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REMEDIAL ACTION PLAN/CLOSURE REPORT
SUNOCO PIPELINE
LIVERNOIS AND HAZELTON ROADS
OAKLAND COUNTY
ROCHESTER HILLS, MICHIGAN

May 4, 2006

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EXECUTIVE SUMMARY

Based on investigations and response measures completed for the Sunoco, Inc. R&M (Sunoco) Pipeline facility, located at Livernois and Hazelton Roads in Rochester Hills, Michigan, a Remedial Action Plan (RAP)/Closure Report has been prepared by SECOR International Incorporated (SECOR) pursuant to the Administrative Rules for Part 201 of Public Act 451 of 1994, as amended (Part 201) December 21, 2002. This RAP/Closure Report discusses historical activities addressing the area affected by the pipeline release as well as additional response actions requested by the Michigan Department of Environmental Quality (MDEQ) during a March 18, 2003 meeting and outlined in a Work Plan submitted to the MDEQ by SECOR on October 29, 2003.

On September 19, 1994, the pipeline release was discovered by a resident in the area who observed fuel oil in the right-of-way on the east side of Livernois Road south of Hazelton Road. Adsorbent booms were used to remove the fuel oil and prevent migration of the oil. Excavation activities (during which approximately 20 cubic yards of soil were removed by Sunoco) resulted in the discovery of a leak in the pipeline. The leak was repaired and the excavation was backfilled with clean fill material. Fifty-three soil borings were subsequently completed in September, 1994 to collect soil and groundwater samples in the area. From November 7 through November 23, 1994, response actions consisting of the following were completed: 1) 3,140 cubic yards of soil were excavated and 2) 22,132 gallons of water were treated using a mobile remediation unit consisting of an oil/water separator and two sets of paired 200-pound carbon vessels. Fifty soil samples were collected from the completed excavation for verification purposes. In addition, three monitoring wells (MW-1 through MW-3) were installed. From November, 1996 through May, 1998, seven groundwater sampling events were completed.

In July, 1998, a previous consultant submitted a request for closure of the pipeline release to the MDEQ. On November 18, 1998, the MDEQ sent a response letter requiring additional delineation of areas upgradient (west) and downgradient (east) of the original impacted area. Three additional monitoring wells (MW-101 through MW-103) were installed upgradient of the original impacted area in June, 2000 as a result, and a second request for closure based on additional data collected from these wells was submitted by the previous consultant in January, 2001. The previous consultant then abandoned the existing monitoring wells. The MDEQ sent a response letter on June 5, 2001 requiring additional investigation activities including downgradient delineation of fuel oil constituents.

On March 18, 2003, a meeting between the MDEQ Remediation and Redevelopment Division (RRD), Sunoco, and SECOR was held. The objective of the meeting was to come to an understanding of the Site conditions and establish a clear scope of work necessary to achieve regulatory closure. The result of the meeting was the development and execution of a Work Plan that included additional subsurface investigation and quarterly groundwater monitoring at the Site. The Work Plan was submitted to the MDEQ-RRD on October 29, 2003. The Work Plan proposed the installation of eight soil borings and four monitoring wells to 1) determine the fate of constituents of concern (COCs) historically present in groundwater at the pipeline release source area and at the MW-2 location and 2) verify the integrity of the clay aquitard separating the impacted groundwater unit from deeper groundwater units. The subsurface investigation was completed in April, 2004 and one year of quarterly groundwater sampling was completed in April, 2005 to address those two issues and potential Groundwater Surface Water Interface (GSI) issues associated with an intermittent surface water drainage ditch located downgradient

(southeast) of the historical source area. Based on the results of the investigation and monitoring activities, the additional work requested by the MDEQ-RRD during the March, 2003 meeting and outlined in the October, 2003 Work Plan has been completed and the MDEQ-RRD's concerns regarding additional potential issues have been addressed. As a result this RAP/Closure Report has been prepared by SECOR.

Based on the information and evaluations presented in this RAP/Closure Report, concentrations of COCs do not exceed applicable criteria at the Site and no further remedial actions are required. The following exposure pathways were evaluated:

1. The drinking water ingestion pathway is not relevant because groundwater encountered during the subsurface investigation has been determined not to be in an aquifer. This determination is based on the following:
    - Saturated soils / groundwater were not observed during installation of soil borings;
    - Groundwater has taken 3-4 days to charge in newly installed monitoring wells;
    - Monitoring wells have gone dry during attempts at sustained purging during groundwater sampling events with-in 2 gallons. Monitoring wells purged dry have not recharged sufficiently to fill all sample containers; and,
    - A presence of a continuous confining clay layer at the Site has been verified. Based on a review of water well records, the average thickness of the clay layer underlying the site is 100 feet. Nearby water wells are screened below this confining clay layer in separate groundwater units from the shallow groundwater identified during the Site investigation.

2. Athough ethylbenzene concentrations in groundwater in MW-4, which is located at the approximate location of the pipeline release, exceed GSI criteria, adverse impacts to the intermittent surface water drainage ditch are not indicated since COCs have not been detected in samples collected from downgradient soil borings and monitoring wells located between MW-4 and the intermittent surface water drainage ditch. Therefore the site is in compliance with GSI criteria.

3. Concentrations of COCs in soil and groundwater do not exceed volatilization to indoor air inhalation criteria, direct contact criteria, or any other generic cleanup criteria not mentioned here. As a result, the Site is in compliance with all other applicable criteria.

Based on the information presented above and in more detail in the RAP/Closure Report, no further remedial actions are required to address impact related to the historical pipeline release. Once the RAP/Closure Report is approved by the MDEQ, the existing monitoring well network will be abandoned.

1.0 INTRODUCTION

On March 18, 2003, a meeting between Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD), Sunoco, Inc. R&M (Sunoco), and SECOR International Incorporated (SECOR) was held regarding the Site, which is located at Livernois and Hazelton Roads in Rochester Hills, Michigan. The objective of the meeting was to come to an understanding of the Site conditions and establish a clear scope of work necessary to achieve regulatory closure. The result of the meeting was the development and execution of a Work Plan that included additional subsurface investigation and quarterly groundwater monitoring at the Site. The Work Plan was submitted to the MDEQ-RRD on October 29, 2003. The Work Plan proposed the installation of eight soil borings and four monitoring wells to 1) determine the fate of constituents of concern (COCs) historically present in groundwater at the pipeline release source area and at the MW-2 location and 2) verify the integrity of the clay aquitard separating the impacted groundwater unit from deeper groundwater units. The subsurface investigation was completed in April, 2004 and one year of quarterly groundwater sampling was completed in April, 2005 to address the above two issues and potential groundwater / surface water interface (GSI) issues associated with an intermittent surface water drainage ditch located downgradient (southeast) of the historical source area. Based on the results of the investigation and monitoring activities, the additional work requested by the MDEQ-RRD during the March, 2003 meeting and outlined in the October, 2003 Work Plan has been completed and the MDEQ-RRD's concerns regarding additional potential issues have been addressed. As a result this RAP/Closure Report has been prepared by SECOR pursuant to the Administrative Rules for Part 201 (December 21, 2002).

1.1 Site Location

The Sunoco Pipeline is located south of Hazelton Road in the utility easement on the east side of Livernois Road in Rochester Hills, Oakland County, Michigan. The location is illustrated on the Site Location Map (Figure 1). The Site is bordered on the north by Hazelton Street and residences, to the southeast by residences at 3421 Livernois and 3475 Livernois, to the east by a residence at 3300 Hazelton Road, and to the west by Livernois Road, Rochester Hills Baptist Church, and Kensington Forest subdivision. The Site and Surrounding Properties Map (Figure 2) provides a more detailed illustration of the Site (which is defined as the right-of-way on the east side of Livernois Road between Hazelton Road and the east-west trending intermittent surface water drainage ditch located approximately 175 feet to the south of Hazelton Road) and the surrounding area.

The MDEQ has not designated this Site with a Site Identification number (ID#).

1.2 Overview of Past and Current Use of Property

The Site is located in the right-of-way on the east side of Livernois Road between Hazelton Road and the east-west trending intermittent surface water drainage ditch located approximately 175 feet to the south of Hazelton Road. The Site and surrounding properties are currently zoned for one-family residential use. Past uses of the properties surrounding the Livernois Road right-of-way in this area have also been residential.

1.3 Evidence of a 'Facility'

Under Part 201, a 'facility' is defined as an "area, place or property where a hazardous substance in excess of the concentrations which satisfy the requirements of Section 20120(1)(a) or (17)... has been released, deposited, disposed of, or otherwise comes to be located" (Section 20101(o)). Therefore, if hazardous substances are detected on a property in excess of MDEQ residential cleanup criteria, the property is a facility under Part 201. At the time of the initial release, benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected at concentrations exceeding residential drinking water criteria in soil and groundwater. Therefore, the Site is a facility.

1.4 Objectives and Scope of this RAP

The objectives of this RAP are:

- Summarize the investigative and interim response actions conducted at the Site;
- Demonstrate that the interim response actions have effectively reduced concentrations of hazardous substances to levels that are protective of human health and the environment in accordance with Part 201 of Public Act 451 of 1994, as amended;
- Demonstrate that the concentrations of hazardous substances at the Site satisfy the requirements of the MDEQ's residential cleanup criteria;
- Demonstrate that no further remedial actions are required; and,
- Obtain regulatory closure for the Site.

