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18 July 2002

Mr. Ronald Timm
Hydrogeologist
Northwest Region, Toxic Cleanup Section
Washington State Department of Ecology
3190 160th Avenue, SE
Bellevue, Washington 98008

Subject: Soil Evaluation Results and Findings
Storm Sewer Manhole – The Shops at First Street Site
Bellevue, Washington
K/J 946059.00

Dear Mr. Timm:

Kennedy/Jenks Consultants is pleased to present this letter report on behalf of The Benenson Capital Company (Benenson) located at 708 Third Avenue, 28th Floor, New York, New York, 10017. This report contains information on, and the results of, environmental investigation activities conducted between December 2001 and May 2002 at Benenson's The Shops at First Street property located at 110 108th Avenue NE, Bellevue, Washington (site). These activities were conducted based on a work plan submitted to the Washington State Department of Ecology (Ecology) on 22 September 2000. The activities are part of a Voluntary Cleanup Program agreement established for the site in response to the discovery of tetrachloroethene (PCE) in soil at the site. Conclusions regarding the significance of the findings and recommendations for the future course of remedial actions at the site are also included.

BACKGROUND

The presence of PCE was discovered in soil at the site during redevelopment work conducted in 1994. Data obtained during the subsequent remedial investigation (RI) activities conducted by Kennedy/Jenks Consultants in 1994 indicated the presence of PCE in soil surrounding a storm sewer manhole located in the southeastern area of the site. Figure 1 provides a site location and vicinity map. Figure 2 shows the locations of site buildings and the manhole.

During the 1994 remedial investigation, soil samples were collected to 100 feet below grade (bgs) at 5 and 10-foot intervals from a soil boring, BB-15, located near the manhole. PCE was detected at concentrations ranging from 0.02 milligrams per kilogram (mg/kg) to 4,180 mg/kg in the samples collected from boring BB-15. Model Toxics Control Act (MTCA) Method B soil cleanup level for PCE is 19.6 mg/kg (for human contact exposure pathway). Table 1 includes the PCE concentrations detected in boring BB-15 in 1994.

Kennedy/Jenks Consultants installed a one-well soil vapor extraction (SVE) system in 1996 to reduce PCE concentrations in the soil. The system was operated until April 2000 when asymptotically-low PCE concentrations were observed in extracted soil gas following several on and off cycles. Data on operation of the system were periodically discussed with Ecology during this period. Following discussions with Ecology in March 2000, the work plan (dated 22 September 2000) was developed based on MTCA performance monitoring requirements regarding the evaluation of the effectiveness of SVE systems. The work plan included, among others, tasks to advance soil borings and collect soil samples for PCE analysis and to line the interior walls of the storm sewer manhole.

Soil sampling activities and lining of the manhole were completed in May 2002. The methodology and findings of these activities are presented in this letter report. Additional information, data, and detail regarding the environmental conditions at the site and previous investigative activities are included in the RI/FS report submitted to Ecology by Kennedy/Jenks Consultants in November of 1994.

OBJECTIVES

The specific objectives of the investigative tasks are as follows:

- Evaluate the utility of the PCE remediation activities and the distribution of remaining PCE in soils surrounding the manhole following operation of the soil vapor extraction system near the manhole since 1996.
- Seal the storm sewer manhole.

Ecology also requested the investigation of potential PCE impacts to groundwater underlying the site. Limited groundwater investigation activities were conducted during the May 2002 field activities. The results and findings of these activities will be presented to Ecology in a separate letter report.

FIELD METHODS

Field methods generally followed the procedures described in the work plan. These procedures, and any deviations, are summarized below.

SVE Performance Monitoring at the Storm Sewer Manhole

Five soil borings, B-1 through B-5, were advanced around the storm sewer manhole at the approximate locations shown on Figure 3. Borings B-1, B-2, and B-3 were advanced to a depth of 50 feet bgs. Boring B-4 was advanced to a depth of 30 feet bgs and boring B-5 to 110 feet bgs. Boring B-5 was subsequently completed as a groundwater monitoring well (MW-2). The borings were advanced using a hollow-stem auger drilling equipment operated by Cascade Drilling, Inc. located in Woodinville, Washington. Because the manhole tapers out with depth, we were unable to advance a boring within 18 inches of the manhole as had originally been planned.

