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The Trusted Integrator for Sustainable Solutions

8 June 2012

Mr. Andrew Hoffman
NH Department of Environmental Services
Waste Management Division
P.O. Box 95
Concord, NH 03302-0095

Work Order No.: 20118.015.001

Re: Technical Memorandum
Soil Removal Cost Estimate
Kearsarge Metallurgical Corp. Site

Dear Mr. Hoffman:

Weston Solutions, Inc. (WESTON®) is pleased to provide this analysis of projected costs for removal of contaminated soil at the Kearsarge Metallurgical Corporation Superfund Site (Site). New Hampshire Department of Environmental Services (NHDES) requested that Weston develop a cost estimate for a remedial scenario involving excavation and off-site disposal of soil exceeding the Record of Decision (ROD) cleanup goal of 300 µg/L 1,1,1-trichloroethane (TCA).

Sampling and analysis data from the Geoprobe soil boring effort conducted in 2008 has been used to delineate the area and volume of soil that would be removed under this scenario. Figure 1 shows the locations of the soil borings performed in May of 2008 and the maximum concentrations of TCA detected in soil samples collected from each of the borings. The area of where soil samples exceeded 300 µg/L TCA is outlined on this figure. Figure 2 depicts the location of cross-section A-A' shown in Figure 3.

The cost estimate presented in this memorandum is based on the following assumptions:

- The volume of soil outlined in Figures 1 and 3 is estimated to be approximately 1,333 cubic yards, or about 2,000 tons of soil.
- Aproximately 8 to 9 ft of "clean" overburden (approximately 4,000 cy) would be excavated and stockpiled on-site to access the soil targeted for removal.
- Depth to groundwater is approximately 4 ft below ground surface. Therefore, excavation dewatering and treatment/discharge of the extracted groundwater will be required in order to excavate the contaminated soil.
- Excavation methods used for this soil removal are assumed to be similar to the methods used for the 2003 soil removal. The soil conditions encountered during the 2003 excavation required sheet piling to maintain the open excavation. Similar conditions are expected for this excavation.

- It is assumed that the excavated soil will be transported to Turnkey Landfill in Rochester, NH and disposed as "non-hazardous".
- The unit cost for excavation and disposal of the contaminated soil is assumed to be similar to the cost incurred for the 2003 excavation, but have been adjusted based on the Engineering News Record (ENR) Construction Cost Index to reflect 2012 costs. The ENR factor used to adjust October 2003 costs to June 2012 costs is 1.372.
- Costs for a temporary water treatment facility, including 3 frac tanks, flocculation system, filtration system, and carbon vessels for a period of 45 days have been included. A pumping rate of 10 gpm for 10 hours per day has been assumed. It has been assumed that treated water will be discharged to the local sanitary sewer.
- It has been assumed that the disturbed area of the site will be restored by loaming and reseeding with a wetland seed mix. In addition, approximately 600 poplar tree saplings will be planted to replace those disturbed by the excavation.
- Costs have been included for preparation of design documents (plans and specifications) delineating the volume of soil to be removed, the methods to be employed, and other pertinent requirements.
- Costs have been included for evaluation of bids, award of contract(s) construction administration, oversight, and confirmation sampling.

The total cost to complete the excavation and off-site disposal of the soil exceeding the cleanup standard of 300 µg/L TCA is estimated to be approximately $1.5 million. A breakdown of the costs, and a comparison with the costs incurred to perform the 2003 excavation and off-site disposal of soil with VOC concentrations greater than 3000 µg/L is provided in Table 1.

