Phase II Environmental Site Assessment

Lilydale Park Dump Site

City of St. Paul

June 10, 2010

Project Number 000211-10116-0

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VIC Program
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St. Paul, MN 55155-4194

Shanna Schmitt, Technical Analyst
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520 Lafayette Road North
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Re: Phase II Environmental Site Assessment
Lilydale Park Dump Site
Bonestroo File No.: 000211-10116-0
MPCA VIC Program Project ID VP1071

Dear Mmes. Hadiaris and Schmitt:

Enclosed are two copies of the Phase II Environmental Site Assessment Report for the Lilydale Park Dump site located in Lilydale Regional Park. In summary, the project involved the excavation of three test pits at the Site on May 4, 2010, observation of the materials encountered, field screening with a photo ionization detector and an X-ray fluorescence analyzer, and laboratory analyses of selected samples. The enclosed report provides a description of the methods and results of the assessment.

Based on the results of the assessment, and on behalf of the City of St. Paul, we request that the previously submitted and approved Response Action Plan and Construction Contingency Plan (RAP/CCP) for the proposed removal actions at the park be withdrawn. The presence of asbestos in the waste material increases the off-site disposal costs such that the total remediation of the site as described in the previously-submitted RAP/CCP is no longer financially feasible.

The City would like to revise the RAP/CCP to propose further consolidation and burial of the waste material associated with the Lilydale Park Dump site. Conceptually, waste material would be cleared from the proposed re-alignment of Lilydale Road/West Water Street and consolidated as non-structural fill along the northeast and southwest flanks of the existing waste pile. The accumulated fill mound will be used to elevate a proposed park picnic shelter to protect it from flood threat. Dynamic compaction or other methods might be used to reduce the volume and increase the structural stability of the waste. Then crushed material from the Lilydale Park Marina site would likely be placed on top of the pile to provide a protective cover, and possibly as a surcharge if deemed geotechnically prudent.

The City would also like to amend their request for technical assistance only, to a request for a No Association Determination for their proposed actions within the park. We realize this is a significant change from the approach to the project previously proposed, and we are requesting a meeting with VIC staff prior to the preparation and submission of a revised RAP/CCP.

We appreciate your continued support of the City's efforts to rehabilitate Lilydale Regional Park and thank you in advance for your review of the enclosed documents. Please feel free to contact me at (320) 229-5529 if you have any questions regarding this letter or enclosures.

Sincerely,

BONESTROO

Clinton D. Jordahl, PG
Geologist

Enclosure

c: Ms. Alice Messer, City of Saint Paul Parks and Recreation (2 copies)
Mr. Stu Gross, Bonestroo
Ms. Anne Hunt, City of St. Paul
Mr. John Moriarty, Ramsey County
Mr. George Kinney, Dakota County
Ms. Teish Stafne, City of Lilydale

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1. Introduction

1.1 AUTHORIZATION

In accordance with the authorization received from the City of St. Paul (City), Bonestroo conducted a Phase II Environmental Site Assessment (Phase II ESA) at the Lilydale Park Dump site located in Lilydale Regional Park. The Site is generally located in the NW¼ of the NW¼ of Section 13 T28N, R23W. A Site Location Map is included as Figure 1.

1.2 PROJECT BACKGROUND

Lilydale Regional Park (Park) is an approximately 384 acre parcel lying largely within the floodplain of the Mississippi River, and includes the 100-acre spring-fed Pickerel Lake. It extends from the Smith Avenue High Bridge approximately 2.5 miles upriver to the Lilydale Pool and Yacht Club property. It is one half mile wide at its widest point and bounded on the northwest by the Mississippi River and on the southeast by a 250-foot bedrock escarpment. Much of the area comprising the Park was at one time the small town of Lilydale. The lower Lilydale area was subject to repeated flooding, and by the late 1970s, the entire population of 600 people had been relocated to the bluffs above what is now the Park. The Park will be redeveloped to provide the amenities desired by the community with a focus on the restoration, protection and interpretation of the Park's unique natural resources. Proposed Park improvements include the realignment of a portion of Lilydale Road/West Water Street and the construction of a picnic shelter along the western shore of Pickerel Lake.

The Lilydale Park Dump site (Site) lies along the western edge of Pickerel Lake at the location proposed for the picnic shelter and restrooms, and within the footprint of the proposed roadway realignment. The Site straddles the border between Dakota and Ramsey Counties, but appears to be located primarily in Dakota County. The Site is an irregularly shaped area about 6¼ acres size rising about 10 to 16 feet above the surrounding terrain. A topographic map of the dump site is included as Figure 2.