The depths of borings B-1 through B-4 were determined based on PCE results of soil samples analyzed in an onsite mobile laboratory operated by ESN Northwest located in Lacey, Washington. Soil samples were collected in borings B-1, B-2, B-3, B-4, and B-5 every 5 feet starting at depths of 10, 15, 5, 15, and 5 feet bgs, respectively. These samples were rushed to the mobile laboratory for analysis of VOCs using EPA Method 8021B. Split soil samples were collected at depths of 15 and 50 feet bgs at B-1 and B-2, 15 and 45 feet bgs at B-3, 25 feet bgs at B-4, and 20 feet bgs at B-5. The split samples were sent to Analytical Resources, Inc. (ARI) laboratory located in Tukwila, Washington for confirmation analysis of the presence of VOCs using EPA Method 8260B. The split samples were transferred into a pre-cleaned sample container provided by ARI and shipped under chain-of-custody protocol.

Soils encountered during drilling were described for lithology identification in accordance with the Standard Practice for Description and Identification of Soils (ASTM D-2488-93) method. Following sample collection and onsite analysis, borings B-1 through B-4 were abandoned with bentonite chips in accordance with Ecology's monitoring well regulations (WAC 173-160).

Sealing of Storm Sewer Manhole Walls and Bottom

The storm sewer manhole was sealed in May 2002. The specific activities performed as part of this task are summarized below.

- A Kennedy/Jenks Consultants staff collected a grab sample of the sediments in the bottom of the manhole in December 2001 for laboratory analysis of VOCs. This sample was sent to ARI and analyzed by EPA Method 8260B. PCE was detected in the sediment sample at a concentration of 620 micrograms per kilogram (µg/kg). Acetone and trichloroethene (TCE) were also detected at concentrations of 200 and 110 µg/kg, respectively. A copy of the laboratory analytical report and chain-of-custody forms for the sediment sample is attached as Appendix A.

- A volume of less than 55-gallons of sediments was removed from the manhole by Safety-Kleen located in Seattle, Washington and stored in a steel drum in April 2002. The sediment was transported to the hazardous waste landfill located in Arlington, Oregon for disposal. Kennedy/Jenks Consultants staff was present during sediment removal activities. A copy of the Uniform Hazardous Waste Manifest is attached as Appendix B.

- In May 2002, Gelco Services, Inc. (Gelco) located in Salem, Oregon, mobilized to the site to pressure wash and seal the manhole. Kennedy/Jenks Consultants staff was present during these activities. The integrity of the interior brick and mortar was observed to be good. Gelco applied Thoroc SP-15 spray mortar on the interior walls, floor, and perimeter edges of the manhole to a smooth finish. The condition of the mortar was visually checked during the subsequent soil sampling activities and was observed to be good.

SOIL SAMPLING RESULTS

Soil Lithology

The soils encountered during drilling were similar to soils observed during drilling of boring BB-15 in 1994. As presented in the RI/FS report, the area in the vicinity of the manhole is underlain by glacial till composed mainly of dense sandy silt and silty sand with gravel. Five to 15-foot-thick zones of soil containing a higher fraction of medium to fine sand are interbedded with soils containing higher silt contents. No evidence of the presence of perched groundwater was observed in the borings. Boring logs are attached as Appendix C.

VOC Results

Laboratory analytical reports and chain-of-custody forms are attached in Appendix D. The results for the soil samples are presented in Table 1 and are summarized below.

- The samples collected from borings B-1, B-2, and B-3 contained concentrations of PCE ranging from below the detection limit of 50 µg/kg to a maximum value of 180,000 µg/kg (detected in the 10-foot sample collected from B-3). The results for the split samples confirmed the presence of elevated levels of PCE in the soil samples.

- The highest concentrations of PCE were detected in samples obtained from B-1, B-2, and B-3 between depths of approximately 10 and 25 feet bgs, corresponding to the soil immediately beneath the bottom of the manhole. Below 25 feet, the PCE concentrations decreased by orders of magnitude.