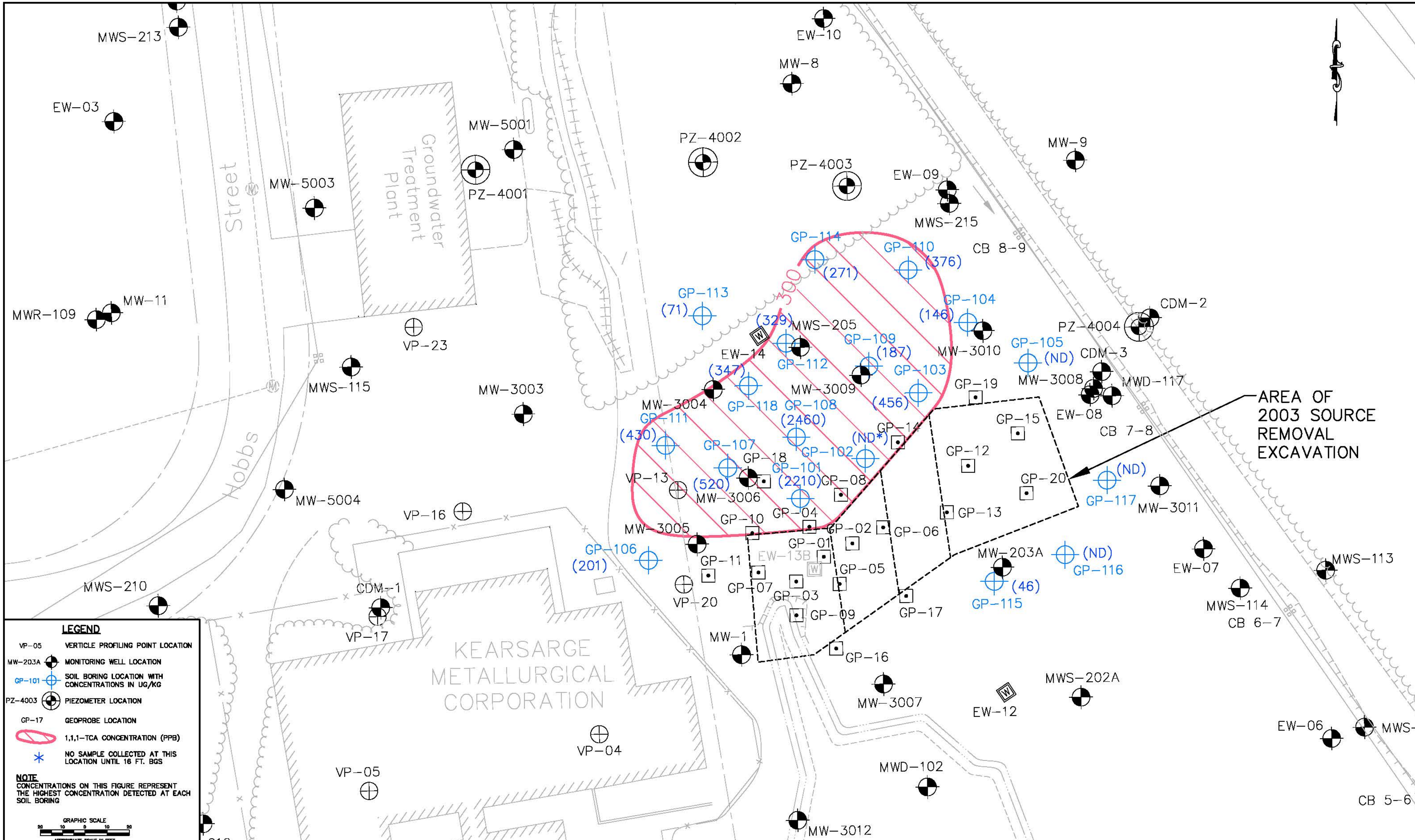
If you have any questions regarding this cost estimate or back-up, please feel free to call me. We appreciate the opportunity to be of continued service to NHDES.

Very Truly Yours,
WESTON SOLUTIONS, INC.

Bette L Nowack

Bette L. Nowack, PE
Project Manager

Enclosures



M:\Design\DWG\KRSARGE\2012\Cost Estimate Memorandem\FIG 1.dwg, Layout1, 6/6/2012 11:16:07 AM, GIRARDEB, 1:2

