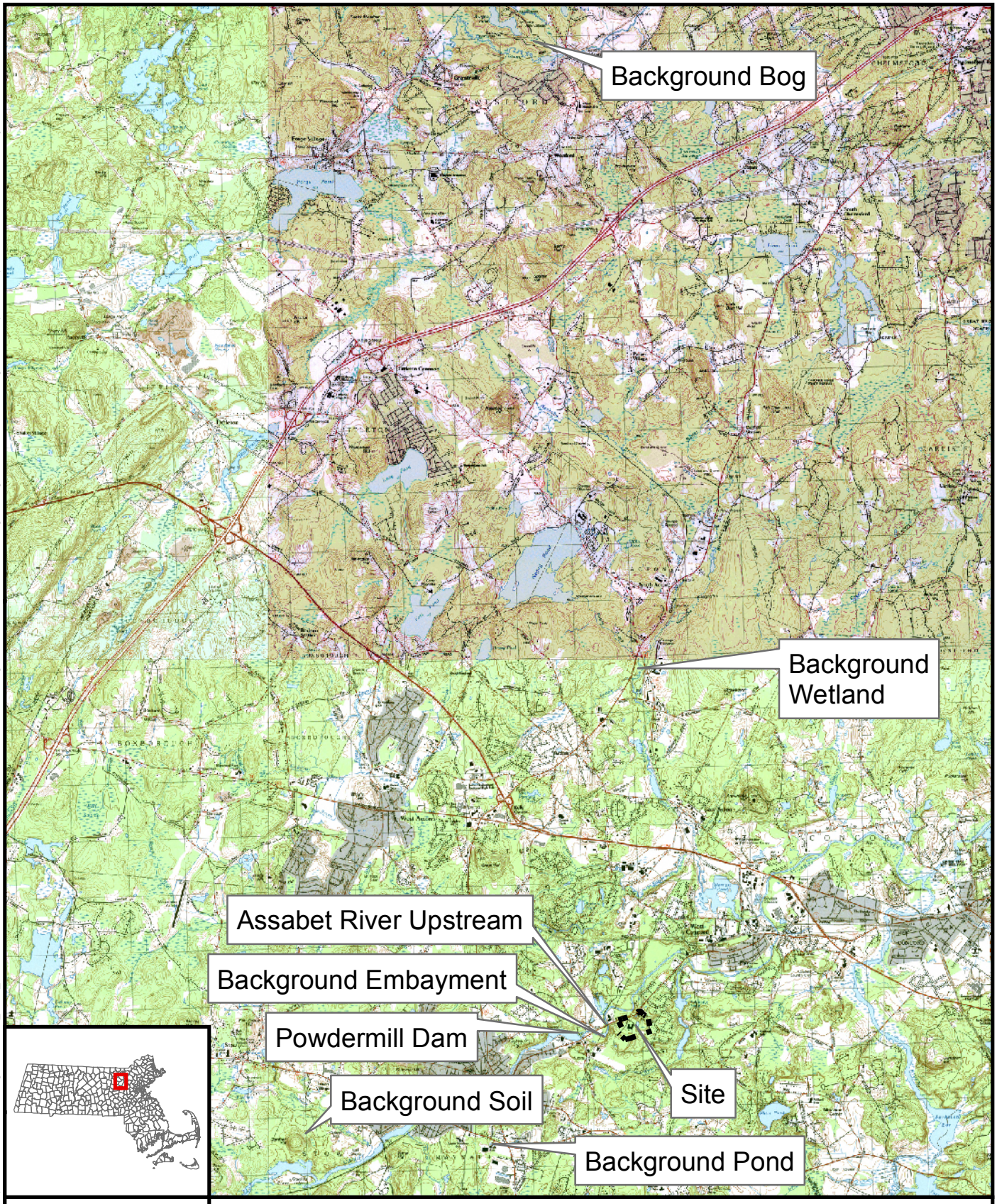
APPENDIX N

Background Data Evaluation and Sample Locations



de maximis, inc.

MACTEC

N

0 0.75 1.5 Miles

Prepared by BJR 12/15/09

Checked by AMR 12/15/09

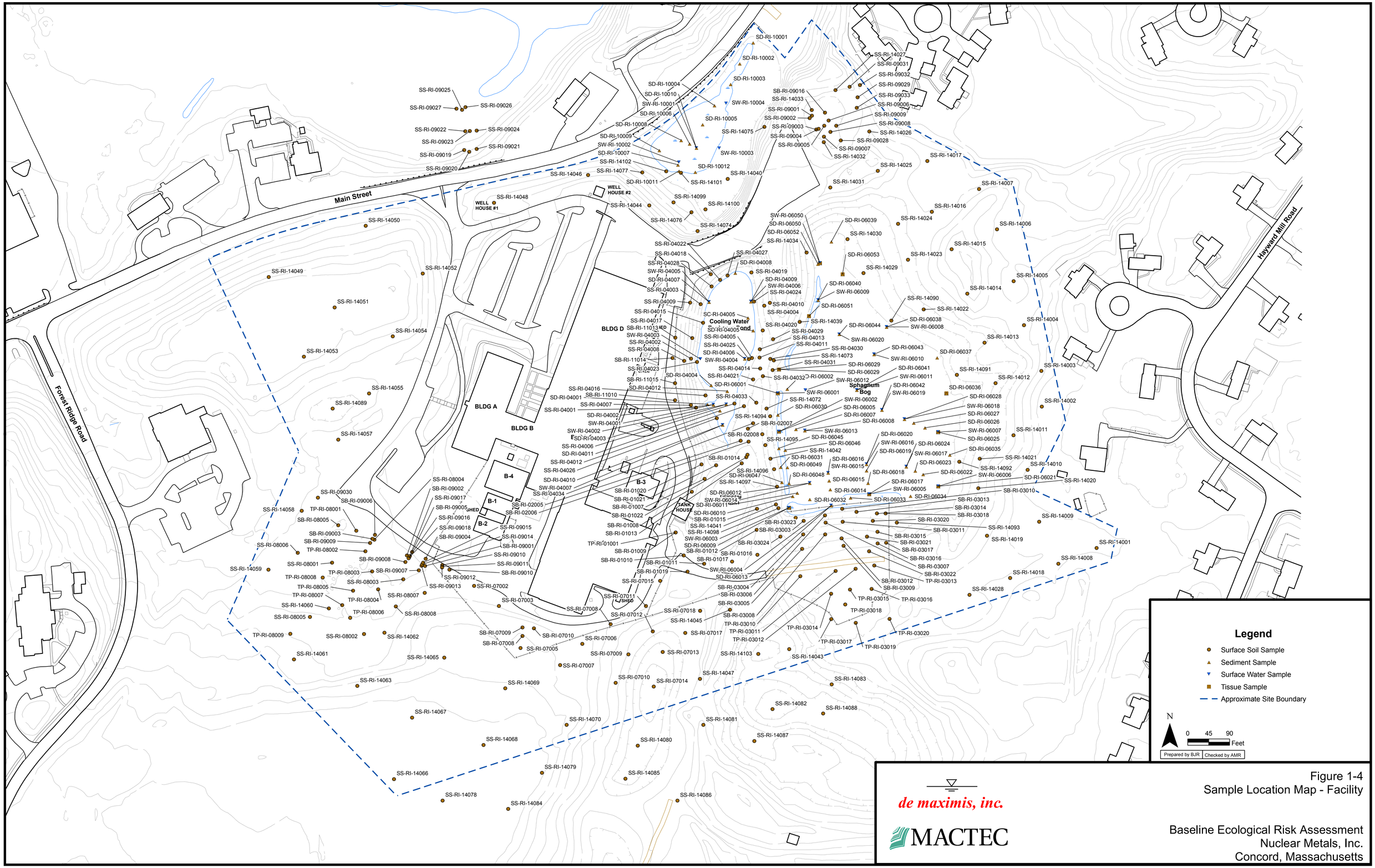
Legend

Site Boundary

Figure 1-3
Site and Background Sample Areas

Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\BackgroundLocus_8X11_P.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-3 - Site and Background Sample Areas.pdf 01/18/2010 4:00 PM bjroden

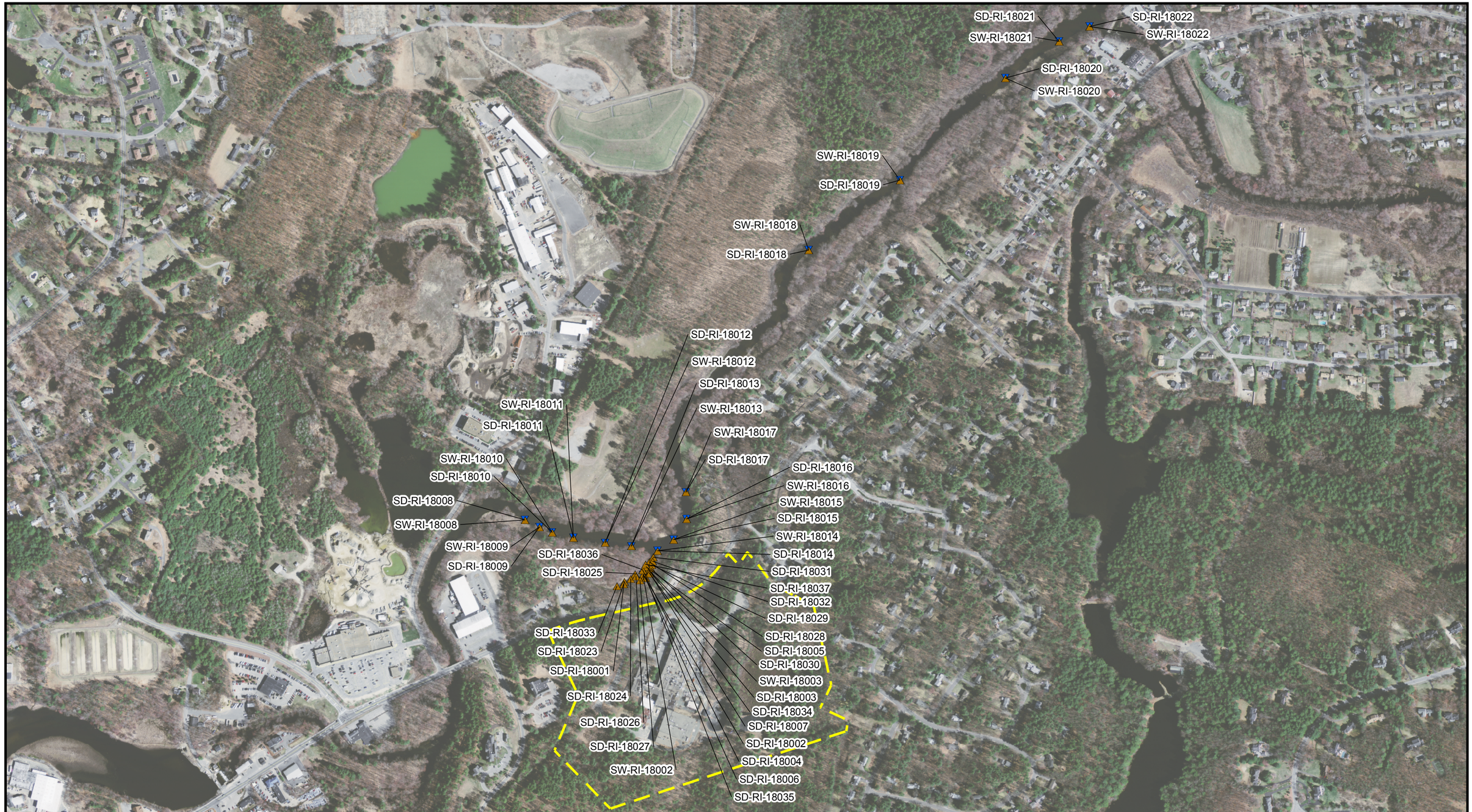


de maximis, inc.

MACTEC

Figure 1-4
Sample Location Map - Facility

Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts



de maximis, inc.

MACTEC

N

0 300 600 Feet

Prepared by BJR | Checked by AMR

Legend

- Sediment Sample
- Surface Water Sample
- Approximate Site Boundary

Figure 1-5
Sample Location Map - Assabet River

Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\River_11x17L.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-5 - Sample Location Map - Assabet River.pdf 12/22/2009 1:01 PM bjroden

de maximis, inc.

MACTEC

Legend

Background Surface Water Sample

Background Sediment Sample

N

0 20 40 Feet

Prepared by BJR 12/16/09

Checked by AMR 12/16/09

Location: Maynard High School Pond, Maynard, Massachusetts

Figure 1-6
Sample Location Map - Background Pond
Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\BackgroundLocations_8X11_P.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-6 - Sample Location Map - Background Pond.pdf 12/22/2009 1:13 PM bjroden

de maximis, inc.

MACTEC

N

0 50 100 Feet

Prepared by BJR 12/16/09

Checked by AMR 12/16/09

Legend

- Background Sediment Sample
- Background Surface Water Sample
- Background Amphibian Tissue Sample
- Background Amphibian and Invertebrate Tissue Sample

Location: Westford Bog
Westford, Massachusetts

Figure 1-7
Sample Location Map - Background Bog
Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\BackgroundLocations_8X11_P.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-7 - Sample Location Map - Background Bog.pdf 12/22/2009 1:15 PM bjroden

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MACTEC

N

0 30 60 Feet

Prepared by BJR 12/16/09

Checked by AMR 12/16/09

Legend

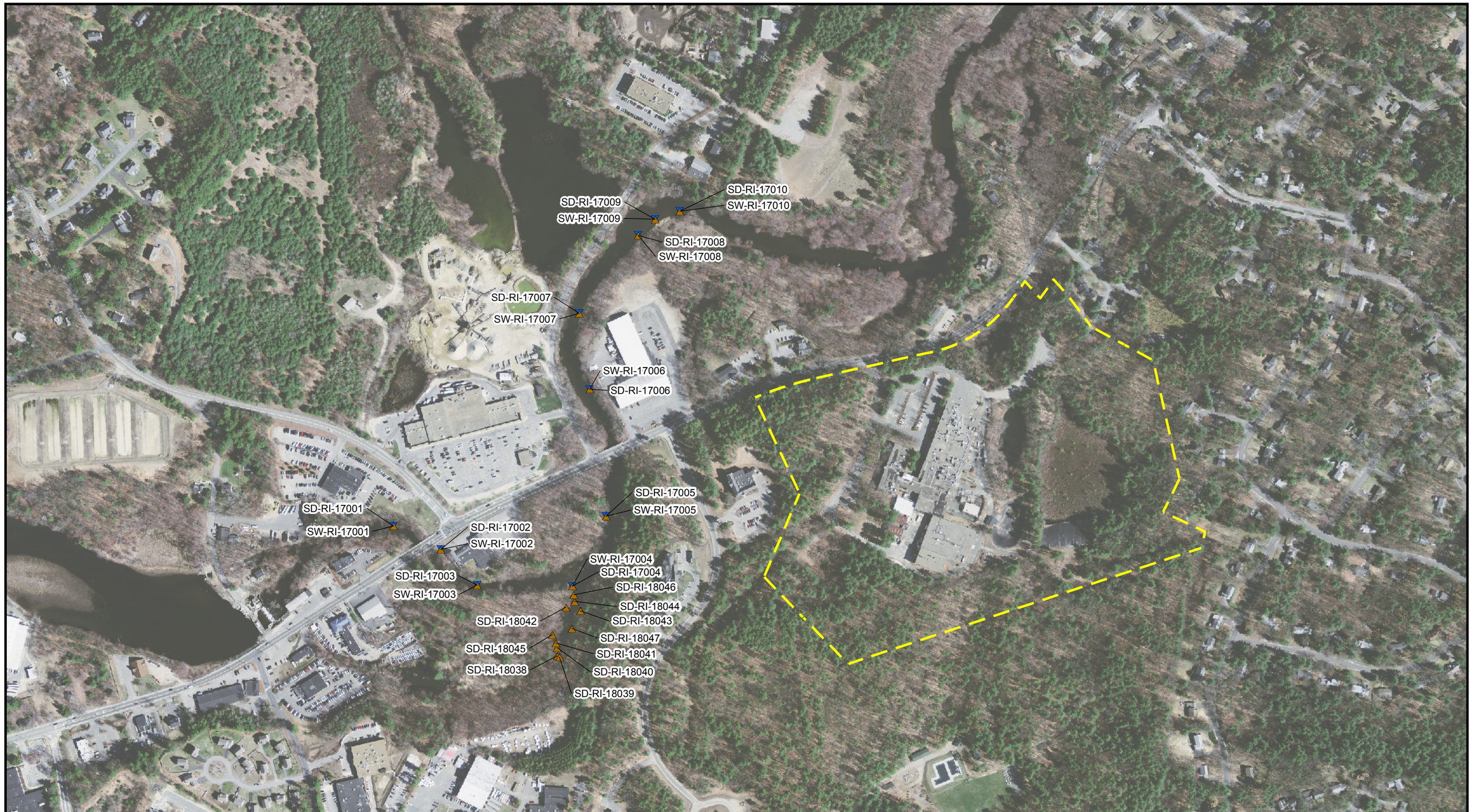
Background Sediment Sample

Background Surface Water Sample

Location: Conant Well Property
Acton, Massachusetts

Figure 1-8
Sample Location Map -
Background Wetland
Baseline Ecological
Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\BackgroundLocations_8X11_P.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-8 - Sample Location Map - Background Wetland.pdf 12/22/2009 1:17 PM bjroden



de maximis, inc.

