



Petroleum Remediation Program

Minnesota Pollution Control Agency

http://www.pca.state.mn.us/programs/lust_p.html

RECEIVED

Investigation Report Form

Guidance Document 4-06

FEB - 6 2006

Complete this form to document site investigation activities, including Limited Site Investigations (LSIs) and full Remedial Investigations (RIs). Do not revise or delete any text or questions from this report form. Include any additional information that is important for making a site cleanup decision. If only an LSI is necessary, you may skip Section 6 and Section 7 of this report form.

Refer to Minnesota Pollution Control Agency (MPCA) Guidance Document 1-01 *Petroleum Remediation Program General Policy* for the overall site investigation objectives, and to other MPCA guidance document for details on investigation methods. When a tank has been excavated, refer to Guidance Documents 3-01 *Excavation of Petroleum Contaminated Soil* and 3-02 *General Excavation Report Worksheet* for reporting requirements. Document the occurrence of free product using Guidance Document 2-02 *Free Product: Evaluation and Recover*, and Guidance Document 2-03 *Free Product Recovery Report Worksheet*.

MPCA Site ID: Leak: **00016075**

Date: **November 15, 2005**

Responsible Party: **Holiday Stationstores
Bruce Anthony**

R.P. phone #: **952/830-8899**

Responsible Party Address: **P.O. Box 1224
County: Hennepin**

City: **Minneapolis**
Zip Code: **55440**

Alternate Contact (if any) for Responsible Party:

phone #: **952-830-8899**

Consultant: **Liesch Associates, Inc.
Aaron Benker**

Consultant phone #: **763-489-3147**

Facility Name: **Holiday Stationstore #205**

Facility Address: **5720 Excelsior Boulevard**

City: **St Louis Park**

County: **Hennepin**

Zip Code: **55416**

Site Location Information: Complete Guidance Document 1-03a *Spatial Data Reporting Form* and include in Appendix G.

Section 1: Emergency and High Priority Sites

- 1.1 Is an existing drinking water well impacted or likely to be impacted within a two-year travel time? Yes No
- 1.2 Are there any existing field-detectable vapor impacts (OVM, explosimeter, odors, etc.)? Yes No
- 1.3 Is there an existing surface water impact as indicated by 1) a product sheen on the surface water or 2) a product sheen or volatile organic compounds in the part per million (ppm) range in ground water in a well located close to the surface water. Yes No
- 1.4 Has the release occurred in the last 30 days? Yes No
- 1.5 Has free product been detected at the site? **If YES**, attach Guidance Document 2-03 *Free Product Recovery Report Worksheet*. Yes No
- 1.6 Is a hydrogeologically sensitive aquifer impacted which is tapped by water wells within 500 feet from the release source? **If YES**, explain: Yes No
- 1.7 Has the public water supply risk assessment concluded that the site is a high priority site with respect to a public water supply well (see Guidance Document 4-18 *Public Water Supply Risk Assessment at Petroleum Remediation Sites*)? **If YES**, provide the name of the public water supply system(s) at risk. Yes No
- 1.8 Did the vapor intrusion assessment detect exceedences of soil gas action levels (see Guidance Document 4-01a *Vapor Intrusion Assessments Performed during Site Investigations*)? Yes No

If you answered *YES* to any of questions 1 through 8 above describe below the actions taken to date to reduce or eliminate the risk posed by the release.

Based on the limited nature of the release and the soil and ground water results obtained during this LSI, further vapor monitoring does not appear to be warranted.

Section 2: Site and Release Information

2.1 Attach Table 1 - Tank Information. Describe the status of the other components of the tank system(s), (i.e., piping and dispensers).

All components of the tank system are in place and operational, and are believed to be in good condition.

2.2 Describe the land use and pertinent geographic features within 1,000 feet of the site.

The site is bounded to the south by Excelsior Boulevard. Surrounding properties are mixed residential and commercial, with most commercial properties concentrated along Excelsior Boulevard. State Highway 100 is east of the site.

2.3 List other potential leak sources within 500 feet of the site.

Based on review of MPCA's "What's in My Backyard" webpage, no other known leak sites are known to exist.

2.4 Identify and describe the source or suspected source(s) of the release.

The leak occurred in a line under the northeast dispenser on the site.

2.5 What was the volume of the release? (if known): **Approximately 10 gallons**

2.6 When did the release occur? (if known): **April 27, 2005**

2.7 Provide aerial photos and Sanborn Maps of the area for the various time periods they are available.

Section 3: Excavated Soil Information

3.1 Include the Guidance Document 3-02 *General Excavation Report Worksheet* in Appendix A.

3.2 Was soil excavated for off-site treatment? Yes No

Date excavated: NA

Total Volume removed: NA cubic yards

How much of the Total Volume removed was petroleum saturated: NA cubic yards

3.3 Indicate soil treatment type:

- land treatment
- thermal treatment
- composting/biopiling
- other ()

Name and location of treatment facility:

Section 4: Extent and Magnitude of Soil Contamination

4.1 Were soil borings conducted in or immediately adjacent to all likely sources including: YES NO

- dispensers, yes no not present
- transfer areas, yes no not present
- underground storage tank basins, yes no not present
- above ground storage tank areas, yes no not present
- piping, yes no not present
- remote fill pipes, yes no not present
- valves yes no not present
- known spill areas yes no not present

4.2 To adequately define the vertical extent of contamination, soil borings should be completed at least five feet below the water table or ten feet below the deepest measurable (field screening and visual observation) contamination, whichever is deeper. Were all soil borings completed to the required depth? YES NO

4.3 To adequately evaluate site stratigraphy complete at least one boring to 20 feet below the deepest site contamination. If the water table is encountered, at least one boring a minimum of 20 feet below the water table is necessary. If a confining layer is present, drill the boring in an uncontaminated area. Was this done? YES NO

If you answered *NO* to any of the three previous questions, explain why the borings were not conducted in the required locations or to the required depths (see Guidance Document 4-01 *Soil and Ground Water Assessments Performed during Site Investigations* regarding exceptions and MPCA approval for depth of drilling):

4.4 Indicate the drilling method: hollow-stem auger
 sonic drilling
 push probes
 other

Note: MPCA staff hydrologist approval is required before use of flight augers

4.5 Discuss soil borings drilled and provide rationale for their locations. Attach boring logs in Appendix D.

Boring GP-1 was located east of the basin containing Tanks 1 and 2. Boring GP-2 was located near the northwest corner of the basin containing Tanks 1 and 2. Borings GP-3 and GP-4 were located south and north of Tank 3, respectively. These borings were located to determine whether any undetected leakage may have occurred in other areas of the site. Boring GP-5 was located near the northeast corner of the dispenser area, in the immediate area of the detected leak.

4.6 Attach Table 2 - Results of Soil Headspace Screening. In Appendix C, discuss soil headspace screening method and describe any deviation from recommended and/or required methods and procedures.

4.7 Attach Table 3 - Analytical Results of Soil Samples. Provide analytical results in Appendix B. In Appendix C, discuss soil sampling and analytical methods used and describe any deviation from recommended and/or required methods and procedures

4.8 Describe the vertical and horizontal extent and magnitude of soil contamination. Provide a plan-view map and two cross-sections that illustrate both soil head space and laboratory analytical results (Section 14).

