

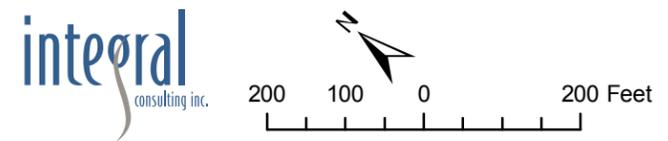
**Chemistry Legend**

4,4'-DDD - Surface Water		4,4'-DDD - Transition Water		4,4'-DDD - Ground Water	
total_or_dissolved, Exceedance_class		total_or_dissolved, Exceedance_class		total_or_dissolved, Exceedance_class	
■	D, HH_Fishx10000 ( 0.00031 mg/l)	●	D, HH_Fishx10000 ( 0.0031 mg/l)	▲	D, HH_Fishx10000 ( 0.0031 mg/l)
■	T, HH_Fishx10000 ( 0.00031 mg/l)	●	T, HH_Fishx10000 ( 0.0031 mg/l)	▲	T, HH_Fishx10000 ( 0.0031 mg/l)
■	D, Acute ( 0.00019 mg/l)	●	D, Acute ( 0.00019 mg/l)	▲	D, Acute ( 0.00019 mg/l)
■	T, Acute ( 0.00019 mg/l)	●	T, Acute ( 0.00019 mg/l)	▲	T, Acute ( 0.00019 mg/l)
□	D, None Exceeded	○	D, None Exceeded	△	D, None Exceeded
□	T, None Exceeded	○	T, None Exceeded	△	T, None Exceeded
■	D, Not Detected	●	D, Not Detected	▲	D, Not Detected
■	T, Not Detected	●	T, Not Detected	▲	T, Not Detected

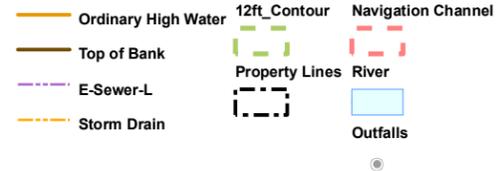
**Screening Level Contours**  
 - ? - Queried Where Approximate

**REVISED DRAFT**  
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**Notes:**  
 1) If both Total and Dissolved values occur coincidentally at a sampling location, the dissolved value will appear on top.

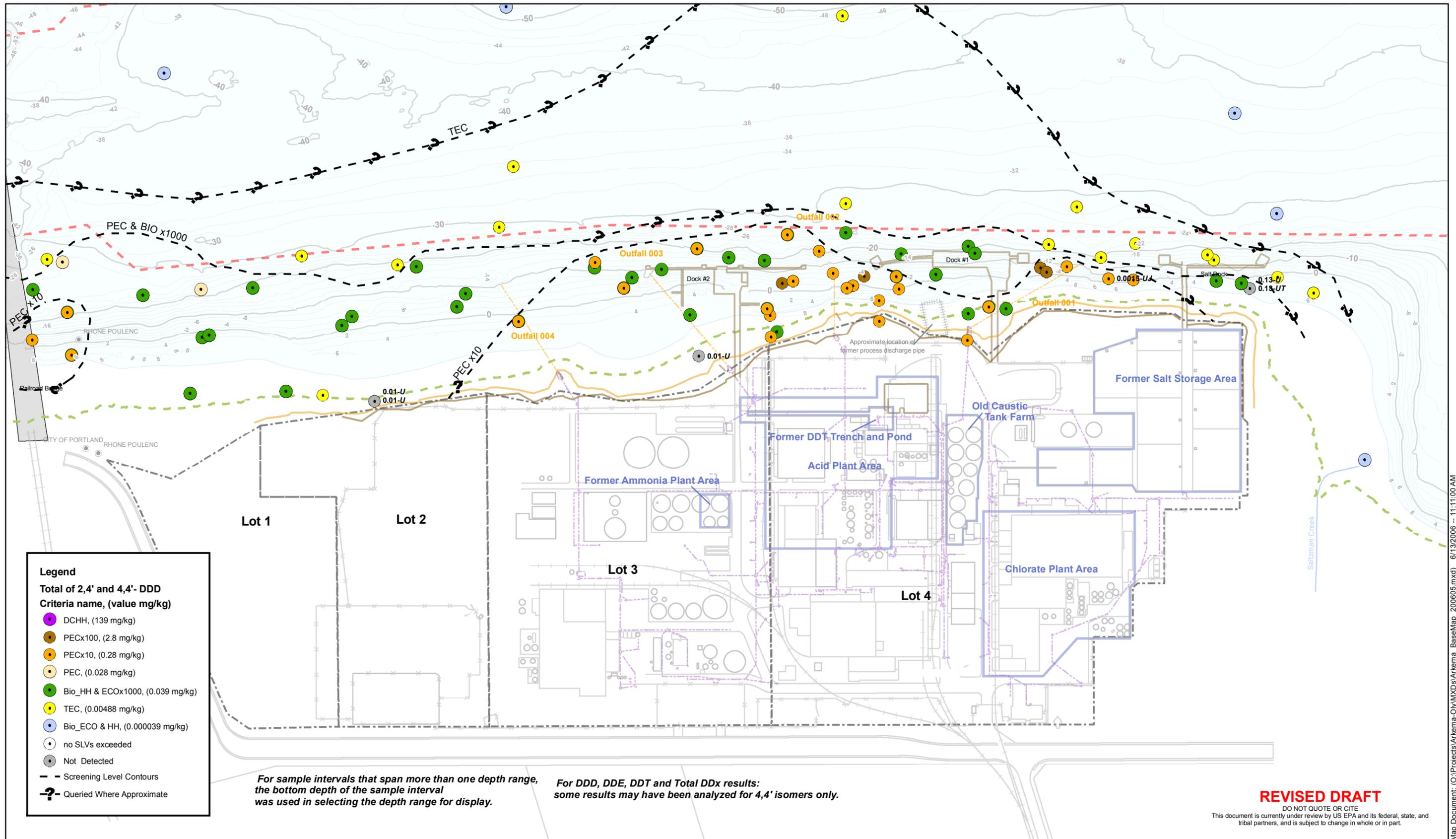


**FEATURE SOURCES:**  
 Bathymetric Information: Multibeam bathymetric survey conducted by David Evans and Associates, Inc. from February 6 - March 6, 2004. Contours were derived from a Digital Terrain Model (DTM) based on a three-foot grid of multibeam data.  
 Vertical Datum: North American Vertical Datum of 1988 (NAVD88).  
 Horizontal Datum: North American Datum of 1983 - 91 adjusted (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.  
 Units: International Feet.  
 Basemap: Basemap features updated in 2006 by David Evans and Associates. Ordinary high water line, top of bank, and other site features surveyed in April 2006.



**Map-15**  
**Arkema Site**  
**Surface Water, Transition Zone Water,**  
**and Groundwater Samples**  
**4,4'-DDD**

Map Document: (O:\Projects\Arkema-01\MapDocs\ArkemaSW\_DotMap\_Screened\_20060622.mxd) 6/23/2006 - 6:06:12 PM



**Legend**

**Total of 2,4' and 4,4'- DDD Criteria name, (value mg/kg)**

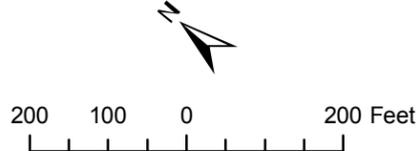
- DCHH, (139 mg/kg)
- PECx100, (2.8 mg/kg)
- PECx10, (0.28 mg/kg)
- PEC, (0.028 mg/kg)
- Bio\_HH & ECOx1000, (0.039 mg/kg)
- TEC, (0.00488 mg/kg)
- Bio\_ECO & HH, (0.000039 mg/kg)
- no SLVs exceeded
- Not Detected
- Screening Level Contours
- Queried Where Approximate

*For sample intervals that span more than one depth range, the bottom depth of the sample interval was used in selecting the depth range for display.*

*For DDD, DDE, DDT and Total DDX results: some results may have been analyzed for 4,4' isomers only.*

