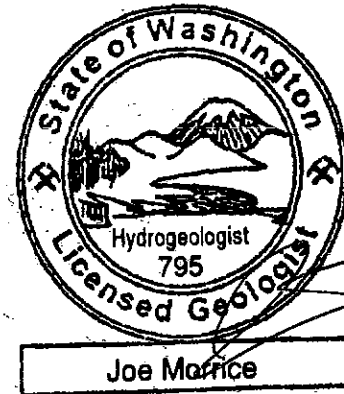


November 23, 2009

**To:** Dave Blanchard, Northland Resources

**From:** Joe Morrice, LHG  
Senior Hydrogeologist

Tim Flynn, LHG  
Principal Hydrogeologist



**Re:** Coal Waste Rock Sampling and Analysis, City Heights Development

This memorandum presents results of sampling and analysis of coal mine-related waste rock at the City Heights property, located in Cle Elum, Washington. As discussed in the August 18, 2009 Phase I Environmental Site Assessment (ESA) prepared by Aspect Consulting, LLC (Aspect) for this project, waste rock is present at two main areas of the property. These areas are shown on Figure 1 and include:

- 1) An area at the west end of the property containing primarily waste coal and mineral rock and coal fines from historic coal washing operations.
- 2) Near the southern property boundary, east of Stafford Street, in the Red Rock area of the site. The waste rock in this area consists primarily of non-coal bearing bedrock overburden, with a smaller volume of apparent coal slag (mineral residue from coal burning).

The purpose of this investigation was to assess whether these materials present an environmental concern and to evaluate the potential implications of these materials for planned site development.

As discussed below the only chemical of potential concern at the site is the presence of low level concentrations of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in the coal washing area waste rock. Naturally occurring cPAH's are commonly found in coal (U.S. Department of Health and Human Services, 1995). The cPAH concentration detected in the composite sample at this location slightly exceeded the human health screening level and may pose a risk for direct human contact. These concentrations do not present a risk of leaching to groundwater.

The coal content of the coal waste rock material, approximated based on percent total organic carbon, could present future risks for soil settlement as the coal degrades over time. The coal content in this material could also present a combustion or methane generation risk, although these risks are uncertain.

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Potential mitigation measures for the coal washing area waste rock include excavation and landfill disposal of this material, or compaction, grading, and capping with clean, non-coal bearing soil followed by revegetation. The potential for methane generation beneath any structures could be mitigated by installation of passive venting systems. Measures to address potential future settlement would need to be addressed as part of a geotechnical evaluation and engineering design.

The following sections document the completed scope of work, compare laboratory analytical results to relevant regulatory screening levels, and provide our conclusions and recommendations.

### **Completed Scope of Work**

On September 21, 2009 Aspect Consulting collected one representative sample of each of the three waste rock materials. Samples were collected as composite samples. In the coal washing area samples were collected using a hand auger. Materials in the Red Rock area were too coarse to use a hand auger, and samples were collected from hand dug pits.

The sample from the coal washing area was composited from four locations. Materials observed at these locations consisted of:

- slightly moist to very moist, dark gray to black silt and clay; and
- dry, black, angular, fine to medium coal and mineral gravelly, sandy silt.

The waste rock sample from the Red Rock area was composited from four locations. Materials observed at these locations consisted of cobble-size sandstone and siltstone mixed with:

- dry to slightly moist, red brown angular fine to medium mineral (sandstone and siltstone) gravelly, silty sand;
- dry to slightly moist, gray, angular fine coal gravelly, sandy silt; and
- slightly moist, red, fine angular mineral (sandstone and siltstone) gravelly, sandy silt with about 10 percent coal.

The coal slag sample from the Red Rock area was composited from two locations. Materials observed at these locations consisted of:

- dry to slightly moist, fine, angular mineral, coal, and slag gravelly, silty sand.

The composite samples were submitted to Friedman & Bruya, Inc. analytical laboratory of Seattle, Washington for analysis of total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), PAHs, and total organic carbon (TOC) content, which was used as an approximation of coal content.

### **Analytical Results and Discussion**

Analytical results are summarized in Table 1 and laboratory certificates of analysis are provided in Attachment A. Table 1 also provides screening levels based on potentially applicable regulatory criteria against which analytical results are compared.

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Screening levels were selected as the Washington State Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted land use, if available. Method B soil cleanup levels were used for chemicals without an established Method A cleanup level. Method A soil cleanup levels are considered protective of human health for direct contact with the soil and of leaching of chemicals to groundwater assuming use as a drinking water source. Method B soil cleanup levels are considered protective of human health for direct contact with the soil.

***Metals***

The metals arsenic, barium, chromium, and lead were detected in all three samples at concentrations well below screening levels. The metals cadmium, mercury, selenium, and silver were not detected in any of the samples. Based on these results, metals in the waste rock materials do not present an environmental risk at the site

***Polycyclic Aromatic Hydrocarbons***

These chemicals grouped as non-carcinogenic PAHs and carcinogenic PAHs. Several non-carcinogenic PAHs were detected in the waste rock samples at concentrations well below screening levels.

Under MTCA, cPAHs are evaluated based on their total toxic equivalency as benzo(a)pyrene. The concentrations of individual cPAHs are multiplied by certain toxic equivalency factors, then summed to determine the benzo(a)pyrene toxic equivalency. This value is then compared to the benzo(a)pyrene screening level. As shown on Table 1, the total cPAH toxic equivalency of the two samples from the Red rock area are about 0.04 milligrams per kilogram (mg/kg), which is less than the screening level of 0.1 mg/kg. The total cPAH toxic equivalency of the sample from the coal washing area is 0.167 mg/kg, which exceeds the screening level.