No soil contamination was detected.



4.9 Is surface soil contamination present at the site (i.e., soil in the uppermost 2 feet that is visibly stained, contaminated at greater than 10 ppm (PID) or petroleum saturated)?

Yes No

If YES, attach site map identifying extent(s) of surface soil contamination (Section 14).
If borings were used to define extent, complete Table 4.

4.10 Attach Table 5 - Other Contaminants Detected in Soils (Petroleum or Non-petroleum Derived).
Discuss the possible sources of these compounds.

No soil contamination was detected.

4.11 Is contaminated soil in contact with ground water?

Yes No

If YES or if ground water contamination appears likely, then complete Section 5.

If NO (contaminated soil is not in contact with ground water), what is the distance separating the deepest contamination from the surface of the water table? Was this distance measured during site activities, referenced from geologic information, or estimated based on professional opinion during a site visit?

No soil contamination was detected.

4.12 Describe observations of any evidence of a fluctuating water table and a seasonal high water table (e.g., mottling). Also, from other sources of information describe the range of natural water table fluctuations in the area.

No evidence of ground water fluctuations was observed.

4.13 In your judgment, is there a sufficient distance separating the petroleum contaminated soil (or an impacted non-aquifer) from the underlying

Yes No

aquifer to prevent petroleum contamination of the aquifer? Please explain in detail. In your explanation, consider the data in this section as well as the nature of the petroleum release (i.e., volume, when it occurred, petroleum product).

The release was no more than 10 gallons. However, no contamination was detected in the soil samples collected. The LSI results indicate the release area is isolated and not expected to have adversely affected surrounding soils.

If **YES**, a ground water contamination assessment is not necessary as part of the LSI.

If **NO**, a ground water contamination assessment is necessary. Complete Section 5.

Section 5: Aquifer Characteristics/Ground Water Contamination Assessment

Complete Section 5 if groundwater has been contaminated or may become contaminated. Aquifer determination is made during the LSI. It is based upon the stratigraphy and a hydraulic conductivity measurement calculated from grain size distribution analysis. The site stratigraphy gives the context within which the hydraulic conductivity measurement can be interpreted. Please refer to Guidance Document 4-01 *Soil and Ground Water Assessments Performed during Site Investigations* for methods and requirements.

5.1 Provide an average hydraulic conductivity value (K) measured:

K = **0.283** ft/day

Indicate the method of measurement (i.e., **Hazen**, Masch and Denny, Kozeny-Carmen, etc.):
Grain-size distribution approximations by _____ method(s).

Indicate the locations and depths of soil samples submitted for grain size analyses. Provide the results of grain size analyses and other information used for the determination of K-values in Appendix F.

5.2 Calculate a range for aquifer transmissivity (T) using the equation $T = Kb$, where b is the thickness of the aquifer:

$T_{\text{High}} = \mathbf{28.3}$ ft²/day
 $T_{\text{Low}} =$ _____ ft²/day

Determine the aquifer thickness (b) from geologic logs of soil borings, water well logs, and available published information. Attach water well logs in Appendix D. If the transmissivity

of a contaminated hydrogeologic unit is greater than 50 ft²/day, it is considered an aquifer (for the purpose of the Petroleum Remediation Program), and monitoring wells will be necessary.

- 5.3** Discuss in detail the site geology and stratigraphy, including a discussion of local and regional hydrogeology, using soil boring data and cross sections, geologic logs of near-by water wells, and available published information.

According to the soil boring logs, soils on the site consist primarily of sand, silty sand and fine sand soils near the surface of the site. The Hennepin County Regional Hydrogeologic Assessment depicts the soils in the region of the site as being outwash Deposits, predominantly sand and gravels.

5.4 Attach Table 6- Water Level Measurements and Depths of Water Samples Collected from Borings. Indicate the method used to measure the water levels in borings and the depth water samples were collected from borings. Allow water levels in borings to equilibrate to static conditions and then adjust the effective screened intervals in borings to intercept the static water table prior to water sample collection. Discuss groundwater flow direction.

Ground water flow direction was not calculated from data obtained from the temporary geoprobe borings. However, static water levels were measured using a solinst in borings which produced measurable water. Ground water flow direction is anticipated to be in an easterly direction towards the Mississippi River, which is approximately 7.2 miles east of the site.

5.5 Attach Table 7 - Analytical Results of Water Samples Collected from Borings. Summarize the analytical results of groundwater samples collected as part of an LSI. Discuss the extent and magnitude of groundwater contamination. Also provide a discussion on QA/QC, including information on the samples collected and laboratory analyses performed.

Ground water was only encountered in GP-2 at 42 feet bgs. Ground water sampling conducted during the LSI identified benzene in GP-2 at 890 ppb, above the HRL of 10 ppb. GRO was detected at 1500 ppb, above the HBV of 200 ppb. All other ground water contaminants were below the HRLs. Refer to Table 7. Based on the limited HRL exceedence for ground water contaminants and the lack of ground water receptors in the area, further assessment of ground water is not recommended.

5.6 Attach Table 8 - Other Contaminants Detected in Water Samples Collected from Borings (Petroleum or Non-petroleum Derived). Discuss the possible sources of these contaminants and provide a discussion of QA/QC information.

sec-Butylbenze was detected at 2.4 ppb, isopropylbenze was detected at 4.7 ppb, p-isopropyltoluene was detected at 1.6 ppb, naphthalene was detected at 17 ppb, n-propylbenzene was detected at 8.0 ppb, 1,2,4-trimethylbenzene was detected at 58 ppb, and 1,3,5-trimethylbenzene was detected at 15 ppb in GP-2. These are all petroleum related contaminants, and most likely are due to a petroleum leak at the site. The concentrations of these contaminants do not appear to pose a significant risk to human health or the environment.

5.7 Laboratory certification number: MDH #027-137-157

Additional Ground Water Investigation

Complete **Section 6** only if: 1) *an aquifer has been impacted at or above Minnesota Department of Health HRLs*, 2) *an aquifer has been impacted below the HRLs, but the levels are likely to reach the HRLs*, or 3) *there is an insufficient distance separating the petroleum contaminated soil (or an impacted non- aquifer) from the underlying aquifer*. Complete **Section 7** only if remediation is anticipated. Regardless of whether you are submitting an *LSI* or a *full RI*, all sections following Section 7 must be completed.