The Lilydale Park Dump was accumulated within the footprint of Lilydale Auto Parts which appears to have begun as a small operation along Lilydale Road/West Water Street in the mid to late 1950s. A fill mound was accumulated at the Site sometime after 1974, and it appears to have received final cover by 1980. Little information is available about the specific nature of the material deposited at the Site; however, it appears that buildings and other "Environmental Intrusions" were collected from the park property and aggregated at the Site in accordance with a plan developed by the Ramsey County Open Space System in 1973.

In January 2010, a Response Action Plan and Construction Contingency Plan (RAP/CCP) was developed to assist the City in conducting removal actions at the Lilydale Park Dump site and the Lilydale Marina Demolition site, which is also located within the Park. The RAP/CCP addressed the removal of accumulated demolition debris and other waste material necessary to initiate the implementation of the park redevelopment plan. The removal of waste material from the Site was proposed as a necessary step to achieve the desired roadway realignment and allow the construction of a picnic shelter on structurally-suitable fill. The removal of demolition debris from the Lilydale Marina Demolition site is necessary to allow the establishment of a dog park at that location and the floodway-fill volume credit necessary to allow the construction of the picnic shelter at an elevation above the regulatory flood protection elevation of the Mississippi River.

Additional information pertaining to the Site and the Park in general can be found in a Natural Resource Management Plan (NRMP) for the Park that was completed by Bonestroo in 2009. The NRMP report included a historical overview of the Park, a summary of known environmental issues based on information provided by the City and the files of the MPCA pertaining to lower Lilydale, and a site reconnaissance.

1.3 PROJECT OBJECTIVES

The general objective of this Phase II ESA is to reduce the uncertainty regarding the nature of the material buried at the Site; provide a better understanding of the material to be encountered during the proposed removal actions, and provide an opportunity to characterize material as may be needed to meet landfill disposal requirements.

1.4 SCOPE OF SERVICES

The following work tasks were completed by Bonestroo during this phase of the project:

- Visually inspected soil and waste materials encountered in three test pits excavated at the Site.
- Field screened soil samples collected from the test pits for the presence and relative concentrations of ionizable organic vapors using a photo-ionization detector (PID) and a polyethylene bag-headspace methodology.
- Field screened bagged and homogenized soil samples for 32 metallic elements using an X-Ray Fluorescence (XRF) analyzer.
- Collected nine samples of suspect asbestos-containing waste material (ACWM) for analysis by Polarized Light Microscopy (PLM).
- Collected nine soil samples for laboratory chemical analyses including: Volatile Organic Compounds (VOC) by Environmental Protection Agency (EPA) Method 8260; Semi-VOCs (SVOC) by EPA Method 8270; Priority pollutant metals by EPA Methods 6010/7470/7471; Polychlorinated Biphenyls (PCB) by EPA Method 8082; Organochlorine Pesticides by EPA Method 8081; and, Diesel Range Organic Compounds (DRO) by Modified WDNR Methodology.

2. Project Results

2.1 TEST PIT LOCATIONS

A total of three test pits were excavated at the Site on May 4, 2010 by Veit Companies of Rogers, Minnesota, using a Caterpillar 320C tracked excavator. The test pits were more or less evenly distributed across the top of the Site in attempt to provide as much characterization of the waste material as possible. Test pit locations are shown on Figure 2.

2.2 MATERIALS ENCOUNTERED

To minimize surface disturbance, each pit was excavated vertically to the practical working limits of the equipment at approximately 13 feet below the surface. Stratigraphic logs of the test pits are included as Figure 3. Photographs of the pits and excavated materials are included in Appendix B.

In general, 6 to 9 inches of top soil cover was encountered at each test pit location (Photograph #1). Although thin, the topsoil layer was well vegetated and appeared to be free of any waste material. The underlying material could generally be characterized as demolition debris consisting primarily of brick, concrete, stone and wood in a primarily sandy matrix (Photographs #3, #6 and #8). Lesser amounts of scrap metal, metal pipe, wire, conduit, and roofing material were included in the waste, as were small fragments of glass, vinyl composite floor tile, and transite siding. Very little household-type waste such as porcelain, glass bottles, tin cans, etc. was noted to be present in any of the test pits.

Test Pit 1 was successfully advanced to a depth of approximately 13½ feet, and about 1 foot into what appeared to be native alluvial silt. An approximately 1-foot thick black tarry layer emanating creosote-like odor and containing much embedded glass was encountered at the base of the fill material and just above native soil (Photograph #4). This stratum likely represents the working elevation of Lilydale Auto Parts.

