ADDENDUM NO. 1

SAMPLING AND ANALYSIS PLAN
HEALTH AND SAFETY PLAN
FOR THE
LITTLE SQUALICUM PARK
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

BELLINGHAM, WASHINGTON

Prepared for

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For submittal to

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I, Mark J. Herrenkohl, a professional engineering geologist in the State of Washington, certify that I have reviewed the geosciences portions of this addendum to the Work Plans.

Signature of Geologist: _____Name: Mark J. Herrenkohl Date:_____

1 INTRODUCTION

This document is an addendum to the Sampling and Analysis Plan (SAP) and Health and Safety Plan (HASP) for the Little Squalicum Park (Park) Remedial Investigation/Feasibility Study (RI/FS) located in Bellingham, Washington (Integral 2005). It includes information on samples collected during the November 7 – 10, 2005 field work conducted at the site which showed visual and olfactory signs of creosote contamination. It also outlines additional sampling activities (supplementary to the September 30, 2005 Little Squalicum Park RI/FS Work Plans) proposed for the site. In addition to providing information on the rationale and objectives for the proposed sampling and testing, this document also contains information on proposed changes to the project HASP as it relates to worker and visitor safety during sampling activities.

Integral is conducting this work under contract No. 2004-014 with the City of Bellingham, Parks and Recreation Department (City), with direction from both the Washington State Department of Ecology Toxics Cleanup program (Ecology) and U.S. Environmental Protection Agency, Region 10 Brownfields program (EPA).

A summary of relevant field observations within the boundaries of the Park are presented in Section 2. Section 3 discusses sample collection and handling methods followed by the proposed sample analysis in Section 4. Selected samples will be analyzed following a tiered approach with an adequate volume of sample archived to allow for follow-up analysis, if necessary. Section 5 discusses additional health and safety considerations for this sampling effort. The proposed sampling schedule is presented in Section 6 followed by references in Section 7.

2 FIELD OBSERVATIONS

Integral made several important observations during the recent sampling investigation conducted at the Park. On November 7th, Integral personnel observed a non-aqueous phase liquid (NAPL) oozing from a lower permeable sand unit, above stiff clay, at the base of the upper portion of Little Squalicum Creek (LSC). The NAPL was observed to have a distinct creosote odor and extensive sheen when disturbed. A heavy sheen and odor was observed for at least 50 feet downstream from this initial observation along the northwest bank of the creek, wherever the sandy unit daylights at the creek bed. Integral did not observe sheen or odor along the south bank of this portion of the creek.

The second notable observation was a distinct creosote odor and sheen in approximately 4 ft of soils excavated at test pit location TP-6 (Figure 1). The upper 1 ft of soil contained a "consolidated mat" of sandy gravel with wood debris and dried petroleum with the appearance of creosote overlying approximately 2 to 3 ft of silty sand (gray in color) with heavy sheen and strong creosote odor. The sand unit grades to a mottled (red/gray in color), organic clay at the bottom of the test pit. TP-6 and TP-7 were purposefully placed in the approximate location of the historic creek bed, which was re-routed to its present course in the late 1950's to early 1960's

based on aerial photographs of the area. Integral did not observe the same conditions at location TP-7. However, TP-7 was moved from its proposed location (Integral 2005) because of difficulties with access, and may not have been positioned in or represent the old creek channel.

The third notable observation in the field was at test pit locations TP-1 and TP-2, located at the northeast corner of the Park near the Bellingham Technical College (BTC) parking lot (not shown on Figure 1). In both test pits, municipal garbage and debris were observed in the upper 4 ft of soils. Materials encountered include intact bottles possibly dating to the 1920' and 1930's, unidentifiable metal fragments, ash materials, and concrete debris, among other materials. Municipal waste was observed to be more extensive in TP-1 including a distinct "garbage odor" in the upper portions of the excavation. After consultation with Tim Wahl of the City, this area of the Park may be the location of the Razore City Landfill which probably operated between 1936 and 1939.

Integral also observed questionable fill materials in test pit location TP-10 located south of the Marine Drive Bridge (not shown on Figure 1). The upper 1 to 2 ft of soils contained treated (creosote?) wood, a steel pipe, and a rubber belt with a weak unidentifiable (described as "sweet") odor. Industrial activities may have historically occupied this portion of the site based on review of aerial photographs and property deed information. Further study of the aerial photographs and historical deed information, in addition to more sampling, will be required to further understand the materials encountered in this area.

All four observations summarized above will likely require additional investigation to understand the nature and extent of contamination of the site. This addendum only addresses supplementary sampling and testing for the old creek channel associated with contamination observed in TP-6 (refer to Figure 1). Integral is proposing the excavation of additional test pits and appropriate testing to identify the location and boundaries of the old creek channel and determine the extent of the creosote contamination in soils identified at station TP-6. Additional addendums to the project work plans may be required to address the nature and extent of contamination observed in other areas of the Park.

It should also be noted that the City has requested digital aerial photography of the site from EPA to assist with the investigation of these recent findings.

3 SAMPLE COLLECTION AND HANDLING PROCEDURES

The primary objective of the proposed sampling is to evaluate soils within the historic creek channel for possible contamination. Integral proposes the collection of samples from six (6) test pits to be excavated at roughly 100 ft intervals[1] along the approximate location of the historic creek channel as shown in Figure 1. The location of the historic creek bed has been determined based on review of aerial photographs taken in 1955 and 1963 for which Integral obtained from the Whatcom Museum of History in Bellingham. Additional historic information was

[1] The distance between TP-6 and TP-13 is about 75 ft.

evaluated from an aerial photographic analysis of the Oeser Company Superfund site (Mack 1998). The information obtained from these sources was used to overlay in Geographical Information System (GIS) an approximate boundary onto the project base map (Figure 1). Station coordinates were estimated in GIS for each of the 6 test pit locations as shown in Table 1.