~~Section 6. Extent and Magnitude of Ground Water Contamination~~

- 6.1** Discuss drilling and installation of wells, including the rationale for their locations. Attach boring logs in Appendix D.
- 6.2** Attach Table 9 - Monitoring Well Completion Information.
- 6.3** Attach Table 10 - Summary of Water Levels Measured in Wells.
- 6.4** Attach Table 11 - Analytical Results of Water Samples Collected from Wells. Indicate here whether samples were purged or unpurged (see Guidance Document 4-05). If purged, indicate purging method.
- 6.5** Attach Table 12 - Other Contaminants Detected in Water Samples Collected from Wells (Petroleum or Non-Petroleum Derived). Indicate here whether samples were purged or unpurged (see Guidance Document 4-05). If purged, indicate purging method.
- 6.6** Describe the extent and magnitude of the ground water contamination. Discuss the presence of non-petroleum compounds, if detected, and identify possible sources of these compounds. Also provide a discussion on QA/QC, including information on the samples collected and laboratory analyses performed.
- 6.7** Is there a clean or nearly clean (below HRLs) down-gradient monitoring well Yes No located along the longitudinal axis of the contaminant plume? (approximately 20 degrees plus or minus the axis)
- 6.8** Is there a worst case well completed through the source area(s) of the release? Yes No

If you have answered *NO* to any of the above two questions, please explain why a well was not completed in the required location.

- 6.9** Provide an estimate of the longitudinal length of the dissolved contaminant plume: _____ feet

- 6.10 Calculate groundwater flow velocity (based on Darcy's Law) using the average K-value, average horizontal hydraulic gradient, and effective porosity. Provide documentation in Appendix F.

Hydraulic Conductivity (K) = Method
 Porosity (n) = method/reference
 Average horizontal gradient (dh/dl) =
 Calculated GW velocity (v) = cm/s ft/day

- 6.11 Using the calculated groundwater flow velocity (above), is there a receptor within a five-year travel time? Yes No

If **YES**, provide the unique well number and identify the location of the receptor(s).

- 6.12 Were any deep monitoring wells completed at the site? Yes No

If **YES**, list them and indicate their depths:

Contact the MPCA project hydrologist before installing a deep monitoring well. A deep monitoring well may be necessary if: 1) Contamination exists more than 10 feet below the water table or 2) the impacted aquifer is a drinking water aquifer or is hydraulically connected to the aquifer(s) presently utilized by a water supply well located within 500 feet of the release source.

If contamination is present at depth in the aquifer or in deeper aquifers, additional deep wells may be required. Provide the following information if deep wells are installed:

Vertical Gradient (dv/dl)
 Inferred GW Flow Direction

Provide the following information for the deep aquifer unit if it appears to be hydrogeologically distinct from the upper unit.

Porosity (n):
 Hydraulic Conductivity (K)

Submit this RI report after completing a minimum of *two quarterly sampling events*. Groundwater monitoring should continue until MPCA response is received.

Section 7: Evaluation of Natural Attenuation

Refer to the Guidance Document 4-03 *Assessment of Natural Attenuation at Petroleum Release Sites*. **Note:** Evaluation of natural attenuation is not required unless requested by MPCA staff.

7.1 Attach Table 13 - Natural Attenuation Parameters. Discuss the results. Specifically, compare the concentrations of the inorganic parameters inside and outside the plume.

7.2 In your judgment, is natural biodegradation occurring at this site? Please Yes No explain.

If active remediation is anticipated, discuss reasons why natural attenuation (including biodegradation) can not adequately remediate the contaminants to acceptable risk levels.

Section 8: Well Receptor Information/Assessment

Include in Appendix E, copies of the water supply well logs obtained from MGS, MDH, drillers, and where applicable, from County well management authorities.

8.1 Attach Table 14 - Properties Located Within 500 Feet of the Release Source. Provide a map identifying the features listed in Table 13.

8.2 Were all property owners within 500 feet of the release source successfully contacted to determine if water wells are present? Yes No **If NO**, please explain.

The properties located within a 500-foot radius from the site are connected to the City water/sewer system.

8.3 Attach Table 15 - Water Supply Wells Located within 500 Feet of the Release Source and Municipal or Industrial Wells Within 1/2 Mile.

8.4 Discuss the results of the ground water receptor survey and any analytical results from sampling conducted at nearby water wells. Comment on the risks to water supply wells identified within 500 feet from the release source as well as the risk posed by or to any municipal or industrial wells found within 1/2 mile. Specifically indicate whether water supply wells identified utilize the impacted aquifer. (Note: an impacted aquifer separated from another aquifer by a clay lens may not be considered a separate aquifer).

No water supply wells were identified within a 500 foot radius of the Property. All wells located within 1/2 mile of the property are screened at several ten to hundred feet below grade and would not be expected to be a risk from the minimal ground water impacts identified at the site.

8.5 Is municipal water available in the area? Yes No

8.6 Are there any plans for ground water development in the impacted aquifer within 1/2 mile of the site, or one mile down-gradient of the site if the aquifer is fractured? Please give the name, title and telephone number of the person that was contacted for this information (below). Yes No

Name: Scott Anderson

Title: City of St Louis Park Superintendent of Utilities

Telephone 952-924-2557

Section 9: Surface Water Risk Assessment

9.1 Are there any surface waters or wetlands located within ¼ mile of the site? Yes No

If **YES**, list them:

Also list any potential pathway such as ditches, drain tiles, storm sewers, etc., that may lead to the identified surface water features.

9.2 If surface water is present down-gradient of the site, is there a clean down-gradient monitoring well (temporary or permanent) located between the site and the surface water? YES
 NO
 N/A

9.3 If you answered **NO** to question 9.2, we assume that contamination discharges to surface water. Therefore, complete the following information:

Name of receiving water:

Receiving water classification

ORVW?

Yes No

Plume width, (W):

feet

Plume thickness, (H):

feet

Hydraulic conductivity, (K):

gal/day/ft²

Horizontal gradient, (dh/dl):

(unitless)

Discharge, (Q) = $H*W*K*(dh/dl)/1440$

gal/min

Applicable chronic standard (7050 or 7052)

Applicable max. standard (7050 or 7052)

Applicable FAV (7050 or 7052)

Contaminant concentration in ground water

9.4 If you answered **YES** to question 9.2, identify the clean down-gradient boring or monitoring well, the distance to the surface water feature, and discuss the contamination risk potential.

Section 10: Field-Detectable Vapor Risk Assessment/Survey

10.1 Is there a history of vapor impacts in the vicinity of the site ? Yes No

If YES, describe:

10.2 Is there any indication that free product or contaminated ground water may be traveling off-site within the utility corridors? Yes No

If YES, utility backfill investigation is required (refer to Guidance Document 4-01). Discuss the investigation rationale and results.

10.3 Discuss the potential for vapor migration/accumulation near the site. Your discussion should consider: Soil types, product type, presence and distribution of free product or high concentrations of dissolved product. Also, using cross-sections to illustrate the relationship, compare the depth of contamination with the location of underground utility lines, location and depth of storm and sanitary sewers, and location of nearby basements and sumps.

Based on the lack of soil impacts detected, vapor migration does not appear to represent a significant risk for the Property.

10.4 Conduct a vapor survey if the vapor risk assessment indicated a risk of vapor impacts to buildings or utilities. Ask occupants of nearby buildings if they have smelled petroleum odors. See Guidance Document 4-02 *Potential Receptor Surveys and Risk Evaluation Procedures at Petroleum Release Sites*. Identify all vapor monitoring locations on an attached site map by labeling each monitoring location with a number. Tabulate the list of vapor monitoring locations in Table 16. Vapor monitoring methods, including instruments used, must be discussed in Appendix C. Provide a detailed description of each vapor monitoring location and an interpretation of the vapor monitoring results below.

