, 2013)	
	FIGURE 8-11

Metals with No Dissolved Detections Above ESV														
Analyte <i>shading = not detected in crude oil</i>	ESV* (mg/L)	All Dissolved Metals Sampling Results (7/15/2013 - 10/31/2013)					Total Metals Sampling Results (7/15/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (mg/L)	Maximum Location	Maximum Date
Arsenic	0.15	109	12	11%	0.0068-0.0092	0.0074	109	69	63%	0.0068	0.016	0.113	WS-007D	7/26/2013
Cadmium	0.00037	109	0	0%	--	--	109	18	17%	0.0009	0.0023	0.0097	WS-007D	7/26/2013
Calcium	116	--	--	--	--	--	109	109	100%	2.17	6.20	43.6	WS-007D	7/26/2013
Chromium	0.0572	109	0	0%	--	--	109	54	50%	0.0016	0.028	0.259	WS-007D	7/26/2013
Magnesium	82	--	--	--	--	--	109	109	100%	1.0	3.6	36.1	WS-007D	7/26/2013
Mercury	0.00077	109	2	2%	0.000063	0.000063	109	19	17%	0.000061	0.00017	0.00044	WS-007D	8/31/2013
Nickel	0.049	109	33	30%	0.0015-0.0029	0.0020	109	83	76%	0.0015	0.021	0.279	WS-007D	7/26/2013
Selenium	0.005	109	0	0%	--	--	109	2	2%	0.0139	0.0175	0.0211	WS-007D	9/28/2013
Vanadium	0.02	109	0	0%	--	--	109	67	61%	0.0021	0.035	0.38	WS-007D	7/26/2013

*All ESVs are for dissolved metals, except for arsenic and mercury. ESVs for arsenic and mercury are for total metals.

Metals with No Recent Dissolved Concentrations Detected Above ESV														
Analyte	ESV (mg/L)	Recent Dissolved Metals Sampling Results (10/1/2013 - 10/31/2013)					Recent Total Metals Sampling Results (10/1/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (µg/L)	Maximum Location	Maximum Date
Silver	0.0003	31	0	0%	--	--	31	0	0%	--	--	--	--	--

Metals with Dissolved Concentrations Detected Above ESV														
Analyte	ESV (mg/L)	Recent Dissolved Metals Sampling Results (10/1/2013 - 10/31/2013)					Recent Total Metals Sampling Results (10/1/2013 - 10/31/2013)							
		Dissolved Samples	Dissolved Detections	Detection Frequency (%)	Range (mg/L)	Average (mg/L)	Total Samples	Total Detections	Detection Frequency (%)	Minimum Detected (mg/L)	Average (mg/L)	Maximum (µg/L)	Maximum Location	Maximum Date
Barium	0.004	31	31	100%	0.0047-0.0381	0.023	31	31	100%	0.0143	0.055	0.22	WS-007D	10/10/2013
Lead	0.00054	31	1	3%	--	0.0057	31	14	45%	0.005	0.010	0.0336	WS-007D	10/13/2013