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

KEARSARGE METALLURGICAL CORP. SUPERFUND SITE
CONWAY, NEW HAMPSHIRE

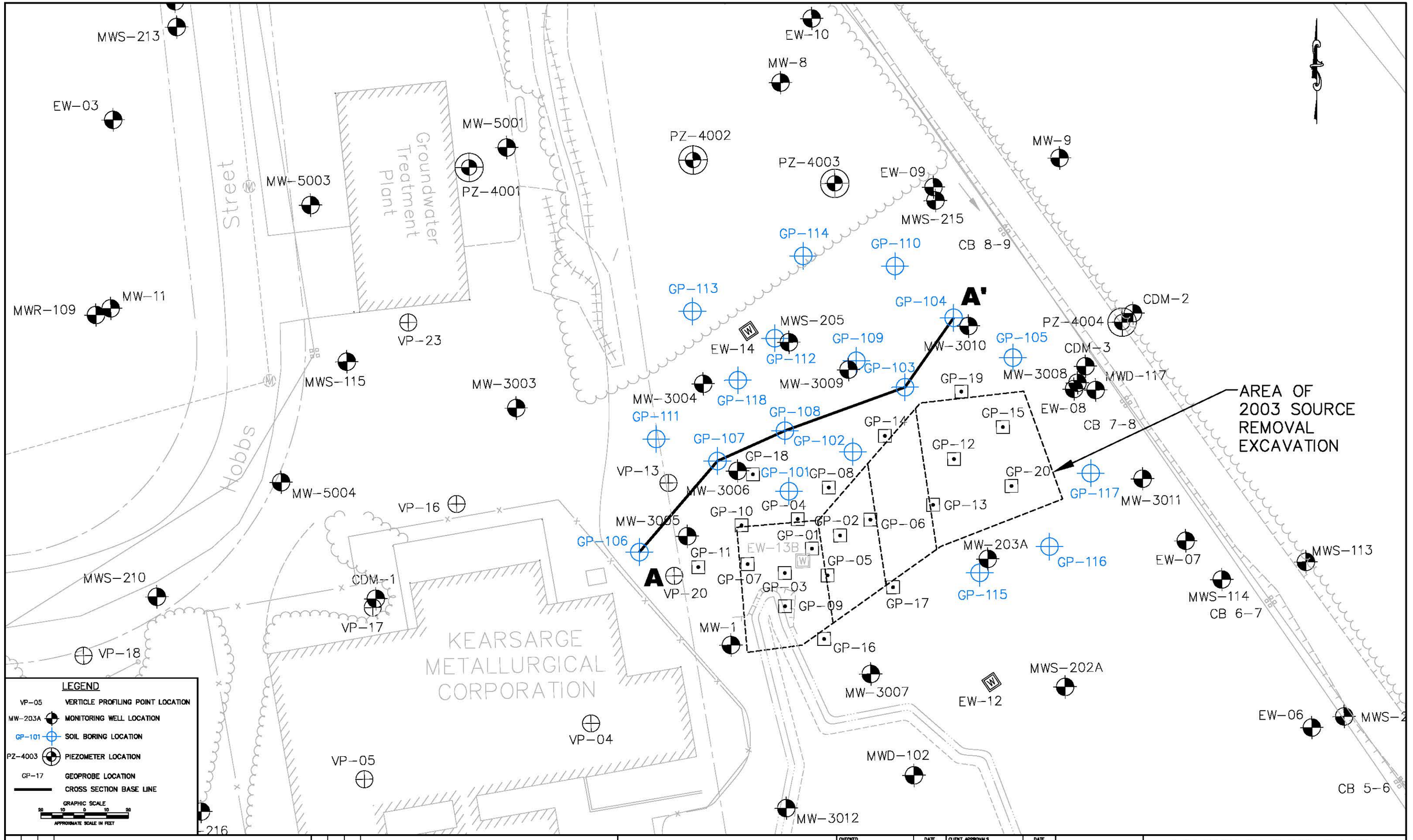
WESTON SOLUTIONS — MANCHESTER, NEW HAMPSHIRE

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

CHECKED	DATE	CLIENT APPROVALS	DATE
DES. ENG.			
PROJ. ENG.			
PROJ. MGR.			
APPROVED			
APPROVED		ISSUED FOR	DATE

CONCENTRATIONS OF 1,1,1-TCA IN SOIL MAY 2008

DRAWN	DATE	FIGURE NO.	REV. NO.
BEG	JUN 2012	1	
SCALE	W.O. NO.	SHT. ___ OF ___	
AS SHOWN	20118.015.001		



LEGEND

VP-05	VERTICLE PROFILING POINT LOCATION
MW-203A	MONITORING WELL LOCATION
GP-101	SOIL BORING LOCATION
PZ-4003	PIEZOMETER LOCATION
GP-17	GEOPROBE LOCATION
	CROSS SECTION BASE LINE

