US EPA RECORDS CENTER REGION 5
474087

Portage Creek Remediation: Volume and Mass Estimations

Prepared by The Fields Group:

Kevin Cunningham

John Canar

Charles Roth

April 14, 2011

FIELDS
Field Environmental Decision Support

United States Environmental Protection Agency

Notes on Volume and Mass Calculations:

Volume of contaminated sediment was estimated using the FIELDS Tools for ArcGIS software by multiplying surface area times a proposed removal depth for each excavation area.

Mass of PCB was estimated using the FIELDS Tools for ArcGIS. The values were derived by Natural Neighbor interpolation of the maximum of the BBL 1993-1997 and MDNRE 2008 and 2010 PCB sediment sampling results at each one foot depth interval. A density of 2,500 lb/yd^3 was used in the estimate.

FIELDS
FIELD ENVIRONMENTAL DECISION SUPPORT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Portage Creek - Remediation Scenario (> 10 ppm): SA1-A

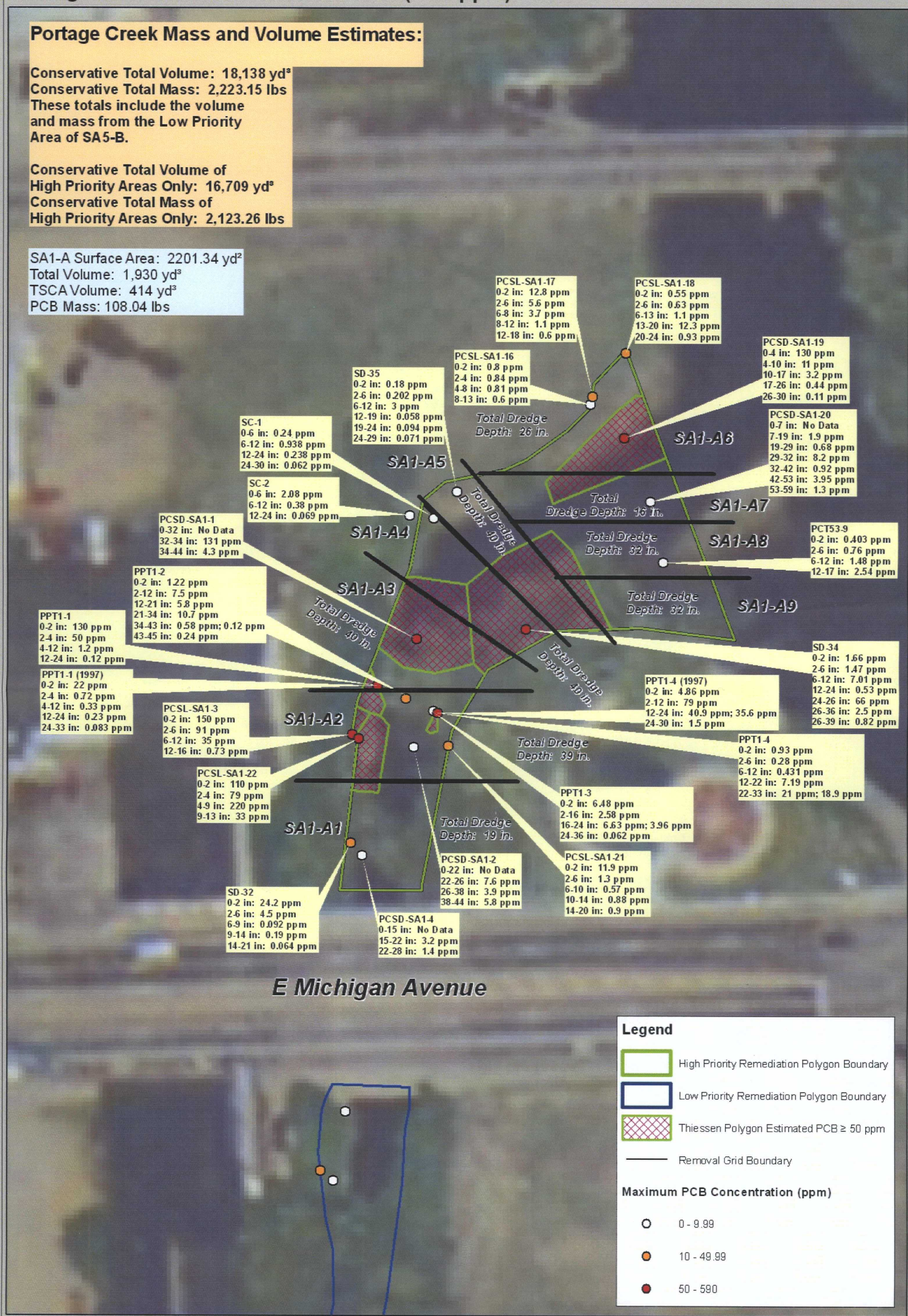
04/14/2011

Portage Creek Mass and Volume Estimates:

Conservative Total Volume: 18,138 yd³
Conservative Total Mass: 2,223.15 lbs
These totals include the volume and mass from the Low Priority Area of SA5-B.