The cPAH screening level is based on protection of human health for direct contact with the soil. If only considering protection of groundwater, the cPAH screening level is 2 mg/kg. Based on this, the cPAH concentration in the coal washing area presents a potential risk for direct human contact, but does not present a risk for leaching to groundwater.

***Total Organic Carbon***

Waste rock samples were analyzed for TOC content as an approximation of coal content. Materials with high coal content present potential risks for methane gas generation, spontaneous combustion, or settlement of soils as the material degrades. There are no regulatory standards above which coal content is considered to present a hazard. The Mine Hazard Assessment for the Mountain Star Resort (now known as Suncadia) used an unoxidized carbon content of 30 percent as a threshold above which soil settlement or methane generation could be of concern, although no basis for this value was provided (Icicle Creek Engineers, 1999).

The TOC content in the Red Rock area waste rock was less than 10 percent. Given that the sample was comprised of the fines within the cobbles of the Red Rock waste rock, the TOC content of this material as a whole (i.e., including the cobbles) is significantly less than 10 percent. The TOC content in the Red Rock area slag sample was about 27 percent, likely

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representing the presence of unburned coal material, and the TOC content in the coal washing area sample was 45 percent.

## **Conclusions and Recommendations**

The following sections present conclusions and recommendations regarding potential risks posed by the waste rock materials and suitability for use as fill elsewhere on site.

### ***Coal Washing Area Waste Rock***

The only potential chemical hazard at the site is the presence of cPAHs in the coal washing area waste rock at concentrations that exceed direct contact screening levels. Concentrations of cPAHs do not exceed screening levels for protection of groundwater, indicating these materials are unlikely to negatively impact groundwater. All other chemical concentrations were below applicable screening levels. A common approach for addressing soils that present only a direct contact risk is to cap the materials with clean soils to prevent contact. This would be consistent with both MTCA remediation requirements and coal mine waste reclamation practices. Alternatively, this material could likely be excavated and disposed of as nonhazardous waste at a Subtitle D landfill, such as the Columbia Ridge landfill in Arlington, Oregon.

The relatively high TOC content of the coal washing area waste rock indicates that this material could exhibit significant settlement as the coal degrades. Measures to address potential future settlement would need to be addressed as part of a geotechnical evaluation and engineering design.

The potential for methane generation is uncertain. Available information from the U.S. Department of the Interior, Office of Surface Mining indicated that methane gas generation is not a major hazard from waste rock piles in Washington State. However, even relatively minor methane generation from the coal washing area waste rock could result in accumulation of methane beneath or within structures built on this material. Building of structures over these materials is not recommended without engineered controls to mitigate potential methane accumulation. Engineered controls typically consist of a subslab vapor barrier and passive venting system to minimize accumulation of gases beneath or within structures.

No evidence of historic combustion was observed at the coal washing area waste rock, nor have any fires within the coal material been reported.. Spontaneous combustion of coal is the result of self-heating due to oxidation. When exposed to air, coal materials will oxidize, producing heat. If the rate of heat production exceeds the rate of cooling, primarily through air movement, temperatures can rise to the point where combustion occurs. A number of factors influence spontaneous combustion potential, including grade of coal, rate of air movement, particle size, and moisture content. Some factors, such as air movement can both increase the combustion potential (increased oxidation) and decrease the combustion potential (cooling). Absorption of water by dry coal produces heat, both through physical reaction between the coal and water and due to oxidation from additional oxygen dissolved in the water. Given the approximately 50 year age of this material, the potential for spontaneous combustion under current conditions appears low

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Typical coal mine waste rock reclamation strategies to minimize spontaneous combustion potential focus on minimizing airflow, erosion, and infiltration of precipitation. These strategies include compaction of the coal material, grading of slopes to minimize erosion, and capping with coal-free soil with revegetation.

## ***Red Rock Area Waste Rock***

Chemical concentrations in the Red Rock area waste rock were below all screening levels. This material does not pose an environmental risk. The TOC content of this material was also low, indicating it does not pose a risk for methane generation or spontaneous combustion and should not exhibit significant settlement due to degradation of coal materials. Based on these results, this material does not pose a risk if left in place and, subject to geotechnical suitability, would be available for use as fill elsewhere on- or off-site.

## ***Red Rock Area Coal Slag***

Chemical concentrations in the Red Rock area coal slag were below all screening levels. This material does not pose an environmental risk. The TOC content of this material was intermediate between the coal washing are waste rock and the Red Rock area waste rock. This material represents a relatively small volume, with limited thickness and is not expected to pose a risk of methane generation or spontaneous combustion. The potential for settlement of this material due to degradation of coal likely makes it unsuitable for use elsewhere on-site as fill.

## **References**

- Aspect Consulting, 2009, Phase I Environmental Site Assessment, City Heights Development, Cle Elum, Washington, Prepared for Northland Resources, LLC., August 18.
- Icicle Creek Engineers, Inc., 1999, Mountainstar Master Planned Resort EIS, Coal Mine Hazard Assessment, Kittitas County, Washington, Prepared for Associated Earth Sciences, Inc., June 1.
- U.S. Department of Health and Human Services, 1995, Toxicological Profile for Polycyclic Aromatic Hydrocarbons, Agency for Toxic Substances and Disease Registry, August.