2.0 FACILITY CHARACTERIZATION

2.1 Site Setting, Surrounding Land Use and Zoning

The Sunoco Pipeline is located south of Hazelton Road in the utility easement on the east side of Livernois Road in Rochester Hills, Oakland County, Michigan. The location is illustrated on the Site Location Map (Figure 1). The Site is bordered on the north by Hazelton Street and residences, to the southeast by residences at 3421 Livernois and 3475 Livernois, to the east by a residence at 3300 Hazelton Road, and to the west by Livernois Road, Rochester Hills Baptist Church, and Kensington Forest subdivision. The Site and Surrounding Properties Map (Figure 2) provides a more detailed illustration of the Site (which is defined as the right-of-way on the east side of Livernois Road between Hazelton Road and the east-west trending intermittent surface water drainage ditch located approximately 175 feet to the south of Hazelton Road) and the surrounding area. The Site and surrounding properties are currently zoned for residential use. Past uses of the properties surrounding the Livernois Road right-of-way in this area have also been residential.

A private well is located at the residential property at 3475 Livernois Road southeast of the Site. The property owner believes his well is set at 168 feet below grade; however, no public record of the well could be located according to the *Initial Site Investigation Report* completed by Handex in October, 1994. A cistern is located at the residential property at 3421 Livernois Road southeast of the Site. On-site groundwater is not being used as a drinking water source. With the exception of 3475 Livernois Road, area drinking water is provided by the City of Rochester Hills, which receives its water supply from the Detroit Water and Sewerage Department (DWSD). The DWSD obtains water from Lake Huron and the Detroit River.

2.2 Summary of Previous Remedial Investigations and Interim Response Actions

On September 19, 1994, the pipeline release was discovered by a resident in the area who observed fuel oil in the right-of-way on the east side of Livernois Road south of Hazelton Road. Adsorbent booms were used to remove the fuel oil and prevent migration. Excavation activities (during which approximately 20 cubic yards of soil were removed) resulted in the discovery of a leak in the pipeline at the location indicated on Figure 2. The leak was repaired and the excavation was backfilled with clean fill material. A summary of the remedial investigations and interim response measures subsequently conducted from 1994 to 2005 is presented below. The investigations consisted of soil sampling and analysis, groundwater sampling and analysis, and hydrogeological evaluations. The interim response actions included soil excavation and disposal and groundwater removal and disposal.

Handex of Michigan, October 17, 1994; *Initial Site Investigation Report*

Handex of Michigan (Handex) was retained by Sunoco to perform a preliminary investigation at the Site following the discovery of the release on September 19, 1994. On September 23, 1994, Sun Pipeline located the source of the release, repaired the pipeline, and conducted initial abatement measures as described previously. On September 26 and 27, 1994, Handex performed a subsurface investigation to delineate the extent of the hydrocarbon impact. A total of 49 soil boring samples, four hand auger boring samples, and 17 groundwater samples were

collected and analyzed for BTEX and polynuclear aromatic hydrocarbons (PNAs). The sample results from these activities were used to evaluate future remedial actions at the Site. The private well located at 3475 Livernois and the cistern located at 3421 Livernois were also sampled for laboratory analysis. COCs were not detected in the private well and cistern samples. The Initial Site Investigation Soil Analytical Results Map (Figure 3) provides soil sample locations and analytical results. The Initial Site Investigation Groundwater Analytical Results Map (Figure 4) provides groundwater sample locations and analytical results. Appendix A includes the available boring logs for this investigation. Appendix B contains historical soil and groundwater data from September, 1994 compared to the applicable MDEQ Part 201 residential cleanup criteria.

The investigation concluded that the hydrocarbon impacted soil extended approximately 100 feet north and 100 feet south from the pipeline release location and approximately 20 feet east of the pipeline. Hydrocarbons were detected in the groundwater in the immediate vicinity of the pipeline release. No hydrocarbons were detected in the water samples collected from the private well and cistern located on the nearby residential properties referenced above.

Handex of Michigan, May 4, 1995; *Remedial Action Report*

Following the initial investigation of the release, Handex was contracted to remove and dispose of impacted soils, surface water, and groundwater at the Site. Between November 7 and November 23, 1994, Handex excavated and disposed of 3,140 cubic yards of impacted soils to a licensed landfill facility. A total of 22,132 gallons of surface water and groundwater were recovered and treated using a mobile remediation unit consisting of an oil/water separator and two sets of paired 200-pound carbon vessels.

Soil verification samples were collected from the sides and bottom of the main excavation to ensure removal of impacted soils. A total of 23 sidewall samples and 12 floor samples were collected from the final excavation. Elevated levels of BTEX in five of the verification samples (1E, 4B, 5B, 6B, and 7B) prompted Handex to widen and/or deepen the excavation in those areas. The main excavation was deemed complete based on sidewall and floor sample analytical results that indicated concentrations of COC's did not exceed applicable criteria in areas where additional excavation activities were feasible. Verification sample 1W, which was collected along the east side of Livernois Road where no further excavation was feasible, did exceed residential generic volatilization to indoor air criteria. Refer to Section 2.4.11 for additional information on this sample location. In addition to the main excavation, two 10-foot long by 4-foot wide by 8-foot deep test pits were completed in the Livernois Road right-of-way south of the main excavation to address anomalous concentrations of COCs that had been detected in the SB-28 sample collected from the 3475 Livernois Road property in September, 1994. Analysis of soil samples collected from the test pits (18B, 18E, 19B, and 19E) indicated that concentrations of COCs in the area did not exceed applicable criteria. The *Remedial Action Report* also indicated that four surface soil samples (S25, S50, S75, and S100) were collected from the intermittent surface water drainage ditch west of the main excavation at 25-foot intervals to determine the extent of potential impact resulting from migration of surface water along this route. Concentrations of COCs in the surface soil samples collected did not exceed applicable criteria. The Post Interim Response Soil Analytical Results Map (Figure 5) provides sample locations and analytical results. Appendix B contains soil data from November, 1994 compared to the applicable MDEQ Part 201 residential cleanup criteria.

IT Corporation, July 17, 1998; *Request for Closure to MDEQ*

In response to MDEQ's concern regarding the impact of the release on groundwater, Handex installed three monitoring wells (MW-1, MW-2, and MW-3) on November 20, 1996. After the installation of the three monitoring wells, IT Corporation conducted quarterly groundwater monitoring of the wells in an effort to demonstrate that residual hydrocarbons had not, and would not in the future, impact the groundwater above MDEQ cleanup criteria. From November, 1996 through May, 1998, six groundwater sampling events were completed. The Post Interim Response Groundwater Analytical Results Map (Figure 6) provides sample locations and analytical results. Appendix B contains historical groundwater data from November, 1996 through May, 1998 compared to the applicable MDEQ Part 201 residential cleanup criteria. MW-1 and MW-3 did not exceed applicable criteria at any time, while MW-2 did not exceed applicable criteria beginning in March, 1998.

In a letter dated July 17, 1998, IT Corporation presented the results of the quarterly groundwater monitoring to the MDEQ and requested closure of the Site. The MDEQ responded to the closure request on November 18, 1998 and requested the following information be collected and presented:

- Monitoring well construction logs;
- A hydrological investigation to determine the rate and direction of groundwater flow; and,
- An investigation to determine the extent of impacted soil and groundwater to the west of Livernois Road.

IT Corporation, January 8, 2001, *Addendum to Closure Letter to MDEQ*

To address the requests made by the MDEQ, IT Corporation prepared an addendum to the closure letter. The addendum was submitted in January, 1998 and included well construction diagrams for monitoring wells MW-1, MW-2, and MW-3, results of a soil and groundwater investigation completed in June, 2000, and results of a hydrogeological investigation also completed in June, 2000.

IT Corporation preformed additional soil and groundwater sampling activities in 2000 to evaluate concentrations of COCs in soil and groundwater to the west of Livernois Road. Three soil borings were advanced to the west of Livernois Road and soil samples were collected from each of the borings. Monitoring wells (MW-101, MW-102, and MW-103) were installed in the three borings. Groundwater samples were collected from MW-101, MW-102, MW-103, MW-2, and MW-3 in June, 2000. Concentrations of COC's were not detected in any of the groundwater samples collected. Figure 5 provides soil sample locations and analytical results. The Post Interim Response Groundwater Analytical Results Map (Figure 6) provides groundwater sample locations and analytical results. Appendix B contains historical groundwater data from June, 2003 compared to the applicable MDEQ Part 201 residential cleanup criteria.

The hydrogeological investigation preformed by IT Corporation included collecting water levels from the monitoring wells and developing a groundwater contour map to determine the direction and rate of groundwater flow. The results of this investigation indicated that groundwater flows from west to east.

Additional conclusions presented in the IT Corporation addendum letter were:

- Historical monitoring showed that natural attenuation was occurring at the Site;
- No significant plume is migrating downgradient from the pipeline;
- Residual hydrocarbons did not pose a significant risk to human health or the environment; and,
- The residual hydrocarbons will continue to degrade naturally and pose no long term risk.

IT Corporation abandoned the existing monitoring well network in the spring of 2001.

SECOR International Incorporated, April 26, 2004; *Additional Site Investigation and Groundwater Monitoring*

In response to a March 18, 2003 meeting between SECOR, Sunoco, and the MDEQ, SECOR conducted additional Site investigation activities to address the following MDEQ concerns at the Site:

- The fate of the groundwater contamination in the source area and MW-2; and,
- The integrity of the clay aquitard which separates the impacted water bearing unit from a potential aquifer beneath it.