Neither Test Pit 2 nor Test Pit 3 could be extended into native material due to excessive slumping of the irregular fill material and the limited reach of the equipment. In general, Test Pit 2 appeared to contain more wood waste than either of the other two pits. A black tarry layer similar to that encountered at the base of the fill material in Test Pit 1, but much thinner and less malodorous, was encountered at the base of the waste material in Test Pit 3. However, rather than being underlain by natural alluvial silt, the waste material at the Test Pit 3 location was underlain by a sandy fill material which included numerous sandstone fragments.

2.3 CONTAMINATION SCREENING

Soils excavated from the test pits were examined visually for staining and other apparent signs of contamination, including the presence of suspect ACWM. Incidental olfactory indications of contamination such as strong or unusual odors were also noted. In addition, the soil samples were screened for the presence and concentrations of organic vapors using a Thermo Environmental Instruments Model 580B PID equipped with a 10.6 electron-volt lamp, and a polyethylene-bag headspace procedure.

The polyethylene-bag headspace analytical procedure consisted of half-filling a new one-quart self-sealing bag with a soil sample. The bag was quickly sealed and headspace was allowed to develop for at least 10 minutes. The bag was manipulated to break up clods and shaken vigorously for 15 seconds, both at the beginning and the end of the headspace development period. After headspace development, the PID probe was inserted through the top of the bag to one-half the headspace depth. The highest reading observed on the PID was then recorded.

PID screening results are presented on Figure 3. An organic vapor concentration of 5.2 parts-per-million (ppm) was detected in the black tarry layer encountered in Test Pit 1 at a depth of approximately 12 feet. No other detectable organic vapors were found to be emanating from any of the other soil samples collected and screened at the site.

During the 10-minute headspace development period, the homogenized sample bags were screened with a Niton XL3t 700 Series XRF analyzer. The XRF was equipped with a 50kV Ag anode X-ray tube and was capable of detecting up to 32 metallic elements. The screening procedure consisted of placing the bagged soil sample on the ground or flat surface, and flattening the soil in the bag to produce a uniform soil thickness of at least one inch beneath the detector. The shutter was then opened a duration of approximately 60 seconds to take the measurement.

The XRF field screening results are presented in Table 1.The most significant contaminant detected by the XRF screening appears to be lead, which was measured at a concentration as high as 1,500 ppm with the XRF. Two measurements are included in Table 1 for samples S-6, S-8, S-10, S-15 and S-16. For each of these samples, the "a" screening result is for the bagged sample following the procedures outlined above. The "b" measurement was taken from the actual sample jar being submitted for metals analysis with the intent of providing a comparison between the metals field screening results and laboratory analytical results.

2.4 SOIL SAMPLE ANALYSES

A total of nine soil samples collected from the test pits were submitted to Pace Analytical Services (Pace) for laboratory chemical analysis. Analytical parameters included VOCs, SVOCs, priority pollutant metals, PCBs, organochlorine pesticides, and DRO. Grab samples collected from depths less than 5 feet were taken directly from the floor of the excavation. Grab samples from depths greater than 5 feet were generally collected from the backhoe bucket. A composite sample from Test Pit 3 was formed by setting aside small subsamples of material as the hole was excavated, then homogenizing the subsamples to form a composite. The samples were placed in new glass sample jars with Teflon®-lined lids. The soil samples collected for volatile analysis were preserved in the field with methanol. The jars were sealed, labeled, and transported to the laboratory under refrigerated conditions using chain-of-custody procedures.

Laboratory analytical results are summarized in Tables 2 through 5. The sample-specific results are included in the laboratory reports are contained in Appendix A. The following is a brief summary of the rational for collecting and analyzing the various samples.

Test Pit 1

Sample S-3 – grab sample taken at the topsoil/waste interface at depth of about 6 inches; XRF screening was 570 ppm lead and there were no organic vapors detected. The rational for analysis was to evaluate the soil cover for reuse. Parameters included VOCs, SVOCs, metals and DRO.

Sample S-4 – grab sample taken at a depth of about 6 feet. XRF screening was 1500 ppm lead and there were no organic vapors detected. The rational for analysis was the apparent high lead content. Parameters included SVOCs, metals and DRO.