**REVISED DRAFT**

DO NOT QUOTE OR CITE  
This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

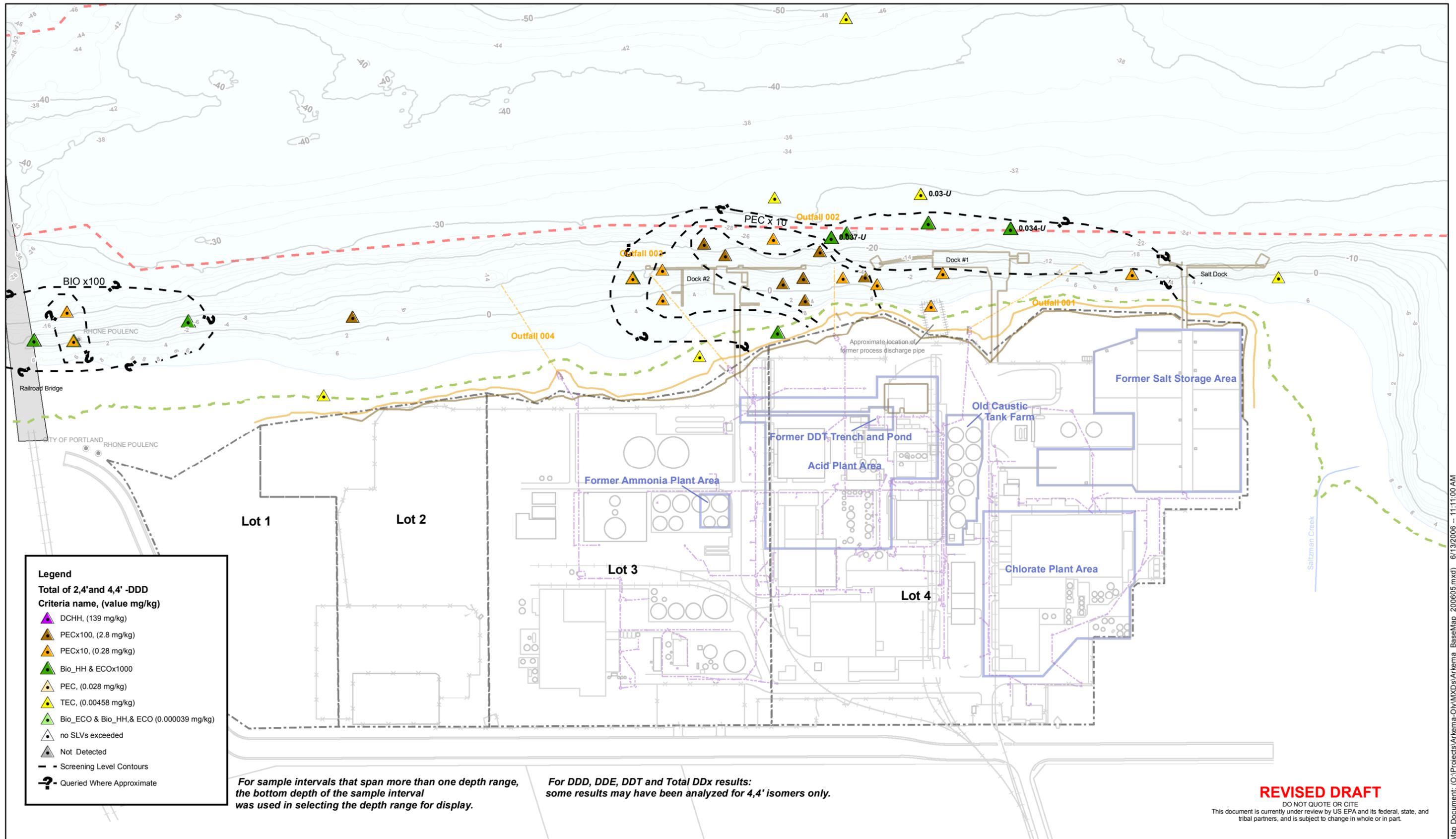


**FEATURE SOURCES:**  
 Bathymetric Information: Multibeam bathymetric survey conducted by David Evans and Associates, Inc. from February 6 - March 6, 2004. Contours were derived from a Digital Terrain Model (DTM) based on a three-foot grid of multibeam data.  
 Vertical Datum: North American Vertical Datum of 1988 (NAVD88).  
 Horizontal Datum: North American Datum of 1983 - 91 adjusted (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.  
 Units: International Feet.  
 Basemap: Basemap features updated in 2006 by David Evans and Associates. Ordinary high water line, top of bank, and other site features surveyed in April 2006. Most buildings and structures on the Arkema site have been demolished or removed.  
 OHW and Top of Slope lines were created from the April 2006 DEA survey, the +12ft contour line was derived from the combined lidar/bathymetry grid.  
 Lot Lines: Created by importing pdf file from ERM, georeferencing to CAD lines (RMS error = 2.3042) and heads-up digitizing the lot lines.

- Ordinary High Water
- Top of Bank
- E-Sewer-L
- Storm Drain
- 12ft Contour
- Bridges
- Property Lines
- Navigation Channel
- River
- Outfalls

**Map-16**  
**Arkema Site**  
**Surface & Sub-Surface Sediment Samples**  
**Depth Range: Surface (0-1 ft)**  
**Total of 2,4 and 4,4-DDD**

Map Document: (O:\Projects\Arkema-01\MapDocs\Arkema\_Basemap\_200605.mxd) 6/13/2006 -- 11:11:00 AM



**Legend**

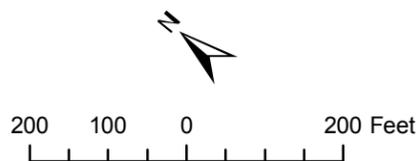
**Total of 2,4' and 4,4' -DDD Criteria name, (value mg/kg)**

- DCHH, (139 mg/kg)
- PECx100, (2.8 mg/kg)
- PECx10, (0.28 mg/kg)
- Bio\_HH & ECOx1000
- PEC, (0.028 mg/kg)
- TEC, (0.00458 mg/kg)
- Bio\_ECO & Bio\_HH, & ECO (0.000039 mg/kg)
- no SLVs exceeded
- Not Detected
- Screening Level Contours
- Queried Where Approximate

*For sample intervals that span more than one depth range, the bottom depth of the sample interval was used in selecting the depth range for display.*

*For DDD, DDE, DDT and Total DDx results: some results may have been analyzed for 4,4' isomers only.*

**REVISED DRAFT**  
 DO NOT QUOTE OR CITE  
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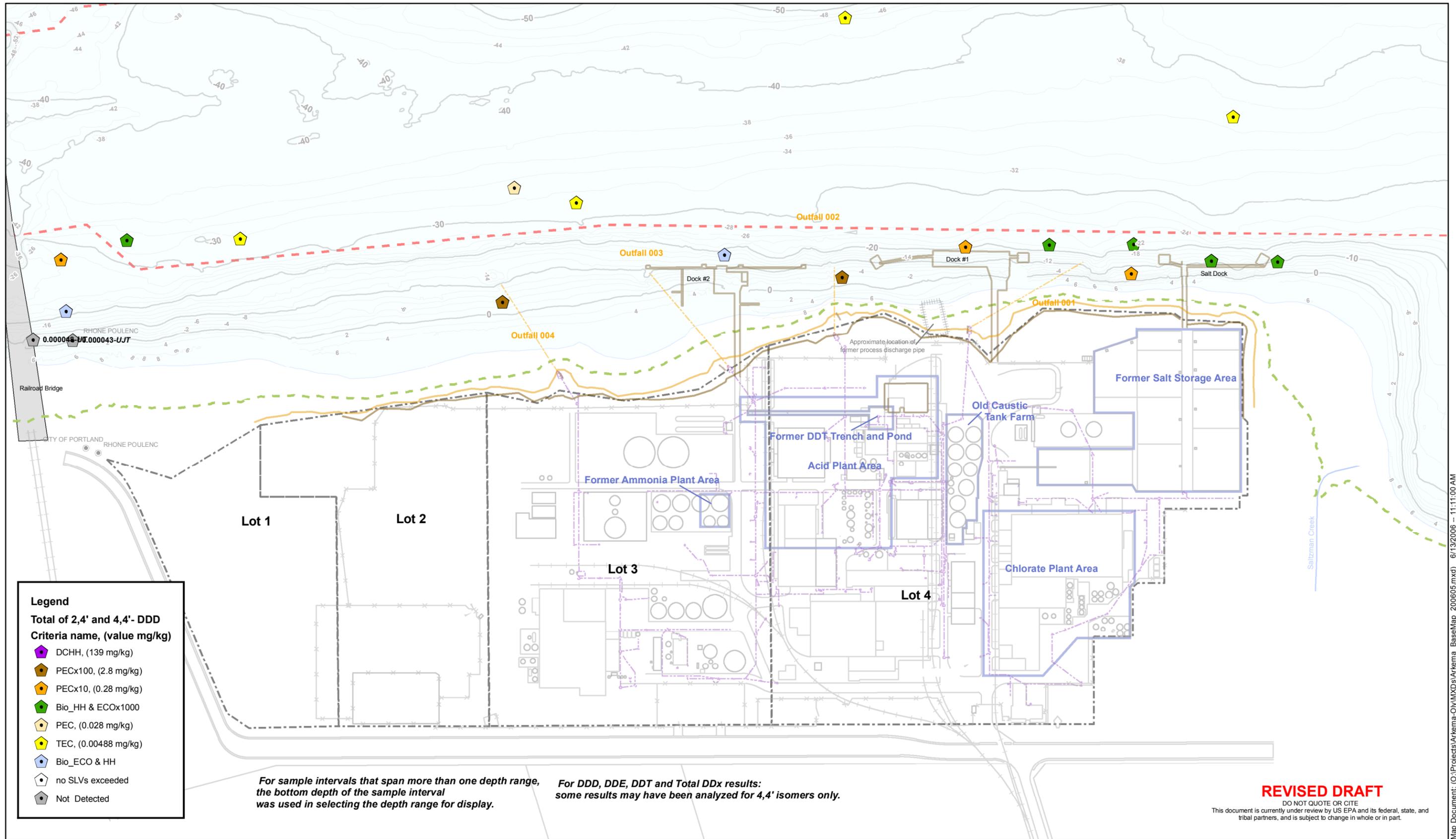


**FEATURE SOURCES:**  
 Bathymetric Information: Multibeam bathymetric survey conducted by David Evans and Associates, Inc. from February 6 - March 6, 2004. Contours were derived from a Digital Terrain Model (DTM) based on a three-foot grid of multibeam data.  
 Vertical Datum: North American Vertical Datum of 1988 (NAVD88).  
 Horizontal Datum: North American Datum of 1983 - 91 adjusted (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.  
 Units: International Feet.  
 Basemap: Basemap features updated in 2006 by David Evans and Associates. Ordinary high water line, top of bank, and other site features surveyed in April 2006. Most buildings and structures on the Arkema site have been demolished or removed.  
 OHW and Top of Slope lines were created from the April 2006 DEA survey, the +12ft contour line was derived from the combined lidar/bathymetry grid.  
 Lot Lines: Created by importing pdf file from ERM, georeferencing to CAD lines (RMS error = 2.3042) and heads-up digitizing the lot lines.