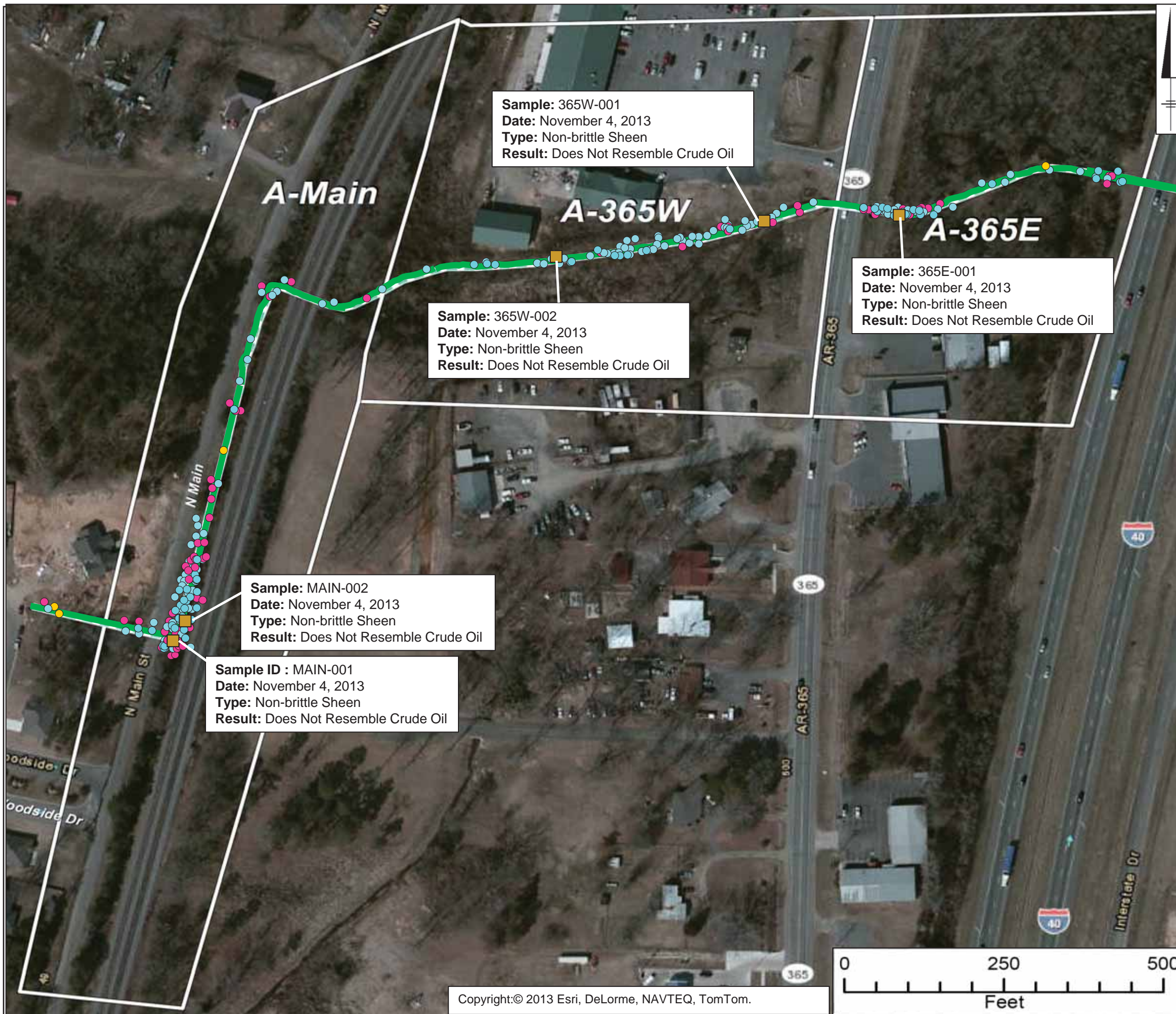
Barium, Lead, and Silver are the only metals that have dissolved concentrations above the screening levels in Dawson Cove since July 15, 2013.

- o **Barium** concentrations in Dawson Cove dissolved samples ranged from 0.0047 to 0.0381 mg/L, which are less than the range of dissolved barium detected in background samples (0.0051 to 0.11 mg/L) and within the range of dissolved barium detected in the Lake Conway samples (0.0027 to 0.194 mg/L) [see graph to left].
- o **Lead** was detected at a concentration of 0.0057 mg/L, above the ESV of 0.00054 mg/L, in one dissolved samples collected at WS-007D on October 24, 2013. Lead was not detected in any Dawson Cove dissolved metal samples collected between October 24 and 31, 2013.
- o **Silver** was detected at a concentration of 0.0024 mg/L, above the ESV of 0.0003 mg/L, in one dissolved sample collected at WS-007D on July 26, 2013. Silver was not detected in recent Dawson Cove dissolved metal samples.

Notes:
 -- = no criterion available or not applicable mg/L = milligrams per liter
 D = deep sample S = shallow sample
 ESV = Ecological screening value

1. Evaluation based on the following location in Dawson Cove: WS-007D.
2. Weekly surface water sampling started from November 1, 2013. Metals analyses were discontinued on October 31, 2013.