Sample S-6 – grab sample taken at a depth of about 12½ feet; XRF 615-750 ppm lead with an organic vapor reading of 5.2 ppm. This was a black layer with a creosote-like odor and with a lot of broken glass. This stratum likely represents the working elevation of Lilydale Auto Parts. Parameters included VOCs, SVOCs, metals, PCBs, Pesticides and DRO.

Sample S-8 – grab sample taken from native soil about a foot below the tar-like layer. XRF screening was 0-94 ppm lead with no organic vapors. Sample was analyzed to evaluate impacts to the underlying soil. Parameters included VOCs, SVOCs, metals, PCBs, Pesticides and DRO.

Test Pit 2

Sample S-10 – grab sample from a depth of about 5 feet; XRF screening was 400 to 770 ppm lead with no organic vapors. Sample was analyzed to help build waste profile. Parameters included VOCs, SVOCs, metals and DRO.

Sample S-11 – grab sample from the bottom of the pit at about 13 feet, which was at the working reach of the backhoe. Pit was terminated in waste at this depth. XRF screening was 1550 ppm lead with no organic vapors. Sample was analyzed due to apparent high lead level and to help build a waste profile. Parameters included VOCs, SVOCs, metals, PCBs, Pesticides and DRO.

Test Pit 3

Sample S-14 – grab sample from a layer of what appeared to be clean sand fill at a depth of about 11 feet. The coarseness of the sand and inclusion of small chunks of sandstone suggested it was fill as opposed to natural alluvium. XRF screening was 0 ppm lead with no organic vapors. The sides of the pit were collapsing at this depth and it was not possible to go deeper without going wider. Sample was analyzed to evaluate impacts to the soil beneath waste. Parameters included VOCs, SVOCs, metals, and DRO.

Sample S-15 – grab sample from a dark layer directly above the S-14 sand fill layer. It was similar to the layer near the bottom of Test Pit 1, but with less of a creosote odor and less incorporated glass and waste. XRF screening was 270 to 640 ppm lead with no organic vapors. Once again, likely represents the working elevation of Lilydale Auto Parts. Parameters included VOCs, SVOCs, metals, PCBs, Pesticides and DRO.

Sample S-16 – composite sample formed by collecting small sub-samples as the pit was excavated and then homogenizing the material. XRF screening was 730 to 1115 ppm lead with no organic vapors. Sample was analyzed due to apparent high lead level and to help build waste profile. Parameters included VOCs, SVOCs, metals, PCBs, Pesticides and DRO

2.5 ASBESTOS ANALYSES

Nine samples of suspect asbestos-containing building material were collected from the test pits and submitted to Pace for PLM analysis. Suspect materials were encountered in each of the test pits and included shingles, built-up roofing, countertop material, vinyl composite floor tile, and transite siding. The results of the analyses are summarized in Table 6. More detailed layer-by-layer analytical results are presented in the microscopy report contained in Appendix A.

3. Discussion

3.1 SOILS

None of the 67 targeted VOC parameters were present in any of the soil samples collected at the Site at concentrations greater than or equal to the lower detection limit of the analytical method. DRO was detected in six of the nine samples with a maximum concentration of 773 mg/kg in the black tarry layer noted at the 12½-foot depth of TP-1. The laboratory reports higher boiling-point hydrocarbons in three of these six samples in which DRO was detected, and also in one sample in which DRO was not detected. DRO analytical results are summarized in Table 4.

PCB analytical results are summarized in Table 5. Trace PCB concentrations were detected in three of the five samples analyzed for PCBs, but the greatest total PCB concentration of 0.638 mg/kg was well below the Tier 2 Recreational Soil Reference Value (SRV) of 1.4 mg/kg, and the Tier 1 Soil Leaching Value (SLV) of 2.1 mg/kg.

Analytical results for pesticides are summarized in Table 4. Organochlorine pesticides were detected at concentrations below 1 mg/kg in four of five samples analyzed for pesticides. A total of 11 parameters were detected. Nevertheless, the concentrations were very low and generally only nominally above the lower analytical method detection limit, which is far below the applicable SRV (where a SRV has been established). The MPCA has not established SLVs for pesticides as they generally fall under the regulatory authority of the Minnesota Department of Agriculture (MDA). The MDA has prescriptive cleanup standards for pesticides currently in use or recently retired, but it does not appear that there are prescriptive cleanup standards for any of the compounds detected on the Site.