- The samples collected from borings B-4 and B-5, 15 feet away from the manhole, did not contain PCE above the detection limit of 50 µg/kg with one exception; the sample collected from a depth of 30-feet bgs in B-4 contained 110 µg/kg of PCE.

CONCLUSIONS

Based on the soil sampling results and comparison with the 1994 results, concentrations of PCE greater than the MTCA cleanup level of 19.6 mg/kg (for a worker exposure scenario) remain in soil in the vicinity of the manhole. The greatest PCE concentrations appear to be limited to the upper 20 to 25 feet within a 15-foot radius of the manhole. The results suggest that the SVE system that operated between 1996 and 2000 was effective in removing PCE from soil immediately near the vapor extraction well. Soils farther away contain elevated concentrations of PCE.

RECOMMENDATIONS

It is recommended that an enhanced SVE system be designed and implemented near the manhole. Kennedy/Jenks Consultants has begun identifying enhancement options such as use of additional extraction wells and use of heated air, steam stripping, and other technologies for this purpose. The feasibility of these options in addition to a remediation alternative consisting

of excavation and offsite disposal of the impacted soil will be evaluated. A report summarizing the results and findings of this feasibility study and a conceptual design of an enhanced SVE system will be provided to Ecology for comment prior to implementation.

We look forward to your review of this submittal. Please call Said Amali at (503) 295-4911, if you have any questions regarding the content of this letter report.

Thank you for your time and consideration.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Said Amali, Ph.D., P.E.
Project Manager

Attachments

cc: Mr. Leonard Kreppel, The Benenson Capital Company, New York, New York (with attachments)
Ms. Beth Ginsberg, Stoel Rives, Seattle, Washington (with attachments)

Table

TABLE 1
LABORATORY ANALYSIS RESULTS FOR PCE IN SOIL SAMPLES
May 2002 Sampling Event
Storm Sewer Manhole - The Shops at First Street Site
Bellevue, Washington

		May 2002 Borings[c]				
Depth feet bgs[a]	1994 Boring BB-15[b] mg/kg[g]	B-1[d] µg/kg[h]	B-2[d] µg/kg	B-3[d] µg/kg	B-4[e] µg/kg	B-5[f] µg/kg
5	--[i]	--	--	420	--	<50[j]
10	--	4,000	--	180,000	--	<50
15	4,180	87,000 - 710,000[k]	60,000 - 190	50,000 - 230	<50	<50
20	--	130,000	740	4,400	<50	<50 - 36
25	6.96	140	1,200	1,600	<50 - 37	<50
30	--	320	370	<50	110	<50
35	0.99	500	570	<50		
40	--	100	60	<50/<50		
45	0.2	1,200/1,900[l]	<50	<50 - 22		
50	--	<50 - 52	120 - 120	<50		
55	0.07					
65	0.39					
70	0.02					
75	0.07					
80	0.03					
85	0.03					
90	0.04					
95	0.02/0.02					
100	0.02					

Notes:

(a) Feet below grade.

(b) Values are measured in a stationary laboratory.

(c) Values are measured in an onsite mobile laboratory, unless otherwise noted.

(d) Boring advanced to 50 feet bgs.

(e) Boring advanced to 30 feet bgs.

(f) Boring advanced to 110 feet bgs and completed as a monitoring well (MW-2). Soil samples were collected to a depth of 30 feet bgs.

(g) Milligrams per kilogram.

(h) Micrograms per kilogram.