MAYFLOWER PIPELINE INCIDENT RESPONSE EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY DOWNSTREAM AREAS DATA ASSESSMENT REPORT	
EVALUATION OF METALS IN DAWSON COVE SURFACE WATER (JULY 15 - OCTOBER 31, 2013)	
	FIGURE 8-12



Sample: 365W-001
Date: November 4, 2013
Type: Non-brittle Sheen
Result: Does Not Resemble Crude Oil

Sample: 365W-002
Date: November 4, 2013
Type: Non-brittle Sheen
Result: Does Not Resemble Crude Oil

Sample: 365E-001
Date: November 4, 2013
Type: Non-brittle Sheen
Result: Does Not Resemble Crude Oil

Sample: MAIN-002
Date: November 4, 2013
Type: Non-brittle Sheen
Result: Does Not Resemble Crude Oil

Sample ID : MAIN-001
Date: November 4, 2013
Type: Non-brittle Sheen
Result: Does Not Resemble Crude Oil

Legend:

- Drainage Path
- Brittle Sheen
- Non-Brittle Sheen
- Non-Brittle Sheen with Oil Spot
- Sheen Sample Location

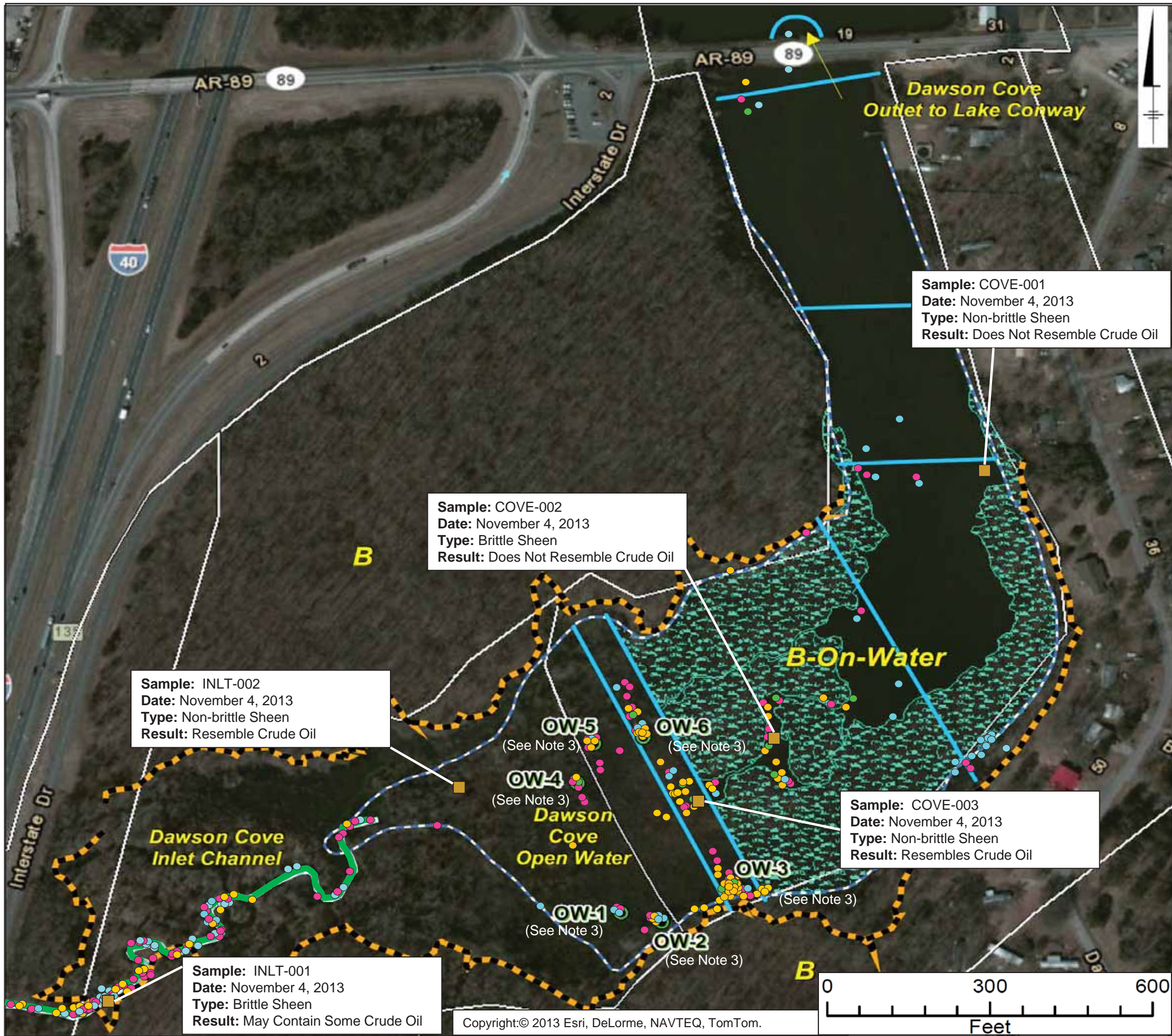
Notes:

1. Location of sheens observed during daily sheen monitoring activities conducted from October 21, 2013 through January 5, 2014. Approximate locations are shown on this figure.
2. Locations of sheen sampling conducted on November 4, 2013. Type of sheen based on field characterization. Sampling results based on data analysis presented in Appendix M.

MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT

SUMMARY OF SHEEN OBSERVATIONS AND SAMPLING
 IN DRAINAGE WAY





Legend:

- Drainage Path
- Brittle Sheen
- Brittle Sheen with Oil Spot
- Non-Brittle Sheen
- Non-Brittle Sheen with Oil Spot
- Sheen Sample Location

OW-1 Staked Locations for Daily Observations (See Note 3)

Notes:

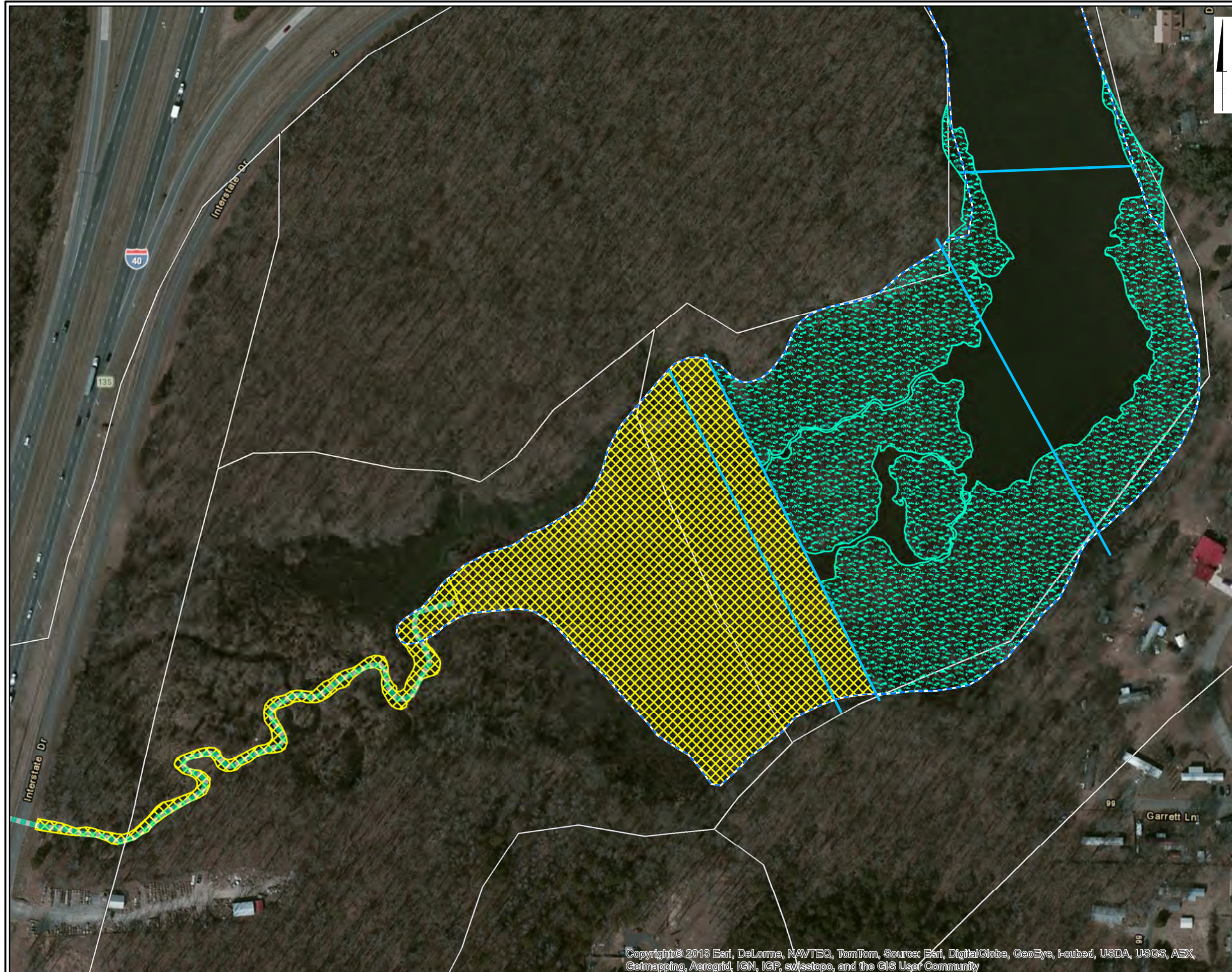
1. Location of sheens observed during daily sheen monitoring activities conducted from October 21, 2013 through January 5, 2014. Approximate locations are shown on this figure.
2. Locations of sheen sampling conducted on November 4, 2013. Type of sheen based on field characterization. Sampling results based on data analysis presented in Appendix M.
3. Brittle and non-brittle sheens observed at the staked locations are summarized in the table below.