Ordinary High Water	12ft Contour	Navigation Channel
Top of Bank	Bridges	River
E-Sewer-L	Property Lines	Outfalls
Storm Drain		

**Map-17**  
**Arkema Site**  
**Surface & Sub-Surface Sediment Samples**  
**Depth Range: Shallow Subsurface (1-4 ft)**  
**Total of 2,4 and 4,4-DDD**

Map Document: (O:\Projects\Arkema-01\MapDocs\Arkema\_Basemap\_200605.mxd) 6/13/2006 -- 11:11:00 AM



**Legend**

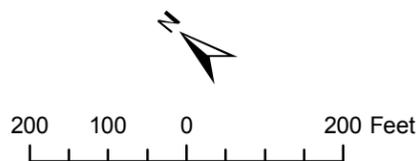
**Total of 2,4' and 4,4'- DDD Criteria name, (value mg/kg)**

- ◆ DCHH, (139 mg/kg)
- ◆ PECx100, (2.8 mg/kg)
- ◆ PECx10, (0.28 mg/kg)
- ◆ Bio\_HH & ECOx1000
- ◆ PEC, (0.028 mg/kg)
- ◆ TEC, (0.00488 mg/kg)
- ◆ Bio\_ECO & HH
- ◆ no SLVs exceeded
- ◆ Not Detected

*For sample intervals that span more than one depth range, the bottom depth of the sample interval was used in selecting the depth range for display.*

*For DDD, DDE, DDT and Total DDx results: some results may have been analyzed for 4,4' isomers only.*

**REVISED DRAFT**  
DO NOT QUOTE OR CITE  
This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

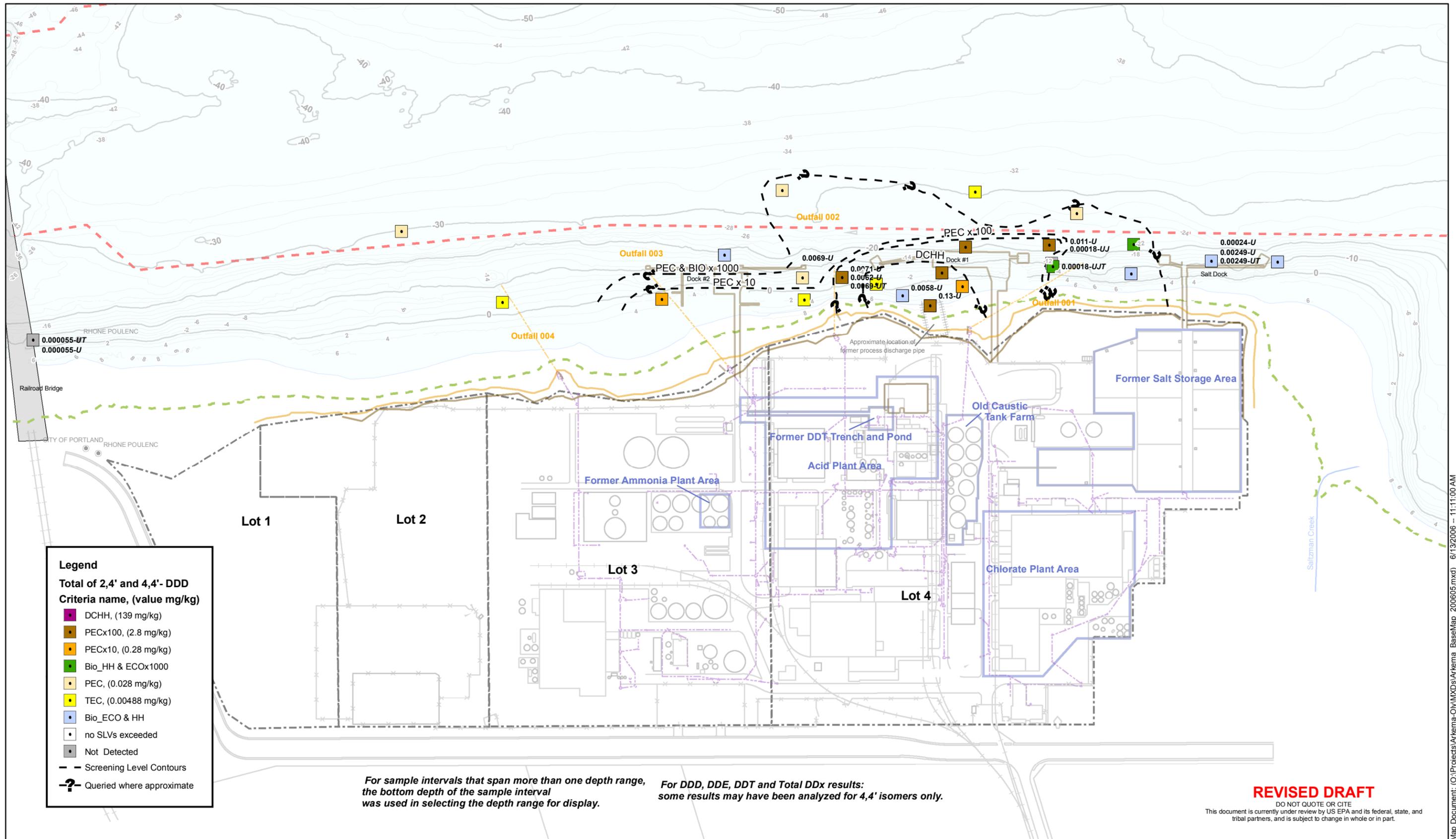


**FEATURE SOURCES:**  
 Bathymetric Information: Multibeam bathymetric survey conducted by David Evans and Associates, Inc. from February 6 - March 6, 2004. Contours were derived from a Digital Terrain Model (DTM) based on a three-foot grid of multibeam data.  
 Vertical Datum: North American Vertical Datum of 1988 (NAVD88).  
 Horizontal Datum: North American Datum of 1983 - 91 adjusted (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.  
 Units: International Feet.  
 Basemap: Basemap features updated in 2006 by David Evans and Associates. Ordinary high water line, top of bank, and other site features surveyed in April 2006. Most buildings and structures on the Arkema site have been demolished or removed.  
 OHW and Top of Slope lines were created from the April 2006 DEA survey, the +12ft contour line was derived from the combined lidar/bathymetry grid.  
 Lot Lines: Created by importing pdf file from ERM, georeferencing to CAD lines (RMS error = 2.3042) and heads-up digitizing the lot lines.

- Ordinary High Water
- Top of Bank
- E-Sewer-L
- - - Storm Drain
- - - 12ft Contour
- Bridges
- Property Lines
- - - Navigation Channel
- River
- Outfalls

**Map-18**  
**Arkema Site**  
**Surface & Sub-Surface Sediment Samples**  
**Depth Range: Intermediate Subsurface (4-8 ft)**  
**Total of 2,4 and 4,4-DDD**

Map Document: (O:\Projects\Arkema-01\MapDocs\Arkema\_BaseMap\_200605.mxd) 6/13/2006 -- 11:11:00 AM



**Legend**

**Total of 2,4' and 4,4'- DDD Criteria name, (value mg/kg)**

- DCHH, (139 mg/kg)
- PECx100, (2.8 mg/kg)
- PECx10, (0.28 mg/kg)
- Bio\_HH & ECOx1000
- PEC, (0.028 mg/kg)
- TEC, (0.00488 mg/kg)
- Bio\_ECO & HH
- no SLVs exceeded
- Not Detected
- - Screening Level Contours
- ? Queried where approximate

*For sample intervals that span more than one depth range, the bottom depth of the sample interval was used in selecting the depth range for display.*

*For DDD, DDE, DDT and Total DDx results: some results may have been analyzed for 4,4' isomers only.*

**REVISED DRAFT**  
 DO NOT QUOTE OR CITE  
 This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

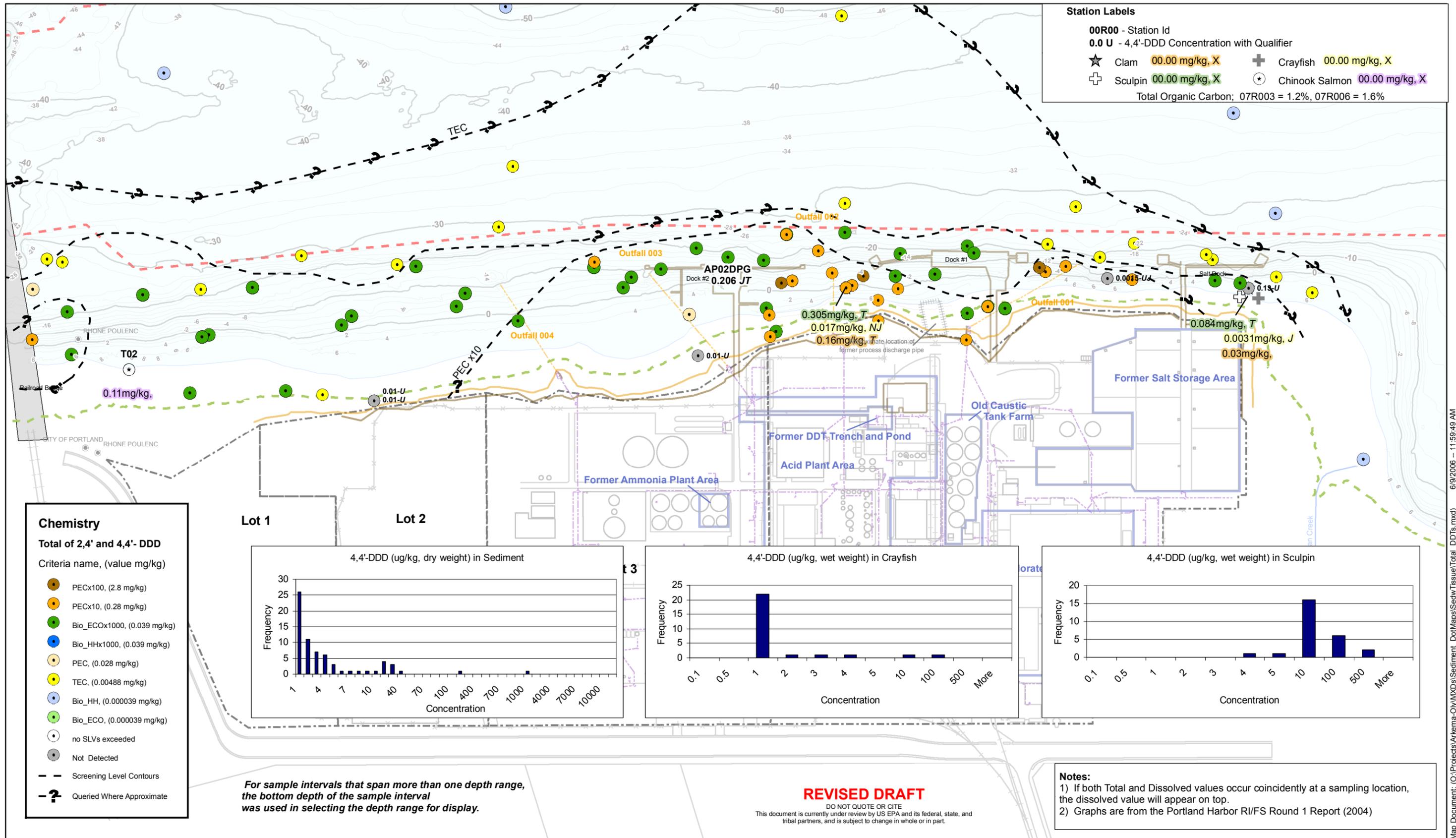
200 100 0 200 Feet

**FEATURE SOURCES:**  
 Bathymetric Information: Multibeam bathymetric survey conducted by David Evans and Associates, Inc. from February 6 - March 6, 2004. Contours were derived from a Digital Terrain Model (DTM) based on a three-foot grid of multibeam data.  
 Vertical Datum: North American Vertical Datum of 1988 (NAVD88).  
 Horizontal Datum: North American Datum of 1983 - 91 adjusted (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.  
 Units: International Feet.  
 Basemap: Basemap features updated in 2006 by David Evans and Associates. Ordinary high water line, top of bank, and other site features surveyed in April 2006. Most buildings and structures on the Arkema site have been demolished or removed.  
 OHW and Top of Slope lines were created from the April 2006 DEA survey, the +12ft contour line was derived from the combined lidar/bathymetry grid.  
 Lot Lines: Created by importing pdf file from ERM, georeferencing to CAD lines (RMS error = 2.3042) and heads-up digitizing the lot lines.