A Work Plan submitted to the MDEQ by SECOR on October 29, 2003 proposed the installation of eight soil borings and four monitoring wells to address the above issues and potential GSI issues associated with an intermittent surface water drainage ditch located downgradient (southeast) of the historical source area. The proposed investigation activities were initiated in April, 2004. MW-2R was installed in the same location as MW-2 (which was abandoned in the spring of 2001) to verify the water quality in this area and to address the MDEQ's concern regarding the abrupt change in concentrations from December, 1997 to March, 1998. MW-4 was installed near the approximate location of the release to determine the soil and water quality in this area. MW-5 was installed as requested by the MDEQ to evaluate soil and water quality downgradient of the release. MW-6 was installed downgradient of MW-2R as requested by the MDEQ to determine whether impacted groundwater previously identified in MW-2 had migrated downgradient. The location of MW-6 was determined by the estimated groundwater travel time since December, 1997. The MW-2R, MW-5, and MW-6 locations were also selected to evaluate potential GSI issues associated with an intermittent surface water drainage ditch located downgradient (southeast) of the historical source area. One soil sample was collected from each of the monitoring well borings and analyzed for BTEX, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene (TMBs), naphthalene, 2-methylnaphthalene, and PNAs. Groundwater samples were also collected from each well and analyzed for BTEX, methyl tert-butyl ether (MTBE), TMBs, naphthalene, 2-methylnaphthalene, and PNAs. The April, 2004 Soil Analytical Results Map (Figure 7) and the April, 2004 to April, 2005 Groundwater Analytical Map (Figure 8) provide sample locations and analytical results. The Soil Analytical Results Tables (Tables 1 and 2) and Groundwater Analytical Results Tables (Tables 3 and 4) provide a summary of the data collected from April, 2004 through April, 2005 compared to the applicable MDEQ Part 201 residential cleanup criteria.

Seven soil borings (GP-1 through GP-3 and GP-5 through GP-8 on Figure 7) were installed in locations where borings from previous investigations were not advanced deep enough to

encounter the underlying clay aquitard (MW-1, SB-31, SB-35, SB-B, SB-10, SB-11, and SB-16). The borings were sampled continuously, logged, and screened with a PID. No soil samples were collected for laboratory analysis from these borings. Clay was encountered in all of the soil borings at depths between 4 and 12 feet below ground (bg), confirming the presence of a continuous confining clay layer that separates the shallow groundwater zone from potential deeper aquifers identified in local water well records reviewed. Based on the water well records reviewed, the average thickness of the continuous clay layer identified is 100 feet. Nearby water wells are screened below this confining clay layer in separate groundwater units from the shallow groundwater identified during the Site investigation.

The soil analytical results from the soil samples collected in April, 2004 during the monitoring well installations were all below the laboratory detection limits, with the exception of ethylbenzene detected at 210 micrograms per kilograms (ug/kg) in MW-4 at 2-3 feet bg. This ethylbenzene concentration was below all applicable MDEQ cleanup criteria in this sample. Figure 7 provides soil sample locations and analytical results. The Soil Analytical Results Tables (Tables 1 and 2) provide a summary of the soil quality data collected in April, 2004 compared to the applicable MDEQ Part 201 residential cleanup criteria. Boring logs are included in Appendix A.

The groundwater analytical results from the samples collected from the monitoring wells in April, 2004 indicated that concentrations of COCs in MW-6 and MW-2R were not detected, while concentrations of COCs in MW-5 were below applicable criteria. Concentrations of benzene, ethylbenzene, 1,2,4-trimethylbenzene, and naphthalene exceeded Groundwater-Surface Water Interface (GSI) Criteria in MW-4. Figure 8 provides sample locations and analytical results. The Groundwater Analytical Results Tables (Tables 3 and 4) provide a summary of the groundwater quality data collected from April, 2004 compared to the applicable MDEQ Part 201 residential cleanup criteria.

Groundwater elevation data were also collected on April 27, 2004 from the monitoring wells to confirm the groundwater flow direction. The groundwater flow direction was determined to be to the east-southeast. The Groundwater Contour Map (Figure 9) depicts groundwater contours and flow direction based on the April, 2004 elevation data.

Following the April, 2004 investigation, groundwater samples were collected on a quarterly basis from July, 2004 through April, 2005. Results from the groundwater monitoring indicated that:

- The drinking water ingestion pathway is not relevant because groundwater encountered during the subsurface investigation has been determined not to be in an aquifer. Applicable criteria include GSI, volatilization to indoor air inhalation, soil volatilization to ambient air inhalation, and direct contact. Refer to Section 2.4 below for additional information on exposure pathway evaluations;
- In response to the MDEQ's concerns regarding groundwater quality at MW-2R and MW-6, both located adjacent to the intermittent surface water drainage ditch, sampling results were below laboratory detection limits in all sampling events. Therefore, downgradient groundwater and surface water intermittently present in the open drainage ditch have not been impacted by migration from the historical source area;

- In response to the MDEQ's concerns regarding groundwater quality at MW-5, sampling results were below applicable criteria in all sampling events. Benzene was detected in MW-5 at concentrations below applicable MDEQ cleanup criteria and the benzene concentrations are decreasing, indicating that downgradient groundwater approximately 30 feet from the release area has not been impacted by migration from the historical source area. Based on the MW-5 results, as well as the MW-2R and MW-6 results, MDEQ concerns regarding the fate of the groundwater contamination in the source area have been addressed. The concentrations of COCs in MW-2R and MW-6 for all monitoring events are below laboratory detection limits;
- In response to the MDEQ's concerns regarding groundwater quality in the area of the release (MW-4), concentrations of benzene, ethylbenzene, xylenes, 1, 2, 4-trimethylbenzene, have been consistently decreasing over time, and for two quarters there were no exceedances of applicable MDEQ residential criteria. Ethylbenzene concentration in MW-4 during the last quarterly groundwater sampling event (April, 2005) exceeded the GSI criterion. However, the soil sample collected from two to three feet bg at the MW-4 location was below GSI protection criteria, and no groundwater exceedances have been detected downgradient of MW-4. Therefore, the soil is protective of groundwater and concentrations of ethylbenzene in MW-4 will continue to decrease over time as it naturally attenuates; and,
- In response to the MDEQ concern of the integrity of the underlying clay aquitard, clay was encountered in all the confirmatory soil borings at depths between 4 and 12 feet bg, confirming the presence of a continuous confining clay layer that separates the shallow groundwater unit from deeper aquifers identified in local water well records reviewed.

Based on these conclusions, the additional work requested by the MDEQ-RRD during the March, 2003 meeting and outlined in the October, 2003 Work Plan has been completed and the MDEQ-RRD's concerns regarding the fate of the groundwater contamination in the source area and at the MW-2 location, the integrity of the clay aquitard which separates the impacted water bearing unit from the aquifer beneath it, and potential GSI issues associated with the intermittent surface water drainage ditch located downgradient (southeast) of the historical source area have been addressed.

2.3 Geology/Hydrogeology

Information on the regional hydrogeology and groundwater use has been compiled from the Michigan Department of Natural Resources, and "Quaternary Geology of Southern Michigan" W.R. Farrand and D.L. Bell, University of Michigan, Ann Arbor, Michigan.

The Sunoco Pipeline is located in Rochester Hills, Michigan. Rochester Hills is located in a geographic region of the state which was highly influenced by the presence of glaciers and the former glacial Great Lakes which were present approximately 11,000 to 12,000 years ago. Soil types beneath the City of Rochester Hills consist of glacial lake (lacustrine) clays and silts. These deposits typically range in thickness from 3 to 180 feet. The clays and silts are underlain by bedrock, which consists of Traverse Limestone of the Middle Devonian period (360 to 375 million years before present). The surface elevation of the top of the Traverse Limestone beneath the Site is approximately 180 feet bg, indicating that glacial drift deposits of clay likely extend to the surface of the bedrock. The Traverse Limestone is not generally known for groundwater production.

A series of subsurface investigations have been conducted at the Site in the location of the pipeline release. In all cases, the subsurface lithology description recorded in drilling logs has been similar. The available drilling logs, which are included in Appendix A, describe a layer of stiff, silty sand to approximately 4 to 8 feet below grade. Below this layer is stiff medium to low plasticity silty clay starting from 4 to 8 feet below ground surface. The Geologic Cross Sections (Figures 10, 11, and 12) provide more detailed information on the Site subsurface. Based on local water well records, the clay is on average 100 feet thick. During the initial Site investigation, Handex reported the clay extending down to approximately 82 feet bg.

A private well at the 3475 Livernois Road residence southeast of the Site is set at approximately 168 feet bg and is protected by the continuous confining clay layer separating the deep potable groundwater unit from the shallow water bearing unit. A cistern is located at the residence at 3241 Livernois Road southeast of the Site, but it is not used as a potable water source. Any aquifer that may be encountered at depth within the bedrock would be listed as "protected." A "protected" aquifer is described as being protected from surface contamination by thick layers of impervious materials. The Site and immediately adjacent properties are provided with water service by the City of Rochester Hills through the DWSD.

