BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

February 16, 2009

Mr. Jaspal S. Walia, P.E.
Environmental Engineer II
NY State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Ave.
Buffalo, NY 14203

Re: Summary Report - Delineation of Buried Brass Cylinders
Former NL Industries Site
3241 Walden Avenue, Depew, New York

Dear Mr. Walia:

Benchmark Environmental Engineering and Science, PLLC (Benchmark) has prepared this report on behalf of Norampac Industries, Inc. to summarize our efforts toward delineation of buried brass cylinders at the above-referenced Site.

BACKGROUND

The Former NL Industries site, which is currently occupied by Metro Waste Paper Recovery, Inc. (a member of Norampac Industries, Inc.), is a remediated New York State Brownfield Cleanup Program Site awaiting approval of the Final Engineering Report (FER) and Site Management Plan (SMP). In discussing project closeout requirements, the NYSDEC has indicated that it will be necessary to attempt to delineate areas where mercaptan-filled buried brass cylinders, which were inadvertently discovered during remedial work activities, may be present in the Site subsurface.

Benchmark and our designated Geophysical subconsultant, Amec Geomatrix, Inc., have investigated all known commercially available non-intrusive methods for delineating the brass cylinders, including:

- Conventional artifact (metal) detection equipment.
- Specialized artifact/concealed metal detection equipment
- Ground-penetrating radar (GPR)
- Time Domain Electromagnetics (TDEM)
- Frequency Domain Electromagnetics (FDEM)

A description of these efforts and findings is presented below.

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CONVENTIONAL METAL DETECTION EQUIPMENT

On November 28, 2008 Benchmark attempted to detect a sample brass cylinder using a Shonstedt GA-52Cx Heliflux metal detector. The sample was placed at grade and the metal detector sensitivity adjusted throughout its span in an attempt to determine if the cylinder or any components thereof would register a definitive audio signal. The sample produced no distinguishable response, indicating that conventional (i.e., magnetic field-based) metal detection would not be successful in identifying subsurface cylinders.

SPECIALIZED METAL DETECTION EQUIPMENT

In early December 2008 Benchmark contacted Reliatech, Inc., a local metal detection equipment manufacturer and supplier, regarding the availability of alternative metal detection equipment that might be capable of identifying the buried brass cylinders. A sample cylinder was provided to Reliatech, which attempted to detect the cylinder using several alternative security and artifact metal detection equipment. Again, the sample did not produce a significant response via any of the available devices.

GROUND PENETRATING RADAR (GPR)

On December 23, 2008, Amec Geomatrix performed a ground penetrating radar (GPR) pilot test in the area of the site where brass cylinders were reportedly identified during construction of a subsurface storm drainage line. The pilot test employed a GPR unit with a 250 MHz antenna and software. No discernible anomalies were detected, indicating that GPR would not be successful in identifying the locations of buried brass cylinders.

TIME-DOMAIN ELECTROMAGNETICS (TDEM)

Similar to the GPR pilot test, Amec Geomatrix also performed a pilot test using a Geonics EM-61 TDEM unit. Prior to the pilot test, a brass cylinder sample was tested to determine if the unit would register a response to a single cylinder at ground level. The sample was placed at grade and raised between the EM-61 coils, but did not indicate a discernible electromagnetic response (i.e., greater than background) on the EM-61 receiver. However, a pilot test was carried out on November 14, 2008 on the possibility that the EM-61 unit might respond to a larger grouping of subsurface cylinders. Again the test was focused toward the area of the site where brass cylinders were encountered during prior subsurface utility improvements. The EM-61 pilot test survey output is presented in Attachment 1. As indicated, no anomalies were detected in the vicinity of the previously encountered subsurface cylinders, indicating that the EM-61 would not be successful in detecting individual or larger groups of cylinders.