## **Attachments**

- Table 1 – Waste Rock Sampling Results  
Figure 1 – Site Plan and Geologic Units  
Attachment A – Laboratory Certificates of Analysis

W:\090081 Northland Resources\Deliverables\Coal Waste Rock Memo\NorthlandWasteRock.docx

## Table 1 - Waste Rock Sampling Results

Coal Waste Rock Sampling and Analysis, City Heights Development, 090081

| Sample ID                             | 090081-092109-1500 | 090081-092109-1600 | 090081-092109-1630 | Screening Level | Screening Level Basis |
|---------------------------------------|--------------------|--------------------|--------------------|-----------------|-----------------------|
| Sample Location                       | Coal Wash Area     | Red Rock Area      | Red Rock Area      |                 |                       |
| Material                              | Waste Rock         | Waste Rock         | Coal Slag          |                 |                       |
| <b>Metals in mg/kg</b>                |                    |                    |                    |                 |                       |
| Arsenic                               | 11.7               | 9.1                | 8.28               | 20              | Method A              |
| Barium                                | 331                | 131                | 86.6               | 16,000          | Method B              |
| Cadmium                               | <1                 | <1                 | <1                 | 2               | Method A              |
| Chromium                              | 9.38               | 13.5               | 17.1               | 19/2,000        | Method A              |
| Lead                                  | 9.12               | 6.11               | 71.8               | 250             | Method A              |
| Mercury                               | <0.2               | <0.2               | <0.2               | 2               | Method A              |
| Selenium                              | <1                 | <1                 | <1                 | 400             | Method B              |
| Silver                                | <1                 | <1                 | <1                 | 400             | Method B              |
| <b>Non-carcinogenic PAHs in mg/kg</b> |                    |                    |                    |                 |                       |
| Acenaphthene                          | 0.066              | <0.01              | <0.1               | 4,800           | Method B              |
| Acenaphthylene                        | <0.01              | <0.01              | <0.1               | ---             | NA                    |
| Anthracene                            | 0.28               | 0.087              | <0.1               | 24,000          | Method B              |
| Benzo(g,h,i)perylene                  | 0.057              | 0.011              | 0.1                | ---             | NA                    |
| Fluoranthene                          | 0.25               | 0.17               | 0.12               | 3,200           | Method B              |
| Fluorene                              | 0.13               | <0.01              | <0.1               | 3,200           | Method B              |
| Naphthalene                           | 1.3                | 0.13               | 0.28               | 5               | Method A              |
| Phenanthrene                          | 0.7                | 0.71               | 1.4                | ---             | NA                    |
| Pyrene                                | 0.26               | 0.26               | 0.35               | 2,400           | Method B              |
| <b>Carcinogenic PAHs in mg/kg</b>     |                    |                    |                    |                 |                       |
| Benz(a)anthracene                     | 0.15               | 0.079              | 0.11               | ---             | NA                    |
| Benzo(a)pyrene                        | 0.12               | 0.021              | <0.1               | ---             | NA                    |
| Benzo(b)fluoranthene                  | 0.21               | 0.098              | 0.21               | ---             | NA                    |
| Benzo(k)fluoranthene                  | 0.027              | <0.01              | <0.1               | ---             | NA                    |
| Chrysene                              | 0.17               | 0.17               | 0.89               | ---             | NA                    |
| Dibenz(a,h)anthracene                 | 0.013              | <0.01              | <0.1               | ---             | NA                    |
| Indeno(1,2,3-cd)pyrene                | 0.049              | <0.01              | <0.1               | ---             | NA                    |
| Total cPAH TEQ                        | 0.167              | 0.040              | 0.041              | 0.1             | Method A              |
| <b>Conventionals</b>                  |                    |                    |                    |                 |                       |
| % Total Organic Carbon                | 45                 | 9.23               | 26.8               | ---             | NA                    |