Conservative Total Volume of High Priority Areas Only: 16,709 yd³
Conservative Total Mass of High Priority Areas Only: 2,123.26 lbs

SA1-A Surface Area: 2201.34 yd²
Total Volume: 1,930 yd³
TSCA Volume: 414 yd³
PCB Mass: 108.04 lbs



FIELDS

0 50 100 200 Feet

Projection: UTM Zone 16N
Datum: NAD 83

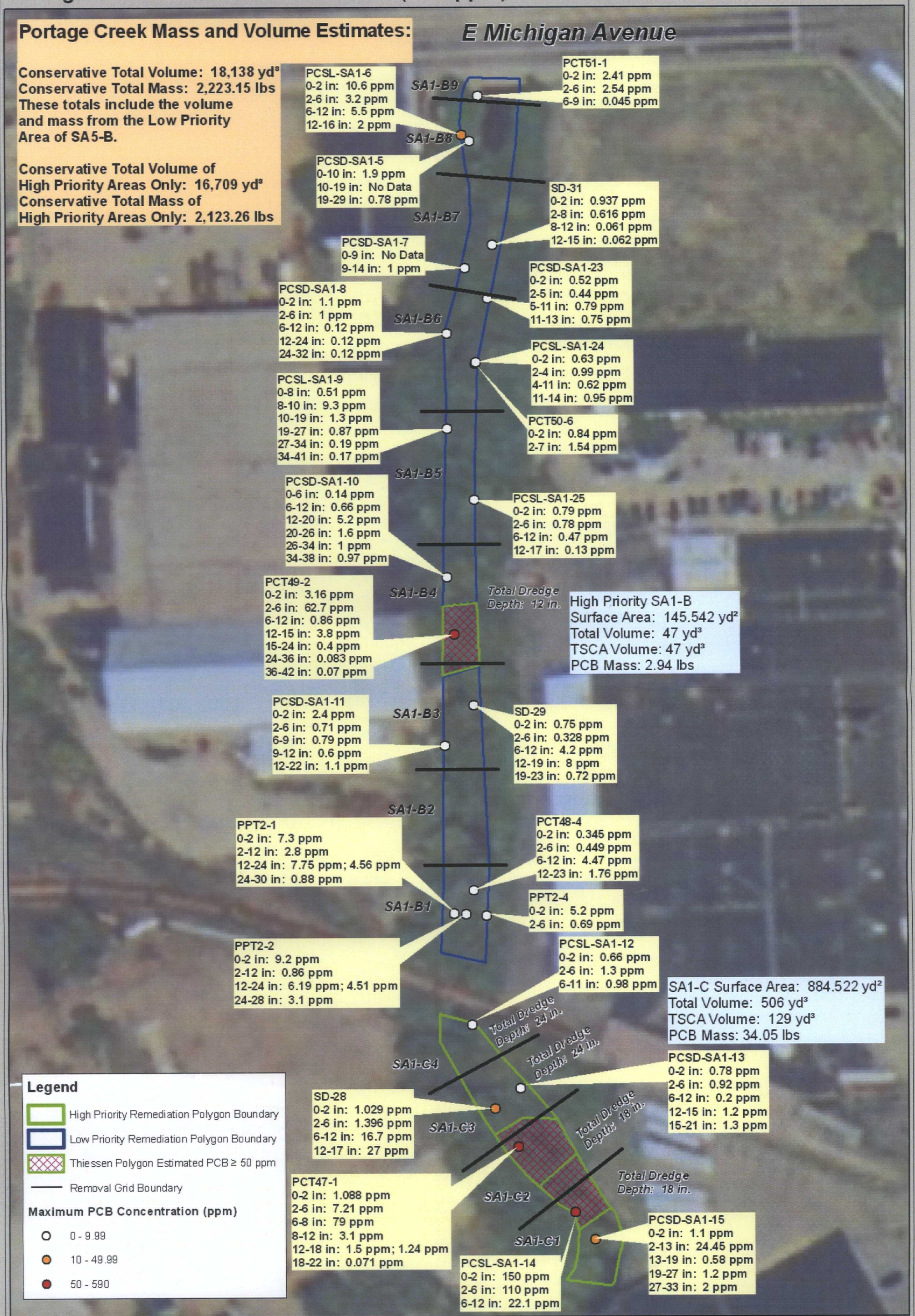
Portage Creek - Remediation Scenario (> 10 ppm): SA1-B and SA1-C

04/14/2011

Portage Creek Mass and Volume Estimates:

Conservative Total Volume: 18,138 yd³
Conservative Total Mass: 2,223.15 lbs
These totals include the volume and mass from the Low Priority Area of SA5-B.