FREQUENCY-DOMAIN ELECTROMAGNETICS (FDEM)

Following the EM-61 Pilot Test, Amec-Geomatrix consulted with Geonics, Inc. the manufacturer of EM-61 unit and other electromagnetic equipment, concerning the need to detect subsurface brass via a non-intrusive method. Geonics indicted that an EM-38 Frequency-Domain Electromagnetic (FDEM) unit would have the greatest potential for success. AMEC Geomatrix subsequently obtained an EM-38 unit and performed an at grade response test on a brass sample in a manner similar to that described above for the EM-61 unit. The EM-38 unit registered a significant response to a small surface brass sample. Accordingly, a pilot test was performed with the EM-38 unit, again in the area of previously detected cylinders.

The EM-38 pilot test was performed on December 29, 2008. At the time of the test, a snow mound from plowing operations precluded accessing the area immediately over the former drainage improvements. However, the EM-38 registered anomalies along the perimeter of the snow mound in the general area where cylinders were previously encountered. Output from the EM-38 pilot test is presented as Attachment 2.

To confirm that the EM-38 had positively identified brass cylinders, a focused test pit program was completed on January 26, 2009. Specifically, Benchmark excavated two narrow test pits at EM-38 Pilot Survey coordinates 10W:30N and 5W:45N. In both instances, fill materials comprised of brick, traces of slag and wood were encountered beneath the asphalt pad, however no brass cylinders were detected. Because the fill is likely more conductive than surrounding soil it is probable that the EM-38 registered a false positive response to these materials.

CONCLUSIONS AND RECOMMENDATIONS

As described above, Benchmark and Amec Geomatrix have exhausted all known commercially available, non-intrusive methods for detecting the brass cylinders. None of these methods were successful. In addition, test pits excavated in the general area where cylinders were encountered during site drainage improvements yielded only ubiquitous fill materials suggesting that the cylinders, if present outside of the drainage improvements, are in isolated areas and cannot be practically identified through intrusive methods.

Based on these findings, Benchmark recommends that the Final Engineering Report summarize the attempts to identify a method for locating other potential areas of cylinders as identified herein. The Soil/Fill Management Plan (SFMP) component of the Site Management Plan should be similarly modified to include this information as well as procedures for handling of brass cylinders encountered during future construction or redevelopment activities. This is consistent with the intent of the SFMP, which recognizes that no environmental investigation can wholly eliminate uncertainty concerning subsurface conditions and as such provides means for addressing residual/unknown impacts if encountered during redevelopment activities.

Please do not hesitate to contact us if you have any questions or require additional information. We would be happy to meet with you to discuss the above-described investigation attempts in greater detail, if desired.