MACTEC

N

0 200 400 Feet

Prepared by BJR | Checked by AMR

Legend

- Sediment Sample
- Surface Water Sample
- Approximate Site Boundary

Figure 1-9
Sample Location Map -
Assabet River Upstream and
Background Embayment
Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\River_11x17L.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-9 - Sample Location Map - Assabet River Upstream and Background Embayment.pdf 12/22/2009 1:07 PM bjroden

de maximis, inc.

MACTEC

N

0 200 400 Feet

Prepared by BJR 12/16/09

Checked by AMR 12/16/09

Legend

Background Surface Soil Sample

Location: Gardner Hill Town Forest
Stow, Massachusetts

Figure 1-10
Sample Location Map - Background Soil
Baseline Ecological Risk Assessment
Nuclear Metals, Inc.
Concord, Massachusetts

Document: P:\Nuclear Metals\GIS\Mapdocuments\BERA\BackgroundLocations_8X11_P.mxd PDF: P:\Nuclear Metals\Nuclear Metals RI FS EECA\Ecological Risk Assessment\BERA\Figures\Figure 1-10 - Sample Locations Map - Background Soil.pdf 12/22/2009 1:11 PM bjroden

An Examination of Site and Background Sediment Sample Data with Statistical Comparisons

Introduction:

The former Nuclear Metals, Inc. (NMI) Site (Site) in Concord, Massachusetts experienced releases of process-related contaminants during its history of operation. The Site Remedial Investigation (RI) of potentially contaminated media has included sampling of sediments in a backwater, or embayment, of the Assabet River located across Route 62 to the north of the Site (hereafter referred to as Site embayment area) due to potential migration of contaminants via runoff from the Site through drainage ways toward the River. In particular, the results of the RI sampling indicate elevated concentrations above RI screening levels (RSLs) of chromium, lead, mercury, and zinc in the Site embayment area. These analytes do not appear to be associated with Site-related releases as evidenced by the general lack of detections in other site media (e.g., soil, groundwater and on-property sediment) at concentrations greater than the RSLs.

In order to assess whether or not the Site has adversely impacted sediments in the Site embayment area, a background set of samples is needed for comparison. The Assabet River is known to have historically received contaminant loadings over the course of approximately 200 years of industrial activity from multiple sources upstream of the Site. Therefore, two data sets of sediment samples collected from locations upstream of the Site have been obtained for comparison to Site embayment area sediment samples. One of these data sets is derived from a United States Geological Survey (USGS) sampling and analysis program of several impoundments of the Assabet River, one of which, the Powdermill, is about 0.9 miles upstream of the Site embayment. The second data set is comprised of sediment samples collected in April 2008 at ten locations in a backwater of the Assabet River approximately 0.6 miles upstream of the Site.

This letter report presents results of an examination of sediment analytical results from the Site embayment area, the upstream USGS Powdermill impoundment, and 2008 upstream backwater samples. Basic statistics were performed for those analytes (metals) which were common to the data sets. In addition, statistical comparisons were made between the sets of data (Site to upstream locations) to assess whether or not there was any indication of Site impacts to the embayment sediments over and above concentrations detected in the sediments within the Assabet as collected at the Powdermill impoundment and the upstream backwater sampling location.

Description of the Sediment Sample Sets:

The USGS collected sediment samples from six impoundments along the Assabet in 2003; however, this report considers only those samples obtained in the Powdermill impoundment located about 0.9 miles upstream from the Site (see Figure 1). Samples were taken at 12 locations (P26 through P57) within the impoundment (see Figure 2), and, while a sample was typically taken in the top 6 to 11 inches at each location, samples were taken at various depths (up to 69 inches deep) at several of the 12 locations. The USGS collected 37 discrete samples at the twelve locations, with some duplicates and other quality control samples. Typically, the duplicates and quality control samples agreed with the results of the analysis of the original samples. Hence, in the following statistical analyses, duplicate or quality control results were not included. Results of the sampling are presented in the USGS report "Sediment Studies in the Assabet River, Central Massachusetts, 2003". The Powdermill Embayment is the consequence of the Powdermill Dam which has resulted in a broadening of the river behind the dam.

For the Site RI, MACTEC obtained seven sediment samples (samples SD-RI-18001 to SD-RI-18007) from the Assabet River embayment in November 2004 and fifteen additional samples (SD-RI-180023 to SD-RI-18037) in July 2007, for a total of 22 samples (see Figure 3). All samples were obtained from the

upper 0 to 12 inches of sediment. Some sample results were rejected, leading to a smaller number of samples for antimony (10), tungsten (13) and zirconium (14). Water level, volume and flow within the embayment vary seasonally.

In April 2008, MACTEC collected ten sediment samples from the upper six inches at a backwater similar to that potentially impacted by the Site, and situated approximately 0.6 miles upriver, and on the same side of the river as the Site (see Figure 4). One duplicate sample was also collected. However, as the results of the analysis of the duplicate sample were similar to the original sample, the statistical analysis does not include the duplicate results.

Detection limits for some of the USGS analyses were relatively greater than for MACTEC analyses, e.g., cadmium at 1 part per million (ppm) or milligram per kilogram (mg/Kg). Detection limits for the Site sediment data had typically low, but variable detection limits. The USGS Powdermill data for several analytes (aluminum, calcium, iron, magnesium, sodium and titanium) were expressed in percent. These were converted to ppm; however, the rounding process used in presenting these data in the USGS report makes some of the data appear discrete rather than continuous. One oddity in the USGS set is for silver, in which results for four samples were reported as greater than 10 ppm. In dealing with these results, the 10 ppm has been used as the reported result, which should bias the background mean and standard deviation on the low side for silver.

As a further refinement, USGS results for the surficial (less than 1-foot in depth) sediment samples were also extracted as a subset for comparison to the Site RI sediment data. This set of surficial samples contains 12 members. Statistical comparison of the Site samples was made to each of the Powdermill data sets (shallow samples and all samples).

It should be noted that while the majority of analytes analyzed for in each of the data sets were common, there were a few analytes in the Site RI sample set not present in the upstream data sets that may have some particular bearing on the evaluation of potential impact of the Site on the adjacent embayment area. These include thallium, thorium and uranium for the USGS data set, and molybdenum, thorium, titanium, tungsten, zirconium, and uranium for the 2008 upstream backwater samples. The only parameters that are not analyzed in either of the upstream data sets (i.e., parameters for which there are no upstream data) are thorium and uranium. However, concentrations of these two analytes in Site embayment sediment are generally below the RSLs that were used in the RI to delineate the nature and extent of contamination.

Methods:

Statistical analysis was performed by importing sample results into and out of Excel and then into Minitab (Version 15) for statistical analyses. Basic statistic measures included mean, median, minimum, maximum, standard deviation, skewness, kurtosis, outliers and tests for equality of medians for USGS Powdermill and 2008 upstream backwater with Site (MACTEC RI) sample sets. Further analysis of determining an appropriate identified distribution and using upper tolerance limits would be employed if the comparison of data sets suggested Site impacts exceeding upstream results.

Potential outliers were identified in Minitab by the outlier symbol(s) on boxplots displayed for each of the analytes. Outliers on the boxplot are determined as those values that exceed 1.5 time the inter-quartile range above the upper 75th percentile (Q3) inter-quartile range value (a high outlier) or less than 1.5 times the inter-quartile range less than the lower 25th percentile (Q1) of the inter-quartile range. It should be noted that potential outliers identified by this method may be an artifact of the underlying assumption of normality. If the data are treated as lognormal, some of these potential outliers may not be evident.

Comparison of the upstream with Site RI samples was performed primarily using the non-parametric Mann-Whitney test in Minitab. This is equivalent to the Wilcoxon Rank-Sum test cited in USEPA statistical guidance documents. This test creates a 95 (or other specified) percent level of confidence interval for the difference between the two set median values. If the confidence interval contains zero, then there is a statistical basis for accepting the null hypothesis of equal medians. This test was used as a screening tool to identify which of the Site-related analytes might exceed background.

Upper tolerance limits (UTLs) were constructed for the Powdermill and 2008 upstream data sets for analytes for which the Site medians exceeded the background medians according to the Mann-Whitney test results. This was required for only three analytes in the Powdermill data set (beryllium, calcium and vanadium) and for only four analytes in the 2008 upstream data set (beryllium, calcium, sodium, and selenium). Given the limited number of samples, the non-parametric one-sided 95 percent coverage, 95 percent confidence level UTL (95,95-UTL) corresponds to the maximum of the data sets. Further investigation of the background data sets to establish a lower parametric 95,95-UTL was also undertaken. Normality and log-normality were tested using the Shapiro-Wilk test as contained in the USEPA software DataQuest (USEPA, 1997) for the Powdermill samples or the comparable Anderson-Darling test in Minitab for the 2008 samples.

Since most analytes were detected for all samples, and when non-detects did occur, the non-detect frequency was low, no substitution of lower than detection limits was used (the exceptions were for antimony, some cadmium, and the tungsten data sets). This is expected to have minimal effect on the analyses. Also, for the non-parametric methods such as Mann-Whitney, order statistics prevail and it is not usually necessary to attempt any substitutions.

While comparable, some slight different approaches were applied to the later comparative analysis of the Site RI and 2008 upstream backwater sediment samples. The Anderson-Darling method for assessing normality of the upstream backwater data was used in place of the Shapiro-Wilk test. For parameters which suggested different median values and were normally distributed, parametric t-test comparisons of means at the 95 percent level of confidence were also performed and parametric UTLs computed. These added tests did not significantly alter non-parametric comparison conclusions. These parameters included beryllium, calcium, sodium and selenium. One-half detection limits were used for the very few non-detects in this sample set; this approach is not expected to have any impact on the non-parametric approaches.

Results:

<u>Site RI and USGS Powdermill sediment sample comparisons:</u> Results of the basic statistics and the Mann-Whitney test are presented on Table 1. Given the relatively high proportion of non-detects, no entries other than frequency of detection are provided for antimony, tungsten and for the complete background set for cadmium. Also, since the Site data were all non-detect for antimony, and no further analyses needed to be conducted for it was required.

In summary, the basic statistics and Mann-Whitney tests suggested that of the 25 analytes in common, the Site sample set exhibited statistically higher medians for only beryllium (about 50 percent higher), calcium and vanadium (both with concentrations approximately twice that of background). In addition, there appeared to be no statistical difference between the medians for chromium (compared to all background data), copper, lead, sodium and zinc (compared to all background). In all other cases, the Powdermill data sets had statistically greater median values, indicative of lack of Site impact on the adjacent embayment for these analytes.

Closer examination of the three Site analytes which appeared to exceed background was performed. This consisted of distributional analysis (normal, lognormal or non-parametric) using the Shapiro-Wilk test, determination of a 95,95-UTL for the background data sets for these analytes, and comparison of the Site data with the 95,95-UTLs. The results of these analyses are summarized on Table 2.

The (null) hypothesis of normality could not be rejected at the 95 percent confidence level for the Site beryllium data. However, the null hypothesis for both USGS background beryllium data sets could not be accepted either for raw or log-transformed data (the conclusion is that the data are neither normally nor lognormally distributed). This is partly due to the large proportion of non-detects in each of the data sets for beryllium. This also leads to appropriate treatment of these data as non-parametric, with the one-sided 95,95- UTL as the maximum for the data, 1.3 mg/Kg for the shallow set and 1.6 mg/Kg for all Powdermill data. Since the maximum of the Site data is 1.3 mg/Kg, none of the Site data values exceed the 95,95-UTL of the Powdermill data. This suggests that on average, the Site data has somewhat higher beryllium concentrations, but not exceeding the computed (95,95-UTL) value of the Powdermill data.

The Shapiro-Wilk test for normality for the calcium data suggested the Site and shallow background data sets to be normally distributed, while the whole Powdermill data set was lognormally distributed. Calculation of a parametric 95,95-UTL for the shallow USGS calcium data indicated a one-sided 95,95-UTL of 7,195 mg/Kg. Calculation of a 95,95-UTL for the entire calcium Powdermill set produced an enormously high estimated value (likely due to the large standard deviation) which would suggest use of the maximum 20,400 mg/Kg as a surrogate 95,95-UTL. However, this value is an outlier as is the next higher value, 14,600 mg/Kg (which is not to say these values are not real). Use of the shallow Powdermill data set 95,95-UTL appears to be a prudent selection for conservative comparison. This indicates that 8 of the 22 Site calcium data are greater than the UTL, and that some impact from the Site is indicated for calcium. However, calcium poses relatively low human or eco-risk and its presence at elevated concentrations in Site embayment sediment may be due to roadway runoff of winter de-icing salt.

The Shapiro-Wilk test indicated normality for the Site and both Powdermill vanadium data sets. Calculation of one-sided 95,95-UTLs for shallow and all background data sets produced values of 49.8 and 50.9 mg/Kg, respectively. Using the latter value of 50.9 mg/Kg for comparsion, 11 of 22 of the Site data vanadium concentrations were greater than the 95,95-UTL, indicating probable Site impacts on the Assabet embayment adjacent to the Site with respect to this analyte.

<u>Site RI and upstream backwater sediment sample comparisons:</u> Results of the basic statistics and the Mann-Whitney test (and where applicable, the t-test) are presented on Table 3. Given the relatively high proportion of non-detects, few entries are provided for antimony or thallium.

Since the data were all non-detect for antimony, no further analyses needed to be conducted for it. For thallium, the other analyte with a high proportion of non-detects (50 percent in the Site samples, 90 percent in the background), only one of the seven detects in the Site RI samples exceeded the maximum of the upstream backwater data set.

In summary, the basic statistics and Mann-Whitney tests suggested that of the 23 analytes in common, the Site RI embayment sample set exhibited statistically significant higher medians for only beryllium (about 33 percent higher), calcium and selenium (both about twice that of the upstream backwater data), and sodium (about three times that of the upstream backwater). The higher sodium at the Site RI embayment might be attributable to its closer proximity to the road and winter road salting run-off. While there were only these few instances of statistically significant difference in the medians for each of the analytes, typically the Site medians exceeded those of the background samples.

For the four analytes with statistically significant different medians, MACTEC computed a 95,95-UTL for the 2008 upstream backwater data set for these analytes, and made a comparison of the Site data with these 95,95-UTLs. Each of these analytes passed the test for normality which permits a straightforward calculation of the 95,95-UTL to be made. The results of these analyses are summarized on Table 4.

For beryllium (22 Site samples), although there was a statistically significant difference between the Site and 2008 backwater data set medians, no Site beryllium sediment sample concentration exceeded either the background set maximum or its 95,95-UTL.

For calcium, the Site sediment concentrations (22 samples) exceeded the 2008 backwater sediment 95,95-UTL in six instances, and the background maximum in nine instances. Calcium is not a significant risk-driver here and its presence at elevated concentrations in Site embayment sediment may be due to roadway runoff of winter de-icing salt

For sodium, the Site sediment concentrations (22 samples) exceeded the 2008 backwater sediment 95,95-UTL in 17 instances and the background maximum in 21 instances. As indicated above, a potential cause of the sodium may be the closer proximity of the Site embayment sediment samples to the road than at the background sample location and possible winter road-salting run-off.

For selenium, the Site sediment concentrations (18 samples, three non-detects) exceeded the 2008 upstream backwater sediment data 95,95-UTL in 3 instances and the background maximum in 9 instances.