The approximate depth to the shallow groundwater unit is between 3 to 5 feet bg. However, this is a perched groundwater unit not of significant volume to yield a continuous purge rate and is not considered to be representative of an "aquifer" in accordance with the definition provided in Part 201 (R299.5101). The determination of the shallow, perched groundwater unit being groundwater not in an aquifer was based on the following:

- Saturated soils/groundwater have not been observed during installation of soil borings;
- Groundwater has taken days to accumulate in newly installed monitoring wells;
- Monitoring wells have gone dry during attempts at sustained purging during groundwater sampling events. Monitoring wells purged dry have not recharged sufficiently to fill all sample containers; and,
- The presence of a continuous confining clay layer at the Site has been verified. Based on water well records reviewed, the average thickness of the clay layer identified is 100 feet. All nearby water wells are screened below this confining clay layer in separate groundwater units from the shallow groundwater identified during the Site investigation.

2.4 Facility Analysis/Conditions Evaluation

Figures 3 through 8 provide sample locations and analytical results discussed in this section. The Soil Analytical Results Tables (Tables 1 and 2) and Groundwater Analytical Results Tables (Tables 3 and 4) provide a summary of the data collected from April, 2004 through April, 2005 compared to the applicable MDEQ Part 201 residential cleanup criteria discussed in this section. Historical soil and groundwater analytical results tables included in Appendix B provide a summary of data collected prior to April, 2004.

2.4.1 Risk Due to COCs in Groundwater as a Result of Use of Groundwater for Drinking Water

As discussed in Section 2.3, soil types beneath the City of Rochester Hills consist of glacial lake (lacustrine) clays and silts. These deposits typically range in thickness from 3 to 180 feet and are underlain by bedrock, which consists of the Traverse Limestone of the Middle Devonian period. The Traverse Limestone is not generally known for groundwater production. Site-specific information obtained from the remedial investigations indicates that the subsurface of the Site is consistent with the regional geology. Specifically, the soils beneath the Site consist of a thin layer of silty sand with underlying clay. Refer to Appendix A for copies of the available soil boring logs for the Site. Based on the field description of the clay soils observed and a review of available regional information including water well logs, the clays beneath the Site are glacial in origin and likely extend to the bedrock surface.

No aquifers have been encountered beneath the Site in any of the remedial investigations conducted to date. The perched groundwater trapped in the silty sand material above the clay does not represent groundwater in an aquifer that could be developed for potable use based on the following:

- Saturated soils/groundwater have not been observed during installation of soil borings;
- Groundwater has taken 3-4 days to charge in newly installed monitoring wells;
- Monitoring wells have gone dry during attempts at sustained purging during groundwater sampling events. Monitoring wells purged dry have not recharged sufficiently to fill all sample containers; and,
- The presence of a continuous confining clay layer at the Site has been verified. Based on water well records reviewed, the average thickness of the clay layer identified is 100 feet. All nearby water wells are screened below this confining clay layer in separate groundwater units from the shallow groundwater identified during the Site investigation.

As previously stated in Section 2.3, the Site and immediately adjacent properties are provided with water service by the City of Rochester Hills through the DWSD. The DWSD obtains water from Lake Huron and the Detroit River. Based on this information, the drinking water pathway is not a relevant exposure pathway.

2.4.2 Risks Due to COCs in Groundwater as a Result of Dermal Contact with Groundwater

Although dermal contact with the shallow impacted perched groundwater is an applicable pathway for construction/road workers or others conducting underground work in the area, groundwater analytical results from 1994 to 2005 did not exceed residential generic groundwater contact criteria. Therefore, no unacceptable exposures to the groundwater contact pathway exist and the site is in compliance with groundwater contact criteria.

2.4.3 Risks Due to COCs in Groundwater as a Result of the COCs Venting to the Surface Water

A pond and an intermittent surface water drainage ditch are located in close proximity to the Site, and as a result the GSI exposure pathway is applicable. The pond is located

approximately 80 feet upgradient (west) of the Site. In June 2000, three monitoring wells, MW-101, MW-102, and MW-103, were installed upgradient of the Site between the Site and the pond. Sampling results from these wells were below laboratory detection limits for both soil and groundwater. Therefore, unacceptable impacts resulting from the venting of COCs in groundwater to the pond is not indicated.

An open drainage ditch runs from west to east approximately 175 feet south of Hazelton Road adjacent to the release location. Surface water has been observed in the drainage ditch on an intermittent basis only. In April, 2004, two monitoring wells (MW-2R and MW-6) were installed adjacent to the intermittent surface water drainage ditch for the purpose of monitoring the groundwater that may vent to this ditch. After installation, water was not present in either well for over 24 hours, indicating that the groundwater recharge in the area of the drainage ditch is extremely slow. These wells were monitored for one year and sampling results were below laboratory detection limits in all sampling events.

An additional monitoring well, MW-4, was installed in April, 2004 near the historical release location to monitor groundwater quality in this area. Ethylbenzene concentrations in MW-4 during the most recent quarterly groundwater sampling event in April, 2005 exceeded GSI criteria. However, soil data collected during installation of MW-4 was below GSI protection criteria, and is therefore protective of groundwater. Additionally, no groundwater exceedances have been detected in downgradient monitoring wells, including MW-5 (located approximately 30 feet to the west of MW-4), MW-2R (located approximately 50 feet to the southwest of MW-4) and MW-6 (located approximately 80 feet to the southwest of MW-4). Based on these downgradient groundwater analytical results, the distances from the source area to the downgradient monitoring points, and the investigation timeframe (1994 to 2005), migration of COCs in groundwater from the release area is not indicated 30 feet downgradient from the release area. No unacceptable exposures to the GSI pathway resulting from groundwater migration are indicated.

Therefore, the site is in compliance with GSI criteria based on the following:

- Intermittent presence of surface water observed in the surface water drainage ditch;
- Slow movement of groundwater at the Site;
- No detections of COCs in soil or groundwater adjacent to the surface water drainage ditch;
- Evidence of natural attenuation;
- Source removal;
- Soils in the former source area protective of groundwater; and,
- No evidence of current or future migration from the former source area.

2.4.4 Risks Due to COCs in Groundwater as a Result of Volatilization of the COCs to Indoor Air

Although volatilization to indoor air inhalation is an applicable pathway, based on recent groundwater sample analytical results residential generic indoor air inhalation criteria have not been exceeded. In addition, according to the City of Rochester Hills Building Department, no building can be built within 25 feet of the property line along the east side of Livernois Road (or within one-half the average setback of the buildings already built in the area, which would make

this area greater than 25 feet). Therefore, no unacceptable exposures to the indoor air inhalation pathway exist and the site is in compliance with groundwater volatilization to indoor air inhalation criteria.

2.4.5 Risks Due to COCs in Soil as a Result of Direct Contact with Soil

Although direct contact with impacted soils is an applicable pathway for construction/road workers or others conducting underground work in the area, recent soil data and historical soil data collected after the excavation of the source area indicate that the residential generic direct contact criteria have not been exceeded. Therefore, no unacceptable exposures to the direct contact pathway exist and the site is in compliance with soil direct contact criteria.

2.4.6 Risks Due to COCs in Soil as a Result of the Inhalation of COCs Being Emitted to and Dispersed in Ambient Air

Although volatilization to ambient air inhalation is an applicable pathway, recent soil data and historical soil data collected after the excavation of the source area indicate that the residential generic ambient air inhalation criteria have not been exceeded. Therefore, no unacceptable exposures to the ambient air inhalation pathway exist and the site is in compliance with soil volatilization to ambient air inhalation criteria.

2.4.7 Risks Due to COCs in Soil as a Result of the Leaching of COCs to Drinking Water

As discussed in Section 2.4.1, the ingestion of groundwater beneath the Site is not a relevant exposure pathway because the impacted shallow perched groundwater unit is not considered to be an aquifer. Therefore, the soil leaching to drinking water pathway is not a relevant pathway and will not be evaluated further.

2.4.8 Risks Due to COCs in Soil as a Result of the Leaching of COCs to Groundwater and Subsequent Dermal Contact with Groundwater

This pathway can be evaluated by comparing the concentrations of COCs in soil to the residential generic GCC protection soil cleanup criteria. Although this is an applicable pathway, soil analytical results indicate that GCC protection soil cleanup criteria have not been exceeded. Therefore, the soils are protective of the groundwater contact pathway and the site is in compliance with GCC protection soil cleanup criteria.

2.4.9 Risks Due to COCs in Soil as a Result of the Leaching of COCs to Groundwater and the Subsequent Venting of the Groundwater to Surface Water

This pathway can be evaluated by comparing the concentrations of COCs in soil to the residential generic GSI protection soil cleanup criteria. Although this is an applicable pathway, soil analytical results indicate that GSI protection soil cleanup criteria were not exceeded. Therefore, the leaching of COCs in soil to groundwater and subsequent venting to surface water is not indicated and the site is in compliance with GSI protection soil cleanup criteria.

2.4.10 Risks Due to COCs in Soil as a Result of the Direct Transport of COCs to the Surface Water as a Result of Erosion or Runoff

As discussed in Section 2.4.3, a pond and an intermittent surface water drainage ditch are located in close proximity to the Site. The pond is located approximately 80 feet upgradient (west) of the Site. In June 2000, three monitoring wells, MW-101, MW-102, and MW-103, were installed upgradient of the Site between the Site and the pond. Soil sampling results from these wells were below laboratory detection limits, and therefore unacceptable impact resulting from the direct transport of COCs in soil to the pond as a result of erosion or runoff is not considered to be a source of unacceptable risk at the Site and will not be evaluated further

Also as discussed in Section 2.4.3, soil sampling conducted adjacent to the intermittent surface water drainage ditch in April, 2004 indicated that COCs were not reported above laboratory detection limits. Figure 7 provides soil sample locations and analytical results from this event. In addition, the May 4, 1995 *Remedial Action Report* indicated that four surface soil samples (S25, S50, S75, and S100) were collected from the intermittent surface water drainage ditch west of the main excavation at 25-foot intervals. Soil analytical results from this event indicated that applicable criteria were not exceeded. Figure 5 provides soil sample locations and analytical results from this event. Since the soils in and around the open drainage ditch are not impacted above criteria, no unacceptable exposures as a result of erosion or runoff exist and the site is in compliance.