- Ordinary High Water
- Top of Bank
- E-Sewer-L
- Storm Drain
- 12ft\_Contour
- Bridges
- Property Lines
- Navigation Channel
- River
- Outfalls

**Map-19**  
**Arkema Site**  
**Surface & Sub-Surface Sediment Samples**  
**Depth Range: Deep Subsurface (> 8 ft)**  
**Total of 2,4 and 4,4-DDD**

Map Document: (O:\Projects\Arkema-OW\MXDs\Arkema\_BaseMap\_200605.mxd) 6/13/2006 -- 11:11:00 AM



**Station Labels**

00R00 - Station Id  
 0.0 U - 4,4'-DDD Concentration with Qualifier

★ Clam	00.00 mg/kg, X	+	Crayfish	00.00 mg/kg, X
+	00.00 mg/kg, X	○	Chinook Salmon	00.00 mg/kg, X

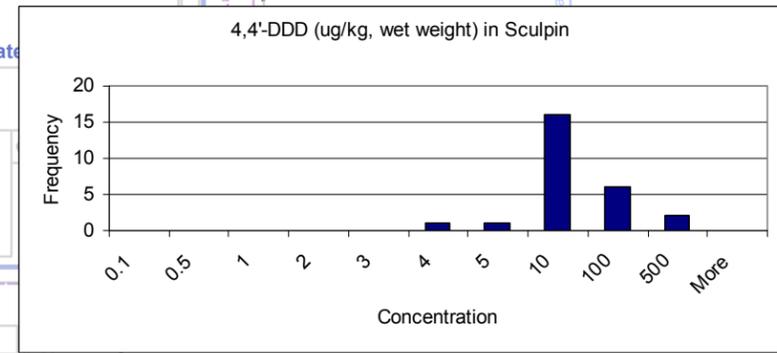
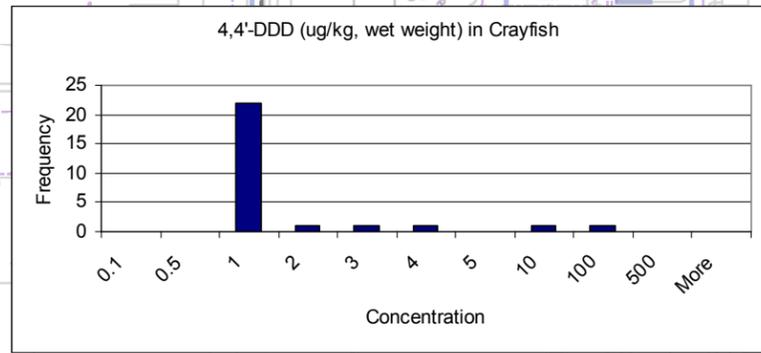
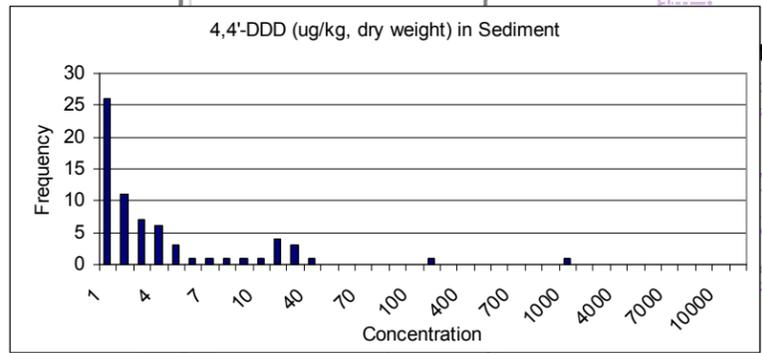
Total Organic Carbon: 07R003 = 1.2%, 07R006 = 1.6%

**Chemistry**

Total of 2,4' and 4,4'- DDD

Criteria name, (value mg/kg)

●	PECx100, (2.8 mg/kg)
●	PECx10, (0.28 mg/kg)
●	Bio_ECOx1000, (0.039 mg/kg)
●	Bio_HHx1000, (0.039 mg/kg)
●	PEC, (0.028 mg/kg)
●	TEC, (0.00488 mg/kg)
●	Bio_HH, (0.000039 mg/kg)
●	Bio_ECO, (0.000039 mg/kg)
○	no SLVs exceeded
○	Not Detected
- -	Screening Level Contours
- ?	Queried Where Approximate



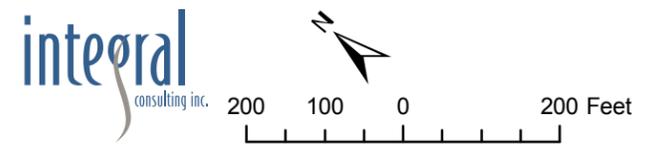
*For sample intervals that span more than one depth range, the bottom depth of the sample interval was used in selecting the depth range for display.*

**REVISED DRAFT**

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**Notes:**

- 1) If both Total and Dissolved values occur coincidentally at a sampling location, the dissolved value will appear on top.
- 2) Graphs are from the Portland Harbor RI/FS Round 1 Report (2004)



**FEATURE SOURCES:**  
 Bathymetric Information: Multibeam bathymetric survey conducted by David Evans and Associates, Inc. from February 6 - March 6, 2004. Contours were derived from a Digital Terrain Model (DTM) based on a three-foot grid of multibeam data.  
 Vertical Datum: North American Vertical Datum of 1988 (NAVD88).  
 Horizontal Datum: North American Datum of 1983 - 91 adjusted (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.  
 Units: International Feet.  
 Basemap: Basemap features updated in 2006 by David Evans and Associates. Ordinary high water line, top of bank, and other site features surveyed in April 2006. Basemap features reflect structures that have been removed from the site.  
 OHW and Top of Slope lines were created from the April 2006 DEA survey, the +12ft contour line was derived from the combined lidar/bathymetry grid.

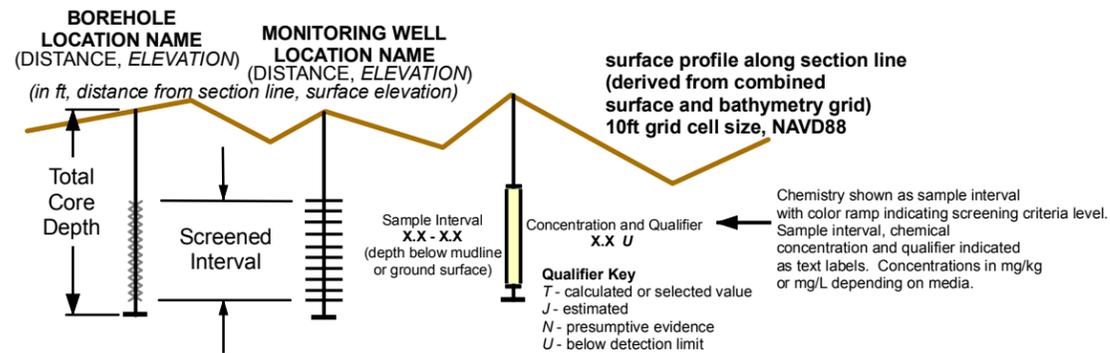
—	Ordinary High Water	—	12ft_Contour	—	Navigation Channel
—	Top of Bank	—	Bridges	—	River
—	E-Sewer-L	—	Property Lines	—	Outfalls
—	Storm Drain	—		—	

**Map-20**  
**Arkema Site**  
**Surface Sediment & Tissue Samples**  
**Total of 2,4 and 4,4-DDD**  
**Depth Range: Surface (0 - 1 ft)**

Map Document: (O:\Projects\Arkema-01\MapDocs\Sediment\_DotMaps\SedW\Tissue\Total\_DDTs.mxd) 6/9/2006 -- 11:59:49 AM

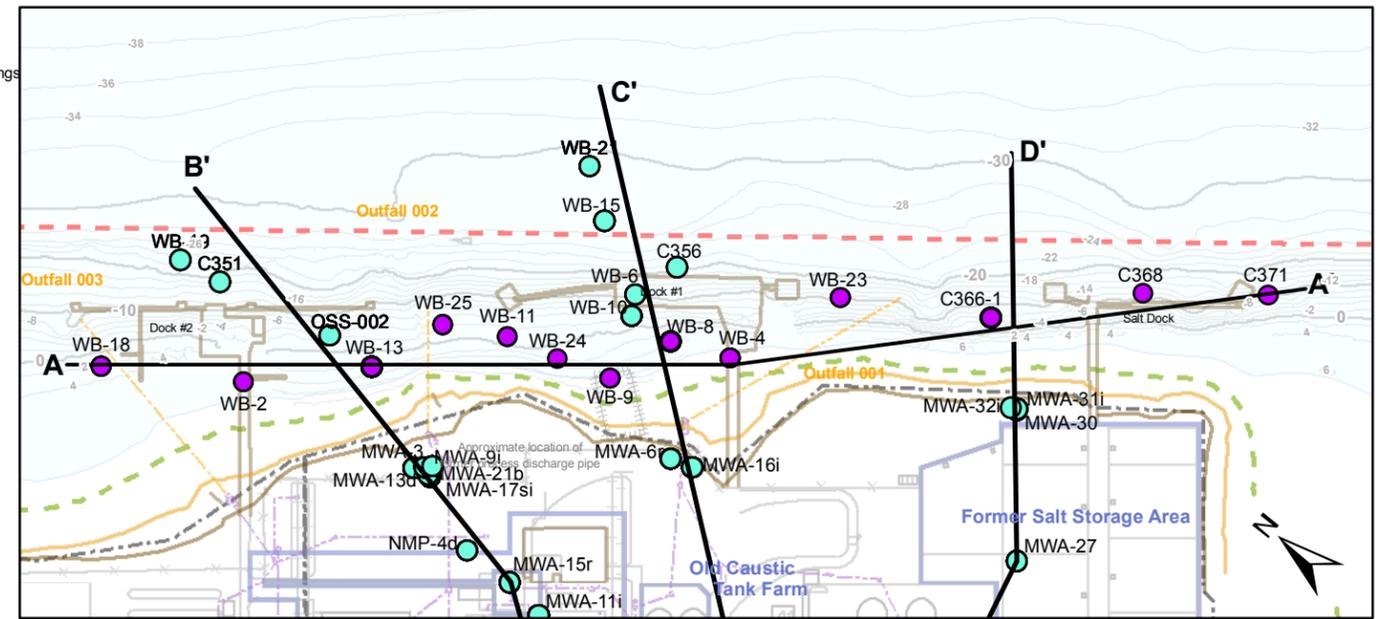
Notes:

- 1) Due to projection onto the section line, lithology was estimated at some well and borehole stations based on best professional judgment
- 2) Groundwater samples were not filtered. Reconnaissance groundwater sample concentrations may be biased high since they are generally more turbid than monitoring well groundwater samples.