10.5 Attach Table 16 - Results of Vapor Monitoring.

Section 11: Soil Gas-Based Vapor Intrusion Screening Assessment

11.1 When significant contamination and receptors are present at a site, a vapor intrusion screening assessment must be conducted (See Guidance Document 4-01a *Vapor Intrusion Assessments Performed during Site Investigations*). Soil gas samples must be completed in the worst case area and at four radial points within a 100' radius. The radial points should be located near inhabited buildings, if there are four or less. If not, they should be located uniformly within the 100' radius. Was this done?

Yes No

If NO, explain why. Only one on-site structure exists within 100 feet so 1 radial boring SV-2 was completed

ok

11.2 Do any of the soil gas samples from points located near inhabited buildings exceed the action levels found in GD 4-01a?

Yes No

If YES, is sub-slab vapor or indoor air sampling needed for these buildings? Describe and discuss locations needing further assessment. Based on the limited nature of the release and the soil and ground water results obtained during this LSI, further vapor monitoring does not appear to be warranted.

Yes No

11.3 Has sufficient data been collected to propose a conceptual Corrective Action Design (CAD) for buildings that are likely to be impacted by elevated soil gas levels and/or field detectable vapor impacts? *Describe your justification for corrective action and proposed conceptual CAD.*

Yes No

11.4 Do any of the soil gas samples from the non-building specific samples within the 100' radius exceed action levels?

Yes No

If YES, and there are many inhabited buildings nearby, is additional building specific soil gas sampling recommended for all these buildings? Describe your proposal for additional sampling. If NO, explain.

Yes No

If YES, are additional soil gas samples recommended to assess the full extent of the soil gas cloud? Describe your proposal for additional sampling. If NO, explain.

Yes No

11.5 Were recommended field sampling procedures and QA/QC from Guidance Document 4-01a followed? Were required laboratory QA/QC objectives met?

Yes No

If NO, explain why and discuss implications on data quality.

11.6 Include a map (Section 14) which shows locations of all soil gas samples and buildings within and at the 100' radius and locations of all soil gas samples exceeding action levels. Include other locational information that may help in evaluating the questions above.

Section 12: Discussion

12.1 Discuss the risks associated with the remaining soil contamination:

Soil contaminants were not identified in any of the samples collected during the completion of this LSI. Therefore, the risk for vapor and contaminant migration is anticipated to be low.

12.2 Discuss the risks associated with the impacted ground water:

Ground water was only encountered in GP-2 at 42 feet bgs. Ground water sampling conducted during the LSI identified benzene in GP-2 at 890 ppb, above the HRL of 10 ppb. GRO was detected at 1500 ppb, above the HBV of 200 ppb. All other ground water contaminants were below the HRLs. Refer to Table 7. Based on the limited HRL exceedence for ground water contaminants and the lack of ground water receptors in the area, further assessment of ground water is not recommended. The concentrations of these contaminants do not appear to pose a significant risk to human health or the environment.

12.3 Discuss the risks for vapor intrusion associated with any soil gas impacts detected:

Based on the limited nature of the release and the soil and ground water results obtained during this LSI, further vapor monitoring does not appear to be warranted.

12.4 Discuss other concerns not mentioned above:

None

Section 13: Conclusions and Recommendations

- 13.1 Recommendation for site:
- site closure
 - additional ground water monitoring
 - additional field detectable vapor monitoring
 - additional soil gas/vapor intrusion investigation
 - corrective action

13.2 Base the recommendation above on Guidance Document 1-01 *Petroleum Remediation Program General Policy*. Describe below how you applied the policy to support your recommendation. If closure is recommended, please summarize significant site investigative events and describe how site specific risk issues have been adequately addressed or minimized to acceptable low risk levels.

Based on the MPCA guidance Document Fact Sheet #1-01, “the MPCA leaking Underground Storage Tank (LUST) program takes a risk-based approach to corrective action at petroleum sites.” The risks targeted are those posed by:

- **Contaminated groundwater that has impacted or may impact human health**
- **Subsurface contamination that has led to or may lead to petroleum vapor impacts to people or structures; and**
- **Contamination that has impacted or may impact surface water quality;**

“The policy’s consideration of risk posed by soil contamination is limited to its potential to contaminate groundwater or surface water or lead to vapor impacts, rather than the risk it poses from direct exposure (i.e. dermal contact or ingestion). This reasoning is based on the potential rapid degradation of petroleum compounds at the surface and the expectation that under most tank conditions scenarios, very little direct soil exposure potential exists”.

As described in this LSI report:

1. **The extent and magnitude of soil contamination has been defined vertically and horizontally.**
2. **There were no identified commercial or residential wells within a 500-foot radius of the site.**
3. **There is no history of vapor impacts in the vicinity of the site and the risk of vapor accumulation at the site appear to be minimal.**
4. **As discussed in section 11, there appears to be no immediate risk associated with the remaining soil or groundwater contamination.**

Based on the findings above, Liesch, on behalf of Holiday Companies, requests site closure to be issued for MPCA Leak ID#0016075 and no further action or monitoring be required for this Leak Site.

- 13.3** If additional ground water and/or vapor monitoring is recommended, indicate the proposed monitoring schedule and frequency. Conduct quarterly monitoring until the MPCA responds to this report.
- 13.4** If additional soil gas/vapor intrusion investigation is recommended, indicate whether there is risk to a specific building or whether additional soil gas definition is necessary. Provide a detailed analysis of the initial soil gas and receptor information leading to these recommendations. Provide details of proposed activities such as sub-slab vapor and/or indoor air sampling, or locations of additional borings for sampling soil gas. If vapor intrusion, or conditions indicative of a high risk of vapor intrusion, has already been established, then corrective action is required. Refer to 13.5 below.
- 13.5** If corrective action is recommended, provide a conceptual approach by completing Guidance Document 4-19 *Conceptual Corrective Action Design Worksheet* and include it as Appendix H. See Guidance Document 4-10 *Elements of the Corrective Action Design* for more information on the corrective action design process and other requirements. (Note: MPCA staff will review this report at a higher-than-normal priority to determine if corrective action is required.)

Section 14: Figures

Attach the following figures in order of discussion in the text:

- Site location map using a U.S. Geological Survey 7.5 minute quadrangle map.
- One or more site maps showing:
 - Structures
 - Locations and depths of on-site buried utilities
 - All past and present petroleum storage tanks, piping, dispensers, and transfer areas.
 - Extent of soil excavation
 - Boring and well locations (including any drinking water wells on site)
 - Horizontal extent of soil contamination
 - Extent of surface soil contamination
 - Soil gas sampling locations and extent of the soil gas cloud
 - Horizontal extent of ground water contamination
 - Location of end points for all geologic cross sections.
 - Potential pathways to surface water features within ¼ mile of the site.

Distinguish sequential elements of investigations by dates, symbols, etc. in the key.