GRAPHIC SCALE
20 10 0 10 20
APPROXIMATE SCALE IN FEET

NO.	DATE	APPR.	REVISION

KEARSARGE METALLURGICAL CORP. SUPERFUND SITE
CONWAY, NEW HAMPSHIRE

WESTON SOLUTIONS MANCHESTER NEW HAMPSHIRE

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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LOCATION OF CROSS SECTION THROUGH SOURCE AREA SOILS MAY 2008

DRAWN	DATE	FIGURE NO.	REV. NO.
BEG	JUN 2012	2	
SCALE	W.O. NO.	SHT. ___ OF ___	
AS SHOWN	20118.015.001		

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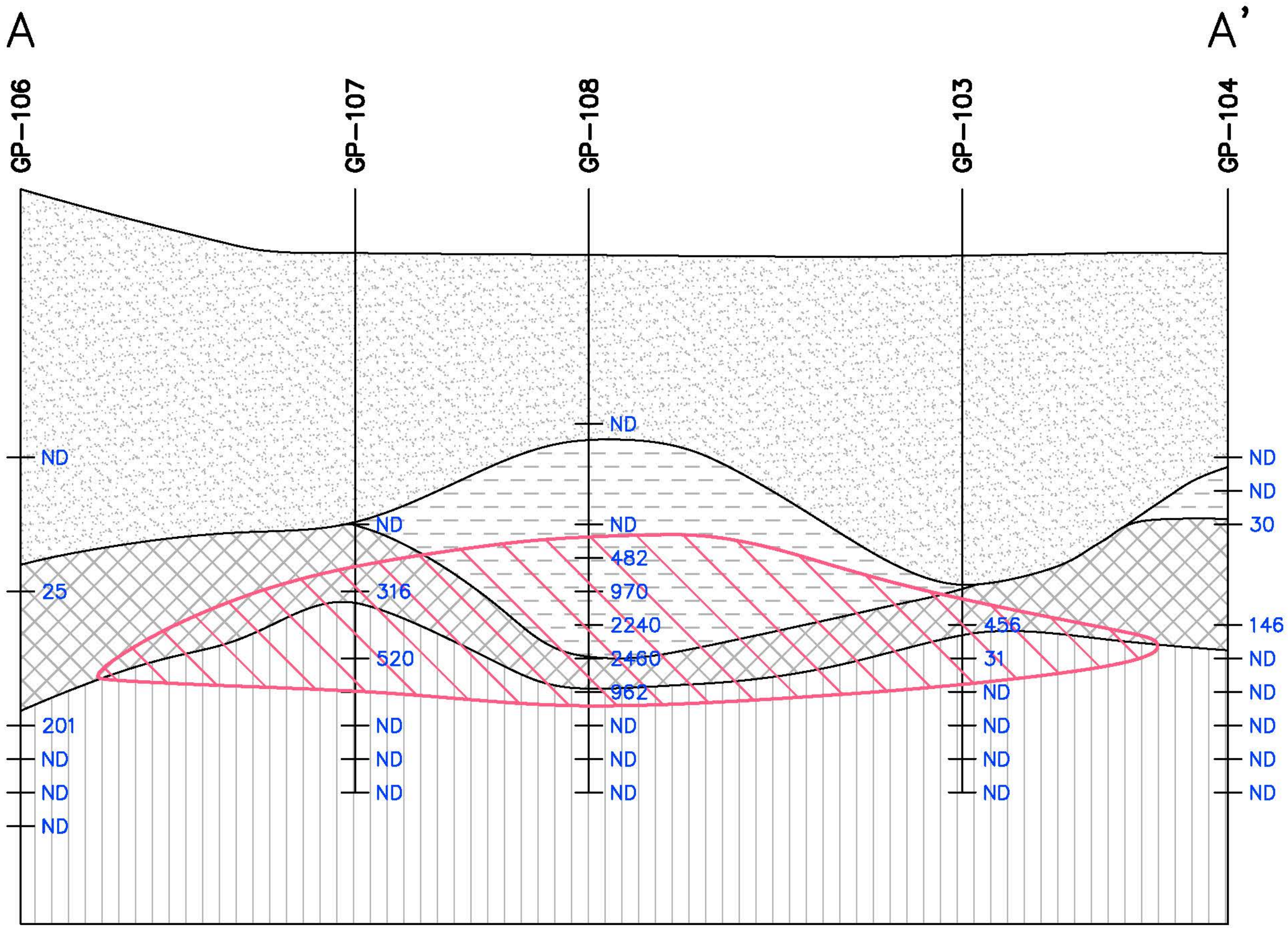