Conservative Total Volume of High Priority Areas Only: 16,709 yd³
Conservative Total Mass of High Priority Areas Only: 2,123.26 lbs



FIELDS

0 62.5 125 250 Feet

Projection: UTM Zone 16N
Datum: NAD 83

Portage Creek - Remediation Scenario (> 10 ppm): SA3-A and SA3-B

04/14/2011

Portage Creek Mass and Volume Estimates:

Conservative Total Volume: 18,138 yd³
Conservative Total Mass: 2,223.15 lbs
These totals include the volume and mass from the Low Priority Area of SA5-B.

Conservative Total Volume of High Priority Areas Only: 16,709 yd³
Conservative Total Mass of High Priority Areas Only: 2,123.26 lbs

SA3-A Surface Area: 1,999.017 yd²
Total Volume: 1,666 yd³
TSCA Volume: 0 yd³
PCB Mass: 38.51 lbs

SA3-B Surface Area: 1,504.281 yd²
Maximum Depth > 10 ppm: 79 Inches
Volume > 10 ppm: 3,301.061 yd³
Maximum Depth + 6 Inches: 85 Inches
Volume + 6 Inches: 3,551.774 yd³
Volume to 60 Inches: 2,506 yd³
PCB Mass (0-60 Inches): 53.47 lbs
TSCA Volume: 0 yd³

SA3-A8
SA3-A7
SA3-A6
SA3-A5
SA3-A4
SA3-A3
SA3-A2
SA3-A1

Total Dredge Depth: 30 in.

PCSD-SA3-15
0-8 in: No Data
8-13 in: 3.2 ppm
13-23 in: 0.64 ppm
23-29 in: 0.97 ppm

SD-27
0-2 in: 0.208 ppm
2-6 in: 0.2 ppm
6-12 in: 0.18 ppm
12-17 in: 0.057 ppm

PCT42-3
0-2 in: 0.168 ppm
2-6 in: 0.2 ppm
6-12 in: 0.347 ppm
12-24 in: 34.4 ppm
24-36 in: 0.091 ppm
36-46 in: 0.19 ppm

PCSL-SA3-13
0-2 in: 0.92 ppm
2-7 in: 1.27 ppm
7-13 in: 34 ppm
13-20 in: 17 ppm
20-26 in: 1.065 ppm
26-36 in: 0.15 ppm

PCSL-SA3-12
0-2 in: 0.55 ppm
2-6 in: 1.53 ppm
6-12 in: 32 ppm
12-17 in: 28.2 ppm
17-22 in: 4.2 ppm
22-32 in: 0.22 ppm

PCSD-SA3-14
0-2 in: No Data
2-6 in: 0.45 ppm
6-14 in: 3.46 ppm
14-21 in: 4.1 ppm
21-27 in: 0.97 ppm

PCSL-SA3-11
0-2 in: 0.97 ppm
2-6 in: 1.82 ppm
6-12 in: 28 ppm
12-18 in: 9.4 ppm
18-23 in: 5.1 ppm
23-26 in: 0.1 ppm

PCSL-SA3-6
0-2 in: 1.4 ppm
2-6 in: 1.8 ppm
6-13 in: 20 ppm
13-15 in: 17 ppm
15-19 in: 9.8 ppm
19-25 in: 3.8 ppm
25-27 in: 3 ppm

PCSL-SA3-7
0-2 in: 0.88 ppm
2-6 in: 1.34 ppm
6-12 in: 0.92 ppm
12-19 in: 0.13 ppm

SA3-B6
SA3-B5
SA3-B4
SA3-B3
SA3-B2
SA3-B1

PCSD-SA3-4
0-2 in: 1.7 ppm
2-7 in: 4.3 ppm
7-17 in: 10 ppm
19-28 in: 21 ppm
28-35 in: 7.3 ppm
35-41 in: 0.11 ppm