Conclusions:

<u>Comparison of Site RI and USGS Powdermill sediment samples:</u>

- The USGS Powdermill impoundment and Site RI embayment sediment data sets shared 25 analytes in common.

- Medians of Site RI sediment data analytes were either significantly (at the 95 percent level of confidence) lower than background or comparable to background (i.e., not statitistically significantly higher or lower than background) for all parameters except beryllium, calcium, and vanadium.

- Statistical analysis indicated the Site sample set medians to significantly (at the 95 percent confidence level) exceed Powdermill data medians for beryllium, calcium and vanadium. However, the higher incidence of non-detects in the Powdermill data sets may affect this conclusion for beryllium as the maximum detected concentration for the Site data did not exceed the maximum in the background data. The somewhat higher Site calcium values pose no significant increased human or eco-risk and may be related to application of winter de-icing salt on Rt. 62.

- Separation of the shallow Powdermill samples from the deeper samples provided only a slightly different data set character for comparison (only one outcome, that for zinc, changed when the shallow Powdermill set was considered as opposed to all Powdermill samples).

- In general, the data suggest no significant Site impacts to the adjacent embayment for most of the analytes common to the USGS study and the Site RI embayment sediment samples.

- Powdermill impoundment samples were not analyzed for mercury, thallium, thorium, or uranium. Of these parameters, only mercury was detected in Site embayment sediment at concentrations greater than RSLs. The 2008 upstream embayment data set was analyzed for mercury to satisfy this data gap.

- The Powdermill impoundment and Site embayment sediments likely have distinctly different depositional conditions and histories. While an attempt has been made here to separate out shallow from deeper samples, there is no way of knowing the comparability of Powdermill with Site sediment samples in time frames or mechanisms affecting sediments (e.g., deposition of suspended impacted particles versus sorption of contaminants to in-place sediments via surface run-off or groundwater discharge). However, the shallow data set is generally consistent with the Site data set.

- It is clear, however, that both the Powdermill sediments (as well as sediments in other impoundments) and Site embayment sediments are affected by a potentially large number of sources of contaminants other than the Site.

<u>Comparison of Site RI and 2008 upstream backwater sediment samples:</u>

- The 2008 upstream backwater sediment and Site RI embayment sediment data sets shared 23 analytes in common.

- Of the 23 analytes in common, the Site sediment sample medians were comparable to 2008 upstream sample medians for 17 of these analytes. Antimony was non-detect in all Site and 2008 upstream samples. Thallium was detected in Site samples only once at a concentration greater than were detected in the 2008 upstream sediment samples.

- Statistical analysis indicated the Site RI sample set medians to significantly (at the 95 percent confidence level) exceed upstream sample set medians for beryllium, calcium, selenium and sodium.

- No Site beryllium sample results exceeded the 2008 upstream backwater sediment data 95,95-UTL or maximum concentration.

- Only one of seven detections of thallium in the Site sediment sample set exceeded the detected thallium in the upstream backwater sediment data set (0.36 versus 0.29 mg/Kg).

- 2008 upstream backwater sediment samples were not analyzed for molybdenum, thorium, titanium, tungsten, zirconium or uranium. Hence no comparison could be made for these analytes. None of these parameters were detected in Site embayment sediment at concentrations greater than RSLs. However, the Powdermill data set was analyzed for molybdenum, titanium, tungsten, and zirconium, thus satisfying this potential data gap.

Overall, the results of this evaluation indicate that the medians of the majority of parameters in Site embayment sediments are significantly lower than or comparable to (i.e., not significantly higher than) the medians of parameters in Powdermill and/or upstream embayment sediments. The exceptions to this include beryllium and calcium, for which the medians in the Site embayment sediments were significantly higher than the medians in both the Powdermill and upstream embayment sediments. However, the Site embayment sediment concentrations of these two parameters were lower than the upper tolerance limit (95,95-UTL) background concentrations. Although uranium and thorium were not analyzed in the Powdermill or upstream embayment data sets, concentrations of uranium and thorium in Site embayment

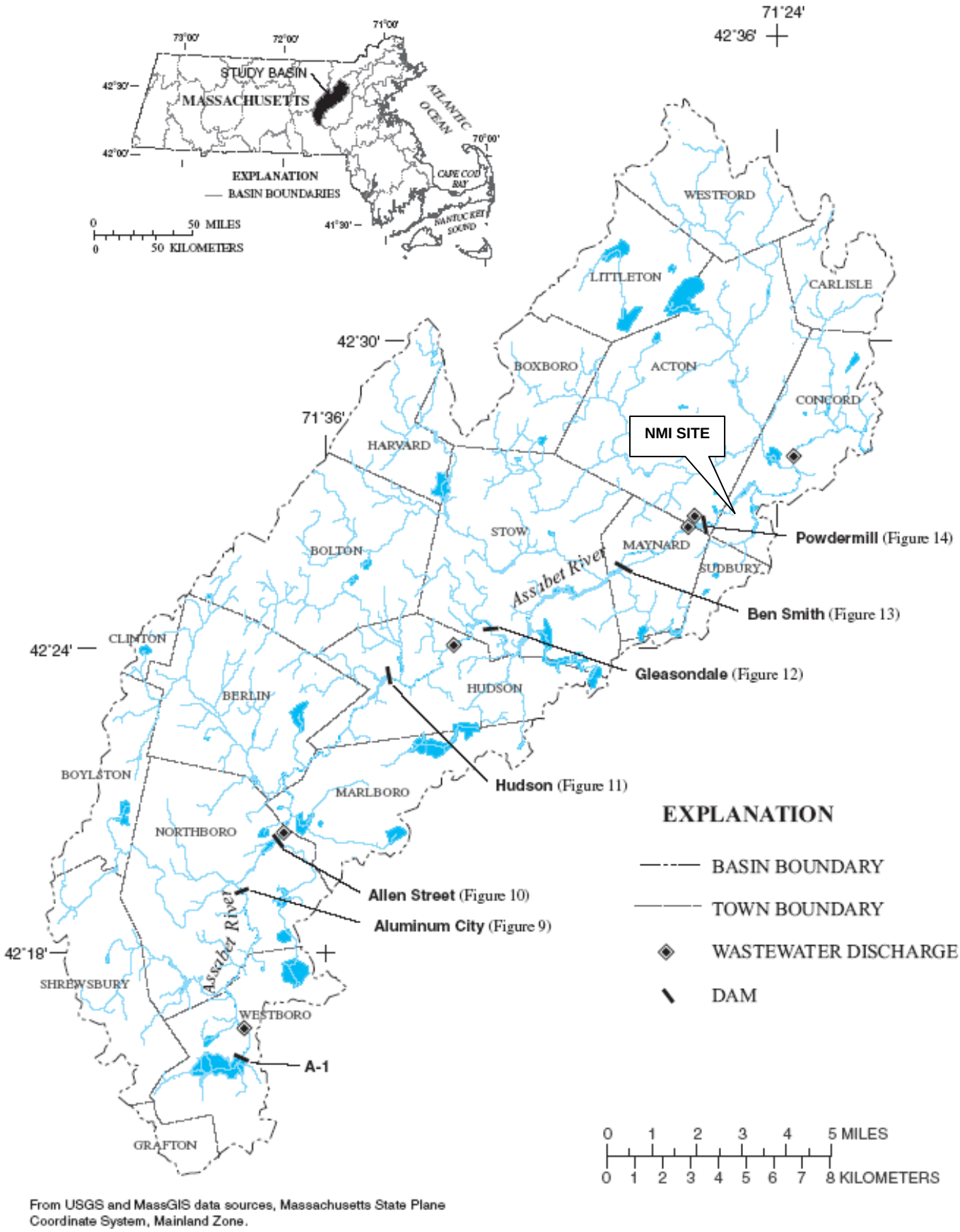
sediments do not exceed the RSLs; these two parameters were not the driver for performing this statistical background analysis. The results of this analysis indicate that metals in Site embayment sediments are consistent with background, and their presence in Site embayment sediments is unlikely to be associated with releases from the Site.

References

USEPA, 1997. Data Quality Evaluation Statistical Toolbox (DataQUEST) User's Guide. EPS/600/R-96/085, Office of Research and Development, Washington, D.C., December 1997.

USGS, 2005. Sediment Studies in the Assabet River, Central Massachusetts, 2003. Scientific Investigations Report 2005-5131. U.S. Geological Survey, Reston, VA.

FIGURES



From USGS and MassGIS data sources, Massachusetts State Plane Coordinate System, Mainland Zone.

Figure 1

Assabet River Basin
Source: USGS, 2005

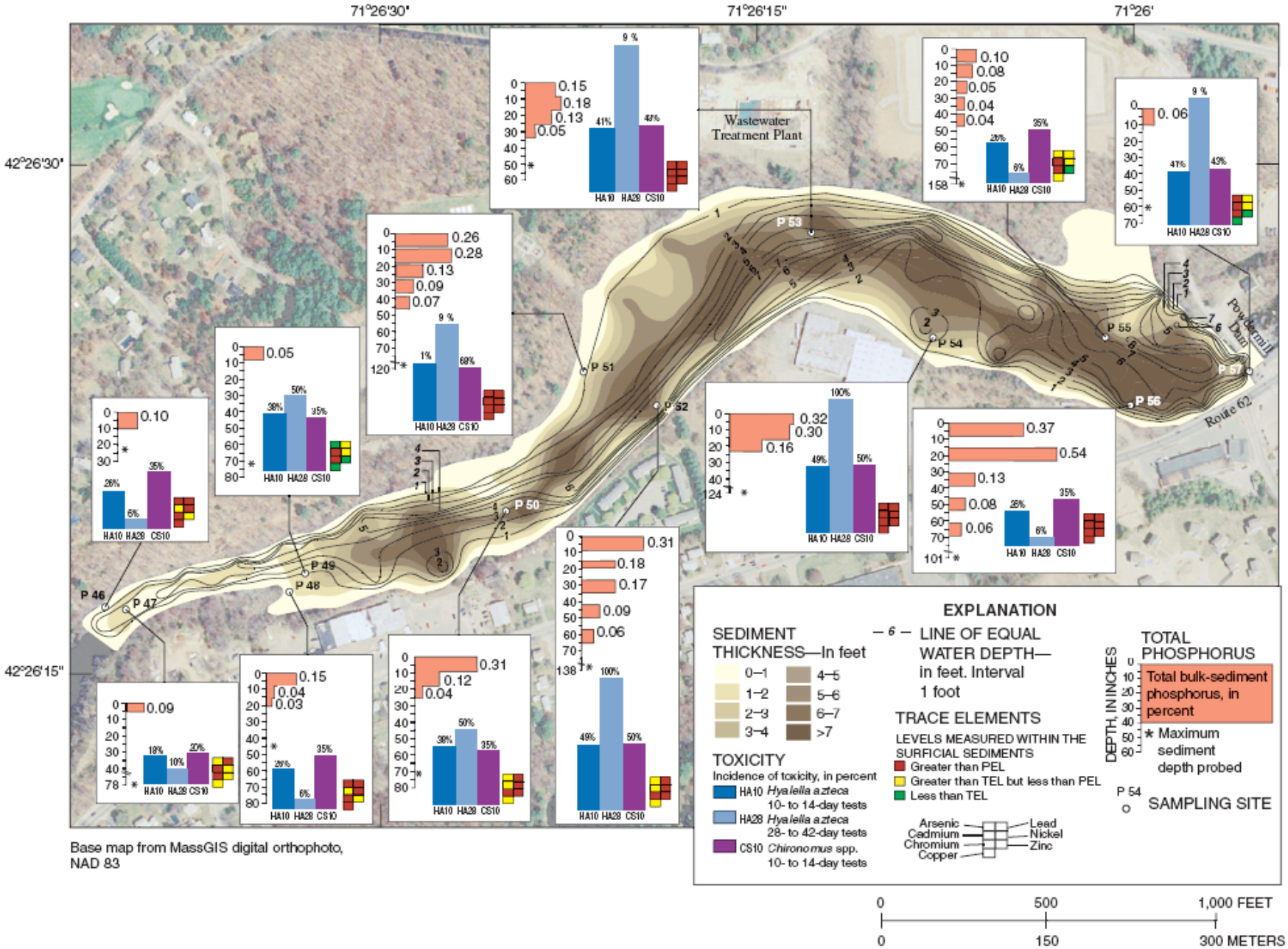
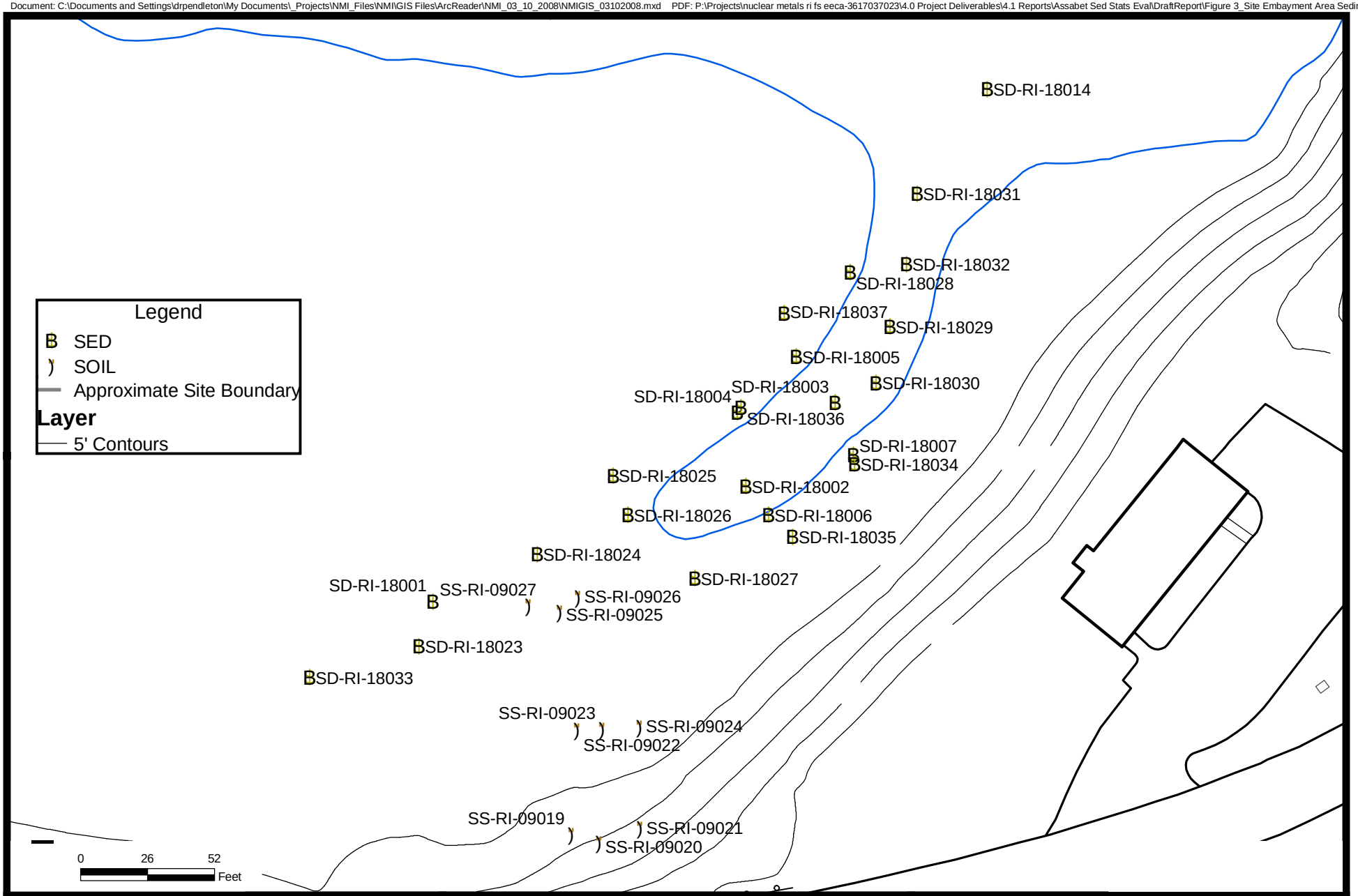