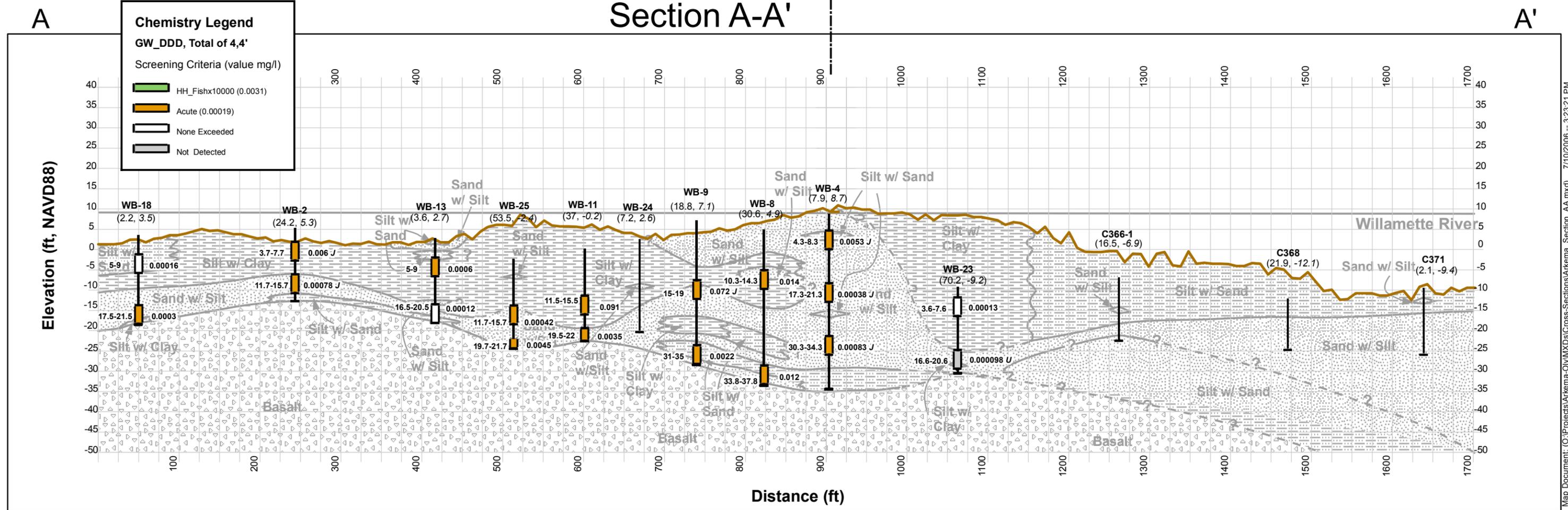
Map View Legend

- Section\_AA Selected Wells and Borings
- Section\_BB
- Section\_CC
- Section\_DD
- Navigation Channel
- River
- 12ft Contour
- Ordinary High Water
- Top of Bank
- Bathymetry (2, 10 ft)
- Index Contour
- 2' contour



Plant North

Plant South



Section View: Vertical Exaggeration: 5X

- Fill
- Sand with varying amounts of silt
- Silt with varying amounts of fine sand
- Silt with some clay and fine sand
- Basalt
- Inferred soil or geologic contact (queried where uncertain)
- Shallow-zone groundwater surface (approximate) June 2003; based on monitoring well data only.

**DRAFT**  
DO NOT QUOTE OR CITE  
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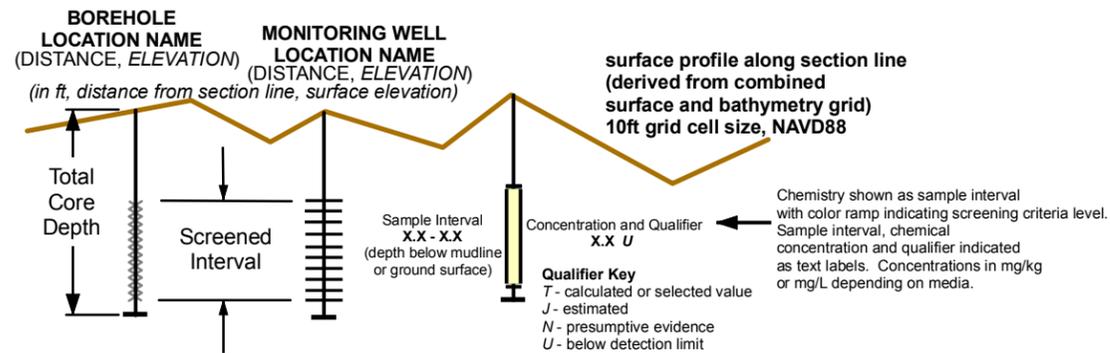
0 50 100 200 Feet

Map-21  
Cross-Section A-A'  
Groundwater Chemistry  
DDD

Map Document: (C:\Projects\Arkema-Oily\MXDs\Cross-Sections\Arkema\_Section\_AA.mxd) 7/10/2006 -- 3:23:21 PM

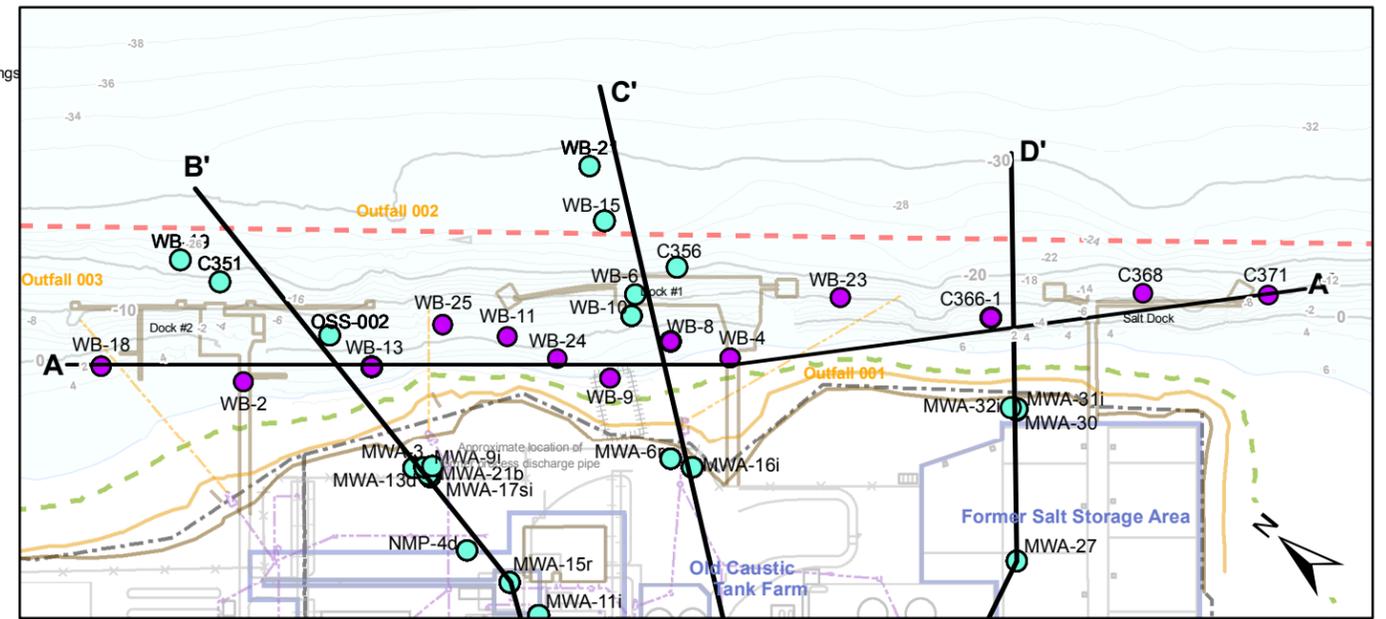
Notes:

- 1) Due to projection onto the section line, lithology was estimated at some well and borehole stations based on best professional judgment
- 2) Groundwater samples were not filtered. Reconnaissance groundwater sample concentrations may be biased high since they are generally more turbid than monitoring well groundwater samples.