PAH - Polycyclic Aromatic Hydrocarbons

TEQ - Toxic Equivalent, referenced to benzo(a)pyrene

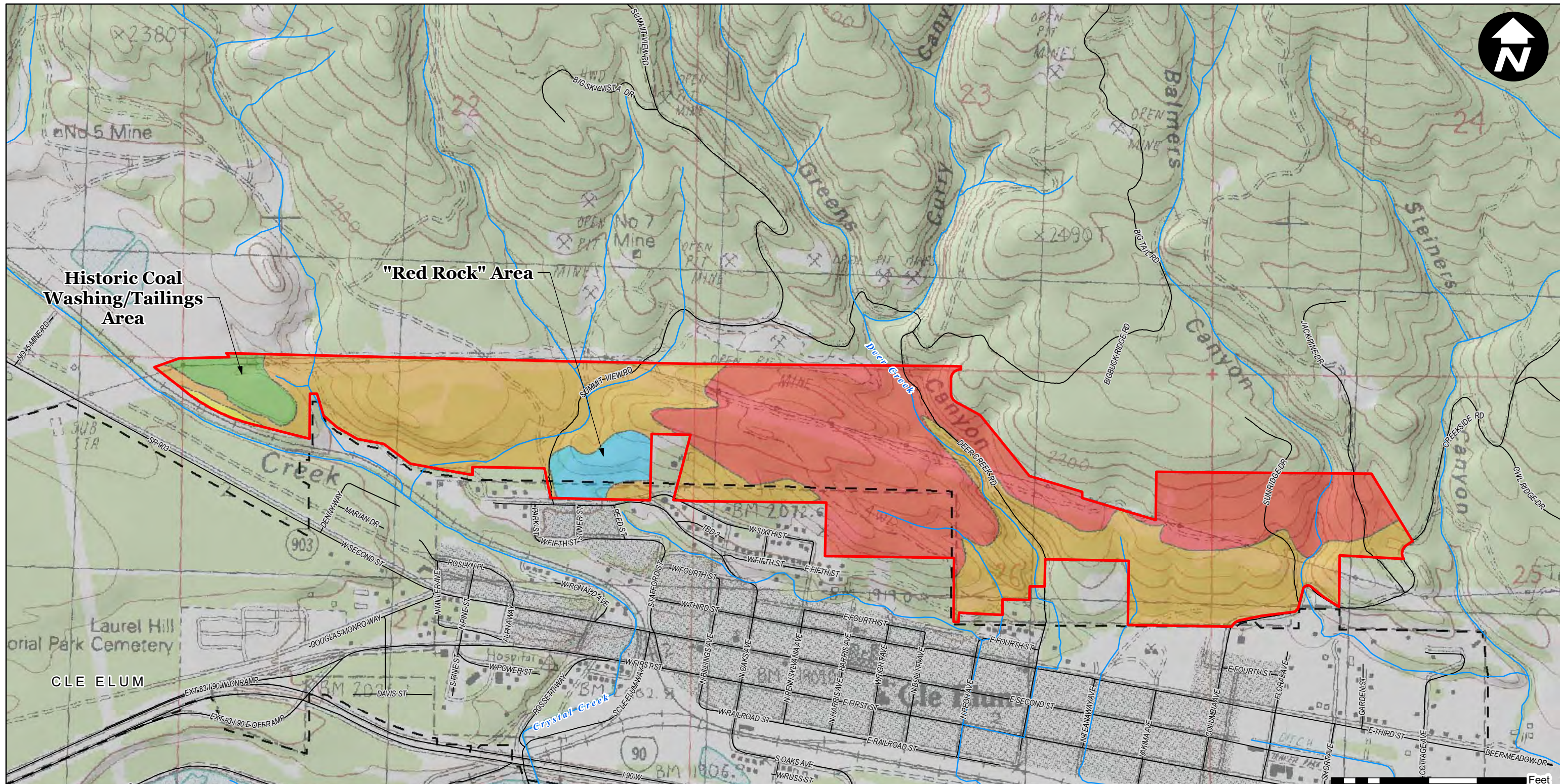
### Aspect Consulting

11/23/2009

W:\090081 Northland Resources\Deliverables\Coal Waste Rock Memo\Northland Waste Rock Tables

**Table 1**

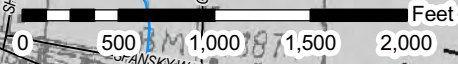
Page 1 of 1



- Geology**
- CW: Coal Waste
  - WR: Waste Rock
  - Qa: Alluvium
  - Qg: Glacial Deposits
  - Ts: Sedimentary Bedrock (Occurs with Bedrock Residuum)

- City Heights Project Boundary
- Stream Courses
- Roads
- City Limits

**Basemap Source:**  
USGS Cle Elum 7 1/2 minute Quadrangle



**Aspect consulting**  
earth + water  
www.aspectconsulting.com  
a limited liability company

|             |          |             |        |
|-------------|----------|-------------|--------|
| DATE        | Oct 2009 | PROJECT NO. | 090081 |
| DESIGNED BY | JM       | FIGURE NO.  | 1      |
| DRAWN BY    | PPW      |             |        |
| REVISED BY  | ---      |             |        |

**Site Plan and Geologic Units**  
Preliminary Geology and Geotechnical Evaluation Report  
City Heights  
Cle Elum, WA

# **ATTACHMENT A**

## **Laboratory Certificates of Analysis**

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
Bradley T. Benson, B.S.  
Kurt Johnson, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
FAX: (206) 283-5044  
e-mail: fbi@isomedia.com

September 30, 2009

Joe Morrice, Project Manager  
Aspect Consulting  
401 2<sup>nd</sup> Ave S, Suite 201  
Seattle, WA 98104

Dear Mr. Morrice:

Included are the results from the testing of material submitted on September 23, 2009 from the City Heights/090081, F&BI 909228 project. There are 15 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
ASP0930R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 23, 2009 by Friedman & Bruya, Inc. from the Aspect Consulting City Heights/090081, F&BI 909228 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>Aspect Consulting</u> |
|----------------------|--------------------------|
| 909228-01            | 090081-092109-1500       |
| 909228-02            | 090081-092109-1600       |
| 909228-03            | 090081-092109-1630       |

The samples were sent to Aquatic Research for total organic carbon analysis. Review of the enclosed report indicates that all quality assurance was acceptable.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

|                 |                    |             |                                  |
|-----------------|--------------------|-------------|----------------------------------|
| Client ID:      | 090081-092109-1500 | Client:     | Aspect Consulting                |
| Date Received:  | 09/23/09           | Project:    | City Heights/090081, F&BI 909228 |
| Date Extracted: | 09/24/09           | Lab ID:     | 909228-01                        |
| Date Analyzed:  | 09/24/09           | Data File:  | 909228-01.121                    |
| Matrix:         | Soil               | Instrument: | ICPMS1                           |
| Units:          | mg/kg (ppm)        | Operator:   | btb                              |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|--------------------|-------------|--------------|--------------|
| Germanium          | 92          | 60           | 125          |
| Indium             | 77          | 60           | 125          |
| Holmium            | 81          | 60           | 125          |

| Analyte: | Concentration<br>mg/kg (ppm) |
|----------|------------------------------|
| Chromium | 9.38                         |
| Arsenic  | 11.7                         |
| Selenium | <1                           |
| Silver   | <1                           |
| Cadmium  | <1                           |
| Barium   | 331                          |
| Lead     | 9.12                         |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

|                 |                    |             |                                  |
|-----------------|--------------------|-------------|----------------------------------|
| Client ID:      | 090081-092109-1600 | Client:     | Aspect Consulting                |
| Date Received:  | 09/23/09           | Project:    | City Heights/090081, F&BI 909228 |
| Date Extracted: | 09/24/09           | Lab ID:     | 909228-02                        |
| Date Analyzed:  | 09/24/09           | Data File:  | 909228-02.122                    |
| Matrix:         | Soil               | Instrument: | ICPMS1                           |
| Units:          | mg/kg (ppm)        | Operator:   | btb                              |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|--------------------|-------------|--------------|--------------|
| Germanium          | 92          | 60           | 125          |
| Indium             | 77          | 60           | 125          |
| Holmium            | 79          | 60           | 125          |