- Ground water gradient contour maps (for sites with monitoring wells) for each gauging event.
- Well receptor survey map showing 1/2 mile radius, 500 foot radius, water supply wells, other potential sources of contamination, using a U.S. Geological Survey 7.5 minute quadrangle.
- Vapor survey map showing utilities and buildings with basements and monitoring locations (if a survey was required).
- Provide at least two (2) geologic cross sections, including utilities.
- Vapor intrusion assessment map showing all soil gas boring locations and buildings within and at a 100 feet radius of the worst case soil gas boring
- Aerial photos and Sanborn Maps of the immediate area.

Section 15: Tables

**Table 1
Tank Information**

Tank #	UST or AST	Capacity	Contents	Year Installed	Status*	Condition
001	UST	8,000	Gasoline	1965	Active	Reconditioned
002	UST	12,000	Gasoline	1981	Active	Reconditioned
003	UST	12,000	Gasoline	1981	Active	Reconditioned

**Indicate: removed (date), abandoned in place (date), or currently used, upgraded tank, installation of new tank.*

Notes:

Table 2
Results of Soil Headspace Screening

Depth (ft)	Soil Boring								
	GP- 1	GP-2	GP-3	GP-4	GP-5	6	7	8	9
0-4	0	0	0	0	0				
4-8	0	0	0	0	0				
8-12	0	0	0	0	6				
12-16	0	0	0	0	12				
16-20	0	12	---	0	0				
20-24	0	6	---	---	0				
24-28	0	0	---	---	---				
28-32	13.2	2.1	---	---	---				
32-36	114	2.8	---	---	---				
36-40	---	---	---	---	---				
40-44	---	2.3	---	---	---				

List instruments used and discuss field methods and procedures in Appendix C.
Notes:

Table 3
Analytical Results of Soil Samples

Boring, Depth(ft)	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO	Lab Type
GP-1 (32-36)	6/9/05	<0.1	<0.1	<0.07	<0.2	<5	NS	Fixed
GP-2 (42-44)	6/9/05	<0.1	<0.1	<0.07	<0.2	<5	NS	Fixed
GP-3 (18-20)	6/9/05	<0.1	<0.1	<0.07	<0.2	<5	NS	Fixed
GP-4 (16-20)	6/9/05	<0.1	<0.1	<0.07	<0.2	<5	NS	Fixed
GP-5 (12-16)	6/9/05	<0.1	<0.1	<0.07	<0.2	<5	NS	Fixed

Report results in mg/kg. Use less than symbols to show detection limit. Indicate mobile or fixed based in the lab type column.

Table 4
Surface Soil Assessment

Sample #	Headspace > 10 ppm (Y/N)	Petroleum Saturated (Y/N)

Notes:

Table 5
Other Contaminants Detected in Soils (Petroleum or Non-petroleum Derived)

Boring, Depth (ft)	Date Sampled						Lab Type

Report results in mg/kg. Indicate other contaminants (either petroleum or non-petroleum derived) detected in soil collected from borings.

Notes:

Table 6
Water Level Measurements and Depths of Water Samples Collected from Borings

	Soil Boring									
	GP-1	GP-2	GP-3	GP-4	GP-5	6	7	8	9	10
Static Water level depth (ft)	No water	43'	No water	No water	No water					
Sampled Depth (ft)		43-44'								

Describe in Appendix C, the methods and procedures used to measure water levels in borings.

Notes:

Table 7
Analytical Results of Water Samples Collected from Borings

Boring Number	Date Sampled	Sampled Depth	Benzene	Toluene	Ethyl benzene	Xylenes	MTBE	GRO	DRO	Lab Type
GP-2	6/9/05	43-46'	890	81	12	141	<1.0	1,500	NS	Fixed
Trip Blank										
Field Blank										
Lab Blank										
HRL			10	1000	700	10000		200		

Report results in ug/L. Use less than symbols to show detection limit. Indicate mobile or fixed based in the lab type column.

Notes:

Notes-NS - Not Sampled

Table 8
Other Contaminants Detected in Water Samples
Collected from Borings (Petroleum or Non-petroleum Derived)

Boring Number	Date Sampled	Sec-Butylbenzene	Isopropylbenzene (Cumene)	p-Isopropyltoluene	Naphthalene	n-Propylbenzene	1,2,4-TMB	1,3,5-TMB
GP-2	6/9/05	2.4	4.7	1.6	17	8.0	58	15
Trip Blank								
Field Blank								
Lab Blank								
HRL (ug/L)		---	300	---	300	---	---	---

Report results in ug/L. Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes.

Notes:

Table 9
Monitoring Well Completion Information

Well Number	Unique Well Number	Date Installed	Surface Elevation	Top of Riser Elevation	Bottom of Well (Elevation)	Screen Interval (Elev. - Elev.)

Notes: (location and elevation of benchmark)

Table 10
Water Level Measurements in Wells

Well Number	Date Sampled	Depth of Water from Top of Riser	Product Thickness	Depth of Water Below Grade	Relative Groundwater Elevation	Water Level Above Screen (Y/N)

Describe in Appendix C, the methods and procedures used to measure water levels.

Notes:

Table 11
Analytical Results of Water Samples Collected from Wells

Well #	Date Sampled	Benzene	Toluene	Ethyl benzene	Xylenes	MTBE	GRO	DRO	Lab Type
MW-1									
MW-2									
MW-3									
MW-4									
Trip Blank									
Field Blank									
Lab Blank HRL(ug/L)		10	1000	700	10000				

Report results in ug/L. Use less than symbols to show detection limit. Indicate mobile or fixed based in the lab type column.

Notes:

Table 12
Other Contaminants Detected in Water Samples
Collected from Wells (Petroleum or Non-petroleum Derived)

Well Number	Date Sampled	1,2 DCA	EDB				
MW-1							
MW-2							
MW-3							
Field Blank							
Trip Blank							
Lab Blank							
HRL (ug/L)		4	0.004				

Report results in ug/L. Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes.

Notes:

Table 13
Natural Attenuation Parameters

Monitoring Well	Sample Date	Temp. °C	pH	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	(Fe II) (mg/L)	(H ₂ S, HS ⁻) (mg/L)
MW-1							
MW-2							
MW-3							
MW-4							

In Appendix C, describe the methods and procedures used.
Notes:

**Table 14
Properties Located Within 500 Feet of the Release Source.**

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply Utilized (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)
1	5813 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
2	5809 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
3	5717 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
4	5707 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
5	4015 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
6	5720 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
7	5810 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
8	5804 Excelsior Blvd	N	Assumed	NA	Y	Y	N	N	
9	3980 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
10	5900 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
11	3941 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
12	3945 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
13	3949 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
14	3953 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
15	3957 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	3961 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	3965 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	

Table 14
Properties Located Within 500 Feet of the Release Source.

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply Utilized (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)
S	3969 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3973 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	4022 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3970 Zarathan Ave	N	Assumed	NA	Y	Y	N ?	N	
S	3966 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3960 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3956 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3952 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3948 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3944 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3940 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3941 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	
S	3945 Zarathan Ave	N	Returned Postcard	NA	Y	Y	Y	N	
S	3949 Zarathan Ave	N	Assumed	NA	Y	Y	N	N	

Table 14
Properties Located Within 500 Feet of the Release Source.