Staked Location	Brittle Sheens	Brittle Sheens with Oil Spots	Non-Brittle Sheens	Non-Brittle Sheens with Oil Spots	Total Sheens Observed
OW-1	2	--	3	1	5
OW-2	4	--	4	3	11
OW-3	--	3	14	37	54
OW-4	--	1	5	2	8
OW-5	1	--	5	7	13
OW-6	3	--	5	17	25







MAYFLOWER PIPELINE INCIDENT RESPONSE
EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
DOWNSTREAM AREAS DATA ASSESSMENT REPORT

SUMMARY OF SHEEN OBSERVATIONS AND SAMPLING
IN DAWSON COVE

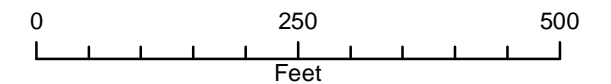
**FIGURE
11-2**



Legend

-  Approximate Areas for Sheen Mitigation
-  Areas with Heavy Vegetation
-  Drainage Path
-  Water's Edge
-  Containment Boom
-  Operations Areas

NOTE:
 1. Areas for mitigation are approximate, and based on daily sheen monitoring activities initiated on October 21, 2013 and results from 10 sheen samples collected on November 4, 2013. Pre-design study will be conducted to confirm and refine the mitigation area.