Figure 2

Sediment thickness, phosphorus bulk-sediment profiles, exceedances of TEL (threshold effect level) and PEL (probable effect level) guidelines for toxic trace elements, and potential for sediment toxicity to aquatic life from cores collected in Powdermill impoundment in Maynard and Acton, Massachusetts, 2003.
Source: USGS, 2005

Document: C:\Documents and Settings\drpendleton\My Documents_Projects\NMI_Files\NMI\GIS Files\ArcReader\NMI_03_10_2008\NMIGIS_03102008.mxd PDF: P:\Projects\nuclear metals ri fs eeca-3617037023\4.0 Project Deliverables\4.1 Reports\Assabet Sed Stats Eval\DraftReport\Figure 3_Site Embayment Area Sediment Sample

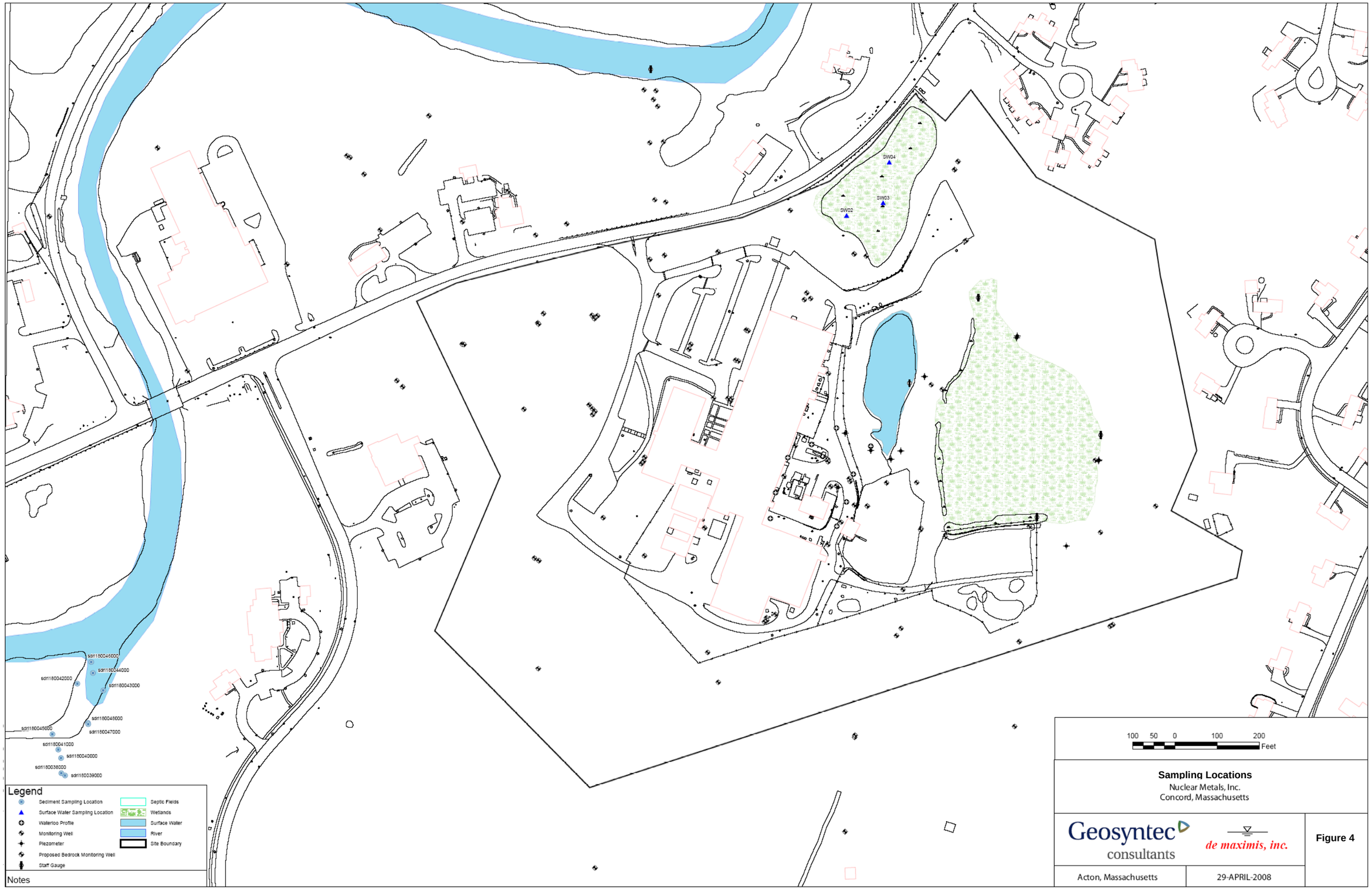


de maximis, inc.
Nuclear Metals, Inc.
Concord, MA

MACTEC

Figure 3
Site Embayment Area Sediment Sample Locations

Project 3617037023.47


SW04
SW03
SW02
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sdri180044000
sdri180042000
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sdri180040000
sdri180038000
sdri180039000
Legend
Sediment Sampling Location
Surface Water Sampling Location
Waterloo Profile
Monitoring Well
Piezometer
Proposed Bedrock Monitoring Well
Staff Gauge
Septic Fields
Wetlands
Surface Water
River
Site Boundary
Notes
100 50 0 100 200
Feet
Sampling Locations
Nuclear Metals, Inc.
Concord, Massachusetts
Geosyntec consultants
de maximis, inc.
Figure 4
Acton, Massachusetts
29-APRIL-2008

TABLES

Table 1
Summary Statistical Analyses
Site and USGS Upstream Powdermill Sediment Data

Data	Analyte	N	ND	DL	Mean	Median	Min	Max	Std Dev	Skew	Kurt	Pot Outlier	MW Interval	Difference?	Higher	Conf Level
Site RI	Aluminum	22	0		12153	12500	4810	21800	4206	0.34	0.1	0				
USGS All		37	0		12868	12300	6000	22600	4166	0.43	-0.5	0	[-3050, 1700]	N		95.1
USGS Shallow		12	0		11858	11500	7600	16100	2813	0.28	-0.71	0	[-2900,2400]	N		95
Site RI	Antimony	10	10	0.03 - 0.68												
USGS All		37	26	5												
USGS Shallow		12	7	5								1				
Site RI	Arsenic	22	0		7.114	6.45	2	18.4	4.102	1.25	1.72	1				
USGS All		37	4	3	22.46	15	3	101	22.14	1.74	3.29	1	[-14.9, -2.7]	Y	Powdermill	95.1
USGS Shallow		12	1	3	17.75	15.5	3	44	12.71	0.91	0.01	0	[-15.1, -2.1]	Y	Powdermill	95
Site RI	Barium	22	0		59.2	58.35	19.7	88.5	20.48	-0.24	-1.06	0				
USGS All		37	0		131	94	22	589	120.3	2.3	5.91	4	[-62.58,-12.51]	Y	Powdermill	95.1
USGS Shallow		12	0		149.1	89.5	46	456	122.6	1.76	2.84	1	[-110.5, -11.6]	Y	Powdermill	95
Site RI	Beryllium	22	0		0.749	0.77	0.27	1.3	0.23	0.06	0.99	1				
USGS All		37	16	0.5	0.68	0.5	0.5	1.6	0.275	1.73	3.49	3	[0.03, 0.25]	Y	Site	95.1
USGS Shallow		12	6	0.5	0.625	0.5	0.5	1.3	0.23	2.64	7.73	1	[0.03, 0.31]	Y	Site	95
Site RI	Cadmium	22	0		0.991	0.905	0.1	2	0.558	0.26	-0.87	0				
USGS All		37	19	1								2				
USGS Shallow		12	4	1	2.5	1.5	1	7	2.195	1.33	0.24	0	[-1.6, -0.13]	Y	Powdermill	95
Site RI	Calcium	22	0		5997	5540	1690	10100	2476	0.17	-1.01	0				
USGS All		37	0		4214	2800	600	20700	4170	2.63	7.34	2	[1160.1,3659.8]	Y	Site	95.1
USGS Shallow		12	0		3433	3200	1600	6000	1375	0.57	-0.56	0	[759.9, 4100.1]	Y	Site	95
Site RI	Chromium	22	0		369.2	238.5	17.8	1400	383.8	1.61	2.02	2				
USGS All		37	0		588.4	311	97	2270	589.7	1.54	1.27	3	[-244.1,32.1]	N		95.1
USGS Shallow		12	0		608	397	248	1530	460	1.1	-0.29	0	[-381.2, --1.1]	Y	Powdermill	95
Site RI	Cobalt	22	0		7.336	6.55	2.5	19.7	4.4	1.47	2.33	2				
USGS All		37	0		18.81	13	2	88	17.71	2.44	6.47	4	[-11.3,-3.4]	Y	Powdermill	95.1
USGS Shallow		12	0		18.5	17	6	50	11.73	1.84	4.6	1	[-14.5,-4.2]	Y	Powdermill	95
Site RI	Copper	22	0		81.4	72.8	2.3	253	64.3	0.93	0.76	1				
USGS All		37	0		283.9	78.3	5.5	3430	587.4	4.55	23.86	1	[-113.4,17.2]	N		95.1
USGS Shallow		12	0		494	105	18	3430	962	3.04	9.71	1	[-241.5, 6.9]	N		95
Site RI	Iron	22	0		8449	7945	3830	20600	3891	1.72	3.73	1				
USGS All		37	0		19686	19600	5400	44000	7498	0.63	2.16	1	[-13910,-8900]	Y	Powdermill	95.1
USGS Shallow		12	0		20825	19600	16200	30700	4513	1.27	0.83	0	[-14390, -9820]	Y	Powdermill	95
Site RI	Lead	22	0		154.6	168	10.2	389	104.1	0.34	-0.51	0				
USGS All		37	0		242	167	7	1250	288.4	1.85	3.91	2	[-126.1,53.9]	N		95.1
USGS Shallow		12	0		284.6	199	45	1030	302.1	1.63	2.36	0	[-198.1, 55]	N		95
Site RI	Magnesium	22	0		2407	2220	1450	6110	1013	2.45	8.12	1				
USGS All		37	0		3138	3300	700	5300	936	-0.52	1.26	3,1	[-1390, -430.2]	Y	Powdermill	95.1
USGS Shallow		12	0		3392	3200	2500	5300	742	1.65	3.65	2	[-1539.9, -499.8]	Y	Powdermill	95
Site RI	Manganese	22	0		155.3	120.5	54.1	492	104	1.8	4.1	1				
USGS All		37	0		356.2	294	53	924	221.4	1.27	1.04	5	[-220.7, -105]	Y	Powdermill	95.1
USGS Shallow		12	0		396.2	324.5	117	924	242.8	1.53	1.65	2	[-278, -111]	Y	Powdermill	95
Site RI	Molybdenum	22	0		2.432	2.3	0.3	5.8	1.315	0.69	0.78	1				
USGS All		37	0		5.865	5	2	15	3.093	1.24	1.55	1	[-4.301, -1.8]	Y	Powdermill	95.1
USGS Shallow		12	0		7.08	6.5	3	15	3.5	1	1.06	0	[-6.3, -2.4]	Y	Powdermill	95
Site RI	Nickel	22	0		16.77	15.65	8.2	31.1	5.4	0.87	1.07	0				
USGS All		37	0		47.3	30	10	272	47.9	3.58	14.55	2	[-29.1,-11.1]	Y	Powdermill	95.1
USGS Shallow		12	0		63	46	26	272	67.3	3.2	10.68	1	[-40.12, -16.6]	Y	Powdermill	95

Table 1
Summary Statistical Analyses
Site and USGS Upstream Powdermill Sediment Data

Site RI	Potassium	22	0		725.1	595.5	434	1950	356.8	2.56	6.85	2				
USGS All		37	0		1430	1400	300	3100	693	0.25	-0.43	0	[-1083, -392]	Y	Powdermill	95.1
USGS Shallow		12	0		1658	1650	900	3100	593	1.18	2.19	0	[-1268.1, -582.9]	Y	Powdermill	95
Site RI	Silver	22	0		0.5288	0.415	0.053	1.5	0.405	1.14	0.7	1				
USGS All		37	2	0.2	2.373	1.1	0.2	10	3.114	1.84	2.08	5	[-1.40, -0.18]	Y	Powdermill	95.1
USGS Shallow		12	0	0.2	3.46	1.7	0.5	10	3.73	1.26	-0.28	0	[-2.28, -0.68]	Y	Powdermill	95
Site RI	Sodium	22	0		372.7	359	169	589	115.2	0.16	-0.79	1				
USGS All		37	0		413.5	400	200	800	129.4	1.52	2.83	5	[-91, 46]	N		95.1
USGS Shallow		12	0		441.7	400	300	600	79.3	0.33	0.33	0	[-145, 4]	N		95
Site RI	Titanium	22	0		473.4	433	194	1290	227.3	2.54	7.98	1,2				
USGS All		37	3	100	421.6	400	100	800	166.9	-0.25	0.29	5,3	[-61, 79]	N		95.1
USGS Shallow		12	0	100	425	400	200	700	121.5	0.52	2.19	1,1	[-72.9, 80]	N		95
Site RI	Tungsten	13	8	0.33 - 1.4												
USGS All		37	35	10												
USGS Shallow		12	10	10												
Site RI	Vanadium	22	0		53.25	55.35	9.6	147	32.98	1.05	1.72	1				
USGS All		37	0		28.11	28	6	53	10.62	-0.09	0.3	0	[9.3, 34.6]	Y	Site	95.1
USGS Shallow		12	0		28.58	27.5	18	49	7.74	1.68	4.31	1	[3.7, 36.6]	Y	Site	95
Site RI	Zinc	22	0		121.8	88.5	19.4	252	75.5	0.31	-1.25	0				
USGS All		37	0		318.7	163	10.3	1200	351	1.29	0.58	4	[-219,15]	N		95.1
USGS Shallow		12	0		336.5	225.5	59.3	1140	343.7	1.68	2.08	2	[-259, -11.9]	Y	Powdermill	95
Site RI	Zirconium	14	6	0.31 - 1.1	1.211	1.1	0.31	2.5	0.748	0.29	-1.25	0				
USGS All		37	2	0.5	2.459	2.1	0.5	8.6	1.856	1.67	3.11	3	[-1.7, -0.2]	Y	Powdermill	95.2
USGS Shallow		12	0	0.5	2.6	2.65	1.4	4.2	0.859	0.28	-0.71	0	[-2.1, -0.7]	Y	Powdermill	95.2

Notes:

1. Potential outliers indicated are high end by default. In cases where both low and high are present, the number of low and high outliers are shown as L,H.
2. N = number of samples; ND = number of non-detects; Min = minimum value; Max = maximum value; Std Dev = standard deviation Skew = skewness; Kurt = kurtosis
3. Pot outlier = potential outlier as indicated by the boxplot
4. MW Interval = The Mann-Whitney test 95 percent confidence interval for the difference between the medians of the sets being compared.
5. The confidence level represents the confidence interval testing the hypothesis of equal medians versus medians unequal.

Table 2
Additional Statistical Analyses
USGS Powdermill Upstream Samples

Analyte	Data Set	N	ND	Shapiro-Wilk Test Data W	Shapiro-Wilk Test Critical W	Conclude	Maximum (mg/Kg)	95,95-UTL(mg/Kg) K-Factor	95,95-UTL(mg/Kg) UTL value
Beryllium	Site RI	22	0	0.966	0.911	Normal	1.3		
	Shallow Powdermill	12	6	0.723	0.859	Not normal	1.3	2.736	
	Shallow Powdermill - LT			0.778	0.859	Not lognormal			NC
	All Powdermill	37	19	0.709	0.936	Not normal	1.6	2.15	
	All Powdermill -LT			0.770	0.936	Not lognormal			NC
Calcium	Site RI	22	0	0.944	0.911	Normal	10100		
	Shallow Powdermill	12	0	0.923	0.859	Normal	6000	2.736	
	All Powdermill	37	0	0.675	0.936	Not normal	20700		
	All Powdermill -LT			0.967	0.936	Lognormal		2.15	>exp(26)
Vanadium	Site RI	22	0	0.923	0.911	Normal	147		
	Shallow Powdermill	12	0	0.917	0.859	Normal	49	2.736	49.8
	All Powdermill	37	0	0.967	0.936	Normal	53	2.15	50.9

Notes: 1. K-factor is the multiplier of the standard deviation added to the mean to give the one-sided 95,95-UTL.
2. If the calculated Shapiro-Wilk W test statistic exceeds the critical value, then accept the null hypothesis of normality (lognormality if log-transformed [LT] values).
3. N = number of samples in the data set; ND = the number of non-detects in the set; NC = not computed.