| Analyte: | Concentration<br>mg/kg (ppm) |
|----------|------------------------------|
| Chromium | 13.5                         |
| Arsenic  | 9.10                         |
| Selenium | <1                           |
| Silver   | <1                           |
| Cadmium  | <1                           |
| Barium   | 131                          |
| Lead     | 6.11                         |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

|                 |                    |             |                                  |
|-----------------|--------------------|-------------|----------------------------------|
| Client ID:      | 090081-092109-1630 | Client:     | Aspect Consulting                |
| Date Received:  | 09/23/09           | Project:    | City Heights/090081, F&BI 909228 |
| Date Extracted: | 09/24/09           | Lab ID:     | 909228-03                        |
| Date Analyzed:  | 09/24/09           | Data File:  | 909228-03.124                    |
| Matrix:         | Soil               | Instrument: | ICPMS1                           |
| Units:          | mg/kg (ppm)        | Operator:   | btb                              |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|--------------------|-------------|--------------|--------------|
| Germanium          | 95          | 60           | 125          |
| Indium             | 80          | 60           | 125          |
| Holmium            | 85          | 60           | 125          |

| Analyte: | Concentration<br>mg/kg (ppm) |
|----------|------------------------------|
| Chromium | 17.1                         |
| Arsenic  | 8.28                         |
| Selenium | <1                           |
| Silver   | <1                           |
| Cadmium  | <1                           |
| Barium   | 86.6                         |
| Lead     | 71.8                         |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

|                 |                |             |                                  |
|-----------------|----------------|-------------|----------------------------------|
| Client ID:      | Method Blank   | Client:     | Aspect Consulting                |
| Date Received:  | Not Applicable | Project:    | City Heights/090081, F&BI 909228 |
| Date Extracted: | 09/24/09       | Lab ID:     | I9-392 mb                        |
| Date Analyzed:  | 09/24/09       | Data File:  | I9-392 mb.114                    |
| Matrix:         | Soil           | Instrument: | ICPMS1                           |
| Units:          | mg/kg (ppm)    | Operator:   | btb                              |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|--------------------|-------------|--------------|--------------|
| Germanium          | 87          | 60           | 125          |
| Indium             | 76          | 60           | 125          |
| Holmium            | 72          | 60           | 125          |

| Analyte: | Concentration<br>mg/kg (ppm) |
|----------|------------------------------|
| Chromium | <1                           |
| Arsenic  | <1                           |
| Selenium | <1                           |
| Silver   | <1                           |
| Cadmium  | <1                           |
| Barium   | <10                          |
| Lead     | <1                           |

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Date of Report: 09/30/09  
Date Received: 09/23/09  
Project: City Heights/090081, F&BI 909228  
Date Extracted: 09/24/09  
Date Analyzed: 09/24/09

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

| <u>Sample ID</u><br>Laboratory ID | <u>Total Mercury</u> |
|-----------------------------------|----------------------|
| 090081-092109-1500<br>909228-01   | <0.2                 |
| 090081-092109-1600<br>909228-02   | <0.2                 |
| 090081-092109-1630<br>909228-03   | <0.2                 |
| Method Blank                      | <0.2                 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

|                                      |   |
|--------------------------------------|---|
| Client Sample ID: 090081-092109-1500 | Client: Aspect Consulting                 |
| Date Received: 09/23/09              | Project: City Heights/090081, F&BI 909228 |
| Date Extracted: 09/25/09             | Lab ID: 909228-01 1/5                     |
| Date Analyzed: 09/28/09              | Data File: 092824.D                       |
| Matrix: Soil                         | Instrument: GCMS6                         |
| Units: mg/kg (ppm)                   | Operator: YA                              |

| Surrogates:            | % Recovery: | Lower Limit: | Upper Limit: |
|------------------------|-------------|--------------|--------------|
| Anthracene-d10         | 81          | 50           | 150          |
| Benzo(a)anthracene-d12 | 84          | 35           | 159          |

| Compounds:             | Concentration mg/kg (ppm) |
|------------------------|---------------------------|
| Naphthalene            | 1.3                       |
| Acenaphthylene         | <0.01                     |
| Acenaphthene           | 0.066                     |
| Fluorene               | 0.13                      |
| Phenanthrene           | 0.70                      |
| Anthracene             | 0.28                      |
| Fluoranthene           | 0.25                      |
| Pyrene                 | 0.26                      |
| Benz(a)anthracene      | 0.15                      |
| Chrysene               | 0.17                      |
| Benzo(a)pyrene         | 0.12                      |
| Benzo(b)fluoranthene   | 0.21                      |
| Benzo(k)fluoranthene   | 0.027                     |
| Indeno(1,2,3-cd)pyrene | 0.049                     |
| Dibenz(a,h)anthracene  | 0.013                     |
| Benzo(g,h,i)perylene   | 0.057                     |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

|                   |                    |             |                                  |
|-------------------|--------------------|-------------|----------------------------------|
| Client Sample ID: | 090081-092109-1600 | Client:     | Aspect Consulting                |
| Date Received:    | 09/23/09           | Project:    | City Heights/090081, F&BI 909228 |
| Date Extracted:   | 09/25/09           | Lab ID:     | 909228-02 1/5                    |
| Date Analyzed:    | 09/28/09           | Data File:  | 092823.D                         |
| Matrix:           | Soil               | Instrument: | GCMS6                            |
| Units:            | mg/kg (ppm)        | Operator:   | YA                               |