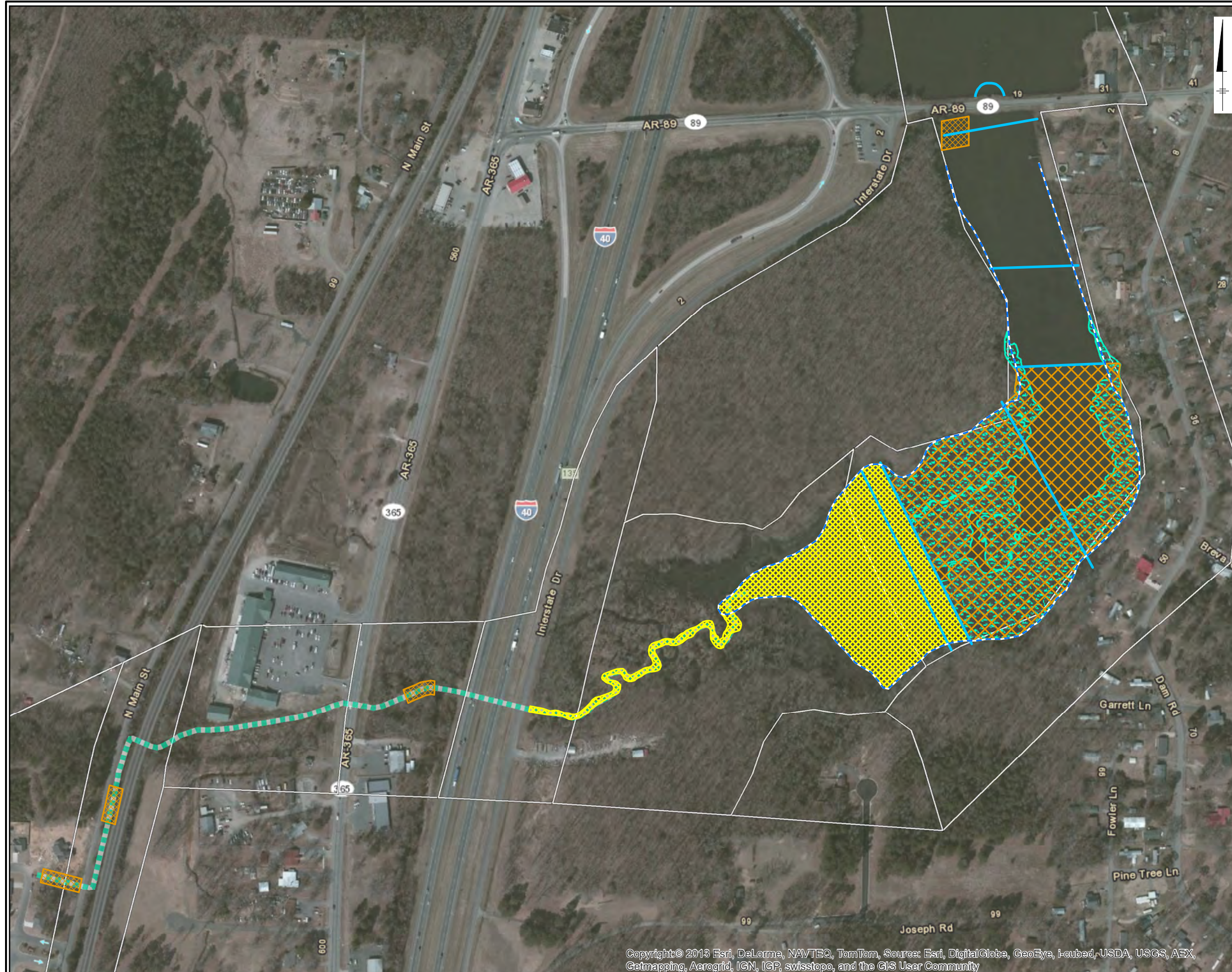


**MAYFLOWER PIPELINE INCIDENT RESPONSE
 EXXONMOBIL ENVIRONMENTAL SERVICES COMPANY
 DOWNSTREAM AREAS DATA ASSESSMENT REPORT**








APPROXIMATE AREAS FOR SHEEN MITIGATION



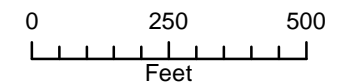
**FIGURE
 12-1**



Legend

-  Pre-Design Study Activities to Refine Proposed Mitigation Area
-  Field Probing to Confirm Delineation of Mitigation Area
-  Areas with Heavy Vegetation
-  Drainage Path
-  Water's Edge
-  Containment Boom
-  Operations Areas