2.4.11 Risks Due to COCs in Soil as a Result of Volatilization of Those COCs to Indoor Air

Volatilization to indoor air inhalation is an applicable pathway. Only one sample has exceeded residential generic volatilization to indoor air criteria. The concentration of benzene in verification sample 1W, collected in the right-of-way on the east side of Livernois Road in 1994, exceeded the residential generic volatilization to indoor air criteria. According to the City of Rochester Hills Building Department, no building can be built within 25 feet of the property line along the east side of Livernois Road (or within one-half the average setback of the buildings already built in the area, which would make this area greater than 25 feet). Additionally, a soil sample was collected during the installation of MW-4 in 2004, located in the vicinity of sample 1W. The results from laboratory analysis show that the COCs are below residential generic volatilization to indoor air criteria in MW-4. Since no building can be built within 25 feet of the right of way where sample 1W was collected and recent soil data from approximately the same location are below residential generic volatilization to indoor air criteria, no unacceptable exposures to the indoor air inhalation pathway exist and the site is in compliance with soil volatilization to indoor air inhalation criteria.

2.4.12 Risks Due to COCs in Surface Water Sediments

As discussed in Section 2.4.3 and 2.4.10, the pipeline release did not impact the soil or groundwater upgradient of the Site where the surface water pond is located, and therefore did not impact the surface water sediments in the pond. Also as discussed in Section 2.4.10, soil sampling conducted adjacent to the intermittent surface water drainage ditch in April, 2004 showed no COCs were reported above laboratory detection limits. In addition, the May 4, 1995 *Remedial Action Report* indicated that four surface soil samples (S25, S50, S75, and S100)

were collected from the intermittent surface water drainage ditch west of the main excavation at 25-foot intervals. Soil analytical results from this event indicated that applicable criteria were not exceeded. Since the soils in and around the open drainage ditch are not impacted above criteria, no unacceptable exposures to COCs in surface water sediments exist and the site is in compliance.

2.4.13 Risks Due to COCs When Considering Acute Toxic Effects and Physical Hazards Not Accounted for in the Development of Generic Cleanup Criteria

COCs in groundwater did not exceed the MDEQ's flammability and explosivity screening levels and acute inhalation screening levels. Therefore, COCs in groundwater do not pose an unacceptable risk from acute toxic effects. Based on the information presented in Sections 2.4.5, 2.4.6, and 2.4.11, COCs in soil do not pose an unacceptable exposure from acute toxic effects.

Because the release area is under a paved road and the adjacent right-of-way, no physical hazards due to COCs have been identified.

2.4.14 Risks Due to Free-Phase Liquids and Abandoned or Discarded Hazardous Substances

Free phase liquids have not been detected during the groundwater monitoring of the on-site monitoring wells. Abandoned or discarded hazardous substances are not present on the Site.

2.4.15 Risks Due to COCs When Considering Impacts on Terrestrial Flora and Fauna and on Aesthetic Characteristics

The Site is located in the Livernois Road right-of-way in the City of Rochester Hills. The Site is covered by vegetation (primarily weeds and small trees), asphalt, gravel and concrete. Signs of stressed vegetation related to COCs have not been observed. Impacted wildlife has also not been observed.

2.4.16 Summary of Relevant Exposure Pathways and Receptors

Based on the discussions and evaluations presented in Sections 2.4.1 through 2.4.15 above, there are no unacceptable applicable exposure pathways and the Site is in compliance.

2.5 Summary of Completed Remedial Actions

As discussed previously, initial response measures were completed in November, 1994 following the discovery of the pipeline release. An initial 20 cubic yards of impacted soils and subsequent 3,140 cubic yards of impacted soils were excavated and disposed of at a licensed landfill facility. A total of 22,132 gallons of surface water and groundwater were recovered and treated using a remediation unit (consisting of an oil/water separator and two sets of paired 200-pound carbon vessels). Verification soil samples were collected and analyzed to confirm that the entire source area was addressed. Supplemental soil samples were collected during subsequent soil boring/monitoring well installation events and groundwater monitoring was completed from November, 1996 through May, 1998 and from April, 2004 through April, 2005.

The results of the soil and groundwater samples collected subsequent to the initial response actions indicate the following:

- The release did not impact the properties upgradient on the west side of Livernois Road;
- Groundwater is not in an aquifer and therefore the drinking water pathway is not relevant;
- The underlying clay aquitard is continuous and separates the perched groundwater from potential deeper water bearing zones;
- After source removal activities, the soils are protective of the groundwater that may vent to the intermittent surface water drainage ditch;
- COCs in groundwater are naturally attenuating prior to reaching the surface water drainage ditch; and,
- Unacceptable exposures for applicable pathways are not indicated; and,
- The Site is in compliance with applicable residential soil and groundwater cleanup criteria.

Based on the results of the investigation and monitoring activities, the work requested by the MDEQ-RRD during the March, 2003 meeting and outlined in the October, 2003 Work Plan has been completed and the MDEQ-RRD's concerns regarding the fate of the groundwater contamination in the source area and at the MW-2 location, the integrity of the clay aquitard which separates the impacted water bearing unit from the aquifer beneath it, and potential GSI issues associated with the intermittent surface water drainage ditch located downgradient (southeast) of the historical source area have been addressed.

3.0 REMEDIAL ACTION PLAN IMPLEMENTATION DETAILS AND DOCUMENTATION

3.1 Description of How Response Activities Meet Requirements of Part 201

Part 201 Rule R299.5526(1) specifies the factors that shall be considered in determining the appropriateness of response activities. An evaluation of how the response activities described in this RAP/Closure Report addressed these factors is presented below:

- The response actions described in Section 2.2 prevented potential threats to public health, safety, or welfare and to the environment (R299.556(1)(a));
- As indicated in Section 2.4.1, the drinking water pathway is not relevant (R299.5526(1)(b));
- Hazardous substances in abandoned or discarded containers were not identified at the Site (R299.5526(1)(c));
- Weather conditions did not impact the response actions described in Section 2.2 (R299.5526(1)(d));
- The response actions described in Section 2.2 did not result in unacceptable exposures (R299.5526(1)(e));
- Fire or explosion threats were not identified at the Site (R299.5526(1)(f));
- Restrictive covenants have not been implemented at the Site (R299.5526(1)(g); and,
- Response actions other than those completed and described in this report are not necessary (R299.5526(1)(h)).

Based on the above, this RAP/Closure Report meets the requirements of Part 201.

3.2 Documentation that Cleanup Criteria are Appropriate

This RAP is based on the MDEQ's residential generic cleanup criteria (Section 201120(1)(a) of Part 201). These cleanup criteria are appropriate because the Site and surrounding properties are zoned one-family residential (R-4). A description of this zoning district is presented in Appendix C. Site uses inconsistent with the exposure scenarios inherent in the residential generic cleanup criteria are not allowed. Refer to Section 2.4 above for detailed information on cleanup criteria deemed appropriate for applicable exposure pathways.

3.3 Source Control Analysis/ Completed Response Measures

On September 19, 1994, the pipeline release was discovered by a resident in the area who observed fuel oil in the right-of-way on the east side of Livernois Road south of Hazelton Road. The following initial source control measures were implemented on this day:

- Adsorbent booms were used to remove the fuel oil and prevent migration;
- Excavation activities (during which approximately 20 cubic yards of soil were removed) resulted in the discovery of a leak in the pipeline; and,
- The leak was repaired and the excavation was backfilled with clean fill material.

Between November 7 and November 23, 1994 the following additional source control measures were implemented:

- An additional 3,140 cubic yards of impacted soils were excavated and disposed of at a licensed landfill facility; and,
- A total of 22,132 gallons of surface water and groundwater were recovered during the excavation activities and treated using a mobile remediation unit consisting of an oil/water separator and two sets of paired 200-pound carbon vessels.

3.4 Documentation of No Facility-Specific Conditions That Result in Generic Cleanup Criteria Not Being Protective

The response actions described in this report are consistent with the MDEQ's generic residential exposure scenario.

3.5 Discussion of Statistical Methods

Statistical methods were not used to evaluate the data.

3.6 Discussion of the Effect of Demolition on Environmental Conditions

Demolition activities were not conducted at the Site.

3.7 Environmental Monitoring During Implementation of Interim Response Activities

On March 18, 2003, a meeting between the MDEQ-RRD, Sunoco, and SECOR was held to come to an understanding of the Site conditions and establish a clear scope of work necessary to achieve regulatory closure. The result of the meeting was the development and execution of a Work Plan that was submitted to the MDEQ-RRD on October 29, 2003. Based on the results of the investigation and monitoring activities, the additional work requested by the MDEQ-RRD during the March, 2003 meeting and outlined in the October, 2003 Work Plan has been completed and the MDEQ-RRD's concerns regarding additional potential issues have been addressed. Therefore, no further response activities or environmental monitoring will be implemented.