| Surrogates:            | % Recovery: | Lower Limit: | Upper Limit: |
|------------------------|-------------|--------------|--------------|
| Anthracene-d10         | 84          | 50           | 150          |
| Benzo(a)anthracene-d12 | 92          | 35           | 159          |

| Compounds:             | Concentration<br>mg/kg (ppm) |
|------------------------|------------------------------|
| Naphthalene            | 0.13                         |
| Acenaphthylene         | <0.01                        |
| Acenaphthene           | <0.01                        |
| Fluorene               | <0.01                        |
| Phenanthrene           | 0.71                         |
| Anthracene             | 0.087                        |
| Fluoranthene           | 0.17                         |
| Pyrene                 | 0.26                         |
| Benz(a)anthracene      | 0.079                        |
| Chrysene               | 0.17                         |
| Benzo(a)pyrene         | 0.021                        |
| Benzo(b)fluoranthene   | 0.098                        |
| Benzo(k)fluoranthene   | <0.01                        |
| Indeno(1,2,3-cd)pyrene | <0.01                        |
| Dibenz(a,h)anthracene  | <0.01                        |
| Benzo(g,h,i)perylene   | 0.011                        |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

|                                      |   |
|--------------------------------------|---|
| Client Sample ID: 090081-092109-1630 | Client: Aspect Consulting                 |
| Date Received: 09/23/09              | Project: City Heights/090081, F&BI 909228 |
| Date Extracted: 09/25/09             | Lab ID: 909228-03 1/50                    |
| Date Analyzed: 09/28/09              | Data File: 092829.D                       |
| Matrix: Soil                         | Instrument: GCMS6                         |
| Units: mg/kg (ppm)                   | Operator: YA                              |

| Surrogates:            | % Recovery: | Lower Limit: | Upper Limit: |
|------------------------|-------------|--------------|--------------|
| Anthracene-d10         | 66          | 50           | 150          |
| Benzo(a)anthracene-d12 | 117         | 35           | 159          |

| Compounds:             | Concentration mg/kg (ppm) |
|------------------------|---------------------------|
| Naphthalene            | 0.28                      |
| Acenaphthylene         | <0.1                      |
| Acenaphthene           | <0.1                      |
| Fluorene               | <0.1                      |
| Phenanthrene           | 1.4                       |
| Anthracene             | <0.1                      |
| Fluoranthene           | 0.12                      |
| Pyrene                 | 0.35                      |
| Benz(a)anthracene      | 0.11                      |
| Chrysene               | 0.89                      |
| Benzo(a)pyrene         | <0.1                      |
| Benzo(b)fluoranthene   | 0.21                      |
| Benzo(k)fluoranthene   | <0.1                      |
| Indeno(1,2,3-cd)pyrene | <0.1                      |
| Dibenz(a,h)anthracene  | <0.1                      |
| Benzo(g,h,i)perylene   | 0.10                      |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

|                   |              |             |                                  |
|-------------------|--------------|-------------|----------------------------------|
| Client Sample ID: | Method Blank | Client:     | Aspect Consulting                |
| Date Received:    | NA           | Project:    | City Heights/090081, F&BI 909228 |
| Date Extracted:   | 09/25/09     | Lab ID:     | 09-1415mb 1/5                    |
| Date Analyzed:    | 09/28/09     | Data File:  | 092807.D                         |
| Matrix:           | Soil         | Instrument: | GCMS6                            |
| Units:            | mg/kg (ppm)  | Operator:   | YA                               |

| Surrogates:            | % Recovery: | Lower Limit: | Upper Limit: |
|------------------------|-------------|--------------|--------------|
| Anthracene-d10         | 92          | 50           | 150          |
| Benzo(a)anthracene-d12 | 92          | 35           | 159          |

| Compounds:             | Concentration<br>mg/kg (ppm) |
|------------------------|------------------------------|
| Naphthalene            | <0.01                        |
| Acenaphthylene         | <0.01                        |
| Acenaphthene           | <0.01                        |
| Fluorene               | <0.01                        |
| Phenanthrene           | <0.01                        |
| Anthracene             | <0.01                        |
| Fluoranthene           | <0.01                        |
| Pyrene                 | <0.01                        |
| Benz(a)anthracene      | <0.01                        |
| Chrysene               | <0.01                        |
| Benzo(a)pyrene         | <0.01                        |
| Benzo(b)fluoranthene   | <0.01                        |
| Benzo(k)fluoranthene   | <0.01                        |
| Indeno(1,2,3-cd)pyrene | <0.01                        |
| Dibenz(a,h)anthracene  | <0.01                        |
| Benzo(g,h,i)perylene   | <0.01                        |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/30/09

Date Received: 09/23/09

Project: City Heights/090081, F&BI 909228

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 909243-01 (Duplicate)

| Analyte  | Reporting Units | Sample Result | Duplicate Result | Relative Percent Difference | Acceptance Criteria |
|----------|-----------------|---------------|------------------|-----------------------------|---------------------|
| Chromium | mg/kg (ppm)     | 12.9          | 12.5             | 3                           | 0-20                |
| Arsenic  | mg/kg (ppm)     | 3.66          | 3.19             | 14                          | 0-20                |
| Selenium | mg/kg (ppm)     | <1            | <1               | nm                          | 0-20                |
| Silver   | mg/kg (ppm)     | <1            | <1               | nm                          | 0-20                |
| Cadmium  | mg/kg (ppm)     | <1            | <1               | nm                          | 0-20                |
| Barium   | mg/kg (ppm)     | 83.4          | 82.1             | 2                           | 0-20                |
| Lead     | mg/kg (ppm)     | 5.99          | 5.59             | 7                           | 0-20                |