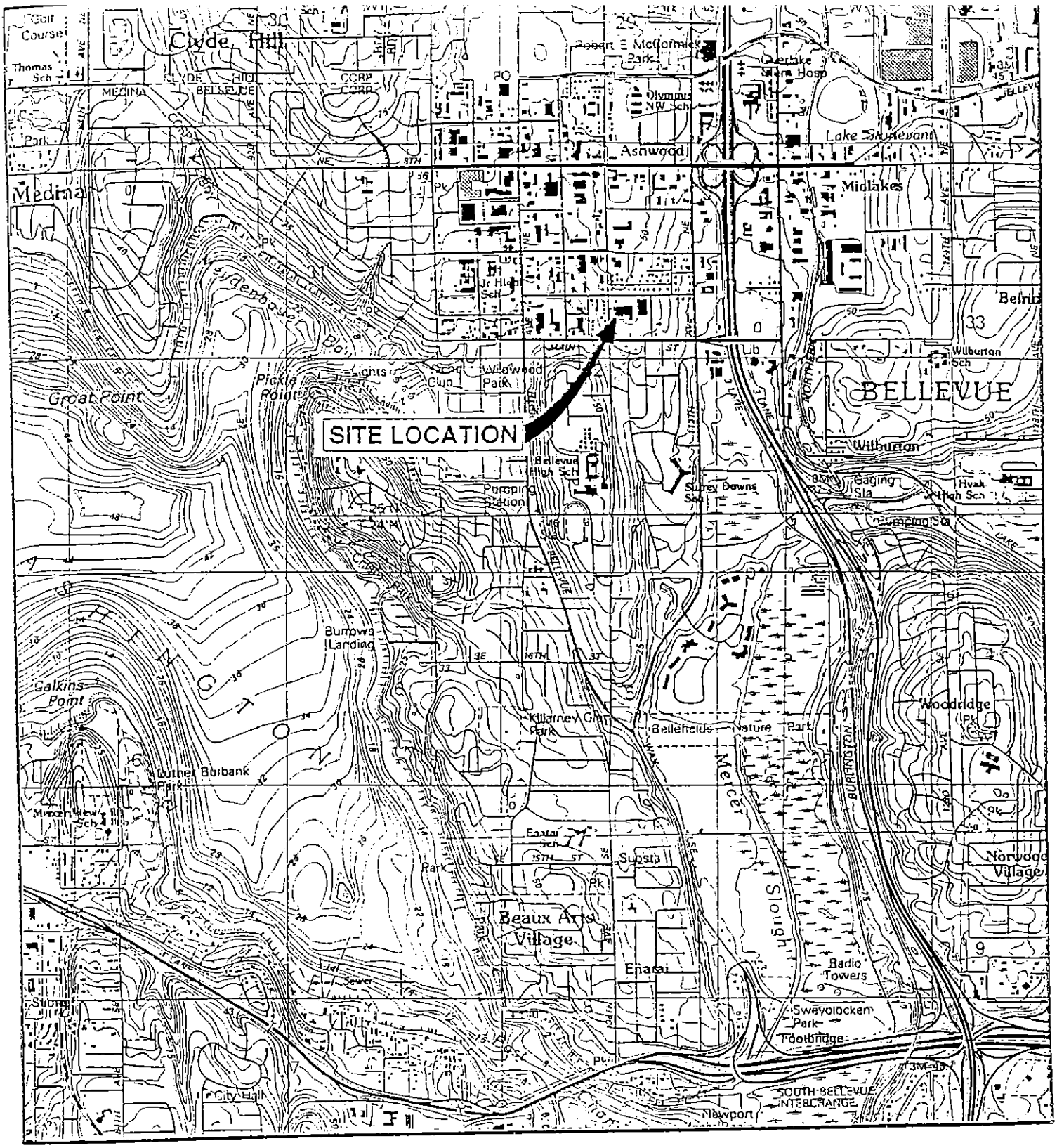
(i) Not analyzed.

(j) PCE was not detected above the indicated laboratory detection limit.

(k) First value is from onsite mobile laboratory use EPA Method 8021B. The second value is from a stationary laboratory using EPA Method 8260B.

(l) Sample result/duplicate sample result.

Figures



SCALE 1:25,000

0 1000 2000

APPROXIMATE SCALE IN FEET
1 CENTIMETER ON THE MAP REPRESENTS
250 METERS ON THE GROUND
CONTOUR INTERVAL 5 METERS

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE
BELLEVUE SOUTH, 1983.