Table 3
Summary Statistical Analyses
Site and Upstream Backwater Sediment Data

Data	Analyte	N	ND	DL	Normality	Mean	Median	Min	Max	Std Dev	Skew	Kurt	Pot Outlier	MW Interval	Difference?	Higher	t-Test Interval	Difference?	Higher
RI Site	Aluminum	22	0		Yes	12153	12500	4810	21800	4206	0.34	0.1	0						
2008 upstream		10	0		Yes	9727	9155	6300	16200	3235	1.09	0.56	0	[-710,5500]	N		[-395, 5247]	N	
RI Site	Antimony	10	10	0.03 - 0.68															
2008 upstream		10	10	0.2-1.0															
RI Site	Arsenic	22	0		Yes	7.114	6.45	2	18.4	4.102	1.25	1.72	1						
2008 upstream		10	0		Yes	19.76	17.25	2.2	51.6	17.03	0.59	-0.73	0	[-25.2,1.3]	N		[-24.99, -0.30]	Y	Background
RI Site	Barium	22	0		Yes	59.2	58.35	19.7	88.5	20.48	-0.24	-1.06	0						
2008 upstream		10	0		No	51.64	47.6	25.2	115	27.94	1.53	2.18	1	[-5.89,29.79]	N				
RI Site	Beryllium	22	0		Yes	0.749	0.77	0.27	1.3	0.23	0.06	0.99	1						
2008 upstream		10	0		Yes	0.5595	0.54	0.14	1.3	0.301	0.36	-0.71	0	[0.0799,0.4001]	Y	Site	[0.087, 0.411]	Y	Site
RI Site	Cadmium	22	0		Yes	0.991	0.905	0.1	2	0.558	0.26	-0.87	0						
2008 upstream		10	0		Yes	0.718	0.605	0.19	2	0.555	1.49	2.36	0	[-0.1199,0.7799]	N		[-0.175, 0.72]	N	
RI Site	Calcium	22	0		Yes	5997	5540	1690	10100	2476	0.17	-1.01	0						
2008 upstream		10	0		Yes	2876	2675	1000	5580	1674	0.35	-1.44	0	[1349.9,4579.9]	Y	Site	[1581, 4661]	Y	Site
RI Site	Chromium	22	0		No	369.2	238.5	17.8	1400	383.8	1.61	2.02	2						
2008 upstream		10	0		No	220.7	95.5	12.2	882	287.3	1.84	2.58	1	[-45.7,328]	N				
RI Site	Cobalt	22	0		No	7.336	6.55	2.5	19.7	4.4	1.47	2.33	2						
2008 upstream		10	0		Yes	6.22	6.95	2.1	11.2	3.49	0.06	-1.69	0	[-2.7,3.4]	N				
RI Site	Copper	22	0		Yes	81.4	72.8	2.3	253	64.3	0.93	0.76	1						
2008 upstream		10	0		No	67.4	36.5	8.1	283	83.3	2.32	5.68	1	[-21.0,69.4]	N				
RI Site	Iron	22	0		No	8449	7945	3830	20600	3891	1.72	3.73	1						
2008 upstream		10	0		Yes	10293	10300	6240	20100	4229	1.42	2.53	0	[-4540,940]	N				
RI Site	Lead	22	0		Yes	154.6	168	10.2	389	104.1	0.34	-0.51	0						
2008 upstream		10	0		No	110.5	74.2	12.7	352	111.3	1.5	1.51	0	[-29.6,134]	N				
RI Site	Magnesium	22	0		No	2407	2220	1450	6110	1013	2.45	8.12	1						
2008 upstream		10	0		No	2270	2120	1820	3670	549	2.13	5.14	1	[-419.9,509.9]	N				
RI Site	Manganese	22	0		No	155.3	120.5	54.1	492	104	1.8	4.1	1						
2008 upstream		10	0		Yes	157.6	123.6	67.1	344	100.4	0.87	-0.49	0	[-77.8,64.3]	N				
RI Site	Mercury	22	1		No	1.118	0.865	0.009	5.2	1.18	2.16	6.08	1						
2008 upstream		10	0		Yes	1.552	1.015	0.26	4.5	1.394	1.17	0.79	0	[-1.201,0.34]	N				
RI Site	Nickel	22	0		Yes	16.77	15.65	8.2	31.1	5.4	0.87	1.07	0						
2008 upstream		10	0		Yes	14.16	14.15	6.6	25.4	6.26	0.42	-0.84	0	[-2.302,6.997]	N		[-2.27, 7.49]	N	
RI Site	Potassium	22	0		No	725.1	595.5	434	1950	356.8	2.56	6.85	2						
2008 upstream		10	0		Yes	720.6	771.5	345	1110	288.9	-0.06	-1.69	0	[-328.9,177.1]	N				
RI Site	Silver	22	0		No	0.5288	0.415	0.053	1.5	0.405	1.14	0.7	1						
2008 upstream		10	2	0.0957-0.0988	No	0.369	0.175	0.048	1.3	0.469	1.71	1.33	2	[-0.008,0.4603]	N				
RI Site	Sodium	22	0		Yes	372.7	359	169	589	115.2	0.16	-0.79	1						
2008 upstream		10	0		Yes	125.3	124	63.2	217	46.5	0.59	0.27	0	[165,326]	Y	Site	[188.8, 305.9]	Y	Site
RI Site	Selenium	18	3	1.1 - 5.3	Yes	2.301	2.25	0.55	6.1	1.364	1.25	2.5	1						
2008 upstream		10	3	0.197 - 0.228	Yes	1.153	1.45	0.099	2.4	0.925	-0.14	-1.94	0	[0.2,2.003]	Y	Site	[0.238, 1.995]	Y	Site
RI Site	Thallium	14	7	0.1 - 0.25	No		0.08		0.36										
2008 upstream		10	9	0.11 - 0.23	Yes				0.29										
RI Site	Vanadium	22	0		Yes	53.25	55.35	9.6	147	32.98	1.05	1.72	1						
2008 upstream		10	0		No	77.8	40.2	13.2	267	85.8	1.72	1.94	1	[-28.2,24.9]	N				
RI Site	Zinc	22	0		Yes	121.8	88.5	19.4	252	75.5	0.31	-1.25	0						
2008 upstream		10	0		No	82	60.8	36.2	207	53.9	1.65	2.45	0	[-16.79,107.39]	N				

Notes:
1. Potential outliers indicated are high end by default. In cases where both low and high are present, the number of low and high outliers are shown as L,H.
2. N = number of samples; ND = number of non-detects; Min = minimum value; Max = maximum value; Std Dev = standard deviation Skew = skewness; Kurt = kurtosis
3. Pot outlier = number of potential outliers as indicated by the boxplot
4. MW Interval = The Mann-Whitney test 95 percent confidence interval for the difference between the medians of the sets being compared.
5. W = the Mann-Whitney test statistic value.
6. t-Test Interval = for instances when both Site and background sample sets exhibited normality, the 95-percent confidence interval of the difference between the means of the two data sets is computed. If zero is contained in the interval, the means are not statistically different.
7. Normality is tested with the Anderson-Darling test. Yes indicates that the hypothesis of normality cannot be rejected at the 95-percent level of confidence.

Table 4
Additional Statistical Analyses
Upstream Backwater Samples

Analyte	Data Set	N	ND	Anderson-Darling Conclude	Maximum (mg/Kg)	95,95-UTL(mg/Kg) K-Factor	95,95-UTL(mg/Kg) UTL value	Site Exceeds Background Max	Site Exceeds Background UTL
Beryllium	Upstream backwater	10	0	Normal	1.3	2.911	1.44	0	0
Calcium	Upstream backwater	10	0	Normal	5580	2.911	7749	8	6
Sodium	Upstream backwater	10	0	Normal	217	2.911	261	21	17
Selenium	Upstream backwater	10	3	Normal	2.4	2.911	3.84	9	3

Notes: 1. K-factor is the multiplier of the standard deviation added to the mean to give the one-sided 95,95-UTL.
2. N = number of samples in the data set; ND = the number of non-detects in the set.
3. Site Exceeds Background = number of times the Site values exceed either the background UTL or maximum

ATTACHMENT A

SELECTED MINITAB SESSION WINDOW OUTPUT

RI SITE AND USGS POWDERMILL SEDIMENT SAMPLE DATA

Pertinent Minitab Session window output

The data sets considered are identified as follows:
Analyte symbol is preceded by SEm for Site backwater (embayment) for a set of 22 data values.
Analyte symbol is preceded by USGS for the full USGS Powdermill impoundment sample set of 37 samples
Analyte symbol is preceded by USGS2 for the shallow (less than 1 foot depth) sediment samples at the Powdermill impoundment for a total of 12 samples.

——— 4/3/2008 ———

Descriptive Statistics: USGSAs

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSAs	37	0	22.46	3.64	22.14	490.37	98.60	3.00	6.00

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSAs	15.00	32.50	101.00	98.00	26.50	1.74	3.29

Descriptive Statistics: USGSCd

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSCd	37	0	2.757	0.436	2.650	7.023	96.13	1.000	1.000

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSCd	1.000	4.000	10.000	9.000	3.000	1.40	0.81

Descriptive Statistics: USGSCr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSCr	37	0	588.4	96.9	589.7	347694.5	100.21	97.0	229.5

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSCr	311.0	842.5	2270.0	2173.0	613.0	1.54	1.27

Descriptive Statistics: USGSCu

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSCu	37	0	283.9	96.6	587.4	344982.5	206.91	5.5	20.9

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSCu	78.3	305.0	3430.0	3424.5	284.1	4.55	23.86

Descriptive Statistics: USGSPb

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSPb	37	0	242.0	47.4	288.4	83154.9	119.16	7.0	18.5

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSPb	167.0	357.0	1250.0	1243.0	338.5	1.85	3.91

Descriptive Statistics: USGSNi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSNi	37	0	47.30	7.88	47.91	2295.71	101.30	10.00	25.50

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSNi	30.00	53.50	272.00	262.00	28.00	3.58	14.55

Descriptive Statistics: USGSZn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSZn	37	0	318.7	57.7	351.0	123202.5	110.13	10.3	47.6

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSZn	163.0	406.0	1200.0	1189.7	358.4	1.29	0.58

——— 4/4/2008 10:40:01 AM ———————————

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Descriptive Statistics: USGSAl

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSAl	37	0	12868	685	4166	17355030	32.38	6000	10450

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSAl	12300	15950	22600	16600	5500	0.43	-0.50

Descriptive Statistics: USGSBa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSBa	37	0	131.0	19.8	120.3	14463.3	91.82	22.0	60.5

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSBa	94.0	159.5	589.0	567.0	99.0	2.30	5.91

Descriptive Statistics: USGSCa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSCa	37	0	4214	686	4170	17392312	98.98	600	2000

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSCa	2800	5000	20700	20100	3000	2.63	7.34

Descriptive Statistics: USGSCo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSCo	37	0	18.81	2.91	17.71	313.77	94.17	2.00	8.00

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSCo	13.00	21.00	88.00	86.00	13.00	2.44	6.47

Descriptive Statistics: USGSFe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSFe	37	0	19686	1233	7498	56217312	38.09	5400	16200

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSFe	19600	22750	44000	38600	6550	0.63	2.16

Descriptive Statistics: USGSMg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSMg	37	0	3138	154	936	875751	29.82	700	2600

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSMg	3300	3500	5300	4600	900	-0.52	1.26

Descriptive Statistics: USGSMn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSMn	37	0	356.2	36.4	221.4	49010.6	62.16	53.0	239.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis

USGSMn	294.0	403.0	924.0	871.0	164.0	1.27	1.04

Descriptive Statistics: USGSMo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSMo	37	0	5.865	0.508	3.093	9.565	52.73	2.000	3.500

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSMo	5.000	8.000	15.000	13.000	4.500	1.24	1.55

Descriptive Statistics: USGSK

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1	Median
USGSK	37	0	1430	114	693	479925	48.45	300	900	1400

Variable	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSK	1900	3100	2800	1000	0.25	-0.43

Descriptive Statistics: USGSAg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSAg	37	0	2.373	0.512	3.114	9.694	131.21	0.200	0.400

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSAg	1.100	2.700	10.000	9.800	2.300	1.84	2.08

Descriptive Statistics: USGSNa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSNa	37	0	413.5	21.3	129.4	16756.8	31.30	200.0	300.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSNa	400.0	400.0	800.0	600.0	100.0	1.52	2.83

Descriptive Statistics: USGSTi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSTi	37	0	421.6	27.4	166.9	27852.9	39.58	100.0	400.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSTi	400.0	500.0	800.0	700.0	100.0	-0.25	0.29

Descriptive Statistics: USGSW

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSW	37	0	16.24	4.37	26.55	705.08	163.47	10.00	10.00

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSW	10.00	10.00	134.00	124.00	0.00	4.15	16.23

Descriptive Statistics: USGSV

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSV	37	0	28.11	1.75	10.62	112.88	37.80	6.00	22.50

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSV	28.00	35.50	53.00	47.00	13.00	-0.09	0.30

Descriptive Statistics: USGSZr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGSZr	37	0	2.459	0.305	1.856	3.443	75.45	0.500	1.250

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGSZr	2.100	3.250	8.600	8.100	2.000	1.67	3.11

——— 4/6/2008 9:59:04 AM ———————————

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Descriptive Statistics: USGS2Al

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Al	12	0	11858	812	2813	7915379	23.73	7600	10425

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Al	11500	14950	16100	8500	4525	0.28	-0.71

Descriptive Statistics: USGS2As

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1

USGS2As	12	0	17.75	3.67	12.71	161.66	71.63	3.00	8.25

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2As	15.50	28.50	44.00	41.00	20.25	0.91	0.01

Descriptive Statistics: USGS2Ba

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Ba	12	0	149.1	35.4	122.6	15030.1	82.23	46.0	77.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Ba	89.5	189.8	456.0	410.0	112.8	1.76	2.84

Descriptive Statistics: USGS2Be

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Be	12	0	0.6250	0.0664	0.2301	0.0530	36.82	0.5000	0.5000

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Be	0.5000	0.7000	1.3000	0.8000	0.2000	2.64	7.73

Descriptive Statistics: USGS2Cd

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Cd	12	0	2.500	0.634	2.195	4.818	87.80	1.000	1.000

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Cd	1.500	4.250	7.000	6.000	3.250	1.33	0.24

Descriptive Statistics: USGS2Ca

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Ca	12	0	3433	397	1375	1889697	40.04	1600	2175

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Ca	3200	4600	6000	4400	2425	0.57	-0.56

Descriptive Statistics: USGS2Cr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1	Median
USGS2Cr	12	0	608	133	460	211921	75.72	248	269	397

Variable	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Cr	1020	1530	1282	751	1.10	-0.29

Descriptive Statistics: USGS2Co

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Co	12	0	18.50	3.39	11.73	137.55	63.39	6.00	10.50

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Co	17.00	23.00	50.00	44.00	12.50	1.84	4.60

Descriptive Statistics: USGS2Cu

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1	Median
USGS2Cu	12	0	494	278	962	924495	194.63	18	58	105

Variable	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Cu	572	3430	3412	514	3.04	9.71

Descriptive Statistics: USGS2Fe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Fe	12	0	20825	1303	4513	20363864	21.67	16200	17750

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Fe	19600	23625	30700	14500	5875	1.27	0.83

Descriptive Statistics: USGS2Pb

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Pb	12	0	284.6	87.2	302.1	91293.2	106.17	45.0	55.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Pb	199.0	499.8	1030.0	985.0	444.8	1.63	2.36

Descriptive Statistics: USGS2Mg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Mg	12	0	3392	214	742	549924	21.86	2500	3050

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis

USGS2Mg	3200	3500	5300	2800	450	1.65	3.65

Descriptive Statistics: USGS2Mn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Mn	12	0	396.2	70.1	242.8	58944.2	61.27	117.0	269.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Mn	324.5	412.5	924.0	807.0	143.5	1.53	1.65

Descriptive Statistics: USGS2Mo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Mo	12	0	7.08	1.01	3.50	12.27	49.44	3.00	4.25

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Mo	6.50	9.00	15.00	12.00	4.75	1.00	1.06

Descriptive Statistics: USGS2Ni

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Ni	12	0	63.0	19.4	67.3	4527.8	106.81	26.0	30.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Ni	46.0	59.0	272.0	246.0	29.0	3.20	10.68