PCSL-SA3-2
0-2 in: 1.06 ppm
2-6 in: 1.53 ppm
6-12 in: 0.8 ppm
12-22 in: 0.81 ppm

PCSD-SA3-3
0-5 in: No Data
5-8 in: 0.49 ppm
8-14 in: 0.23 ppm
14-17 in: 0.21 ppm
17-25 in: 0.11 ppm

SD-25
0-2 in: 0.525 ppm
2-6 in: 1.03 ppm
6-12 in: 1.53 ppm
12-22 in: 0.666 ppm
22-26 in: 8.7 ppm
26-36 in: 3.51 ppm
36-48 in: 2.1 ppm
48-58 in: 4.9 ppm
58-72 in: 27.5 ppm; 19.9 ppm
72-79 in: 11 ppm
79-86 in: 0.5 ppm

PCSD-SA3-1
0-7 in: No Data
7-10 in: 1.9 ppm
10-14 in: 0.12 ppm
14-19 in: 0.24 ppm
19-29 in: 0.11 ppm
29-34 in: 0.195 ppm
34-46 in: 0.11 ppm

Legend

- High Priority Remediation Polygon Boundary
- Low Priority Remediation Polygon Boundary
- Thiessen Polygon Estimated PCB ≥ 50 ppm
- Removal Grid Boundary

Maximum PCB Concentration (ppm)