Additional test pit locations may be excavated near each of the proposed 6 locations depending on observations made in the field, to ascertain the boundaries of the historic creek.

Each test pit will be excavated using a mini track-mounted excavator (Takeuchi TB135 or Kubota KX121) to a depth of approximately 4 ft below ground surface (bgs) to evaluate the character of soils and collect samples for chemical analysis. The track-mounted excavator has a smaller footprint than the backhoe used in earlier investigations and site work, allowing greater accessibility to areas in the Park with dense vegetation. The rubber tracks are not expected to disturb the surface soils as much as the rubber tires of the backhoe when moving through wetter areas of the site.

The number of samples collected for analysis will depend on observations made in the field including visible sheen and odor. A photo ionization detector (PID) and flame ionization detector (FID) will be used in estimating the organic vapor concentration of each sample collected within the test pits.

Table 1. Proposed test pit station coordinates[1].

Test Pit Number	Latitude N	Longitude W	Northing (ft)	Easting (ft)
TP-13	48.76732	122.51403	649121.22	1235095.34
TP-14	48.76693	122.51372	648973.78	1235166.85
TP-15	48.76665	122.51369	648873.80	1235171.84
TP-16	48.76638	122.51379	648775.48	1235145.18
TP-17	48.76614	122.51406	648690.50	1235078.52
TP-18	48.76611	122.51446	648680.50	1234981.87

[1] Station coordinates reference North American Datum 1983 (State Plane Washington North, U.S. Feet). Additional test pits may be excavated and will be identified by continuing this numbering sequence.

4 SAMPLE ANALYSIS

Selected composite soil samples will be analyzed for Northwest Total Petroleum Hydrocarbons, Diesel Range Organics (Ecology Method NWTPH-D)[2]. The laboratory will analyze diesel and creosote standards to assist in source identification. Sample results exceeding the preliminary screening level of 200 mg/kg will be analyzed for Semivolatile Organics by EPA Method SW 8270 (low level method if necessary). If volatile organic vapors are detected with the PID/FID, selected samples may be analyzed for NWTPH-Gasoline Range Organics (-G). A representative portion of each sample collected will be archived for possible future analysis, if necessary.

[2] A silica gel cleanup will be conducted on all samples to remove natural organics before analysis.

Additional information on methodology, quality control, and reporting requirements can be found in the Quality Assurance Project Plan (Integral 2005).

5 HEALTH AND SAFETY CONSIDERATIONS

Integral expects to encounter soils with heavy sheen and prominent odors based on observations while sampling TP-6. Therefore, it will be crucial for the field crew to follow the procedures identified in the project HASP (Integral 2005) with the following additions:

- Air monitoring will be continuous during all excavation and sample processing activities. A portable PID will used to accomplish this task with action levels identified in the project HASP.

- Caution tape will completely surround the exclusion zone, including excavation and processing areas. No site workers or visitors will be allowed in the exclusion zone without appropriate training and equipment as described in the project HASP.

- Several inches of straw will be applied to backfilled excavations when petroleum hydrocarbons are encountered. Once applied, the straw will help absorb remaining sheen on the surface and reduce odors.

- No test pits will be excavated in areas with standing surface water or shallow groundwater due to the potential for transport to other areas of the site. If shallow groundwater (<1 ft) is encountered at a location, the excavation will be abandoned and subsequently backfilled. In addition, samples may not be collected in soils below the groundwater level because of cross-contamination. The decision to sample a test pit will be made in the field by the team supervisor.

6 FIELD SCHEDULE

Sampling described in this addendum is planned for November 16 – 18, 2005. The addition of this sampling event and potentially others described in Section 1 will delay the overall project schedule (refer to Integral 2005). An update of the project schedule will be prepared under separate cover.

7 REFERENCES

Integral. 2005. Final Work Plans. Little Squalicum Park Remedial Investigation/Feasibility Study, Bellingham, Washington. Prepared for the City of Bellingham, Parks & Recreation Department, Bellingham, Washington. Prepared by Integral Consulting Inc., Bellingham, Washington. September 30, 2005.

Mack, W. M. 1998. Aerial Photographic Analysis, OESER Company, Inc. Prepared for the U.S. Environmental Protection Agency, Region 10, Seattle, Washington. Prepared by Lockheed Environmental Systems & Technologies Company, Las Vegas, Nevada. August 1998.

N

0 100 200 Feet

- Brownfield Assessment Project Area Boundary
- Approx. Parcel Location
- Approx Creek Location
- Approx. Depression Location
- Approx. Area of Standing Water
- Approx. Underground Drainage
- Bridge
- Road
- Dock
- Railroad
- Estimated Extent of Historical Creek (Based on historical aerial photos provided by City of Bellingham and US EPA)
- Actual Locations of Selected Test Pits
- New Proposed Soil Locations

Feature Sources:
Topological features: City of Bellingham web site, source 1998 drawings.
Park area, Brownfield area, Area Trails: Transferred from copy - Site Location Map
Appendix B Map of Brownfield Assessment Area.
Notes:
The locations of Ecology were projected from source Lat./Long. to NAD27 WNZ. OESER station locations were provided in NAD27 WNZ.

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Figure 1. Approximate boundaries of historic creek channel and proposed test pit locations. Little Squalicum Park Remedial Investigation