Map View Legend

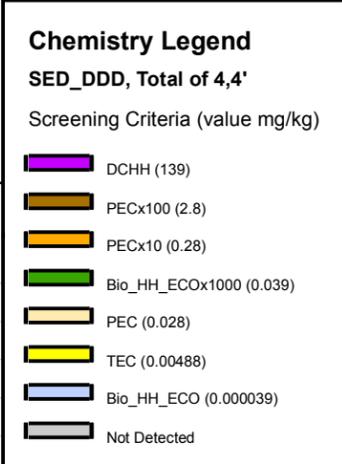
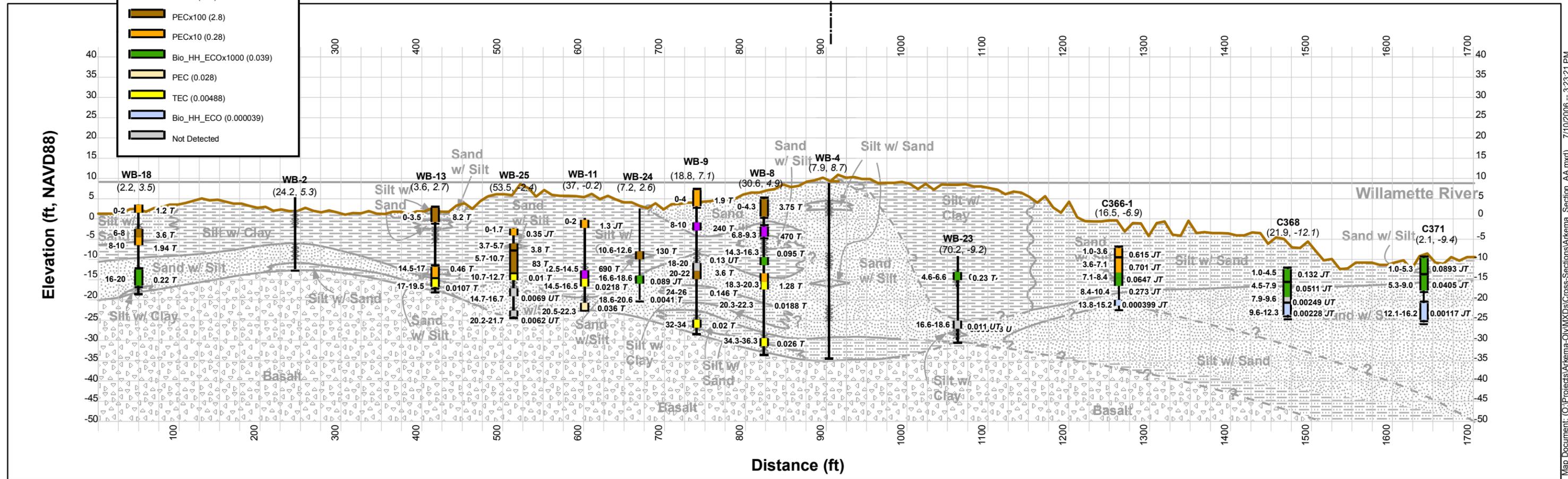
- Section\_AA Selected Wells and Borings
- Section\_BB
- Section\_CC
- Section\_DD
- Navigation Channel
- River
- 12ft Contour
- Ordinary High Water
- Top of Bank
- Bathymetry (2, 10 ft)
- Index Contour
- 2' contour



Plant North  
A

Plant South  
A'

Section A-A'



Section View: Vertical Exaggeration: 5X

- Fill
- Sand with varying amounts of silt
- Silt with varying amounts of fine sand
- Silt with some clay and fine sand
- Basalt
- Inferred soil or geologic contact (queried where uncertain)
- Shallow-zone groundwater surface (approximate) June 2003; based on monitoring well data only.

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0 50 100 200 Feet

Map-22  
Cross-Section A-A'  
Sediment Chemistry  
DDD

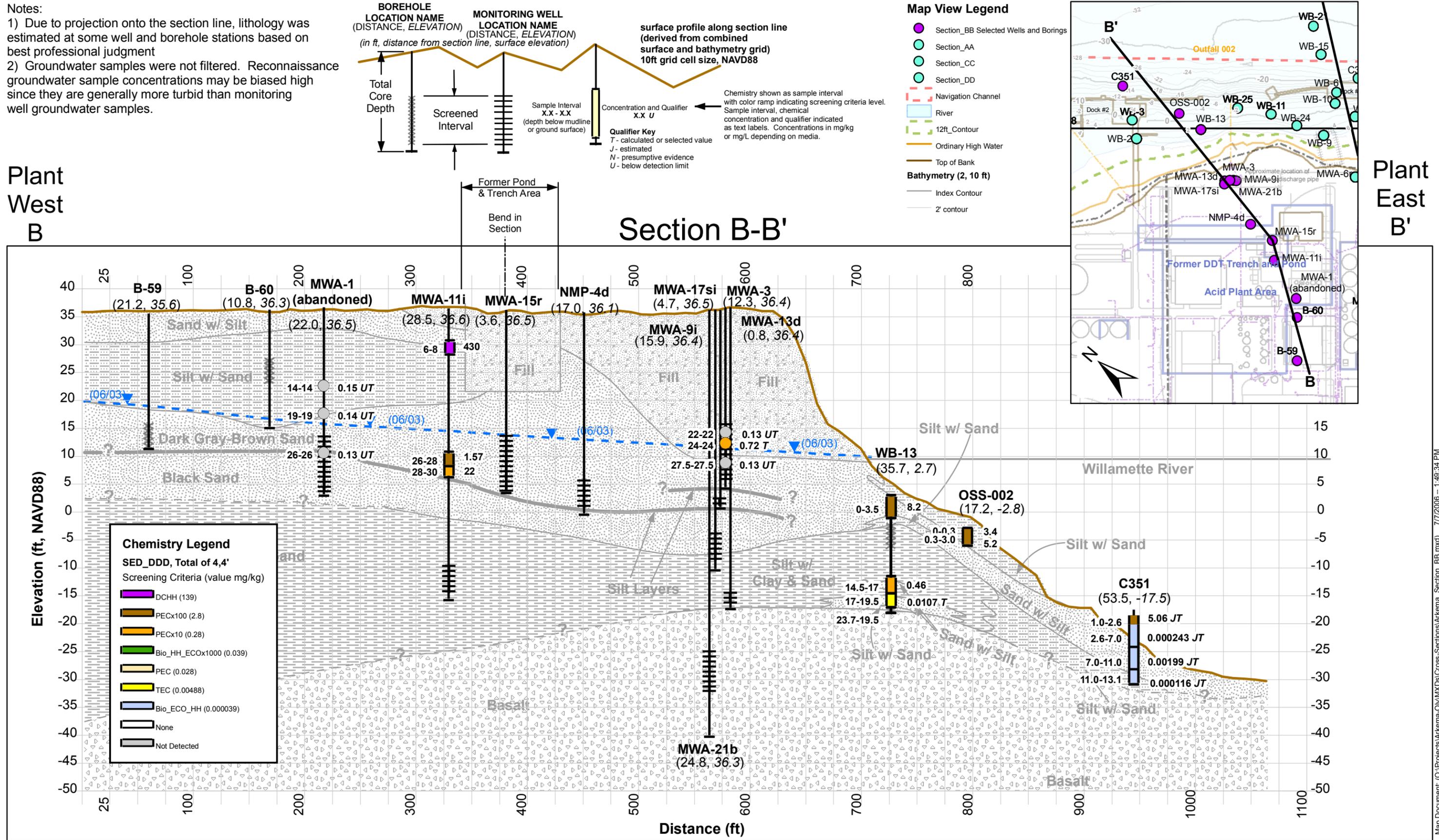


Notes:

- 1) Due to projection onto the section line, lithology was estimated at some well and borehole stations based on best professional judgment
- 2) Groundwater samples were not filtered. Reconnaissance groundwater sample concentrations may be biased high since they are generally more turbid than monitoring well groundwater samples.

Plant West  
B

Plant East  
B'

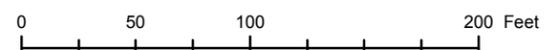


Section View: Vertical Exaggeration: 5X

- Fill
- Sand with varying amounts of silt
- Silt with varying amounts of fine sand
- Silt with some clay and fine sand
- Basalt
- Inferred soil or geologic contact (queried where uncertain)
- Shallow-zone groundwater surface (approximate) June 2003; based on monitoring well data only.
- Silt Layer

**REVISED DRAFT**

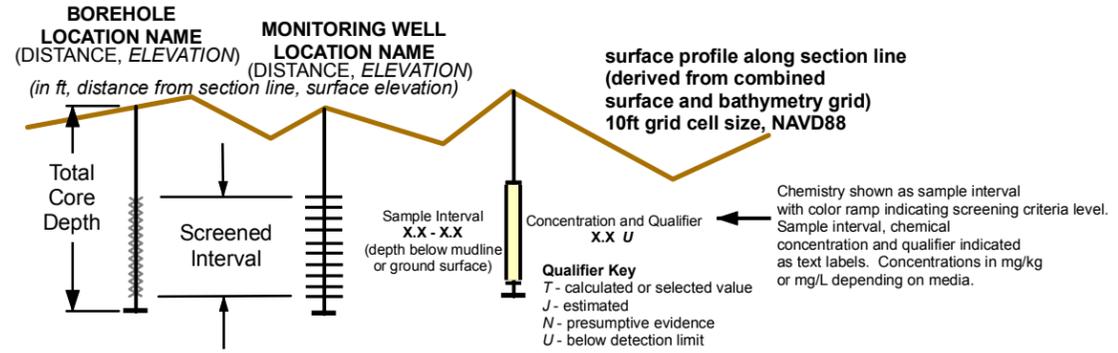
DO NOT QUOTE OR CITE  
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Map-24  
Cross-Section B-B'  
Soil/Sediment Chemistry  
DDD

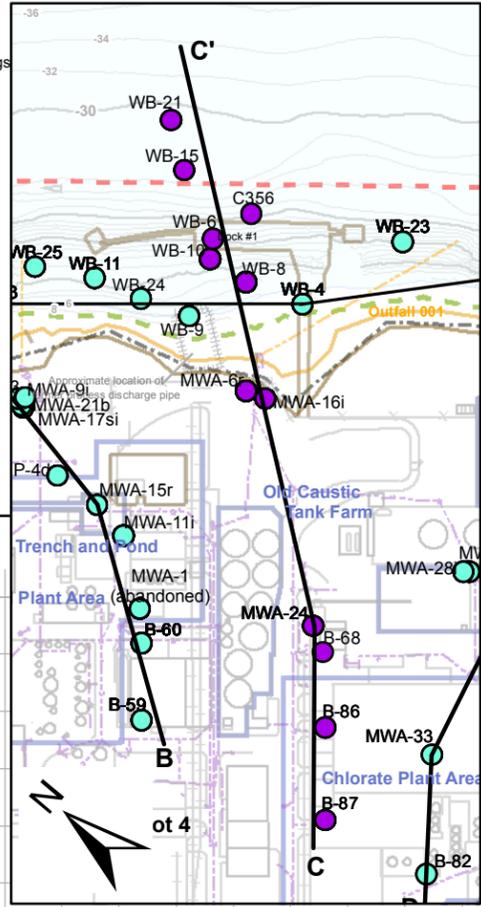
Notes:

- 1) Due to projection onto the section line, lithology was estimated at some well and borehole stations based on best professional judgment
- 2) Groundwater samples were not filtered. Reconnaissance groundwater sample concentrations may be biased high since they are generally more turbid than monitoring well groundwater samples.