Laboratory Code: 909243-01 (Matrix Spike)

| Analyte  | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|----------|-----------------|-------------|---------------|---------------------|---------------------|
| Chromium | mg/kg (ppm)     | 50          | 12.9          | 100 b               | 50-150              |
| Arsenic  | mg/kg (ppm)     | 10          | 3.66          | 84 b                | 50-150              |
| Selenium | mg/kg (ppm)     | 5           | <1            | 70                  | 50-150              |
| Silver   | mg/kg (ppm)     | 10          | <1            | 98                  | 50-150              |
| Cadmium  | mg/kg (ppm)     | 10          | <1            | 102                 | 50-150              |
| Barium   | mg/kg (ppm)     | 50          | 83.4          | 119 b               | 50-150              |
| Lead     | mg/kg (ppm)     | 20          | 5.99          | 98 b                | 50-150              |

Laboratory Code: Laboratory Control Sample

| Analyte  | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|----------|-----------------|-------------|----------------------|---------------------|
| Chromium | mg/kg (ppm)     | 50          | 116                  | 70-130              |
| Arsenic  | mg/kg (ppm)     | 10          | 108                  | 70-130              |
| Selenium | mg/kg (ppm)     | 5           | 109                  | 70-130              |
| Silver   | mg/kg (ppm)     | 10          | 111                  | 70-130              |
| Cadmium  | mg/kg (ppm)     | 10          | 113                  | 70-130              |
| Barium   | mg/kg (ppm)     | 50          | 111                  | 70-130              |
| Lead     | mg/kg (ppm)     | 20          | 111                  | 70-130              |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/30/09

Date Received: 09/23/09

Project: City Heights/090081, F&BI 909228

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES FOR  
TOTAL MERCURY  
USING EPA METHOD 1631E**

Laboratory Code: 909243-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---------|-----------------|-------------|---------------|---------------------|----------------------|---------------------|----------------|
| Mercury | mg/kg (ppm)     | 0.125       | <0.2          | 105                 | 109                  | 50-150              | 4              |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---------|-----------------|-------------|----------------------|---------------------|
| Mercury | mg/kg (ppm)     | 0.125       | 117                  | 70-130              |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/30/09

Date Received: 09/23/09

Project: City Heights/090081, F&BI 909228

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM**

Laboratory Code: 909253-07 (Duplicate)

| Analyte                | Reporting Units | Sample Result | Duplicate Result | Relative Percent Difference (Limit 20) |
|------------------------|-----------------|---------------|------------------|--|
| Naphthalene            | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Acenaphthylene         | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Acenaphthene           | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Fluorene               | mg/kg (ppm)     | <0.01         | 0.011            | nm                                     |
| Phenanthrene           | mg/kg (ppm)     | 0.021         | 0.038            | 58 a                                   |
| Anthracene             | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Fluoranthene           | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Pyrene                 | mg/kg (ppm)     | 0.011         | 0.018            | 48 a                                   |
| Benz(a)anthracene      | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Chrysene               | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Benzo(b)fluoranthene   | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Benzo(k)fluoranthene   | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Benzo(a)pyrene         | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Indeno(1,2,3-cd)pyrene | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Dibenz(a,h)anthracene  | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |
| Benzo(g,h,i)perylene   | mg/kg (ppm)     | <0.01         | <0.01            | nm                                     |

Laboratory Code: 909253-07 (Matrix Spike)

| Analyte                | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|------------------------|-----------------|-------------|---------------|---------------------|---------------------|
| Naphthalene            | mg/kg (ppm)     | 0.17        | <0.01         | 94                  | 26-148              |
| Acenaphthylene         | mg/kg (ppm)     | 0.17        | <0.01         | 92                  | 40-131              |
| Acenaphthene           | mg/kg (ppm)     | 0.17        | <0.01         | 99                  | 58-108              |
| Fluorene               | mg/kg (ppm)     | 0.17        | <0.01         | 107                 | 57-113              |
| Phenanthrene           | mg/kg (ppm)     | 0.17        | 0.021         | 102                 | 30-138              |
| Anthracene             | mg/kg (ppm)     | 0.17        | <0.01         | 99                  | 42-132              |
| Fluoranthene           | mg/kg (ppm)     | 0.17        | <0.01         | 100                 | 45-145              |
| Pyrene                 | mg/kg (ppm)     | 0.17        | 0.011         | 103                 | 44-139              |
| Benz(a)anthracene      | mg/kg (ppm)     | 0.17        | <0.01         | 87                  | 47-113              |
| Chrysene               | mg/kg (ppm)     | 0.17        | <0.01         | 92                  | 45-122              |
| Benzo(b)fluoranthene   | mg/kg (ppm)     | 0.17        | <0.01         | 100                 | 24-145              |
| Benzo(k)fluoranthene   | mg/kg (ppm)     | 0.17        | <0.01         | 100                 | 51-118              |
| Benzo(a)pyrene         | mg/kg (ppm)     | 0.17        | <0.01         | 94                  | 30-134              |
| Indeno(1,2,3-cd)pyrene | mg/kg (ppm)     | 0.17        | <0.01         | 92                  | 40-138              |
| Dibenz(a,h)anthracene  | mg/kg (ppm)     | 0.17        | <0.01         | 95                  | 51-122              |
| Benzo(g,h,i)perylene   | mg/kg (ppm)     | 0.17        | <0.01         | 94                  | 54-115              |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/30/09