The results of the metals analyses are summarized in Table 2. Lead was detected in seven of the nine samples at concentrations in excess of the Recreational SRV for lead, and in six of the nine samples at a concentration above the Tier 1 SLV. The only two samples not exceeding a lead threshold were the samples collected from native soil and sand fill at the terminal depths of Test Pits 1 and 3, respectively. The highest concentration of 3090 mg/kg was detected in sample S-4 collected from the 6-foot depth in TP-1. This sample and the composite sample from TP-3 (S-16, 1210 mg/kg total lead) were analyzed by the Toxic Characteristic Leach Procedure (TCLP). Sample S-16 passed the TCLP for lead with a concentration of 1.9 mg/L, but S-4 failed the TCLP with a lead concentration of 7.1 mg/L.

Copper was detected at a concentration of 482 mg/kg in sample S-15, which was collected from the black-stained layer near the base of TP-3. This concentration is above the Recreational SRV for copper at 400 mg/kg; however, no other metals were detected in the soil samples collected at the Site at concentrations above their respective SRVs.

Antimony, Cadmium, Copper, Selenium and Zinc were all detected in one or more samples at concentrations above their respective Tier 1 SLVs. Total Chromium was detected in five samples at a concentration that is slightly above the SLV for Chromium VI; however, it is unlikely that the total Chromium result is due solely to the presence of Chromium VI.

SVOC analytical results are summarized in Table 3. The Recreational SRV of 2 mg/kg for Benzo(a)pyrene equivalents (BaP equivalents) was exceeded in 4 samples with the highest concentration of 59 mg/kg detected in sample S-10, which was collected from the 5-foot depth of TP-2. It may be worth noting that TP-2 contained significantly more lumber waste than the other test pits. The Tier 1 SLV for BaP equivalents of 10.2 mg/kg was exceeded in two samples including S-10 (56.7 mg/kg) and S-16 which was the composite sample from TP-3 (18.55 mg/kg).

3.2 ABESTOS-CONTAINING WASTE MATERIAL

Six of the nine building material samples submitted for asbestos analysis contained anywhere from 5% to 20% asbestos. According to Minnesota Statues, material containing greater than 1% asbestos is considered "asbestos-containing" and its removal and disposal is regulated under the Administrative Rules of the MPCA and the Minnesota Department of Health (MDH).

Asbestos-containing material including vinyl-composite floor tile and mastic, and transite board was found in each of the three test pits. Materials analyzed and found not to contain asbestos included roofing material and counter top material. It should be noted however that other roofing material and additional suspect asbestos-containing materials are likely to be present in areas not explored, and these materials (if encountered) should be considered asbestos-containing until analyzed to demonstrate otherwise.

4. Conclusions

Each of the test pits conducted at the Site encountered primarily building material consistent with a demolition landfill. The bulk of the material encountered at each test pit location consisted of brick in a sandy-soil matrix. There was more wood encountered at the Test Pit 2 location than in the other test pits; and more plumbing, metal and roofing encountered at the Test Pit 3 location, but there were no identifiable industrial wastes and very little household-type waste encountered at the Site.

Asbestos-containing building materials were present in small amounts throughout the profile of each pit. The soil matrix was not tested for asbestos. The types of materials encountered would generally be considered non-friable in their undamaged state; however, all the material was damaged and incorporated with soil and other debris. In its current condition, it is likely that the entire pile will need to be managed as asbestos containing waste material.

Aside from asbestos, the primary contaminant of concern at the Site appears to be lead, which was pervasive in the waste material but not detected at regulated concentrations in the underlying soils at the two locations where the underlying soil was tested. The source of the lead contamination is not known. Some lead flashing was encountered in Test Pit 2, but it seems unlikely that the presence of flashing or plumbing alone would be the cause of what appears to be such widespread lead contamination. Threats associated with direct contact with soil contaminated with lead or other metals could be mitigated by covering the waste material with additional soil; however, the threat posed to groundwater quality by lead and potentially antimony, cadmium, chromium, copper, selenium, and zinc leaching from the waste material may warrant additional protective measures.

SVOCs in the form of B(a)P equivalents are also present at the Site in concentrations that may pose a direct contract risk and potentially a risk to groundwater quality. Intuitively, measures employed to mitigate the risks posed by the metals contamination should adequately address the threats posed by the identified SVOC contamination.

5. Limitations

The analyses and conclusions submitted in this report are based on our field observations and the results of laboratory chemical analyses of performed on soil samples collected from the test pits completed for this project. Groundwater was not encountered in any of the test pits excavated at the Site, and neither the groundwater condition nor flow direction were evaluated as part of the Scope of Services for this project.

In performing its services, Bonestroo used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession practicing in the same location. No other warranty is made or intended.