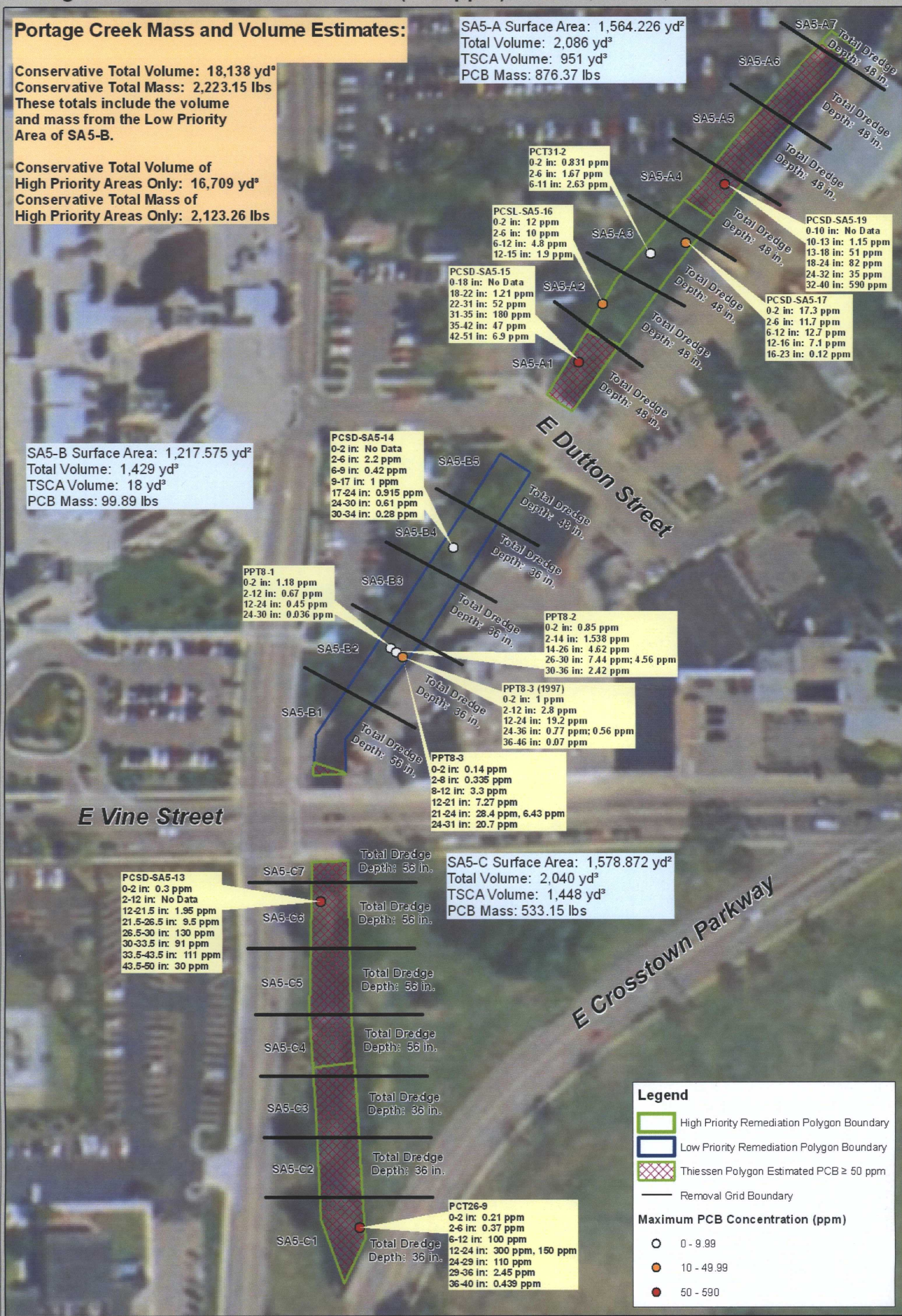
- 0 - 9.99
- 10 - 49.99
- 50 - 590

FIELDS

0 62.5 125 250 Feet

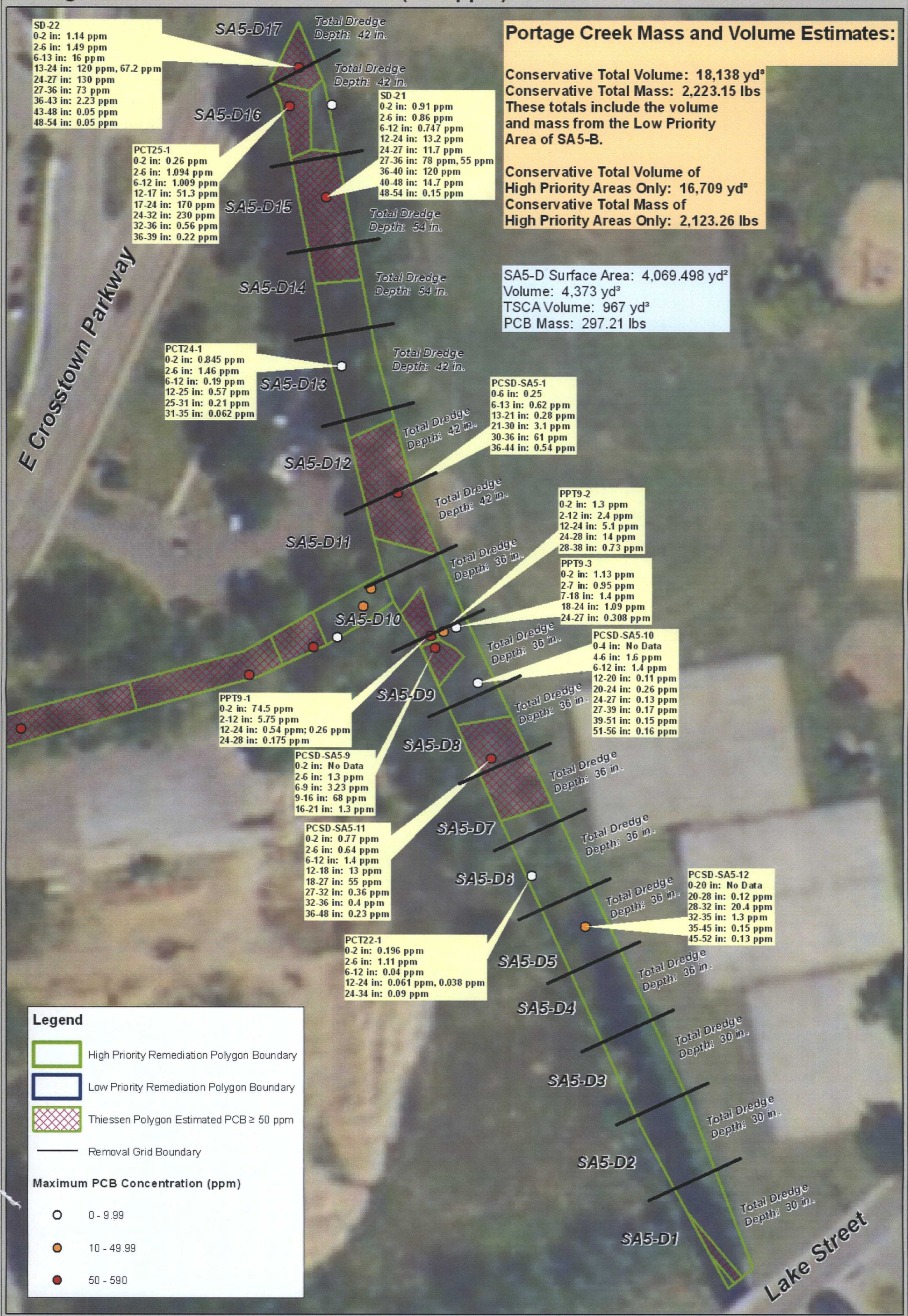
Projection: UTM Zone 16N
Datum: NAD 83

Portage Creek - Remediation Scenario (> 10 ppm): SA5-A, SA5-B, and SA5-C 04/14/2011