Descriptive Statistics: USGS2K

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2K	12	0	1658	171	593	351742	35.76	900	1200

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2K	1650	1975	3100	2200	775	1.18	2.19

Descriptive Statistics: USGS2Ag

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Ag	12	0	3.46	1.08	3.73	13.90	107.80	0.50	1.15

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Ag	1.70	7.12	10.00	9.50	5.97	1.26	-0.28

Descriptive Statistics: USGS2Na

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Na	12	0	441.7	22.9	79.3	6287.9	17.95	300.0	400.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Na	400.0	500.0	600.0	300.0	100.0	0.33	0.33

Descriptive Statistics: USGS2Ti

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Ti	12	0	425.0	35.1	121.5	14772.7	28.60	200.0	400.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Ti	400.0	500.0	700.0	500.0	100.0	0.52	2.19

Descriptive Statistics: USGS2V

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2V	12	0	28.58	2.23	7.74	59.90	27.08	18.00	24.50

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2V	27.50	31.75	49.00	31.00	7.25	1.68	4.31

Descriptive Statistics: USGS2Zn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Zn	12	0	336.5	99.2	343.7	118132.8	102.16	59.3	99.6

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Zn	225.5	372.8	1140.0	1080.7	273.1	1.68	2.08

Descriptive Statistics: USGS2Zr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Zr	12	0	2.600	0.248	0.859	0.738	33.05	1.400	1.800

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Zr	2.650	3.275	4.200	2.800	1.475	0.28	-0.71

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Descriptive Statistics: USGSBe

Variable   N  N*    Mean  SE Mean   StDev  Variance  CoefVar  Minimum
Q1
USGSBe    37   0  0.6811   0.0452  0.2747    0.0755    40.33   0.5000
0.5000

Variable  Median      Q3  Maximum   Range     IQR  Skewness  Kurtosis
USGSBe    0.5000  0.7500   1.6000  1.1000  0.2500      1.93      3.49



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Descriptive Statistics: SEmAl

Variable   N  N*   Mean  SE Mean  StDev  Variance  CoefVar  Minimum
Q1
SEmAl     22   0  12153      897   4206  17686632    34.60     4810
9233

Variable  Median     Q3  Maximum  Range   IQR  Skewness  Kurtosis
SEmAl      12500  14500    21800  16990  5268      0.34      0.10


Boxplot of SEmAl


Descriptive Statistics: SEmSb

Variable   N  N*    Mean  SE Mean   StDev  Variance  CoefVar  Minimum
Q1
SEmSb     10   0  0.3221   0.0664  0.2100    0.0441    65.20   0.0306
0.1375

Variable  Median      Q3  Maximum   Range     IQR  Skewness  Kurtosis
SEmSb     0.3150  0.4825   0.6800  0.6494  0.3450      0.48     -0.59


Descriptive Statistics: SEmAs

Variable   N  N*   Mean  SE Mean  StDev  Variance  CoefVar  Minimum
Q1
SEmAs     22   0  7.114    0.874  4.102    16.823    57.66    2.000
4.075

Variable  Median     Q3  Maximum   Range    IQR  Skewness  Kurtosis
```

SEmAs	6.450	8.950	18.400	16.400	4.875	1.25	1.72

Descriptive Statistics: SEmBa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmBa	22	0	59.20	4.37	20.48	419.42	34.60	19.70	45.28

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmBa	58.35	78.15	88.50	68.80	32.88	-0.24	-1.06

Boxplot of SEmAs

Boxplot of SEmBa

Descriptive Statistics: SEmBe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmBe	22	0	0.7491	0.0490	0.2300	0.0529	30.70	0.2700	0.6075

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmBe	0.7700	0.8650	1.3000	1.0300	0.2575	0.06	0.99

Boxplot of SEmBe

Descriptive Statistics: USGS2Cd

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
USGS2Cd	12	0	2.500	0.634	2.195	4.818	87.80	1.000	1.000

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
USGS2Cd	1.500	4.250	7.000	6.000	3.250	1.33	0.24

Descriptive Statistics: SEmCd

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCd	22	0	0.991	0.119	0.558	0.311	56.26	0.100	0.580

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCd	0.905	1.425	2.000	1.900	0.845	0.26	-0.87

Boxplot of SEmCd

Descriptive Statistics: SEmCa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCa	22	0	5997	528	2476	6133030	41.29	1690	3740

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCa	5540	8645	10100	8410	4905	0.17	-1.01

Boxplot of SEmCa

Descriptive Statistics: SEmCr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCr	22	0	369.2	81.8	383.8	147314.5	103.94	17.8	94.7

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCr	238.5	502.0	1400.0	1382.2	407.3	1.61	2.02

Boxplot of SEmCr

Descriptive Statistics: SEmCo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCo	22	0	7.336	0.938	4.401	19.372	59.99	2.500	3.775

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCo	6.550	9.025	19.700	17.200	5.250	1.47	2.33

Boxplot of SEmCo

Descriptive Statistics: SEmCu

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCu	22	0	81.4	13.7	64.3	4137.5	79.07	2.3	24.9

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCu	72.8	112.3	253.0	250.7	87.3	0.93	0.76

Boxplot of SEmCu

Descriptive Statistics: SEmFe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmFe	22	0	8449	830	3891	15140079	46.06	3830	5820

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmFe	7945	9910	20600	16770	4090	1.72	3.73

Boxplot of SEmFe

Descriptive Statistics: SEmPb

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmPb	22	0	154.6	22.2	104.1	10829.0	67.31	10.2	56.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmPb	168.0	227.0	389.0	378.8	171.0	0.34	-0.51

Boxplot of SEmPb

Descriptive Statistics: SEmMg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmMg	22	0	2407	216	1013	1026004	42.09	1450	1720

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmMg	2220	2950	6110	4660	1230	2.45	8.12

Boxplot of SEmMg

Descriptive Statistics: SEmMn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmMn	22	0	155.3	22.2	104.0	10807.0	66.94	54.1	78.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmMn	120.5	214.5	492.0	437.9	136.5	1.80	4.10

Boxplot of SEmMn

Descriptive Statistics: SEmMo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmMo	22	0	2.432	0.280	1.315	1.729	54.06	0.300	1.600

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmMo	2.300	3.250	5.800	5.500	1.650	0.69	0.78

Boxplot of SEmMo

Descriptive Statistics: SEmNi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmNi	22	0	16.77	1.15	5.40	29.15	32.19	8.20	13.05

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmNi	15.65	20.33	31.10	22.90	7.28	0.87	1.07

Boxplot of SEmNi

Descriptive Statistics: SEmK

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmK	22	0	725.1	76.1	356.8	127341.5	49.21	434.0	522.3

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmK	595.5	736.8	1950.0	1516.0	214.5	2.56	6.85

Boxplot of SEmK

Descriptive Statistics: SEmAg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmAg	22	0	0.5288	0.0863	0.4049	0.1639	76.56	0.0530	0.2150

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmAg	0.4150	0.7250	1.5000	1.4470	0.5100	1.14	0.70

Boxplot of SEmAg

Descriptive Statistics: SEmNa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmNa	22	0	372.7	24.6	115.2	13260.8	30.90	169.0	282.8

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmNa	359.0	467.3	589.0	420.0	184.5	0.16	-0.79

Boxplot of SEmAg

Descriptive Statistics: SEmTi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmTi	22	0	473.4	48.5	227.3	51656.1	48.01	194.0	376.8

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmTi	433.0	495.3	1290.0	1096.0	118.5	2.54	7.98

Boxplot of SEmTi

Descriptive Statistics: SEmW

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmW	13	0	1.747	0.340	1.227	1.505	70.23	0.330	0.940

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmW	1.300	2.500	4.200	3.870	1.560	1.10	0.35

Boxplot of SEmW

Descriptive Statistics: SEmV

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmV	22	0	53.25	7.03	32.98	1087.63	61.93	9.60	22.38

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmV	55.35	68.97	147.00	137.40	46.60	1.05	1.72

Boxplot of SEmV

Descriptive Statistics: SEmZn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmZn	22	0	121.8	16.1	75.5	5707.2	62.03	19.4	61.5

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmZn	88.5	183.8	252.0	232.6	122.3	0.31	-1.25

Boxplot of SEmZn

Descriptive Statistics: SEmZr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmZr	14	0	2.065	0.447	1.672	2.795	80.95	0.500	1.100

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmZr	1.550	2.200	7.000	6.500	1.100	2.34	5.94

Boxplot of SEmZr

Descriptive Statistics: SEmZr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmZr	14	0	1.211	0.200	0.748	0.559	61.76	0.310	0.415

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmZr	1.100	1.925	2.500	2.190	1.510	0.29	-1.25

Boxplot of SEmZr

Mann-Whitney Test and CI: SEmAl, USGSAl

	N	Median
SEmAl	22	12500
USGSAl	37	12300

Point estimate for ETA1-ETA2 is -490
95.1 Percent CI for ETA1-ETA2 is (-3050,1700)
W = 635.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.7068
The test is significant at 0.7067 (adjusted for ties)

Mann-Whitney Test and CI: SEmAl, USGS2Al

	N	Median

```
SEmAl    22   12500
USGS2Al  12   11500


Point estimate for ETA1-ETA2 is 550
95.0 Percent CI for ETA1-ETA2 is (-2900,2400)
W = 395.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.7186
The test is significant at 0.7184 (adjusted for ties)


Mann-Whitney Test and CI: SEmAs, USGSAs

         N  Median
SEmAs   22    6.45
USGSAs  37   15.00


Point estimate for ETA1-ETA2 is -7.90
95.1 Percent CI for ETA1-ETA2 is (-14.90,-2.70)
W = 443.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0007
The test is significant at 0.0007 (adjusted for ties)


Mann-Whitney Test and CI: SEmAs, USGS2As

          N  Median
SEmAs    22    6.45
USGS2As  12   15.50


Point estimate for ETA1-ETA2 is -7.80
95.0 Percent CI for ETA1-ETA2 is (-15.10,-2.10)
W = 307.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0052
The test is significant at 0.0052 (adjusted for ties)


Mann-Whitney Test and CI: SEmBa, USGSBa

         N  Median
SEmBa   22   58.35
USGSBa  37   94.00


Point estimate for ETA1-ETA2 is -33.70
95.1 Percent CI for ETA1-ETA2 is (-62.58,-12.51)
W = 460.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0018
The test is significant at 0.0018 (adjusted for ties)


Mann-Whitney Test and CI: SEmBa, USGS2Ba

          N  Median
SEmBa    22    58.4
```

```
USGS2Ba  12    89.5


Point estimate for ETA1-ETA2 is -42.6
95.0 Percent CI for ETA1-ETA2 is (-110.5,-11.6)
W = 299.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0021
The test is significant at 0.0021 (adjusted for ties)


Mann-Whitney Test and CI: SEmBe, USGSBe

         N  Median
SEmBe   22  0.7700
USGSBe  37  0.5000


Point estimate for ETA1-ETA2 is 0.1300
95.1 Percent CI for ETA1-ETA2 is (0.0300,0.2500)
W = 800.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0282
The test is significant at 0.0255 (adjusted for ties)


Mann-Whitney Test and CI: SEmBe, USGS2Be

          N  Median
SEmBe    22  0.7700
USGS2Be  12  0.5000


Point estimate for ETA1-ETA2 is 0.1600
95.0 Percent CI for ETA1-ETA2 is (0.0301,0.3101)
W = 452.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0158
The test is significant at 0.0152 (adjusted for ties)


Mann-Whitney Test and CI: SEmCd, USGSCd

         N  Median
SEmCd   22   0.905
USGSCd  37   1.000


Point estimate for ETA1-ETA2 is -0.600
95.1 Percent CI for ETA1-ETA2 is (-1.399,-0.300)
W = 467.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0025
The test is significant at 0.0020 (adjusted for ties)


Mann-Whitney Test and CI: SEmCd, USGS2Cd

          N  Median
SEmCd    22   0.905
USGS2Cd  12   1.500
```

```
Point estimate for ETA1-ETA2 is -0.600
95.0 Percent CI for ETA1-ETA2 is (-1.600,-0.130)
W = 316.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0136
The test is significant at 0.0132 (adjusted for ties)


Mann-Whitney Test and CI: SEmCa, USGSCa

         N  Median
SEmCa   22  5540.0
USGSCa  37  2800.0


Point estimate for ETA1-ETA2 is 2490.0
95.1 Percent CI for ETA1-ETA2 is (1160.1,3659.9)
W = 876.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0007
The test is significant at 0.0007 (adjusted for ties)


Mann-Whitney Test and CI: SEmCa, USGS2Ca

          N  Median
SEmCa    22  5540.0
USGS2Ca  12  3200.0


Point estimate for ETA1-ETA2 is 2380.0
95.0 Percent CI for ETA1-ETA2 is (759.9,4100.1)
W = 469.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0026
The test is significant at 0.0026 (adjusted for ties)


Mann-Whitney Test and CI: SEmCr, USGSCr

         N  Median
SEmCr   22   238.5
USGSCr  37   311.0


Point estimate for ETA1-ETA2 is -110.0
95.1 Percent CI for ETA1-ETA2 is (-244.1,32.1)
W = 554.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0982
The test is significant at 0.0982 (adjusted for ties)


Mann-Whitney Test and CI: SEmCr, USGS2Cr

          N  Median
SEmCr    22   238.5
USGS2Cr  12   396.5
```

```
Point estimate for ETA1-ETA2 is -185.3
95.0 Percent CI for ETA1-ETA2 is (-381.2,-1.1)
W = 330.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0495
The test is significant at 0.0495 (adjusted for ties)


Mann-Whitney Test and CI: SEmCo, USGSCo

         N  Median
SEmCo   22    6.55
USGSCo  37   13.00


Point estimate for ETA1-ETA2 is -6.85
95.1 Percent CI for ETA1-ETA2 is (-11.30,-3.40)
W = 412.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0001
The test is significant at 0.0001 (adjusted for ties)


Mann-Whitney Test and CI: SEmCo, USGS2Co

          N  Median
SEmCo    22    6.55
USGS2Co  12   17.00


Point estimate for ETA1-ETA2 is -9.30
95.0 Percent CI for ETA1-ETA2 is (-14.50,-4.20)
W = 287.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0004
The test is significant at 0.0004 (adjusted for ties)


Mann-Whitney Test and CI: SEmCu, USGSCu

         N  Median
SEmCu   22    72.8
USGSCu  37    78.3


Point estimate for ETA1-ETA2 is -18.7
95.1 Percent CI for ETA1-ETA2 is (-113.4,17.2)
W = 596.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.3196


Mann-Whitney Test and CI: SEmCu, USGS2Cu

          N  Median
SEmCu    22    72.8
USGS2Cu  12   104.5


Point estimate for ETA1-ETA2 is -59.5
```

```
95.0 Percent CI for ETA1-ETA2 is (-241.5,6.9)
W = 337.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0869
The test is significant at 0.0869 (adjusted for ties)


Mann-Whitney Test and CI: SEmFe, USGSFe

         N  Median
SEmFe   22    7945
USGSFe  37   19600


Point estimate for ETA1-ETA2 is -11400
95.1 Percent CI for ETA1-ETA2 is (-13910,-8900)
W = 333.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmFe, USGS2Fe

          N  Median
SEmFe    22    7945
USGS2Fe  12   19600


Point estimate for ETA1-ETA2 is -11900
95.0 Percent CI for ETA1-ETA2 is (-14390,-9820)
W = 261.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmPb, USGSPb

         N  Median
SEmPb   22   168.0
USGSPb  37   167.0


Point estimate for ETA1-ETA2 is -9.5
95.1 Percent CI for ETA1-ETA2 is (-126.1,53.9)
W = 645.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.8202
The test is significant at 0.8201 (adjusted for ties)


Mann-Whitney Test and CI: SEmPb, USGS2Pb

          N  Median
SEmPb    22   168.0
USGS2Pb  12   199.0


Point estimate for ETA1-ETA2 is -37.5
95.0 Percent CI for ETA1-ETA2 is (-198.1,55.0)
```

```
W = 362.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.4175
The test is significant at 0.4174 (adjusted for ties)