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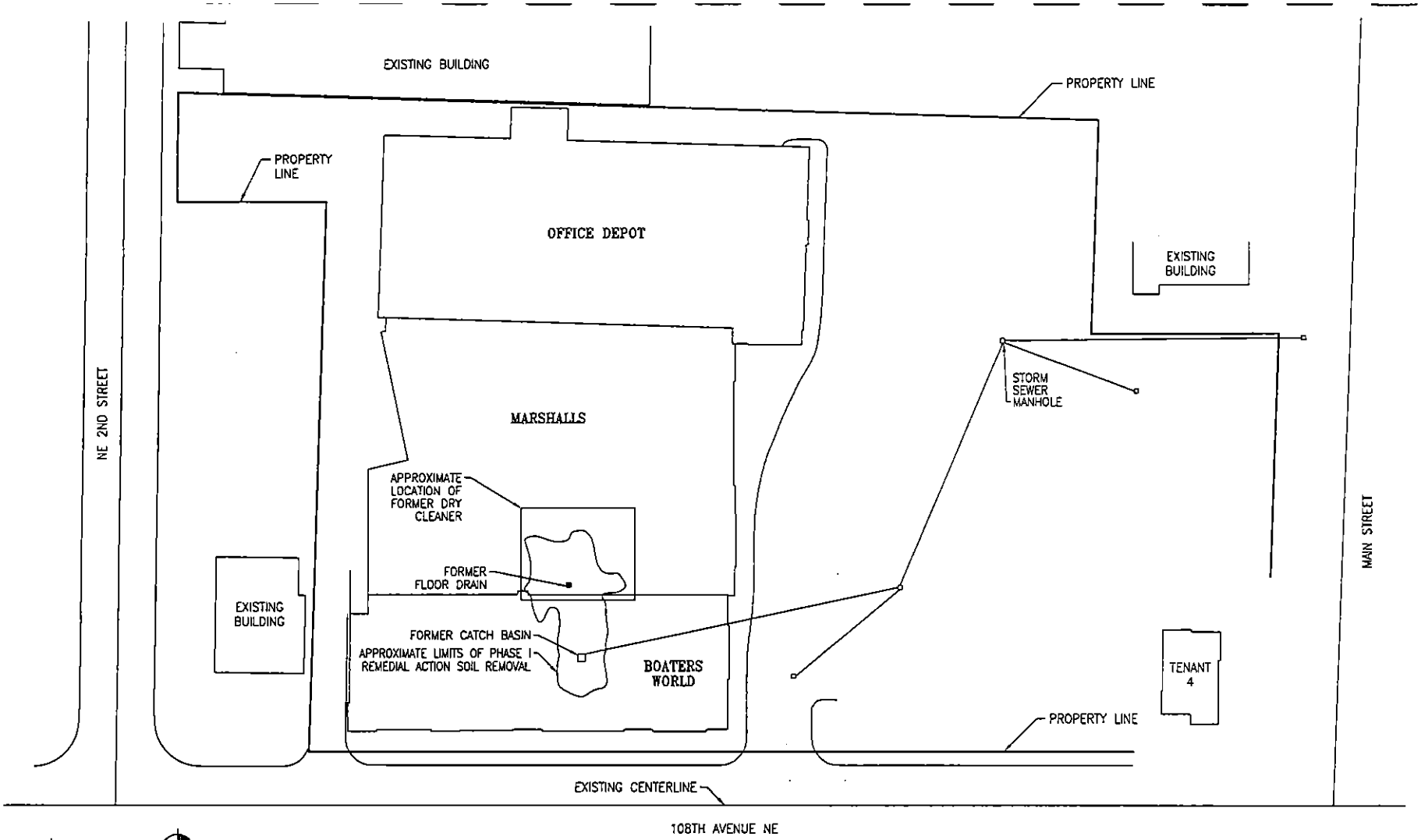
BELLEVUE, WA