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply Utilized (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)
S									
	3953 Zarathan Ave S	N	Returned Postcard	NA	Y	Y	Y	N	
	3957 Zarathan Ave S	N	Returned Postcard	NA	Y	Y	Y	N	
	3961 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	3965 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	3969 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	3973 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	3977 Zarathan Ave S	N	Assumed	NA	Y	Y	N	N	
	4015 Yosemite Ave S	N	Assumed	NA	Y	Y	N	N	
	4019 Yosemite Ave S	N	Assumed	NA	Y	Y	N	N	
	4023 Yosemite Ave S	N	Assumed	NA	Y	Y	N	N	
	4027 Yosemite Ave S	N	Assumed	NA	Y	Y	N	N	
	4031 Yosemite Ave S	N	Assumed	NA	Y	Y	N	N	
	4035 Yosemite Ave S	N	Returned post card	NA	Y	Y	Y	N	

Table 14
Properties Located Within 500 Feet of the Release Source.

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply Utilized (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)
	3936 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3940 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3944 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3948 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3952 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3956 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3962 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3970 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3937 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
		N	Returned Postcard	NA	Y	Y	Y	Y	Resident noted natural gas odor. Liesch contacted residence and advised they immediately contact their local gas supplier
	3940 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3945 Xenwood Ave S	N	Assumed	NA	Y	Y	N	N	
	3949 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	

Table 14
Properties Located Within 500 Feet of the Release Source.

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply Utilized (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)
	S 3983 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4020 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4024 Xenwood Ave	N	Returned Postcard	NA	Y	Y	Y	N	
	S 4028 Xenwood Ave	N	Returned Postcard	NA	Y	Y	Y	N	
	S 4032 Xenwood Ave	N	Returned Postcard	NA	Y	Y	Y	N	
	S 4036 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4040 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4044 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4045 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4041 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4037 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	
	S 4033 Xenwood Ave	N	Returned Postcard	NA	Y	Y	Y	N	
	S 4021 Xenwood Ave	N	Assumed	NA	Y	Y	N	N	

Table 14
Properties Located Within 500 Feet of the Release Source.

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply Utilized (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)

*E.g., visual observation, personal contact, telephone, returned postcard, assumed (i.e., no postcard returned).

**E.g., domestic, industrial, municipal, livestock, lawn/gardening, irrigation.

Table 16
Results of Field Instrumented Vapor Monitoring

Location # and description	Date	PID reading (ppm)	Percent of the LEL

Location numbers must match locations on the site map. Provide a brief description of the monitoring point (e.g., sump, basement corner, sanitary sewer manhole, storm sewer basin, etc.).

Notes:

Table 17
Results of Soil Gas Sampling for Vapor Intrusion Screening

Sample Location	Worst Case		Radial #1		Radial #2		Radial #3		Radial #4		ACTION LEVEL	
	Date	Depth (feet)	Result	Report Limit	Result	Report Limit	Result	Report Limit	Result	Report Limit		
	6/9/05	3-5'	6/9/05	1-3'								
COMPOUNDS	Result	Report Limit	Result	Report Limit	Result	Report Limit	Result	Report Limit	Result	Report Limit	$\mu\text{g}/\text{m}^3$	Source: HRV, ISC, or RFC
Benzene	4.6	0.93	1,100,000	45,000							1000	HRV
MEK	67.2	0.86	---	---							10,000	HRV
Chloroethane	ND	0.77	5360	3800								
Carbon tetrachloride	59.5	1.9	ND	9000							0.67	ISC
Cyclohexane	85.4	4.9	---	---							6000	RfC
Dichlorodifluoromethane	1210	700	ND	7000								
Ethylbenzene	3.6	1.3	181,000	61,000							10,000	HRV
Ethyltoluene	11.6	3.6	---	---								
Naphthalene	48.5	3.9	---	---							3.0	RfC
PCE	81.1	2.0	ND	9700							20,000	HRV
Toluene	14.4	1.1	2,220,000	5,000							37,000	HRV
TCE	6.8	1.6	ND	7600							2000	HRV
Trichlorofluoromethane	16.1	1.6	ND	8000								
2,4-TMB	45.5	3.6	78,500	69,000							6.0	RfC
1,3,5-TMB	12.6	3.6	55,000	7000							6.0	RfC
Xylene (total)	23.1	3.8	742,000	181,000							43,000	HRV

Report results in $\mu\text{g}/\text{m}^3$. The Action Level should be indicated along with the source. When selecting the Action Level, keep in mind the priority of sources we have requested you use.

Section 16: Appendices

Attach the following appendices.

- Appendix A* Guidance Document 3-02 *General Excavation Report Worksheet*.
- Appendix B* Laboratory Analytical Reports for Soil, Soil Gas/Sub-slab Vapor/Indoor Air/Ambient Air, and Ground Water. Include laboratory QA/QC data, Chromatograms, and laboratory certification number.
- Appendix C* Methodologies and Procedures, Including Field Screening of Soil, Other Field Analyses, Soil Boring, Soil Sampling, Soil Gas/Sub-Slab/Indoor air/Ambient Air Sampling, Well Installation, and Water Sampling.
- Appendix D* Geologic Logs of Soil Borings, Including Construction Diagrams of Temporary and Permanent Wells, and Copies of the Minnesota Department of Health Well Record.
- Appendix E* Copies of Water Supply Well Logs With Legible Unique Numbers.
- Appendix* Grain Size Analysis, Hydraulic Conductivity Measurements, and Other Calculations.
- Appendix F* Guidance Document 1-03a *Spatial Data Reporting Form*.
- Appendix H* Guidance Document 4-19 *Conceptual Corrective Action Design Worksheet*

Section 17: Consultant (or other) Information

By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leak site. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in reduction of reimbursement awards. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 (1994) or Minn. R. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.

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Name and Title:

Signature:

Date signed:

Aaron Benker, Project Manager



7-31-06

Company and mailing address:

Liesch Associates, Inc.