LEGEND

BROWN FINE SAND

GRAY SILTY FINE SAND

TAN CLAYEY SAND

GRAY SILT/CLAY

300 PPB 1,1,1-TCA

146 1,1,1-TCA (ug/kg)

HORIZ. GRAPHIC SCALE

20 10 0 10 20

APPROXIMATE SCALE IN FEET

VERT. GRAPHIC SCALE

4 2 0 2 4

APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

KEARSARGE METALLURGICAL CORP. SUPERFUND SITE
CONWAY, NEW HAMPSHIRE

CROSS SECTION
THROUGH SOURCE AREA SOILS

DRAWN BEG	DATE JUN 2012	DES. ENG.	DATE	W.O. NO. 20118.015.001
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 3

M:\Design\DWG\KRSARGE\2012\Cost Estimate Memorandem\FIG 3.dwg, Layout1, 6/6/2012 11:17:50 AM, GIRARDEB, 1:1

Table 1
Kearsarge Metallurgical Superfund Site, Conway, NH
Construction Cost Estimate for Removal of Soil with TCA Concentrations Greater than 300 ppb

Work Tasks	Actual Costs from 2003 Soil Removal to 3000 ppb	Unit	Number of Units	2003 Unit Cost	Extended Cost	Escalated to 2012 (ENR Factor = 1.372)
Preparation of Plans and Specifications	$ 44,675.00	Each	1	$ 44,675.00	$ 44,675.00	$ 61,294.10
Admin, Oversight, Confirmation Sampling & Analysis	$ 102,490.00	Each	1	$ 102,490.00	$ 102,490.00	$ 140,616.28
Mob/Demob and Bonds and Insurance	$ 31,800.00	Each	1	$ 31,800.00	$ 31,800.00	$ 43,629.60
stockpile of existing piping and well pumps	$ 10,985.00	N/A	N/A	N/A	N/A	N/A
Establish, maintain, and remove staging areas	$ 20,200.00	Each	1	$ 20,200.00	$ 20,200.00	$ 27,714.40
Excavate Soils (Clean Overburden and Contaminated)	$ 254,002.50	Cubic Yard	5333	$ 33.13	$ 176,678.67	$ 242,403.13
Load and T&D of soils	$ 709,502.50	Ton	2000	$ 305.25	$ 610,493.66	$ 837,597.29
Backfill excavation	$ 94,200.00	Ton	2000	$ 16.62	$ 33,245.10	$ 45,612.28
controller, conduit, wire and controls and spare pump motor	$ 10,000.00	N/A	N/A	N/A	N/A	N/A
Air Monitoring Program	$ 2,000.00	Each	1	$ 2,000.00	$ 2,000.00	$ 2,744.00
Grade, Loam & Seed Site	$ 24,725.00	Each	1	$ 24,725.00	$ 24,725.00	$ 33,922.70
directed by the Owner, including disposal and backfill	$ 11,150.00	N/A	N/A	N/A	N/A	N/A
Boulder excavation, disposal and replacement	$ 1,150.00	N/A	N/A	N/A	N/A	N/A
Upgrade to Level C	$ 1,080.00	N/A	N/A	N/A	N/A	N/A
Temporary Water Treatment System	N/A	Each	1	N/A	N/A	$ 53,650.00
Site Restoration - Tree Planting	$ 16,731.00	Each	1	$ 16,731.00	$ 16,731.00	$ 22,954.93
Total Cost Estimate	$ 1,317,960.00					$ 1,512,138.72