Mann-Whitney Test and CI: SEmMg, USGSMg

         N  Median
SEmMg   22  2220.0
USGSMg  37  3300.0


Point estimate for ETA1-ETA2 is -980.0
95.1 Percent CI for ETA1-ETA2 is (-1390.0,-430.2)
W = 429.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0003
The test is significant at 0.0003 (adjusted for ties)


Mann-Whitney Test and CI: SEmMg, USGS2Mg

          N  Median
SEmMg    22  2220.0
USGS2Mg  12  3200.0


Point estimate for ETA1-ETA2 is -1060.0
95.0 Percent CI for ETA1-ETA2 is (-1539.9,-499.8)
W = 286.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0004
The test is significant at 0.0004 (adjusted for ties)


Mann-Whitney Test and CI: SEmMn, USGSMn

         N  Median
SEmMn   22   120.5
USGSMn  37   294.0


Point estimate for ETA1-ETA2 is -167.0
95.1 Percent CI for ETA1-ETA2 is (-220.7,-105.0)
W = 386.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmMn, USGSMn

         N  Median
SEmMn   22   120.5
USGSMn  37   294.0


Point estimate for ETA1-ETA2 is -167.0
95.1 Percent CI for ETA1-ETA2 is (-220.7,-105.0)
W = 386.5
```

```
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmMn, USGS2Mn

          N  Median
SEmMn    22   120.5
USGS2Mn  12   324.5


Point estimate for ETA1-ETA2 is -195.9
95.0 Percent CI for ETA1-ETA2 is (-278.0,-111.0)
W = 283.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0003
The test is significant at 0.0003 (adjusted for ties)


Mann-Whitney Test and CI: SEmMo, USGSMo

         N  Median
SEmMo   22   2.300
USGSMo  37   5.000


Point estimate for ETA1-ETA2 is -2.800
95.1 Percent CI for ETA1-ETA2 is (-4.301,-1.800)
W = 342.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmMo, USGS2Mo

          N  Median
SEmMo    22   2.300
USGS2Mo  12   6.500


Point estimate for ETA1-ETA2 is -4.200
95.0 Percent CI for ETA1-ETA2 is (-6.302,-2.402)
W = 268.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmNi, USGSNi

         N  Median
SEmNi   22   15.65
USGSNi  37   30.00


Point estimate for ETA1-ETA2 is -16.45
95.1 Percent CI for ETA1-ETA2 is (-29.10,-11.10)
W = 337.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
```

```
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmNi, USGS2Ni

          N  Median
SEmNi    22   15.65
USGS2Ni  12   46.00


Point estimate for ETA1-ETA2 is -29.80
95.0 Percent CI for ETA1-ETA2 is (-40.12,-16.60)
W = 257.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmK, USGSK

        N  Median
SEmK   22   595.5
USGSK  37  1400.0


Point estimate for ETA1-ETA2 is -703.0
95.1 Percent CI for ETA1-ETA2 is (-1083.0,-392.0)
W = 421.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0002
The test is significant at 0.0002 (adjusted for ties)


Mann-Whitney Test and CI: SEmK, USGS2K

         N  Median
SEmK    22   595.5
USGS2K  12  1650.0


Point estimate for ETA1-ETA2 is -897.5
95.0 Percent CI for ETA1-ETA2 is (-1268.1,-582.9)
W = 268.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmAg, USGSAg

         N  Median
SEmAg   22   0.415
USGSAg  37   1.100


Point estimate for ETA1-ETA2 is -0.640
95.1 Percent CI for ETA1-ETA2 is (-1.400,-0.180)
W = 461.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0019
The test is significant at 0.0019 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmAg, USGS2Ag

```
          N  Median
SEmAg    22   0.415
USGS2Ag  12   1.700


Point estimate for ETA1-ETA2 is -1.209
95.0 Percent CI for ETA1-ETA2 is (-2.279,-0.681)
W = 279.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0001
The test is significant at 0.0001 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmNa, USGSNa

```
         N  Median
SEmNa   22   359.0
USGSNa  37   400.0


Point estimate for ETA1-ETA2 is -40.0
95.1 Percent CI for ETA1-ETA2 is (-91.0,46.0)
W = 585.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.2429
The test is significant at 0.2345 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmNa, USGS2Na

```
          N  Median
SEmNa    22   359.0
USGS2Na  12   400.0


Point estimate for ETA1-ETA2 is -54.0
95.0 Percent CI for ETA1-ETA2 is (-145.0,4.0)
W = 332.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0609
The test is significant at 0.0600 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmTi, USGSTi

```
         N  Median
SEmTi   22   433.0
USGSTi  37   400.0


Point estimate for ETA1-ETA2 is -12.0
95.1 Percent CI for ETA1-ETA2 is (-61.0,79.0)
W = 652.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.9064
The test is significant at 0.9057 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmTi, USGS2Ti

```
          N  Median
SEmTi    22   433.0
USGS2Ti  12   400.0


Point estimate for ETA1-ETA2 is 4.0
95.0 Percent CI for ETA1-ETA2 is (-72.9,80.0)
W = 388.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.9282
The test is significant at 0.9280 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmV, USGSV

```
        N  Median
SEmV   22   55.35
USGSV  37   28.00


Point estimate for ETA1-ETA2 is 23.35
95.1 Percent CI for ETA1-ETA2 is (9.30,34.60)
W = 855.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0023
The test is significant at 0.0023 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmV, USGS2V

```
         N  Median
SEmV    22   55.35
USGS2V  12   27.50


Point estimate for ETA1-ETA2 is 24.70
95.0 Percent CI for ETA1-ETA2 is (3.70,36.60)
W = 445.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0320
The test is significant at 0.0319 (adjusted for ties)
```

Mann-Whitney Test and CI: SEmZn, USGSZn

```
         N  Median
SEmZn   22    88.5
USGSZn  37   163.0


Point estimate for ETA1-ETA2 is -76.9
95.1 Percent CI for ETA1-ETA2 is (-219.0,15.0)
W = 567.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1471
The test is significant at 0.1471 (adjusted for ties)
```

```
Mann-Whitney Test and CI: SEmZn, USGS2Zn

          N  Median
SEmZn    22    88.5
USGS2Zn  12   225.5


Point estimate for ETA1-ETA2 is -104.8
95.0 Percent CI for ETA1-ETA2 is (-259.0,-11.9)
W = 323.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0267
The test is significant at 0.0266 (adjusted for ties)


Mann-Whitney Test and CI: SEmZr, USGSZr

         N  Median
SEmZr   14   1.100
USGSZr  37   2.100


Point estimate for ETA1-ETA2 is -0.900
95.2 Percent CI for ETA1-ETA2 is (-1.700,-0.200)
W = 238.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0081
The test is significant at 0.0080 (adjusted for ties)


Mann-Whitney Test and CI: SEmZr, USGS2Zr

          N  Median
SEmZr    14   1.100
USGS2Zr  12   2.650

Point estimate for ETA1-ETA2 is -1.370
95.2 Percent CI for ETA1-ETA2 is (-2.100,-0.700)
W = 125.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0011
The test is significant at 0.0011 (adjusted for ties)
```

ATTACHMENT B

SELECTED MINITAB SESSION WINDOW OUTPUT

RI SITE AND 2008 UPSTREAM BACKWATER SEDIMENT SAMPLE DATA

Pertinent Minitab Session window output

```
———   4/8/2008 4:54:49 PM   ———————————————————

Welcome to Minitab, press F1 for help.
Retrieving project from file: 'G:\NMI\NMISeds.MPJ'

Descriptive Statistics: SEmAl

Variable   N  N*   Mean  SE Mean  StDev  Variance  CoefVar  Minimum
Q1
SEmAl     22   0  12153      897   4206  17686632    34.60     4810
9233

Variable  Median     Q3  Maximum  Range   IQR  Skewness  Kurtosis
SEmAl      12500  14500    21800  16990  5268      0.34      0.10


Boxplot of SEmAl


Descriptive Statistics: SEmSb

Variable   N  N*    Mean  SE Mean   StDev  Variance  CoefVar  Minimum
Q1
SEmSb     10   0  0.3221   0.0664  0.2100    0.0441    65.20   0.0306
0.1375

Variable  Median      Q3  Maximum   Range     IQR  Skewness  Kurtosis
SEmSb     0.3150  0.4825   0.6800  0.6494  0.3450      0.48     -0.59


Descriptive Statistics: SEmAs

Variable   N  N*   Mean  SE Mean  StDev  Variance  CoefVar  Minimum
Q1
SEmAs     22   0  7.114    0.874  4.102    16.823    57.66    2.000
4.075

Variable  Median     Q3  Maximum   Range    IQR  Skewness  Kurtosis
SEmAs      6.450  8.950   18.400  16.400  4.875      1.25      1.72


Descriptive Statistics: SEmBa

Variable   N  N*   Mean  SE Mean  StDev  Variance  CoefVar  Minimum
Q1
SEmBa     22   0  59.20     4.37  20.48    419.42    34.60    19.70
45.28

Variable  Median     Q3  Maximum  Range    IQR  Skewness  Kurtosis
SEmBa      58.35  78.15    88.50  68.80  32.88     -0.24     -1.06


Boxplot of SEmAs
```

Boxplot of SEmBa

Descriptive Statistics: SEmBe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmBe	22	0	0.7491	0.0490	0.2300	0.0529	30.70	0.2700	0.6075

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmBe	0.7700	0.8650	1.3000	1.0300	0.2575	0.06	0.99

Boxplot of SEmBe

Descriptive Statistics: SEmCd

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCd	22	0	0.991	0.119	0.558	0.311	56.26	0.100	0.580

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCd	0.905	1.425	2.000	1.900	0.845	0.26	-0.87

Boxplot of SEmCd

Descriptive Statistics: SEmCa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCa	22	0	5997	528	2476	6133030	41.29	1690	3740

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCa	5540	8645	10100	8410	4905	0.17	-1.01

Boxplot of SEmCa

Descriptive Statistics: SEmCr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCr	22	0	369.2	81.8	383.8	147314.5	103.94	17.8	94.7

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCr	238.5	502.0	1400.0	1382.2	407.3	1.61	2.02

Boxplot of SEmCr

Descriptive Statistics: SEmCo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCo	22	0	7.336	0.938	4.401	19.372	59.99	2.500	3.775

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCo	6.550	9.025	19.700	17.200	5.250	1.47	2.33

Boxplot of SEmCo

Descriptive Statistics: SEmCu

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmCu	22	0	81.4	13.7	64.3	4137.5	79.07	2.3	24.9

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmCu	72.8	112.3	253.0	250.7	87.3	0.93	0.76

Boxplot of SEmCu

Descriptive Statistics: SEmFe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmFe	22	0	8449	830	3891	15140079	46.06	3830	5820

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmFe	7945	9910	20600	16770	4090	1.72	3.73

Boxplot of SEmFe

Descriptive Statistics: SEmPb

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmPb	22	0	154.6	22.2	104.1	10829.0	67.31	10.2	56.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmPb	168.0	227.0	389.0	378.8	171.0	0.34	-0.51

Boxplot of SEmPb

Descriptive Statistics: SEmMg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmMg	22	0	2407	216	1013	1026004	42.09	1450	1720

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmMg	2220	2950	6110	4660	1230	2.45	8.12

Boxplot of SEmMg

Descriptive Statistics: SEmMn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmMn	22	0	155.3	22.2	104.0	10807.0	66.94	54.1	78.0

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmMn	120.5	214.5	492.0	437.9	136.5	1.80	4.10

Boxplot of SEmMn

Descriptive Statistics: SEmMo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmMo	22	0	2.432	0.280	1.315	1.729	54.06	0.300	1.600

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmMo	2.300	3.250	5.800	5.500	1.650	0.69	0.78

Boxplot of SEmMo

Descriptive Statistics: SEmNi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmNi	22	0	16.77	1.15	5.40	29.15	32.19	8.20	13.05

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmNi	15.65	20.33	31.10	22.90	7.28	0.87	1.07

Boxplot of SEmNi

Descriptive Statistics: SEmK

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmK	22	0	725.1	76.1	356.8	127341.5	49.21	434.0	522.3

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmK	595.5	736.8	1950.0	1516.0	214.5	2.56	6.85

Boxplot of SEmK

Descriptive Statistics: SEmAg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmAg	22	0	0.5288	0.0863	0.4049	0.1639	76.56	0.0530	0.2150

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmAg	0.4150	0.7250	1.5000	1.4470	0.5100	1.14	0.70

Boxplot of SEmAg

Descriptive Statistics: SEmNa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmNa	22	0	372.7	24.6	115.2	13260.8	30.90	169.0	282.8

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmNa	359.0	467.3	589.0	420.0	184.5	0.16	-0.79

Boxplot of SEmAg

Descriptive Statistics: SEmTi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmTi	22	0	473.4	48.5	227.3	51656.1	48.01	194.0	376.8

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmTi	433.0	495.3	1290.0	1096.0	118.5	2.54	7.98

Boxplot of SEmTi

Descriptive Statistics: SEmW

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmW	13	0	1.747	0.340	1.227	1.505	70.23	0.330	0.940

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmW	1.300	2.500	4.200	3.870	1.560	1.10	0.35

Boxplot of SEmW

Descriptive Statistics: SEmV

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmV	22	0	53.25	7.03	32.98	1087.63	61.93	9.60	22.38

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmV	55.35	68.97	147.00	137.40	46.60	1.05	1.72

Boxplot of SEmV

Descriptive Statistics: SEmZn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmZn	22	0	121.8	16.1	75.5	5707.2	62.03	19.4	61.5

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmZn	88.5	183.8	252.0	232.6	122.3	0.31	-1.25

Boxplot of SEmZn

Descriptive Statistics: SEmZr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmZr	14	0	2.065	0.447	1.672	2.795	80.95	0.500	1.100

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmZr	1.550	2.200	7.000	6.500	1.100	2.34	5.94

Boxplot of SEmZr

Descriptive Statistics: SEmZr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmZr	14	0	1.211	0.200	0.748	0.559	61.76	0.310	0.415

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmZr	1.100	1.925	2.500	2.190	1.510	0.29	-1.25

Boxplot of SEmZr

———— 6/29/2008 12:10:01 PM ————————————

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Descriptive Statistics: BGAl

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGAl	10	0	9727	1023	3235	10462112	33.25	6300	6798

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGAl	9155	11275	16200	9900	4478	1.09	0.56

Descriptive Statistics: BGCd

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGCd	10	0	0.718	0.176	0.555	0.309	77.36	0.190	0.282

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGCd	0.605	1.100	2.000	1.810	0.818	1.49	2.36

Descriptive Statistics: BGCa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGCa	10	0	2876	529	1674	2803671	58.22	1000	1255

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGCa	2675	4308	5580	4580	3053	0.35	-1.44

Descriptive Statistics: BGCr

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGCr	10	0	220.7	90.9	287.3	82563.2	130.21	12.2	59.5

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGCr	95.5	309.5	882.0	869.8	250.0	1.84	2.58

Descriptive Statistics: BGCo

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGCo	10	0	6.22	1.10	3.49	12.15	56.05	2.10	2.60

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGCo	6.95	9.30	11.20	9.10	6.70	0.06	-1.69

Descriptive Statistics: BGFe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGFe	10	0	10293	1337	4229	17882046	41.08	6240	6728

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGFe	10300	12150	20100	13860	5423	1.42	2.53

Descriptive Statistics: BGPb

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGPb	10	0	110.5	35.2	111.3	12390.1	100.77	12.7	28.3

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGPb	74.2	169.0	352.0	339.3	140.7	1.50	1.51

Descriptive Statistics: BGMg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGMg	10	0	2270	174	549	301356	24.18	1820	1893

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGMg	2120	2470	3670	1850	578	2.13	5.14

Descriptive Statistics: BGMn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGMn	10	0	157.6	31.7	100.4	10078.8	63.71	67.1	69.7

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGMn	123.6	230.0	344.0	276.9	160.3	0.87	-0.49

Descriptive Statistics: BGNi

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGNi	10	0	14.16	1.98	6.26	39.19	44.21	6.60	8.20

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGNi	14.15	18.90	25.40	18.80	10.70	0.42	-0.84

Descriptive Statistics: BGK

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGK	10	0	720.6	91.3	288.9	83442.9	40.09	345.0	398.8

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGK	771.5	949.3	1110.0	765.0	550.5	-0.06	-1.69

Descriptive Statistics: BGSe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGSe	10	0	1.153	0.293	0.925	0.856	80.23	0.099	0.110