3.8 Implementation Schedule

No further response activities or environmental monitoring will be implemented as indicated in Section 3.7 above.

3.9 Plans For Abandoning Monitoring Wells

The four existing monitoring wells will be abandoned after the RAP/Closure Report has been approved. The wells will be abandoned according to ASTM Standard D 5299-92 (*Standard Guide for Decommissioning Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities*) or other relevant and/or applicable standards.

3.10 Groundwater Monitoring Plan

Periodic groundwater monitoring was performed form November, 1996 through May, 1998. Quarterly groundwater monitoring was performed from April, 2004 through April, 2005. Results from Site investigation activities indicate that the concentrations of COCs have consistently declined over time to levels below applicable residential generic cleanup criteria. Based on the analytical results from these activities and the exposure pathways evaluated, unacceptable exposures due to concentrations of COCs do not exist and the Site is in compliance. Because the objectives set forth during the March 18, 2003 meeting between the MDEQ-RRD, Sunoco, and SECOR and outlined in the Work Plan submitted by SECOR on October 29, 2003 have been met as a result of these investigation activities and no threat of human exposure or negative impacts to the environment are indicated, a monitoring plan is not necessary.

3.11 Discussion of Mechanisms That Will Assure Continued Compliance With Land Use Restrictions

Land use restrictions have not been implemented at the Site.

3.12 Operation and Maintenance

An Operation and Maintenance Plan is not required because no further response actions or investigation activities will be implemented.

3.13 Contingency Plan

Since a monitoring plan is not required for this Site, a contingency plan is also not required.

3.14 Subtitling RAP as Closure Report

All remedial activities have been implemented at the site and no future activities are necessary. This RAP has therefore been subtitled as a Closure Report.

3.15 Documentation of Department's Approval of Interim Response Activities

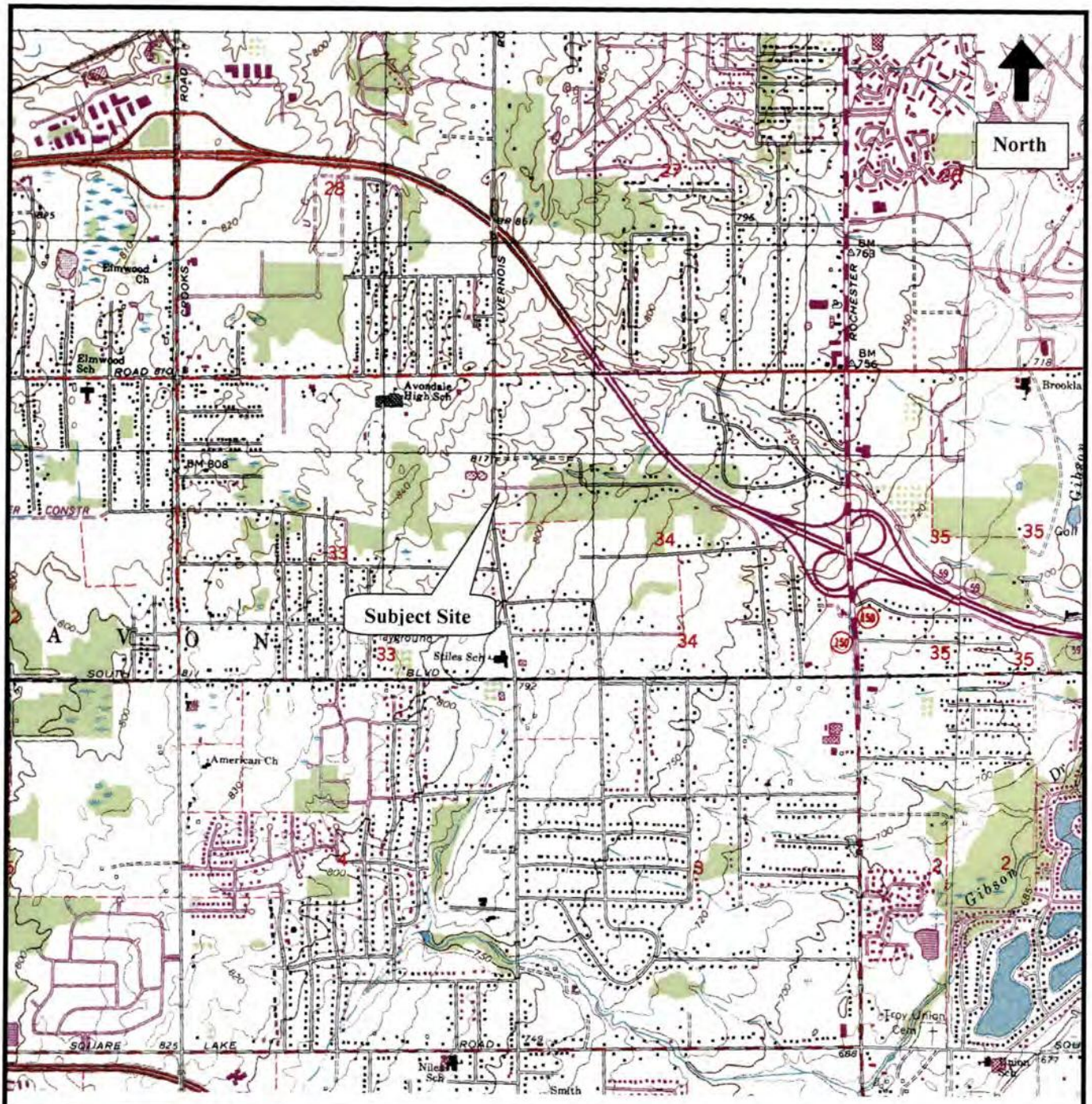
Documentation of the MDEQ's approval of this RAP/Closure Report will be maintained at Sunoco offices in Marcus Hook, Pennsylvania.

3.16 Evidence of Part 31 Compliance

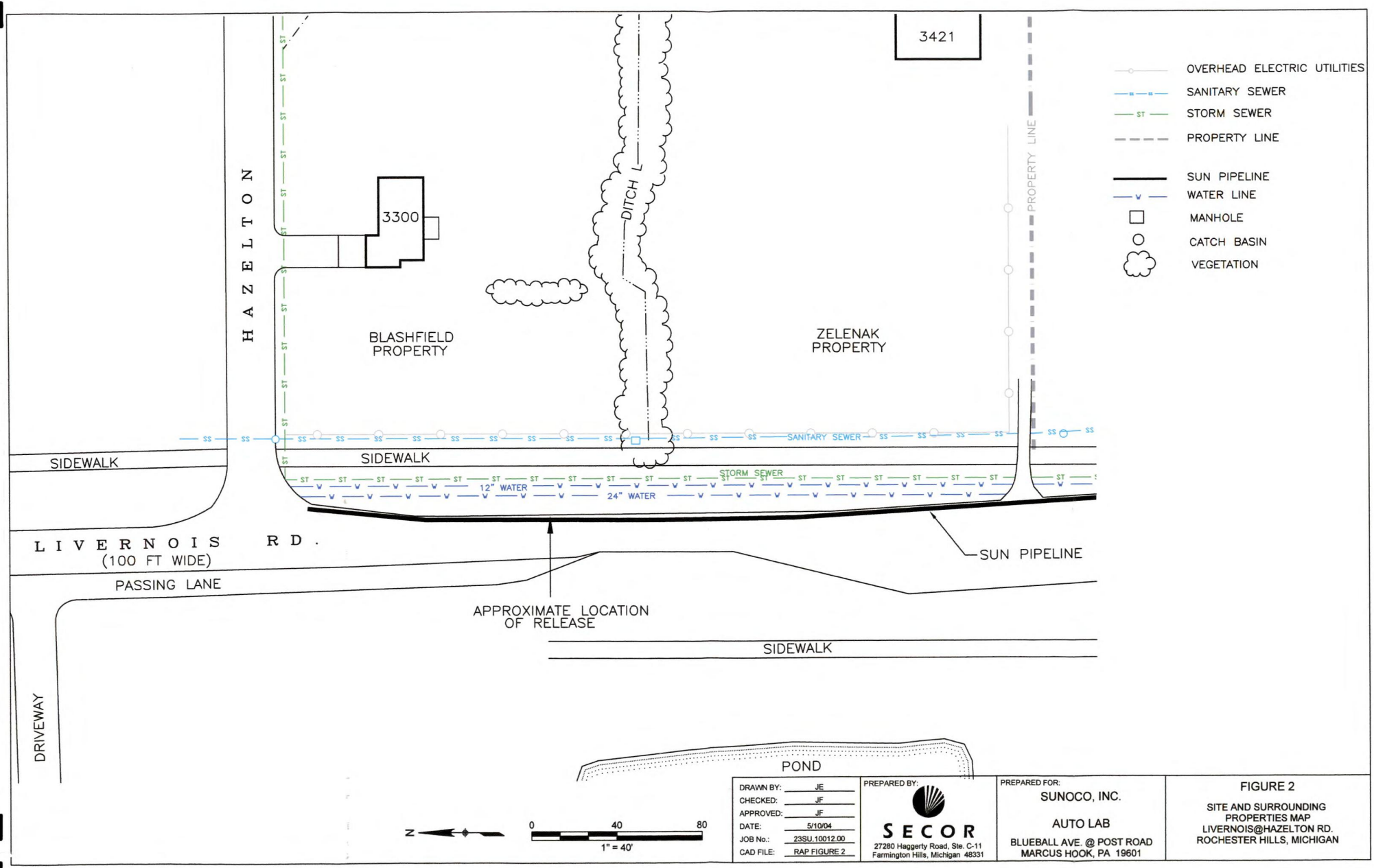
As discussed in Sections, 2.4.3, 2.4.9, and 2.4.10, unacceptable exposures as a result of COCs in groundwater venting to surface water, COCs in soil leaching to groundwater and the subsequent venting to surface water, and the direct transport of COCs to surface water as a result of erosion or runoff do not exist. Therefore, this RAP/Closure Report is in compliance with Part 31.