Date Received: 09/23/09

Project: City Heights/090081, F&BI 909228

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample

| Analyte                | Reporting<br>Units | Spike<br>Level | Percent<br>Recovery<br>LCS | Percent<br>Recovery<br>LCSD | Acceptance<br>Criteria | RPD<br>(Limit 20) |
|------------------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Naphthalene            | mg/kg (ppm)        | 0.17           | 82                         | 87                          | 72-112                 | 6                 |
| Acenaphthylene         | mg/kg (ppm)        | 0.17           | 81                         | 85                          | 68-112                 | 5                 |
| Acenaphthene           | mg/kg (ppm)        | 0.17           | 83                         | 88                          | 70-111                 | 6                 |
| Fluorene               | mg/kg (ppm)        | 0.17           | 83                         | 87                          | 69-110                 | 5                 |
| Phenanthrene           | mg/kg (ppm)        | 0.17           | 82                         | 87                          | 68-111                 | 6                 |
| Anthracene             | mg/kg (ppm)        | 0.17           | 74                         | 78                          | 67-110                 | 5                 |
| Fluoranthene           | mg/kg (ppm)        | 0.17           | 81                         | 84                          | 68-114                 | 4                 |
| Pyrene                 | mg/kg (ppm)        | 0.17           | 81                         | 83                          | 68-114                 | 2                 |
| Benz(a)anthracene      | mg/kg (ppm)        | 0.17           | 77                         | 78                          | 58-108                 | 1                 |
| Chrysene               | mg/kg (ppm)        | 0.17           | 83                         | 86                          | 64-115                 | 4                 |
| Benzo(b)fluoranthene   | mg/kg (ppm)        | 0.17           | 86                         | 90                          | 54-119                 | 5                 |
| Benzo(k)fluoranthene   | mg/kg (ppm)        | 0.17           | 91                         | 93                          | 61-123                 | 2                 |
| Benzo(a)pyrene         | mg/kg (ppm)        | 0.17           | 80                         | 82                          | 54-111                 | 2                 |
| Indeno(1,2,3-cd)pyrene | mg/kg (ppm)        | 0.17           | 80                         | 86                          | 52-118                 | 7                 |
| Dibenz(a,h)anthracene  | mg/kg (ppm)        | 0.17           | 85                         | 88                          | 57-119                 | 3                 |
| Benzo(g,h,i)perylene   | mg/kg (ppm)        | 0.17           | 84                         | 88                          | 60-116                 | 5                 |

**Data Qualifiers & Definitions**

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- A1 - More than one compound of similar molecule structure was identified with equal probability.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte indicated may be due to carryover from previous sample injections.
- d - The sample was diluted. Detection limits may be raised due to dilution.
- ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.
- dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.
- fb - The analyte indicated was found in the method blank. The result should be considered an estimate.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.
- ht - The sample was extracted outside of holding time. Results should be considered estimates.
- ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The result is below normal reporting limits. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.
- jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the compound indicated is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.
- pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.
- ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The pattern of peaks present is not indicative of diesel.
- y - The pattern of peaks present is not indicative of motor oil.



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|   |                  |                                |
|---|------------------|--------------------------------|
| <b>CASE FILE NUMBER:</b>  | <b>FBI004-99</b> | <b>PAGE 1</b>                  |
| <b>REPORT DATE:</b>   | <b>09/28/09</b>  |                                |
| <b>DATE SAMPLED:</b>  | <b>09/21/09</b>  | <b>DATE RECEIVED: 09/25/09</b> |
| <b>FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON SEDIMENT</b> |                  |                                |
| <b>SAMPLES FROM FRIEDMAN &amp; BRUYA, INC. / PROJECT NO. 909228</b>         |                  |                                |

**CASE NARRATIVE**

Three sediment samples were received by the laboratory in good condition. Analysis was performed according to the chain of custody received with the samples. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on the following page.

**SAMPLE DATA**

| SAMPLE ID          | TOC (%) |
|--------------------|---------|
| 090081-092109-1500 | 45.0    |
| 090081-092109-1600 | 9.23    |
| 090081-092109-1630 | 26.8    |



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|   |                  |                                |
|---|------------------|--------------------------------|
| <b>CASE FILE NUMBER:</b>  | <b>FBI004-99</b> | <b>PAGE 2</b>                  |
| <b>REPORT DATE:</b>   | <b>09/28/09</b>  |                                |
| <b>DATE SAMPLED:</b>  | <b>09/21/09</b>  | <b>DATE RECEIVED: 09/25/09</b> |
| <b>FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON SEDIMENT</b> |                  |                                |
| <b>SAMPLES FROM FRIEDMAN &amp; BRUYA, INC. / PROJECT NO. 909228</b>         |                  |                                |

**QA/QC DATA**

|                 |                    |
|-----------------|--------------------|
| QC PARAMETER    | TOC (%)            |
| METHOD          | EPA 9060           |
| DATE ANALYZED   | 09/28/09           |
| DETECTION LIMIT | 0.01               |
| DUPLICATE       |                    |
| SAMPLE ID       | 090081-092109-1500 |
| ORIGINAL        | 45.0               |
| DUPLICATE       | 44.2               |
| RPD             | 1.77%              |
| SPIKE SAMPLE    |                    |
| SAMPLE ID       |                    |
| ORIGINAL        |                    |
| SPIKED SAMPLE   |                    |
| SPIKE ADDED     |                    |
| % RECOVERY      | NA                 |
| QC CHECK        |                    |
| FOUND           | 3.41               |
| TRUE            | 3.35               |
| % RECOVERY      | 101.67%            |
| BLANK           | <0.01              |

RPD = RELATIVE PERCENT DIFFERENCE.  
NA = NOT APPLICABLE OR NOT AVAILABLE.  
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.  
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff  
Laboratory Director