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGSe	1.450	1.950	2.400	2.301	1.840	-0.14	-1.94

Descriptive Statistics: BGNa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGNa	10	0	125.3	14.7	46.5	2158.3	37.07	63.2	86.9

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGNa	124.0	157.0	217.0	153.8	70.1	0.59	0.27

Descriptive Statistics: BGV

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1

BGV	10	0	77.8	27.1	85.8	7357.7	110.22	13.2	25.9

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGV	40.2	103.3	267.0	253.8	77.4	1.72	1.94

Descriptive Statistics: BGZn

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGZn	10	0	82.0	17.0	53.9	2899.9	65.64	36.2	44.9

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGZn	60.8	117.3	207.0	170.8	72.3	1.65	2.45

Descriptive Statistics: BGAg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGAg	10	0	0.369	0.148	0.469	0.220	127.29	0.048	0.117

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGAg	0.175	0.495	1.300	1.252	0.378	1.71	1.33

Descriptive Statistics: BGHg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGHg	10	0	1.552	0.441	1.394	1.942	89.80	0.260	0.323

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGHg	1.015	2.625	4.500	4.240	2.303	1.17	0.79

Boxplot of SiteTl

Boxplot of BGAl

Boxplot of BGAs

Descriptive Statistics: BGAs

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGAs	10	0	19.76	5.39	17.03	290.13	86.20	2.20	3.70

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis

BGAs	17.25	32.97	51.60	49.40	29.27	0.59	-0.73

Boxplot of BGBa

Boxplot of BGBe

Boxplot of BGCd

Boxplot of BGCa

Boxplot of BGCr

Boxplot of BGCo

Boxplot of BGFe

Boxplot of BGPb

Boxplot of BGMg

Boxplot of BGMn

Boxplot of BGNi

Boxplot of BGK

Boxplot of BGSe

Boxplot of BGNa

Boxplot of BGV

Boxplot of BGZn

Boxplot of BGAg

Boxplot of BGHg

Probability Plot of BGAl

Probability Plot of BGAs

Probability Plot of BGBa

Probability Plot of BGAl

Probability Plot of BGAs

Probability Plot of BGBe

Probability Plot of BGCd

Probability Plot of BGCa

Probability Plot of BGCr

Probability Plot of BGCo

Probability Plot of BGFe

Probability Plot of SitePb

Probability Plot of BGPb

Probability Plot of BGMg

Probability Plot of SiteMn

Probability Plot of BGMn

Probability Plot of BGNi

Probability Plot of BGK

Probability Plot of BGSe

Probability Plot of BGNa

Probability Plot of BGV

Probability Plot of BGZn

Probability Plot of BGAg

Probability Plot of BGHg

Descriptive Statistics: BGBa

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGBa	10	0	51.64	8.84	27.94	780.70	54.11	25.20	29.82

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGBa	47.60	59.77	115.00	89.80	29.95	1.53	2.18

———— 6/30/2008 6:25:09 AM ————————————————

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Descriptive Statistics: BGCu

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
BGCu	10	0	67.4	26.3	83.3	6935.0	123.63	8.1	18.8

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
BGCu	36.5	76.5	283.0	274.9	57.7	2.32	5.68

Probability Plot of BGCu

Boxplot of BGCu

Mann-Whitney Test and CI: SiteCu, BGCu

	N	Median
SiteCu	37	25.7

BGCu 10 36.5

Point estimate for ETA1-ETA2 is -5.1
95.0 Percent CI for ETA1-ETA2 is (-30.0,30.6)
W = 874.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.7257

——— 7/1/2008 5:21:54 AM ———————————

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Descriptive Statistics: SEmTl

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmTl	14	0	0.1459	0.0280	0.1049	0.0110	71.86	0.0500	0.0695

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmTl	0.0800	0.2500	0.3600	0.3100	0.1805	0.90	-0.69

Probability Plot of SEmTl

Boxplot of SEmTl

Descriptive Statistics: SEmHg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmHg	21	0	1.157	0.261	1.194	1.426	103.22	0.009	0.335

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmHg	0.940	1.600	5.200	5.191	1.265	2.11	5.83

Descriptive Statistics: SEmHg

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmHg	22	0	1.118	0.252	1.180	1.392	105.52	0.009	0.285

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmHg	0.865	1.500	5.200	5.191	1.215	2.16	6.08

Probability Plot of SEmHg

Boxplot of SEmHg

Descriptive Statistics: SEmSe

Variable	N	N*	Mean	SE Mean	StDev	Variance	CoefVar	Minimum	Q1
SEmSe	18	0	2.301	0.322	1.364	1.861	59.28	0.550	1.350

Variable	Median	Q3	Maximum	Range	IQR	Skewness	Kurtosis
SEmSe	2.250	2.688	6.100	5.550	1.338	1.25	2.50

Probability Plot of SEmSe

Boxplot of SEmSe

Mann-Whitney Test and CI: SEmAl, BGAl

	N	Median
SEmAl	22	12500
BGAl	10	9155

Point estimate for ETA1-ETA2 is 2755
95.1 Percent CI for ETA1-ETA2 is (-710,5500)
W = 402.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1175
The test is significant at 0.1175 (adjusted for ties)

Mann-Whitney Test and CI: SEmAs, BGAs

	N	Median
SEmAs	22	6.45
BGAs	10	17.25

Point estimate for ETA1-ETA2 is -9.60
95.1 Percent CI for ETA1-ETA2 is (-25.20,1.30)
W = 326.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1378
The test is significant at 0.1376 (adjusted for ties)

Mann-Whitney Test and CI: SEmBa, BGBa

	N	Median
SEmBa	22	58.35
BGBa	10	47.60

Point estimate for ETA1-ETA2 is 13.10
95.1 Percent CI for ETA1-ETA2 is (-5.89,29.79)

```
W = 387.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.3292
The test is significant at 0.3291 (adjusted for ties)


Mann-Whitney Test and CI: SEmBe, BGBe

        N  Median
SEmBe  22  0.7700
BGBe   10  0.4750


Point estimate for ETA1-ETA2 is 0.2700
95.1 Percent CI for ETA1-ETA2 is (0.0799,0.4001)
W = 432.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0050
The test is significant at 0.0050 (adjusted for ties)


Mann-Whitney Test and CI: SEmCd, BGCd

        N  Median
SEmCd  22  0.9050
BGCd   10  0.6050


Point estimate for ETA1-ETA2 is 0.3000
95.1 Percent CI for ETA1-ETA2 is (-0.1199,0.7799)
W = 398.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1607
The test is significant at 0.1603 (adjusted for ties)


Mann-Whitney Test and CI: SEmCa, BGCa

        N  Median
SEmCa  22  5540.0
BGCa   10  2675.0


Point estimate for ETA1-ETA2 is 3150.0
95.1 Percent CI for ETA1-ETA2 is (1349.9,4579.9)
W = 438.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0023
The test is significant at 0.0023 (adjusted for ties)


Mann-Whitney Test and CI: SEmCr, BGCr

        N  Median
SEmCr  22   238.5
BGCr   10    95.5


Point estimate for ETA1-ETA2 is 97.5
95.1 Percent CI for ETA1-ETA2 is (-45.7,328.0)
W = 396.0
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Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1864


Mann-Whitney Test and CI: SEmCo, BGCo

        N  Median
SEmCo  22   6.550
BGCo   10   6.950


Point estimate for ETA1-ETA2 is 0.800
95.1 Percent CI for ETA1-ETA2 is (-2.700,3.400)
W = 378.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.5420
The test is significant at 0.5419 (adjusted for ties)


Mann-Whitney Test and CI: SEmCu, BGCu

        N  Median
SEmCu  22    72.8
BGCu   10    36.5


Point estimate for ETA1-ETA2 is 18.0
95.1 Percent CI for ETA1-ETA2 is (-21.0,69.4)
W = 388.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.3192


Mann-Whitney Test and CI: SEmFe, BGFe

        N  Median
SEmFe  22    7945
BGFe   10   10300


Point estimate for ETA1-ETA2 is -1925
95.1 Percent CI for ETA1-ETA2 is (-4540,940)
W = 329.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1732


Mann-Whitney Test and CI: SEmPb, BGPb

        N  Median
SEmPb  22   168.0
BGPb   10    74.2


Point estimate for ETA1-ETA2 is 44.5
95.1 Percent CI for ETA1-ETA2 is (-29.6,134.0)
W = 391.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.2636


Mann-Whitney Test and CI: SEmMg, BGMg
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```
        N  Median
SEmMg  22  2220.0
BGMg   10  2120.0


Point estimate for ETA1-ETA2 is -15.0
95.1 Percent CI for ETA1-ETA2 is (-419.9,509.9)
W = 360.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.9190
The test is significant at 0.9190 (adjusted for ties)


Mann-Whitney Test and CI: SEmMn, BGMn

        N  Median
SEmMn  22   120.5
BGMn   10   123.6


Point estimate for ETA1-ETA2 is -0.4
95.1 Percent CI for ETA1-ETA2 is (-77.8,64.3)
W = 363.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 1.0000
The test is significant at 1.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmHg, BGHg

        N  Median
SEmHg  22   0.865
BGHg   10   1.015


Point estimate for ETA1-ETA2 is -0.300
95.1 Percent CI for ETA1-ETA2 is (-1.201,0.340)
W = 341.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.3932
The test is significant at 0.3931 (adjusted for ties)


Mann-Whitney Test and CI: SEmNi, BGNi

        N  Median
SEmNi  22  15.650
BGNi   10  14.150


Point estimate for ETA1-ETA2 is 2.800
95.1 Percent CI for ETA1-ETA2 is (-2.302,6.997)
W = 389.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.2999
The test is significant at 0.2998 (adjusted for ties)


Mann-Whitney Test and CI: SEmK, BGK
```

```
       N  Median
SEmK  22   595.5
BGK   10   771.5


Point estimate for ETA1-ETA2 is -57.0
95.1 Percent CI for ETA1-ETA2 is (-328.9,177.1)
W = 356.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.7916


Mann-Whitney Test and CI: SEmSe, BGSe

        N  Median
SEmSe  18   2.250
BGSe   10   1.450


Point estimate for ETA1-ETA2 is 0.900
95.3 Percent CI for ETA1-ETA2 is (0.200,2.003)
W = 311.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0176
The test is significant at 0.0176 (adjusted for ties)


Mann-Whitney Test and CI: SEmAg, BGAg

        N  Median
SEmAg  22  0.4150
BGAg   10  0.1750


Point estimate for ETA1-ETA2 is 0.1627
95.1 Percent CI for ETA1-ETA2 is (-0.0080,0.4603)
W = 407.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0736
The test is significant at 0.0734 (adjusted for ties)


Mann-Whitney Test and CI: SEmNa, BGNa

        N  Median
SEmNa  22   359.0
BGNa   10   124.0


Point estimate for ETA1-ETA2 is 239.5
95.1 Percent CI for ETA1-ETA2 is (165.0,326.0)
W = 472.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.0000
The test is significant at 0.0000 (adjusted for ties)


Mann-Whitney Test and CI: SEmTl, BGTl

        N  Median
SEmTl  14  0.0800
```

```
BGTl   10  0.1550


Point estimate for ETA1-ETA2 is -0.0500
95.0 Percent CI for ETA1-ETA2 is (-0.0920,0.0700)
W = 153.5
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.2188
The test is significant at 0.2183 (adjusted for ties)


Mann-Whitney Test and CI: SEmV, BGV

       N  Median
SEmV  22    55.4
BGV   10    40.2


Point estimate for ETA1-ETA2 is 0.6
95.1 Percent CI for ETA1-ETA2 is (-28.2,24.9)
W = 363.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 1.0000


Mann-Whitney Test and CI: SEmZn, BGZn

        N  Median
SEmZn  22   88.45
BGZn   10   60.80


Point estimate for ETA1-ETA2 is 29.80
95.1 Percent CI for ETA1-ETA2 is (-16.79,107.39)
W = 403.0
Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1083
The test is significant at 0.1083 (adjusted for ties)


Probability Plot of SEmAl


Probability Plot of SEmAs


Probability Plot of SEmBa


Probability Plot of SEmBe


Probability Plot of SEmCd


Probability Plot of SEmCa


Probability Plot of SEmCr
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Probability Plot of SEmCo

Probability Plot of SEmCu

Probability Plot of SEmFe

Probability Plot of SEmPb

Probability Plot of SEmMg

Probability Plot of SEmMn

Probability Plot of SEmNi

Probability Plot of SEmK

Probability Plot of SEmAg

Probability Plot of SEmNa

Probability Plot of SEmV

Probability Plot of SEmZn

Two-Sample T-Test and CI: SEmAl, BGAl

Two-sample T for SEmAl vs BGAl

	N	Mean	StDev	SE Mean
SEmAl	22	12153	4206	897
BGAl	10	9727	3235	1023

Difference = mu (SEmAl) - mu (BGAl)
Estimate for difference: 2426
95% CI for difference: (-395, 5247)
T-Test of difference = 0 (vs not =): T-Value = 1.78 P-Value = 0.088
DF = 22

Two-Sample T-Test and CI: SEmAs, BGAs

Two-sample T for SEmAs vs BGAs

```
        N  Mean  StDev  SE Mean
SEmAs  22  7.11   4.10     0.87
BGAs   10  19.8   17.0      5.4


Difference = mu (SEmAs) - mu (BGAs)
Estimate for difference:  -12.65
95% CI for difference:  (-24.99, -0.30)
T-Test of difference = 0 (vs not =): T-Value = -2.32  P-Value = 0.046
DF = 9


Two-Sample T-Test and CI: SEmBe, BGBe

Two-sample T for SEmBe vs BGBe

        N   Mean  StDev  SE Mean
SEmBe  22  0.749  0.230    0.049
BGBe   10  0.500  0.190    0.060


Difference = mu (SEmBe) - mu (BGBe)
Estimate for difference:  0.2491
95% CI for difference:  (0.0874, 0.4108)
T-Test of difference = 0 (vs not =): T-Value = 3.21  P-Value = 0.004
DF = 20


Two-Sample T-Test and CI: SEmCd, BGCd

Two-sample T for SEmCd vs BGCd

        N   Mean  StDev  SE Mean
SEmCd  22  0.991  0.558     0.12
BGCd   10  0.718  0.555     0.18


Difference = mu (SEmCd) - mu (BGCd)
Estimate for difference:  0.273
95% CI for difference:  (-0.175, 0.720)
T-Test of difference = 0 (vs not =): T-Value = 1.29  P-Value = 0.215
DF = 17


Two-Sample T-Test and CI: SEmCa, BGCa

Two-sample T for SEmCa vs BGCa

        N  Mean  StDev  SE Mean
SEmCa  22  5997   2476      528
BGCa   10  2876   1674      529


Difference = mu (SEmCa) - mu (BGCa)
Estimate for difference:  3121
95% CI for difference:  (1581, 4661)
```

```
T-Test of difference = 0 (vs not =): T-Value = 4.17  P-Value = 0.000
DF = 25


Two-Sample T-Test and CI: SEmNi, BGNi

Two-sample T for SEmNi vs BGNi

        N   Mean  StDev  SE Mean
SEmNi  22  16.77   5.40      1.2
BGNi   10  14.16   6.26      2.0


Difference = mu (SEmNi) - mu (BGNi)
Estimate for difference:  2.61
95% CI for difference:  (-2.27, 7.49)
T-Test of difference = 0 (vs not =): T-Value = 1.14  P-Value = 0.272
DF = 15


Two-Sample T-Test and CI: SEmSe, BGSe

Two-sample T for SEmSe vs BGSe

        N   Mean  StDev  SE Mean
SEmSe  18   2.30   1.36     0.32
BGSe   10  1.184  0.886     0.28


Difference = mu (SEmSe) - mu (BGSe)
Estimate for difference:  1.117
95% CI for difference:  (0.238, 1.995)
T-Test of difference = 0 (vs not =): T-Value = 2.62  P-Value = 0.015
DF = 25


Two-Sample T-Test and CI: SEmNa, BGNa

Two-sample T for SEmNa vs BGNa

                            SE
        N   Mean  StDev  Mean
SEmNa  22    373    115    25
BGNa   10  125.3   46.5    15


Difference = mu (SEmNa) - mu (BGNa)
Estimate for difference:  247.4
95% CI for difference:  (188.8, 305.9)
T-Test of difference = 0 (vs not =): T-Value = 8.65  P-Value = 0.000
DF = 29
```