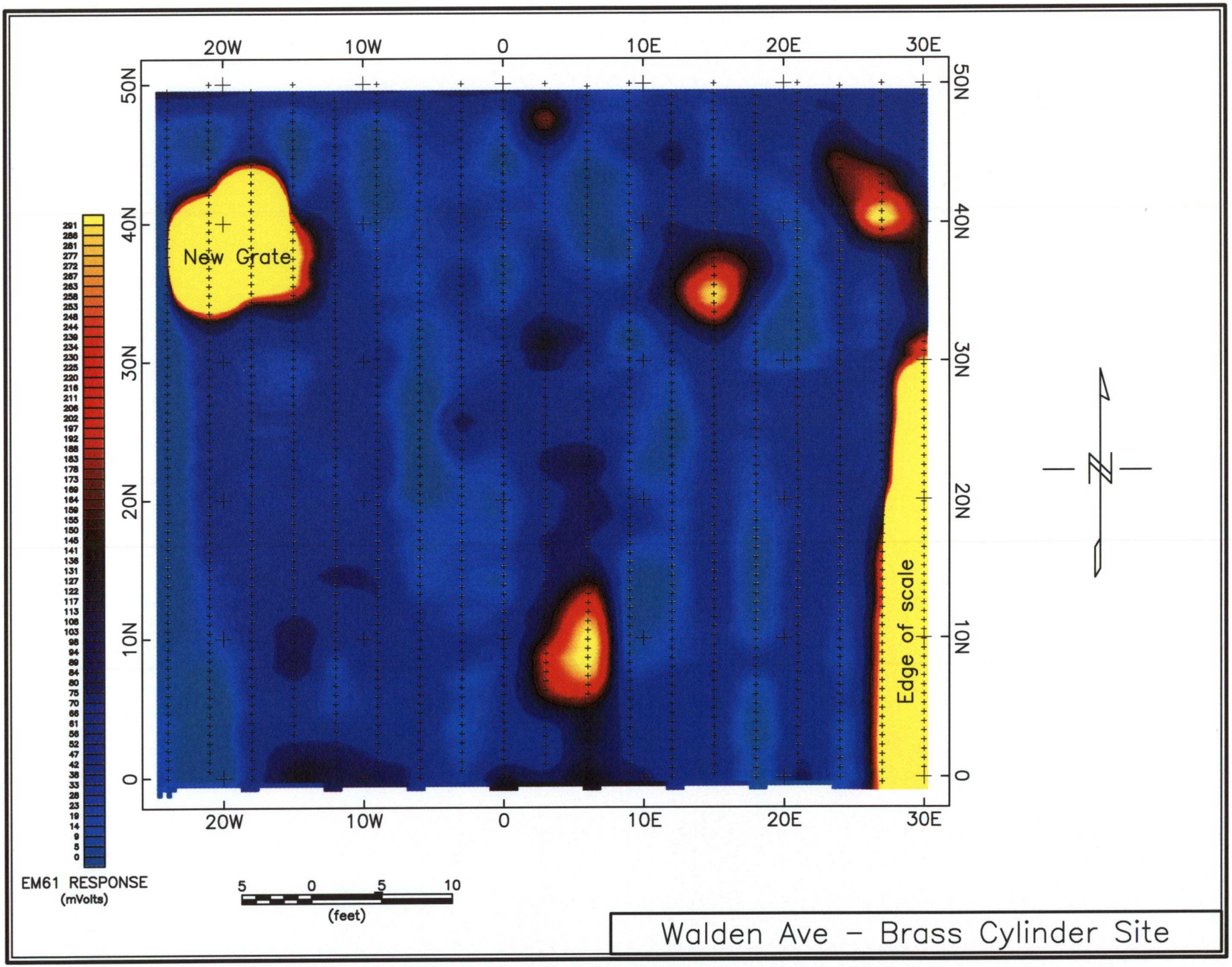
Sincerely,
Benchmark Environmental Engineering & Science, PLLC

Thomas H. Forbes, P.E.
Sr. Project Manager

C: C. Slater (Harter Secrest)
L. Marineau (Cascades)
J. Luttinger (Amec)