Portage Creek - Remediation Scenario (> 10 ppm): SA5-D

04/14/2011



Portage Creek Mass and Volume Estimates:

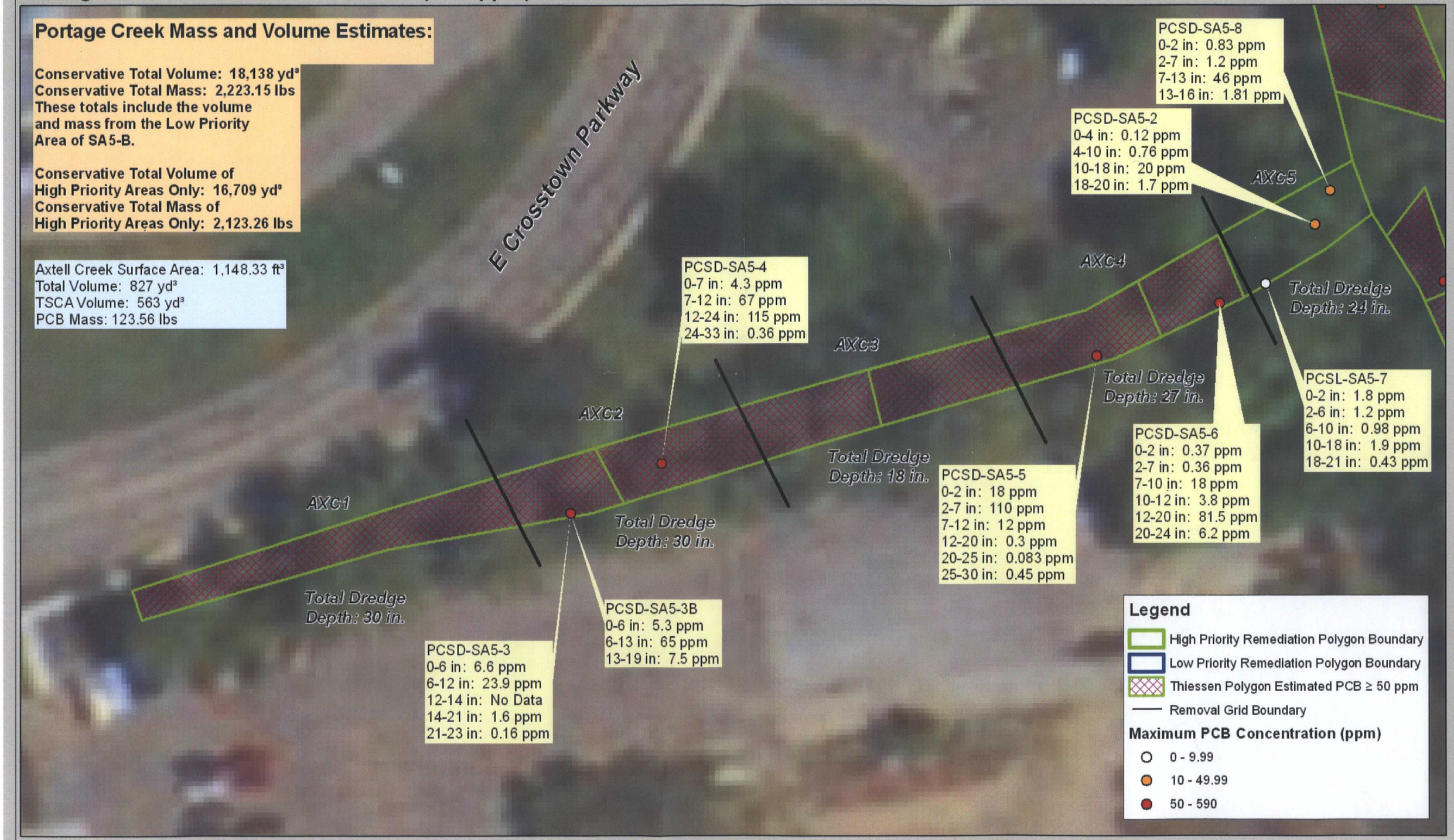
Conservative Total Volume: 18,138 yd³
Conservative Total Mass: 2,223.15 lbs
These totals include the volume and mass from the Low Priority Area of SA5-B.