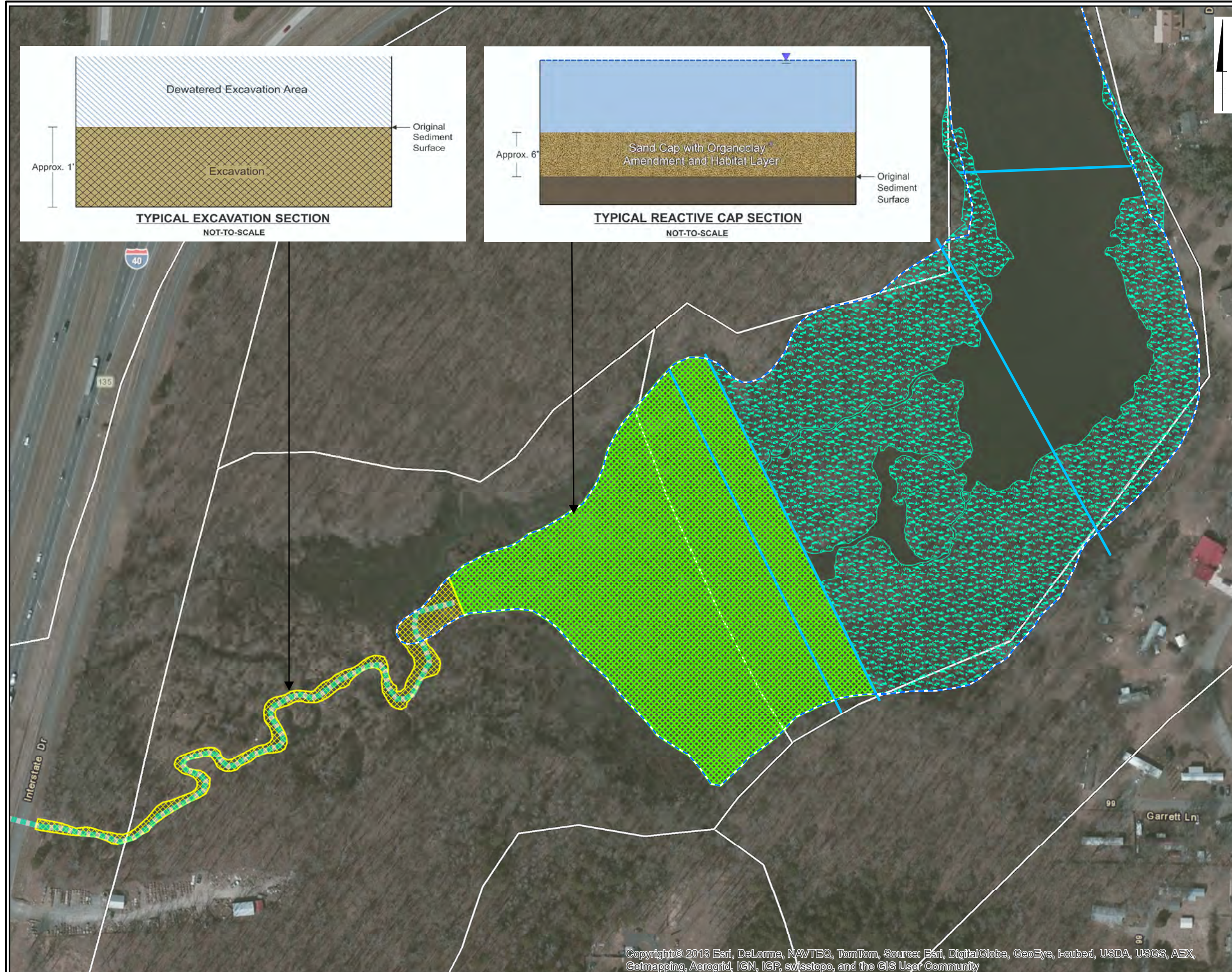
NOTE:
 1. Details regarding proposed pre-design activities are described in Appendix O.



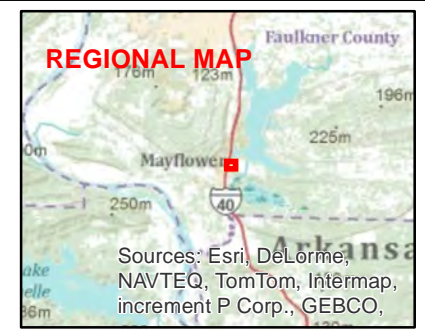
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PRE-DESIGN STUDY AREAS





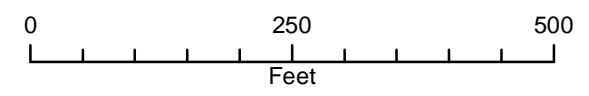
DRAFT



Legend

- Approximate Inlet Channel Targeted Removal Area
- Approximate Open Water Cap Placement Area
- Areas with Heavy Vegetation
- Drainage Path
- Water's Edge
- Containment Boom
- Operations Areas

NOTE:
 1. Potential targeted removal area and cap placement areas are approximate, and based on daily sheen monitoring activities initiated on October 21, 2013 and results from 10 sheen samples collected on November 4, 2013. Pre-design study will be conducted to confirm the mitigation area.



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**ALTERNATIVE 4 - TARGETED REMOVAL
 IN THE INLET CHANNEL AND REACTIVE
 CAPPING IN THE OPEN WATER AREA**



**FIGURE
 12-3**