Map View Legend

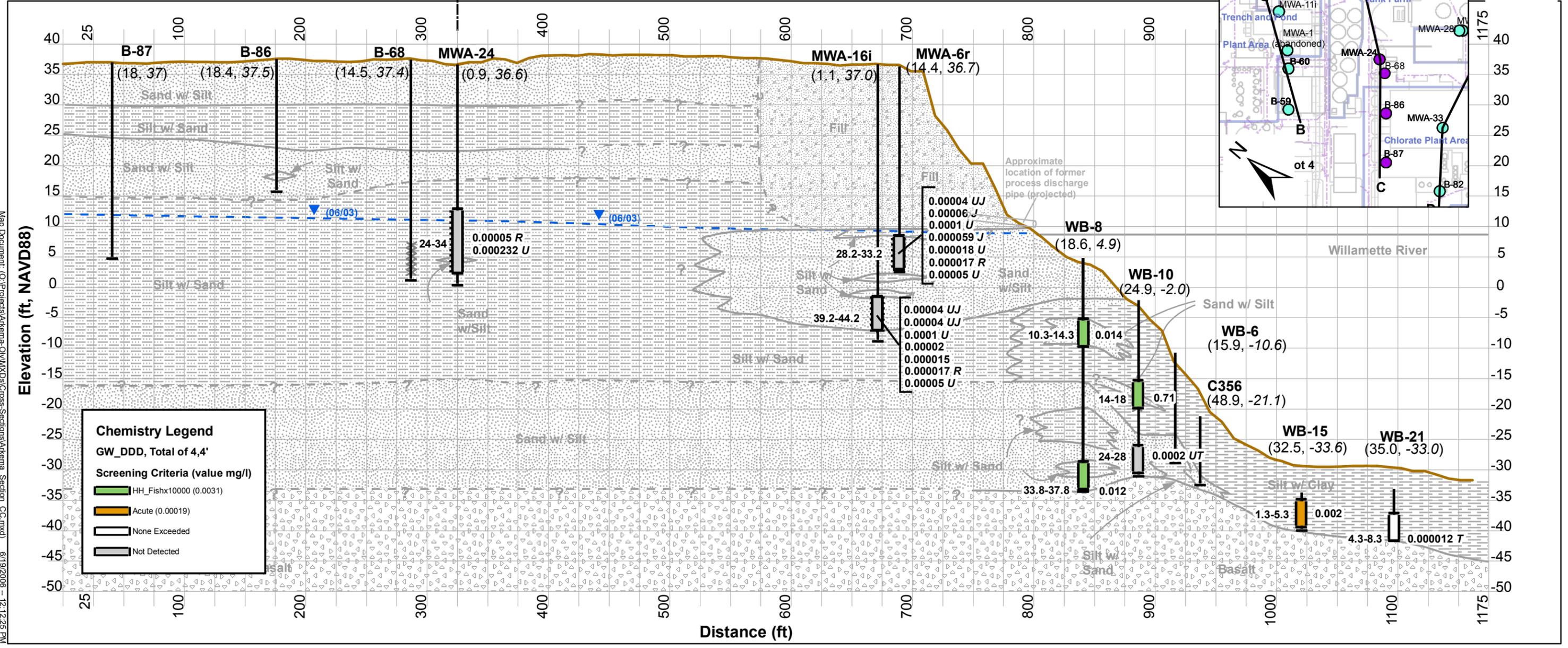
- Section\_CC Selected Wells and Borings
- Section\_AA
- Section\_BB
- Section\_DD
- Navigation Channel
- River
- 12ft Contour
- Ordinary High Water
- Top of Bank
- Bathymetry (2, 10 ft)
- Index Contour
- 2' contour



Plant West  
C

Plant East  
C'

Section C-C'



Map Document: C:\Projects\Arkema-Oil\WMD\SD\Cross-Sections\Arkema\_Section\_CC.mxd 6/19/2006 - 12:12:25 PM

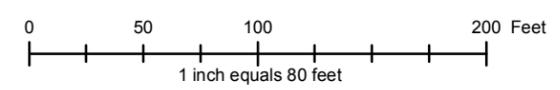


Section View: Vertical Exaggeration: 5X

- Fill
- Sand with varying amounts of silt
- Silt with varying amounts of fine sand
- Silt with some clay and fine sand
- Basalt
- Inferred soil or geologic contact (queried where uncertain)
- Shallow-zone groundwater surface (approximate) June 2003; based on monitoring well data only.

**REVISED DRAFT**

DO NOT QUOTE OR CITE  
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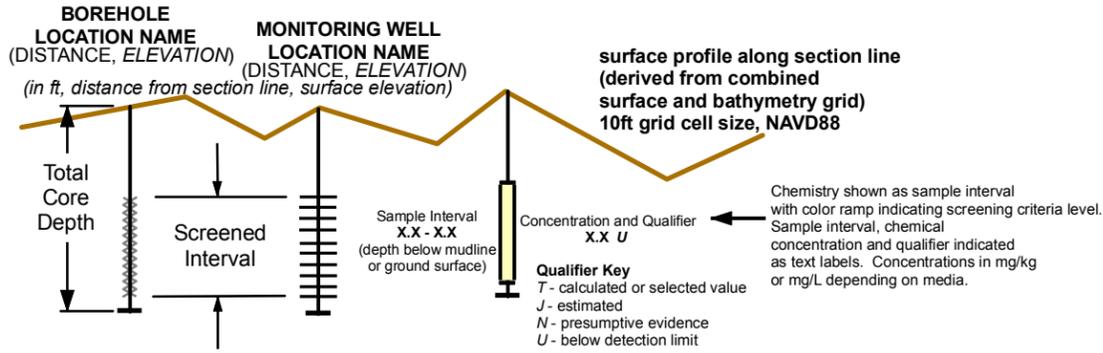


Map-25  
Cross-Section C-C'  
Groundwater Chemistry  
DDD



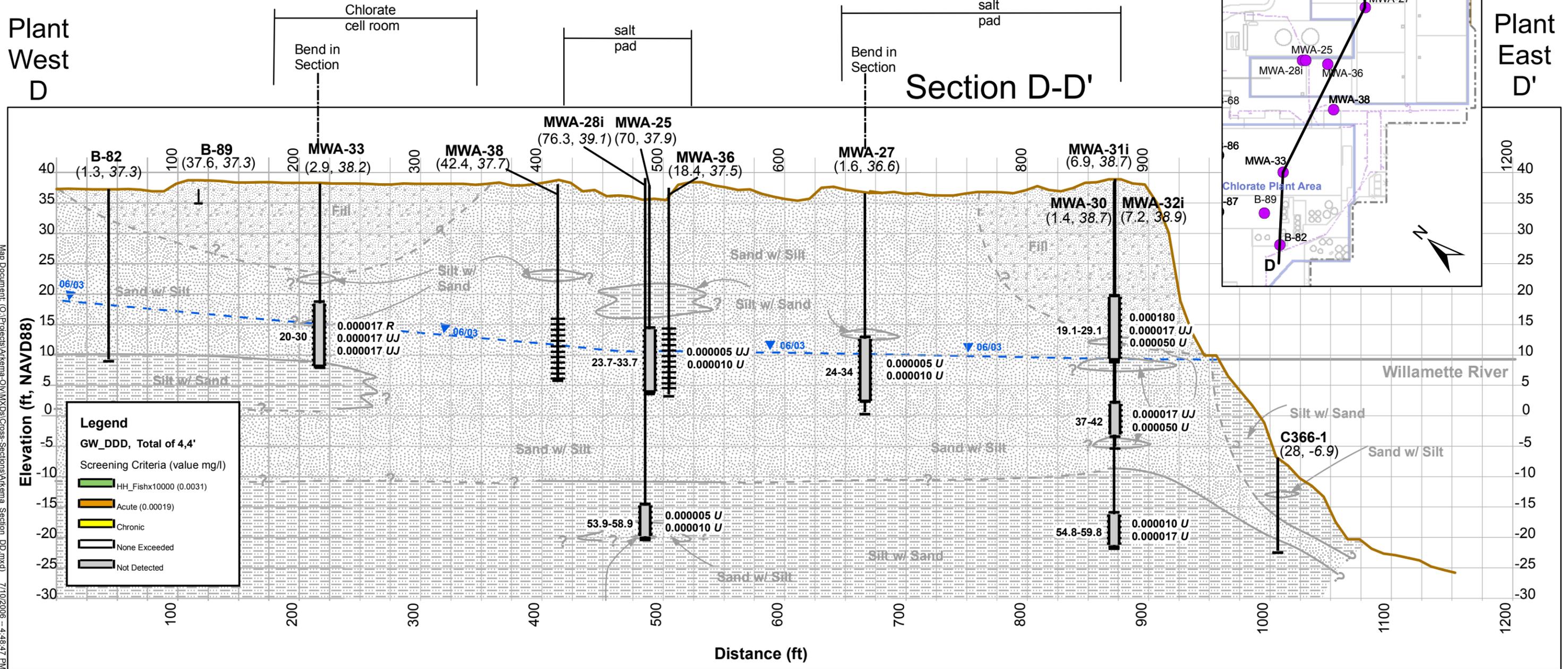
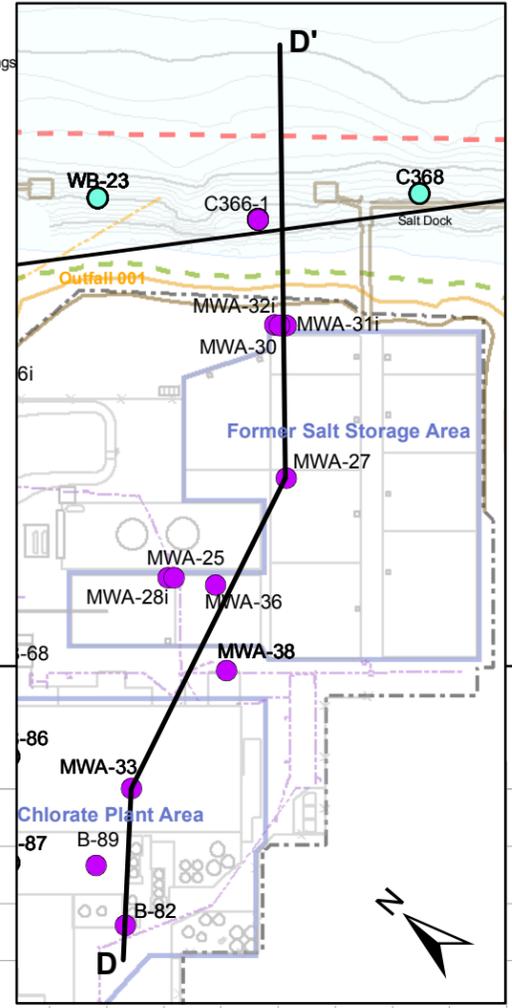
Notes:

- 1) Due to projection onto the section line, lithology was estimated at some well and borehole stations based on best professional judgment
- 2) Groundwater samples were not filtered. Reconnaissance groundwater sample concentrations may be biased high since they are generally more turbid than monitoring well groundwater samples.