Conservative Total Volume of High Priority Areas Only: 16,709 yd³
Conservative Total Mass of High Priority Areas Only: 2,123.26 lbs

SA5-D Surface Area: 4,069.498 yd²
Volume: 4,373 yd³
TSCA Volume: 967 yd³
PCB Mass: 297.21 lbs

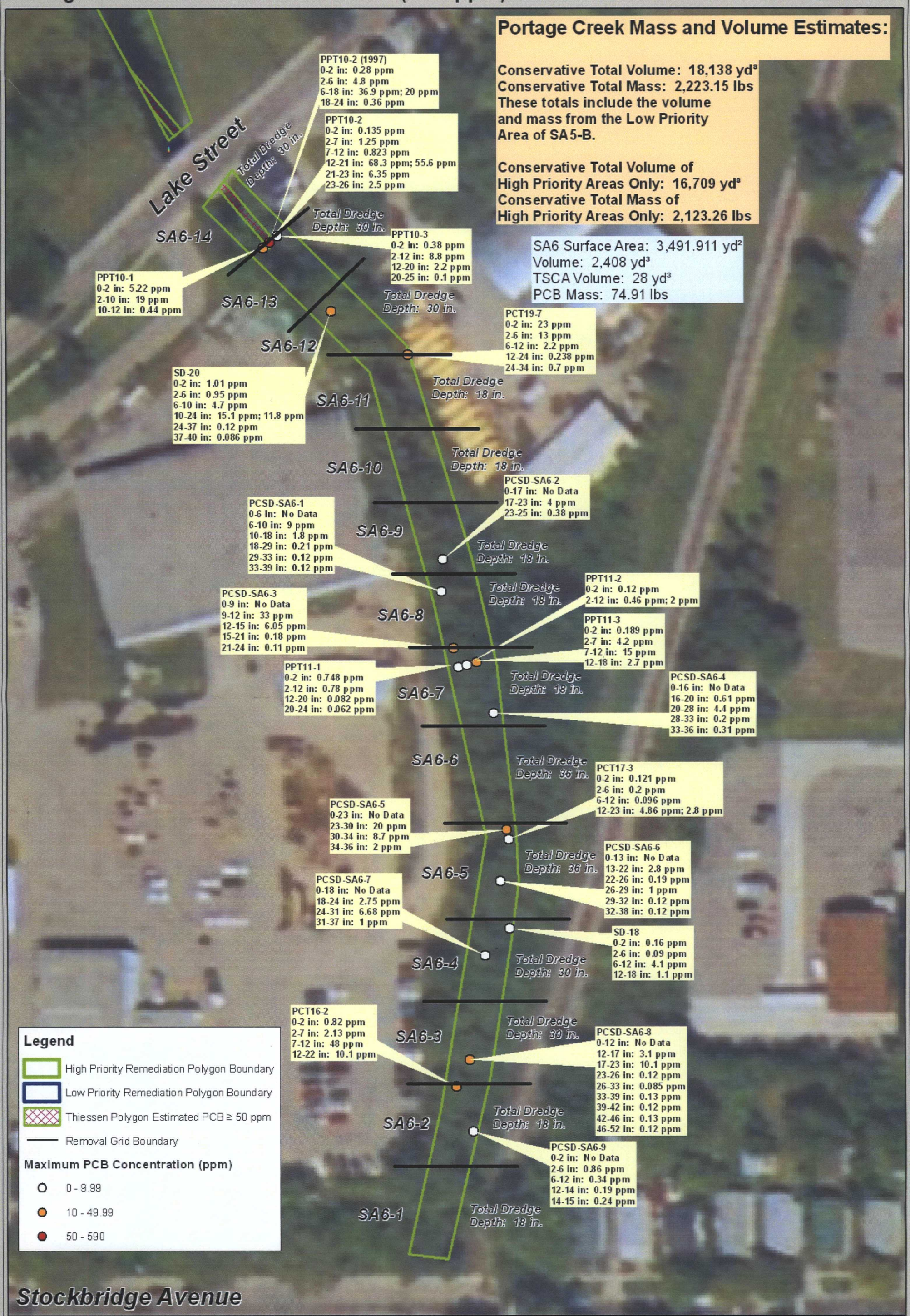
Portage Creek - Remediation Scenario (> 10 ppm): Axtell Creek