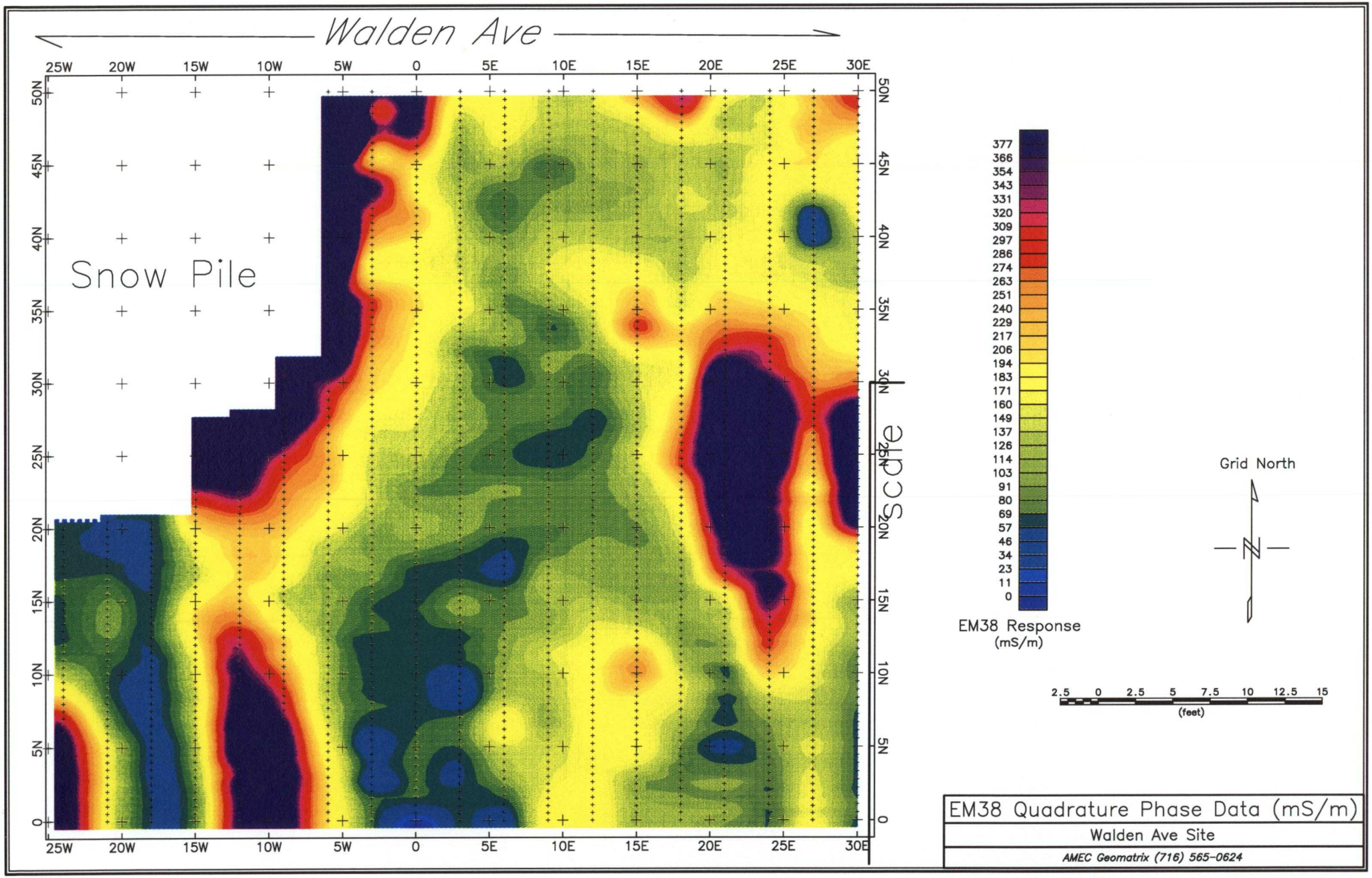
ATTACHMENT 1

EM-61 PILOT TEST OUTPUT


20W
10W
0
10E
20E
30E
50N
40N
30N
20N
10N
0
New Grate
Edge of scale
291
286
281
277
272
267
263
258
253
248
244
239
234
230
225
220
216
211
206
202
197
192
188
183
178
173
169
164
159
155
150
145
141
136
131
127
122
117
113
108
103
98
94
89
84
80
75
70
66
61
56
52
47
42
38
33
28
23
19
14
9
5
0
EM61 RESPONSE
(mVolts)
5
0
5
10
(feet)
N
Walden Ave - Brass Cylinder Site

ATTACHMENT 2

EM-38 PILOT TEST OUTPUT


Walden Ave
Snow Pile
25W 20W 15W 10W 5W 0 5E 10E 15E 20E 25E 30E
50N 45N 40N 35N 30N 25N 20N 15N 10N 5N 0
377 366 354 343 331 320 309 297 286 274 263 251 240 229 217 206 194 183 171 160 149 137 126 114 103 91 80 69 57 46 34 23 11 0
EM38 Response (mS/m)
Grid North
2.5 0 2.5 5 7.5 10 12.5 15
(feet)
EM38 Quadrature Phase Data (mS/m)
Walden Ave Site
AMEC Geomatrix (716) 565-0624