Map View Legend

- Section\_DD\_Selected\_Wells and Borings
- Section\_AA
- Section\_BB
- Section\_CC
- Navigation Channel
- River
- 12ft\_Contour
- Ordinary High Water
- Top of Bank
- Bathymetry (2, 10 ft)
- Index Contour
- 2' contour



Map Document: (O:\Projects\Arkema-Oil\WX\GIS\Cross-Sections\Arkema\_Section\_DD.mxd) 7/10/2006 - 4:48:47 PM

**Legend**

GW\_DDD, Total of 4,4'

Screening Criteria (value mg/l)

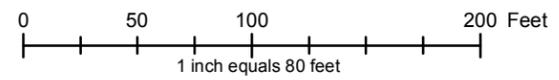
- HH\_Fishx10000 (0.0031)
- Acute (0.00019)
- Chronic
- None Exceeded
- Not Detected

Section View: Vertical Exaggeration: 5X

- Fill
- Sand with varying amounts of silt
- Silt with varying amounts of fine sand
- Silt with some clay and fine sand
- Basalt
- Inferred soil or geologic contact (queried where uncertain)
- Shallow-zone groundwater surface (approximate) June 2003; based on monitoring well data only.

**DRAFT**

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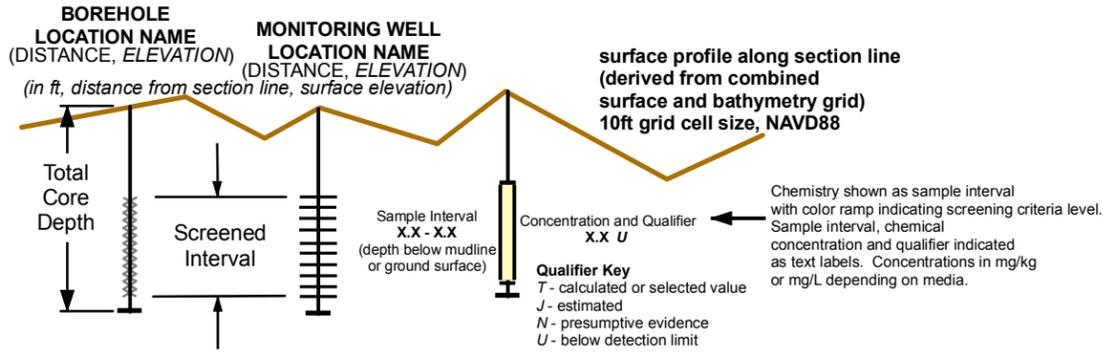


**Map-27**  
**Cross-Section D-D'**  
**Groundwater Chemistry**  
**DDD**



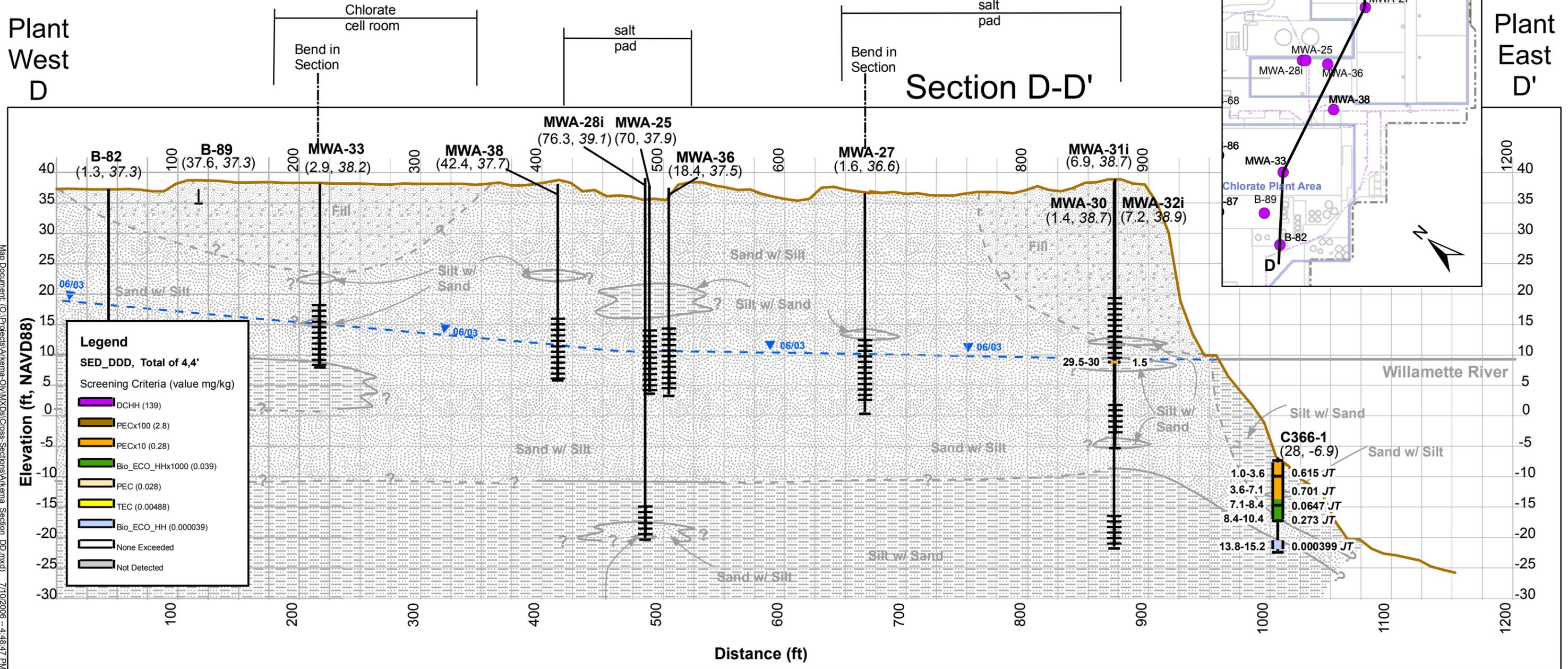
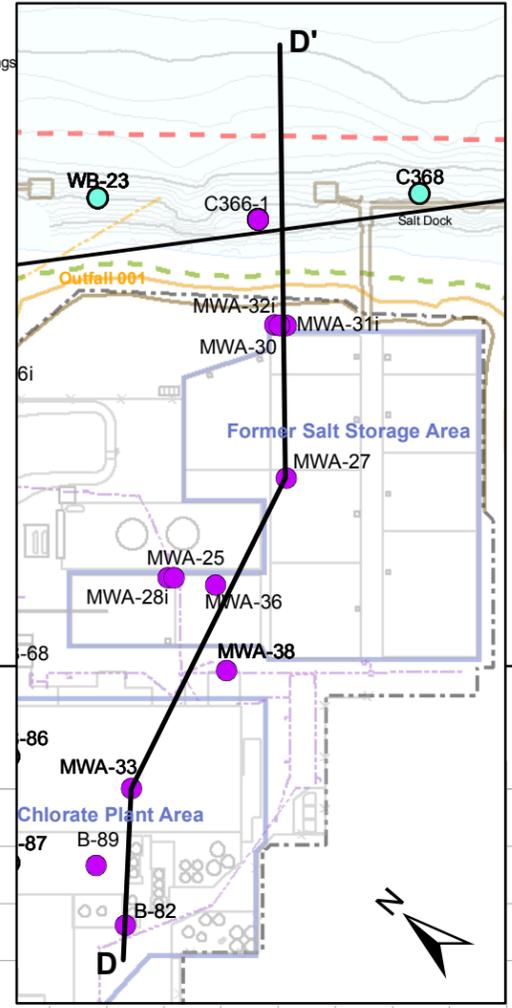
Notes:

- 1) Due to projection onto the section line, lithology was estimated at some well and borehole stations based on best professional judgment
- 2) Groundwater samples were not filtered. Reconnaissance groundwater sample concentrations may be biased high since they are generally more turbid than monitoring well groundwater samples.



Map View Legend

- Section\_DD\_Selected\_Wells and Borings
- Section\_AA
- Section\_BB
- Section\_CC
- Navigation Channel
- River
- 12ft\_Contour
- Ordinary High Water
- Top of Bank
- Bathymetry (2, 10 ft)
- Index Contour
- 2' contour



Map Document: (O:\Projects\Arkema-Oil\MapDocs\Cross-Sections\Arkema\_Section\_DD.mxd) 7/10/2006 - 4:48:47 PM

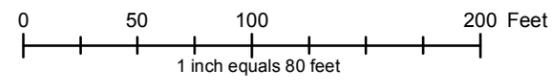


Section View: Vertical Exaggeration: 5X

- Fill
- Silt with some clay and fine sand
- Sand with varying amounts of silt
- Basalt
- Silt with varying amounts of fine sand
- Inferred soil or geologic contact (queried where uncertain)
- Shallow-zone groundwater surface (approximate) June 2003; based on monitoring well data only.

**REVISED DRAFT**

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Map-28  
**Cross-Section D-D'**  
 Soil/Sediment Chemistry  
 DDD