04/14/2011



Portage Creek - Remediation Scenario (> 10 ppm): SA6

04/14/2011



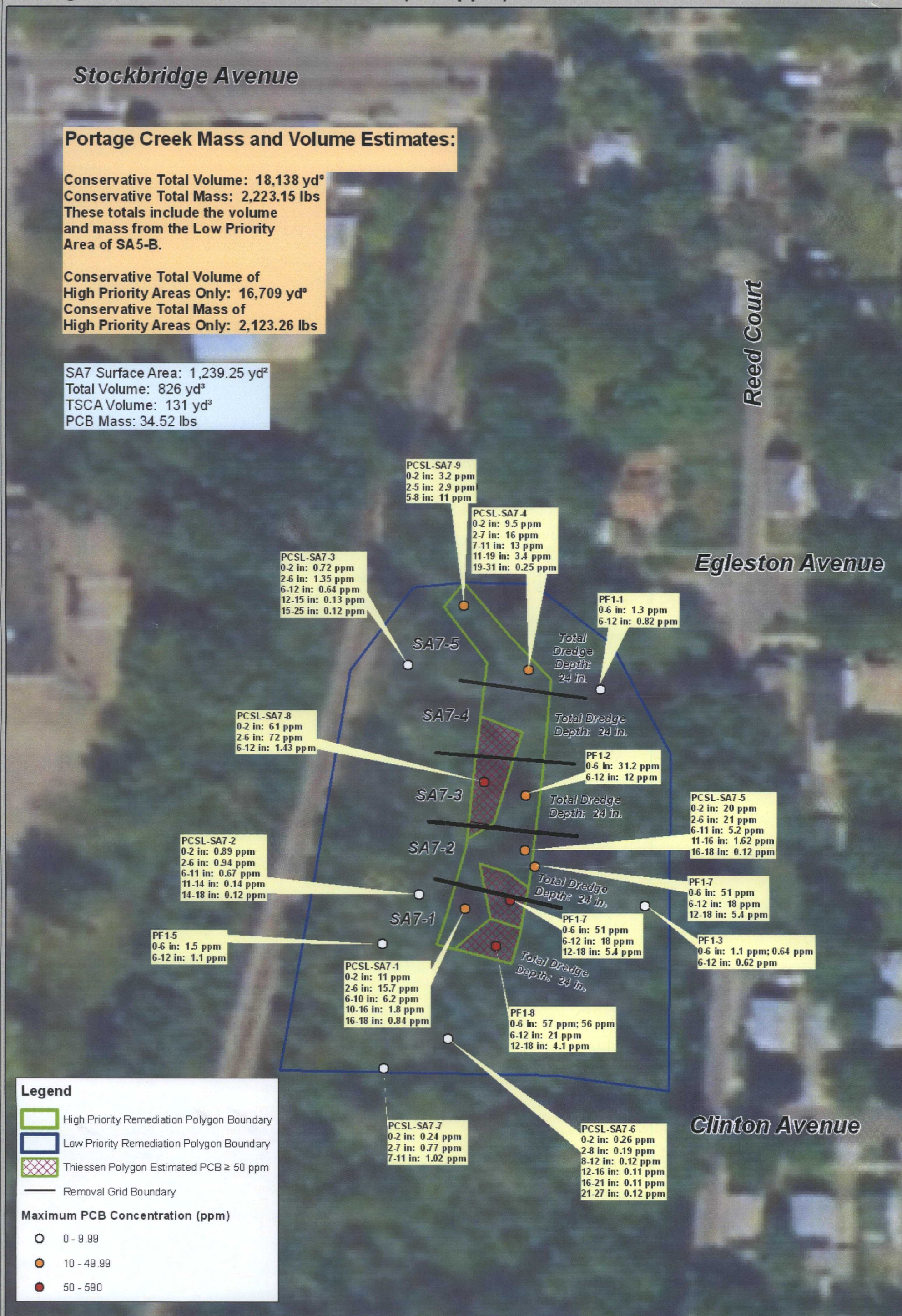
FIELDS

0 62.5 125 250 Feet

Projection: UTM Zone 16N
Datum: NAD 83

Portage Creek - Remediation Scenario (> 10 ppm): SA7

04/14/2011



Portage Creek Mass and Volume Estimates:

Conservative Total Volume: 18,138 yd³
Conservative Total Mass: 2,223.15 lbs
These totals include the volume and mass from the Low Priority Area of SA5-B.

Conservative Total Volume of High Priority Areas Only: 16,709 yd³
Conservative Total Mass of High Priority Areas Only: 2,123.26 lbs

SA7 Surface Area: 1,239.25 yd²
Total Volume: 826 yd³
TSCA Volume: 131 yd³
PCB Mass: 34.52 lbs

FIELDS

0 62.5 125 250 Feet

Projection: UTM Zone 16N
Datum: NAD 83