13400 15th Avenue North

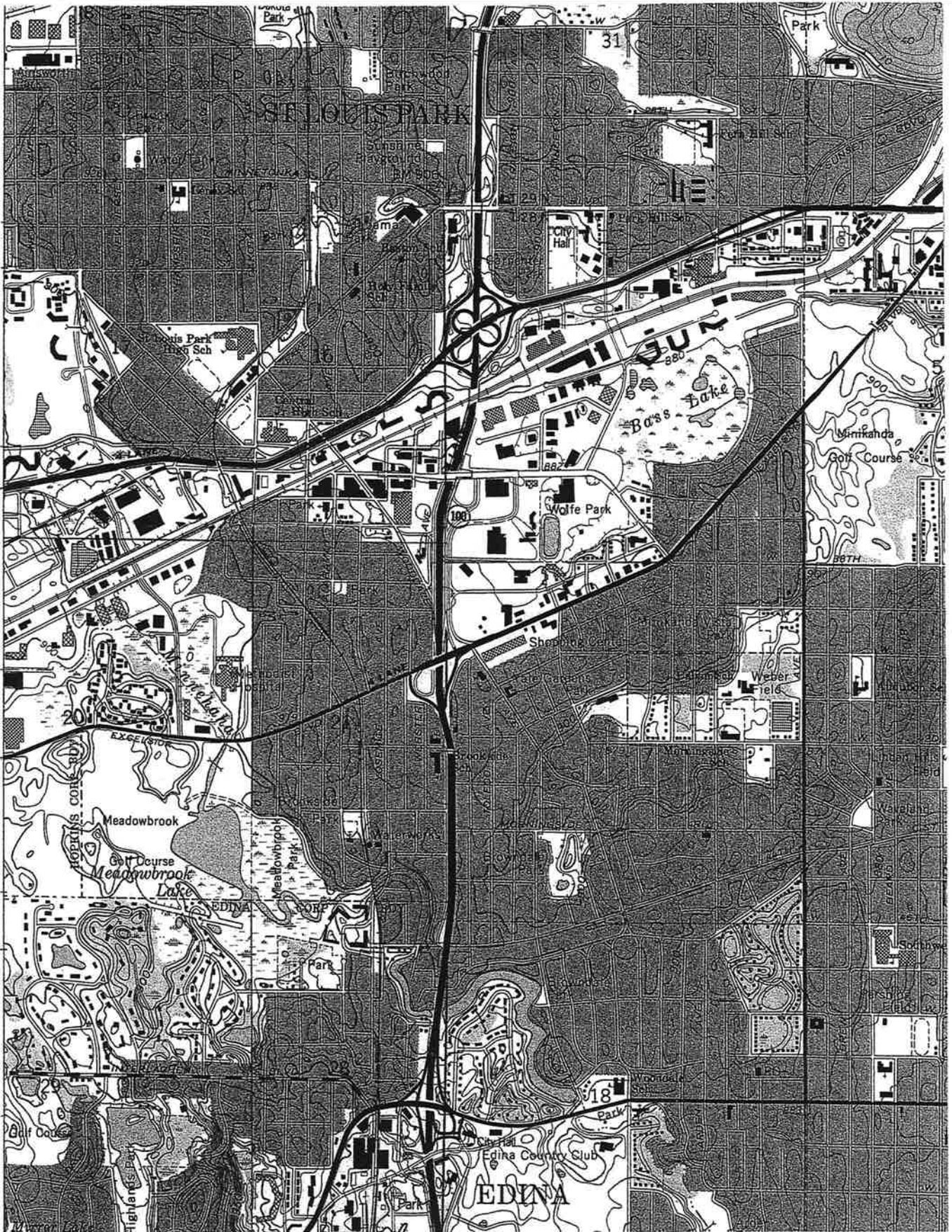
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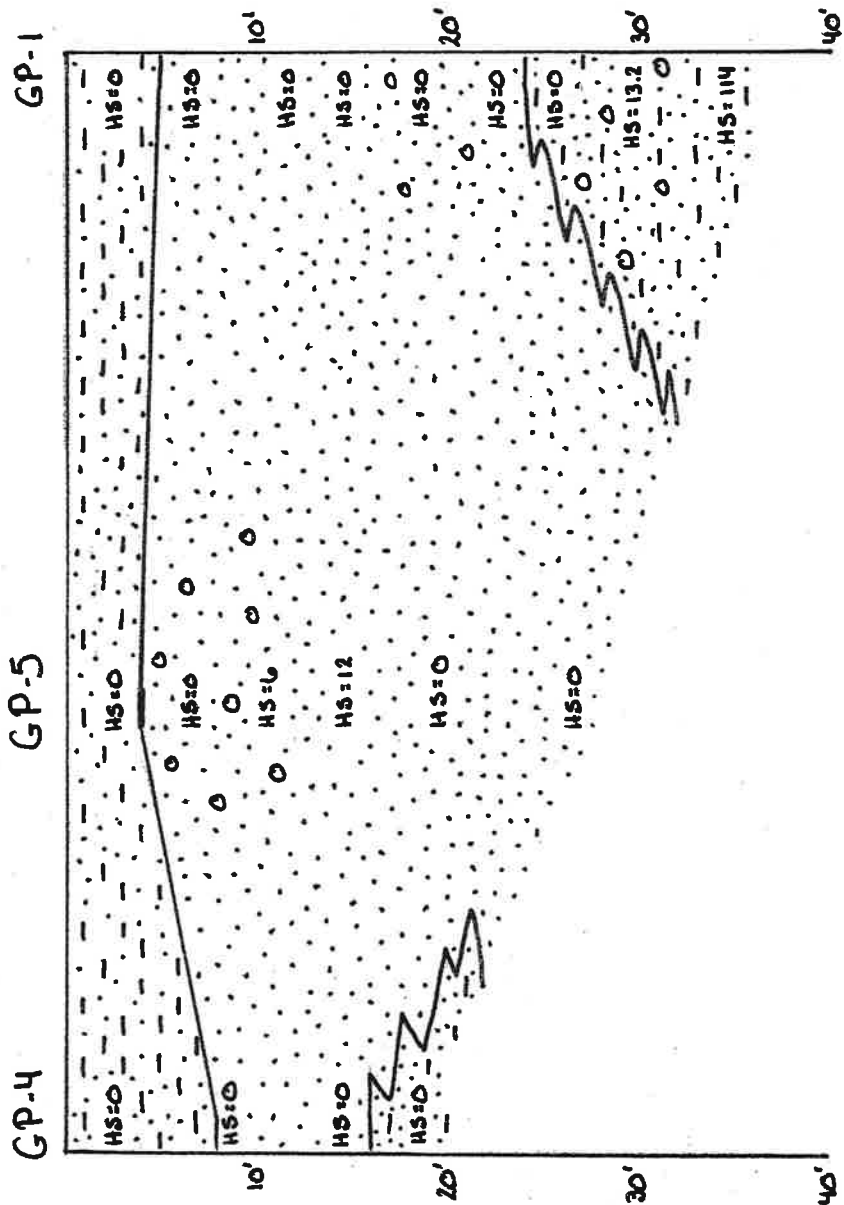
Site Location