SITE LOCATION MAP

946059.00/P4SK007

FIGURE 1



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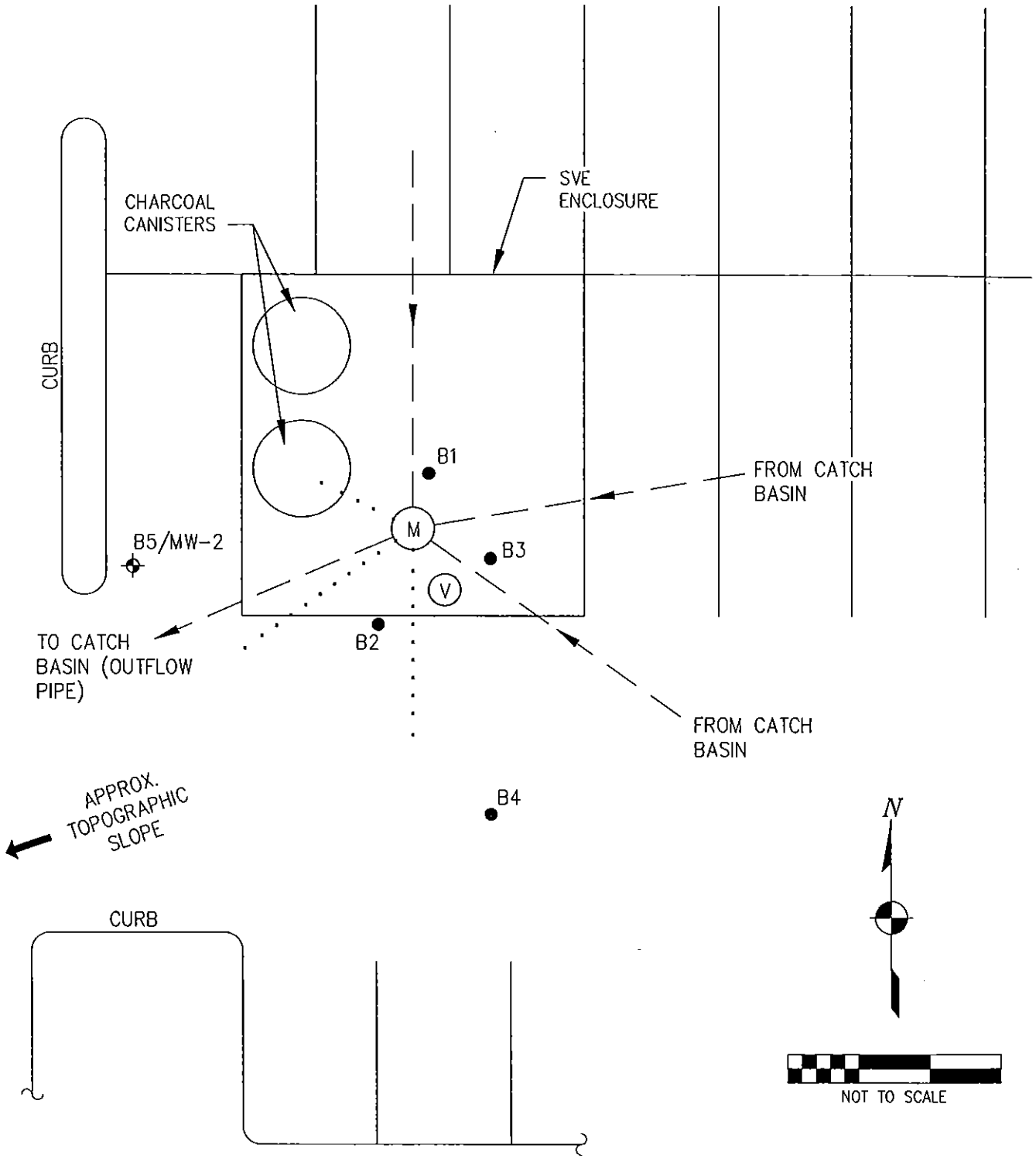
SITE PLAN

K/J 946059.00/P02SK002

FIGURE 2



LEGEND:

- EXISTING PIPES (APS TRACED)
- PLUGGED PIPES (APPROX.)
- (M) MANHOLE
- (V) VAPOR EXTRACTION WELL
- NEW WELL/BORING
- SOIL BORING LOCATION

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STORMWATER MANHOLE SOIL BORING LOCATIONS

K/J 946059.00/P02SK003

FIGURE 3