Nov 05




Figure #1

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11/14/2005



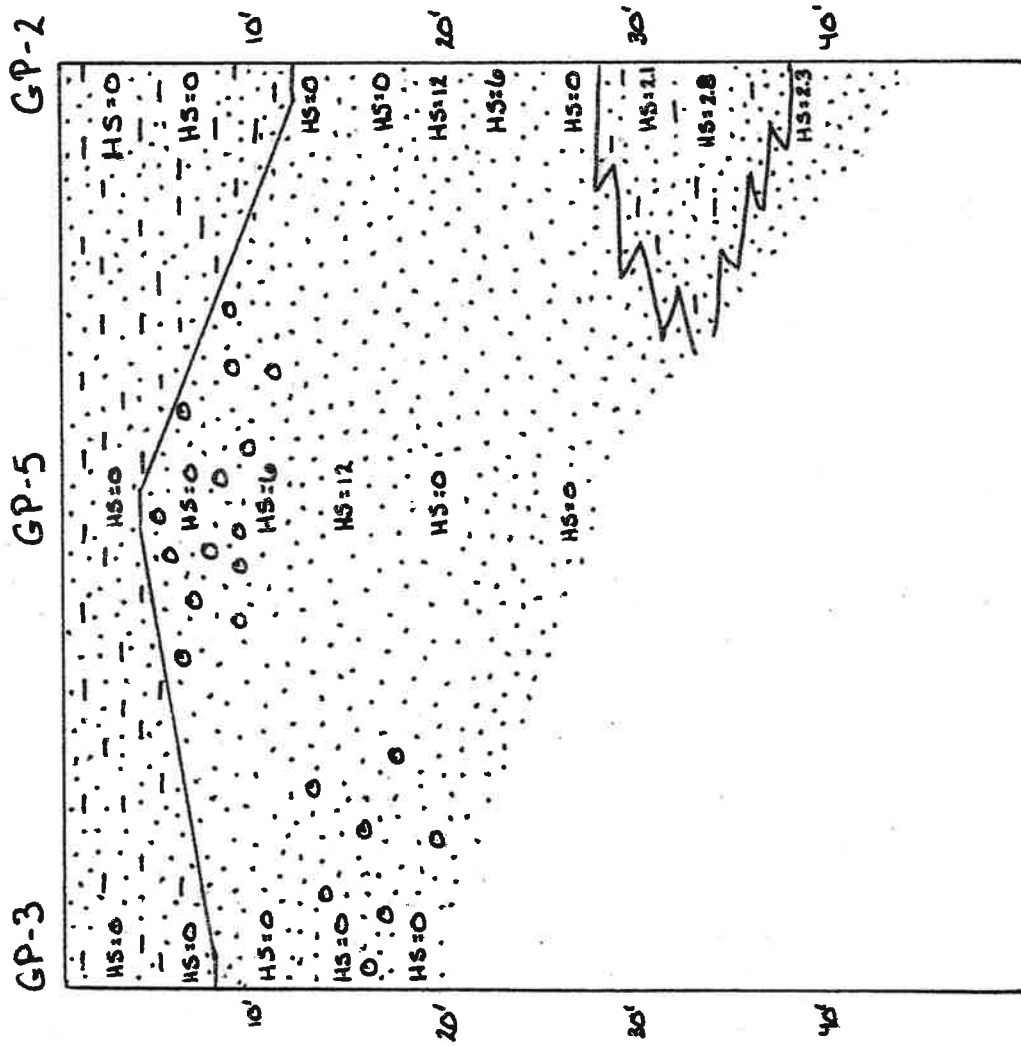
HS=0 HEADSPACE
READING (PPM)

-  GRAVEL
-  SAND
-  SILT / CLAY




NOT TO HORIZONTAL SCALE

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5270 EXCELSIOR BOULEVARD	NOV 05
EAST-WEST CROSS-SECTION AND HEADSPACE READINGS	FIG 3



HS=0 HEADSPACE
READING (PBM)

 GRAVEL
 SAND
 SILT/CLAY

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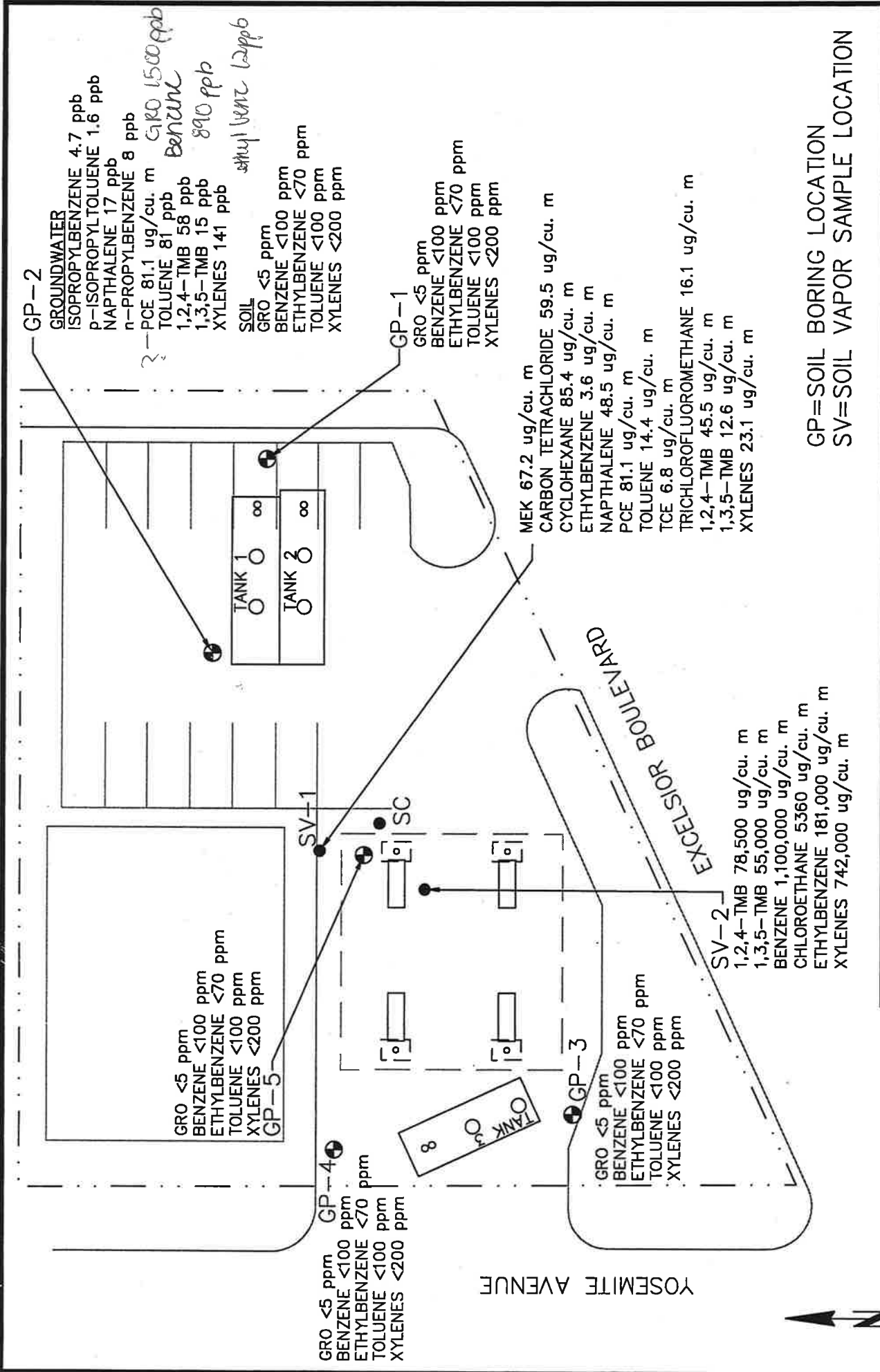
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5270 EXCELSIOR BOULEVARD

NORTHEAST-SOUTHWEST CROSS SECTION
 AND HEADSPACE READINGS

NOV 05

FIG 4



NO SCALE

GP=SOIL BORING LOCATION
 SV=SOIL VAPOR SAMPLE LOCATION

<p>5720 EXCELSIOR BOULEVARD</p>	<p>NOV 05</p>
<p>SAMPLE LOCATIONS AND LABORATORY ANALYTICAL RESULTS</p> <p>Figure 5</p>	

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