SECOR

FIGURES



	Job #: 23SU.10012.00 **Site Location Map** **Sunoco Pipeline Release** **Livernois @ Hazelton Road** **Rochester Hills, Michigan**	**SECOR** **27280 Haggerty Road** **Suite C-11** **Farmington Hills, MI** **48331**	
DATE: 1/17/06	**Source: USGS Rochester Hills, MI Quad 2000**	**Scale 1:24000**	**Figure: 1**
DWN: ERICA BROWN	**APPR:**		**Revision: 0**



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APPROVED:	JF
DATE:	5/10/04
JOB No.:	23SU.10012.00
CAD FILE:	RAP FIGURE 2

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Farmington Hills, Michigan 48331

PREPARED FOR:

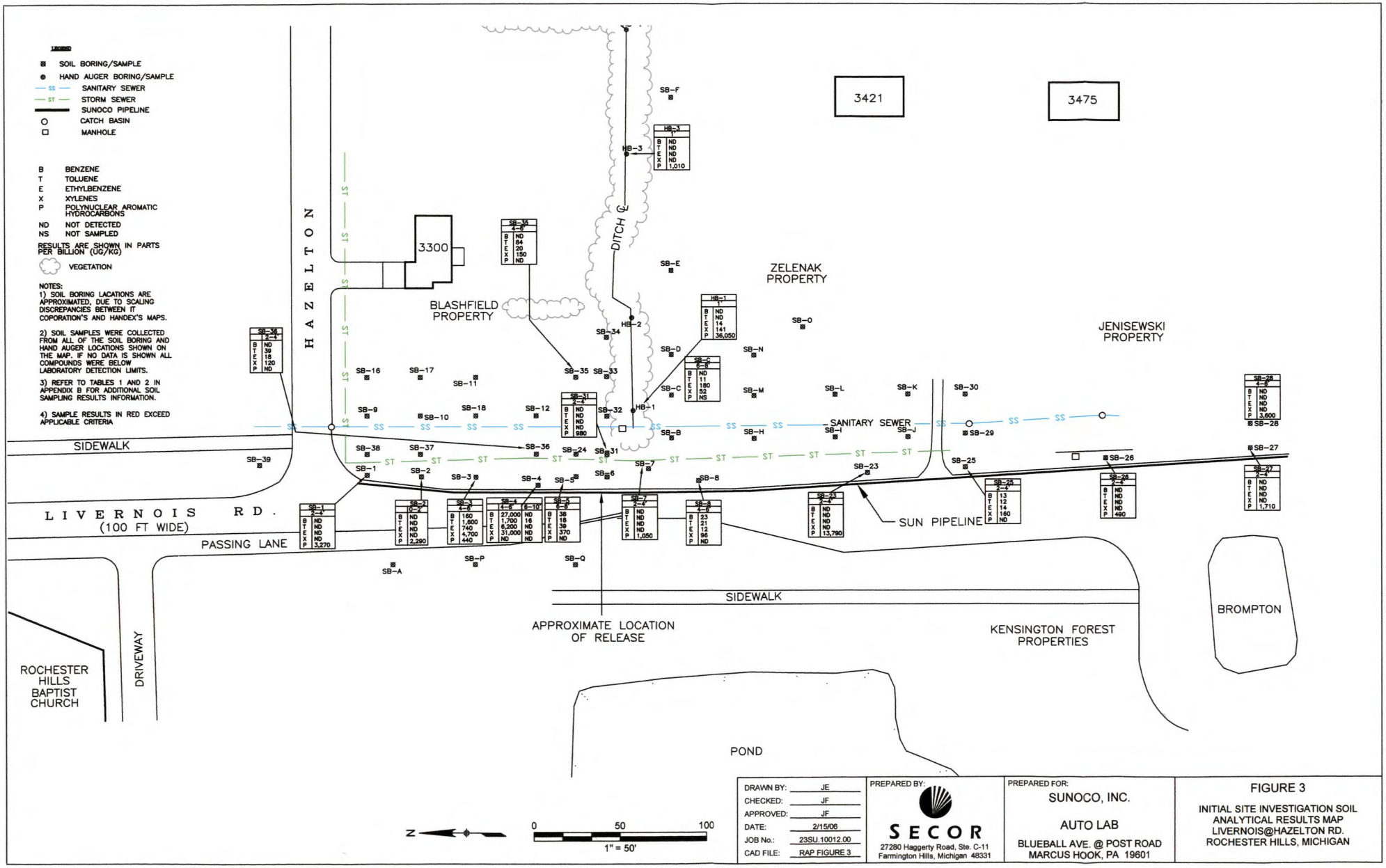
SUNOCO, INC.

AUTO LAB

BLUEBALL AVE. @ POST ROAD
MARCUS HOOK, PA 19601

FIGURE 2

SITE AND SURROUNDING PROPERTIES MAP
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN



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DATE:	2/15/06
JOB No.:	23SU.10012.00
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FIGURE 3
INITIAL SITE INVESTIGATION SOIL ANALYTICAL RESULTS MAP
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN

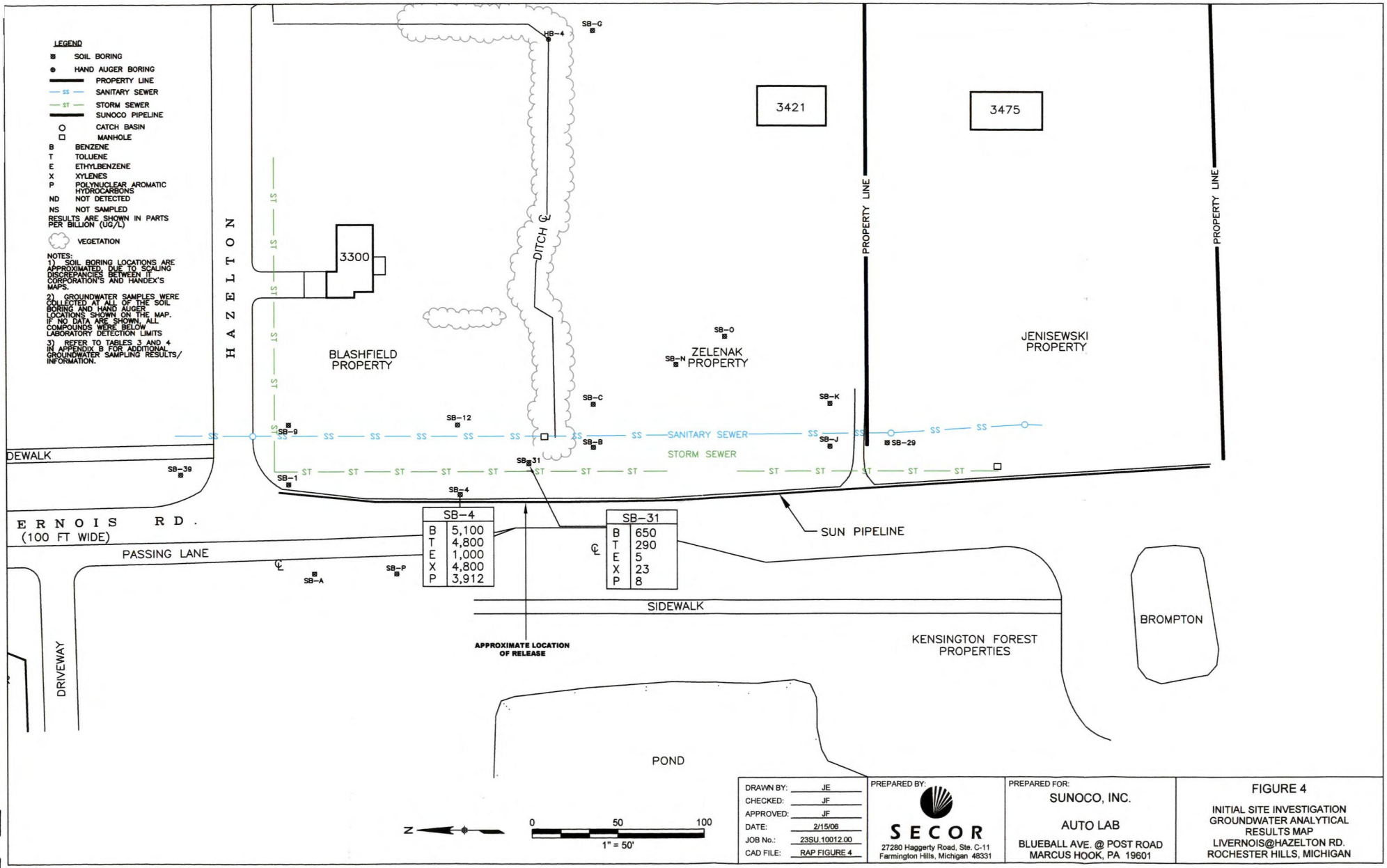

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FIGURE 4

INITIAL SITE INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS MAP
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN

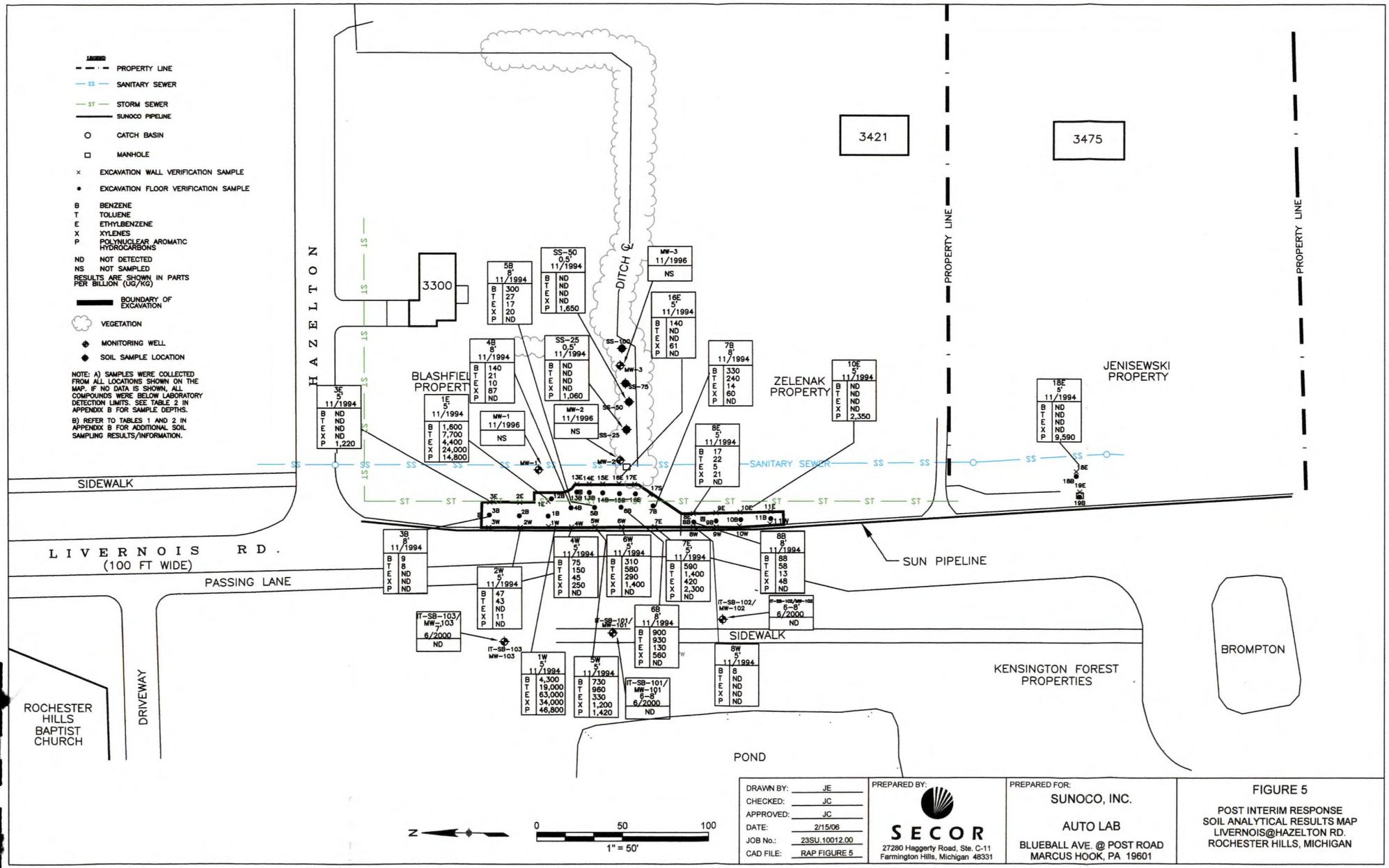

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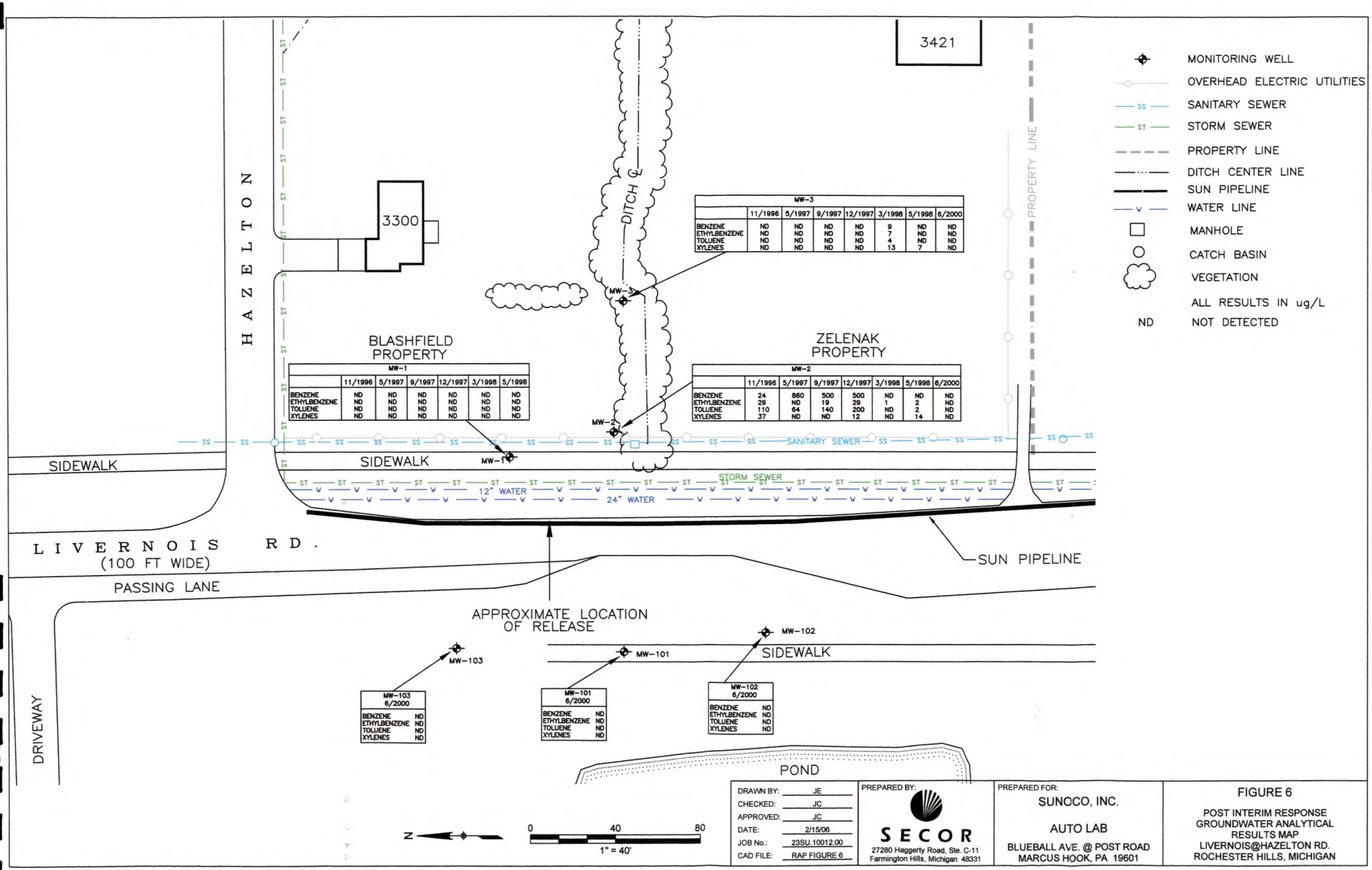
FIGURE 5
POST INTERIM RESPONSE
SOIL ANALYTICAL RESULTS MAP
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN



MW-1	11/1996	5/1997	9/1997	12/1997	3/1998	5/1998
BENZENE	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	ND	ND	ND
XYLENES	ND	ND	ND	ND	ND	ND

MW-2	11/1996	5/1997	9/1997	12/1997	3/1998	5/1998	6/2000
BENZENE	24	860	500	500	ND	ND	ND
ETHYLBENZENE	29	ND	19	29	1	2	ND
TOLUENE	110	64	140	200	ND	2	ND
XYLENES	37	ND	ND	12	ND	14	ND

MW-3	11/1996	5/1997	9/1997	12/1997	3/1998	5/1998	6/2000
BENZENE	ND	ND	ND	ND	9	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	7	ND	ND
TOLUENE	ND	ND	ND	ND	4	ND	ND
XYLENES	ND	ND	ND	ND	13	7	ND

MW-103 6/2000	
BENZENE	ND
ETHYLBENZENE	ND
TOLUENE	ND
XYLENES	ND

MW-101 6/2000	
BENZENE	ND
ETHYLBENZENE	ND
TOLUENE	ND
XYLENES	ND

MW-102 6/2000	
BENZENE	ND
ETHYLBENZENE	ND
TOLUENE	ND
XYLENES	ND

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FIGURE 6
POST INTERIM RESPONSE GROUNDWATER ANALYTICAL RESULTS MAP
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN

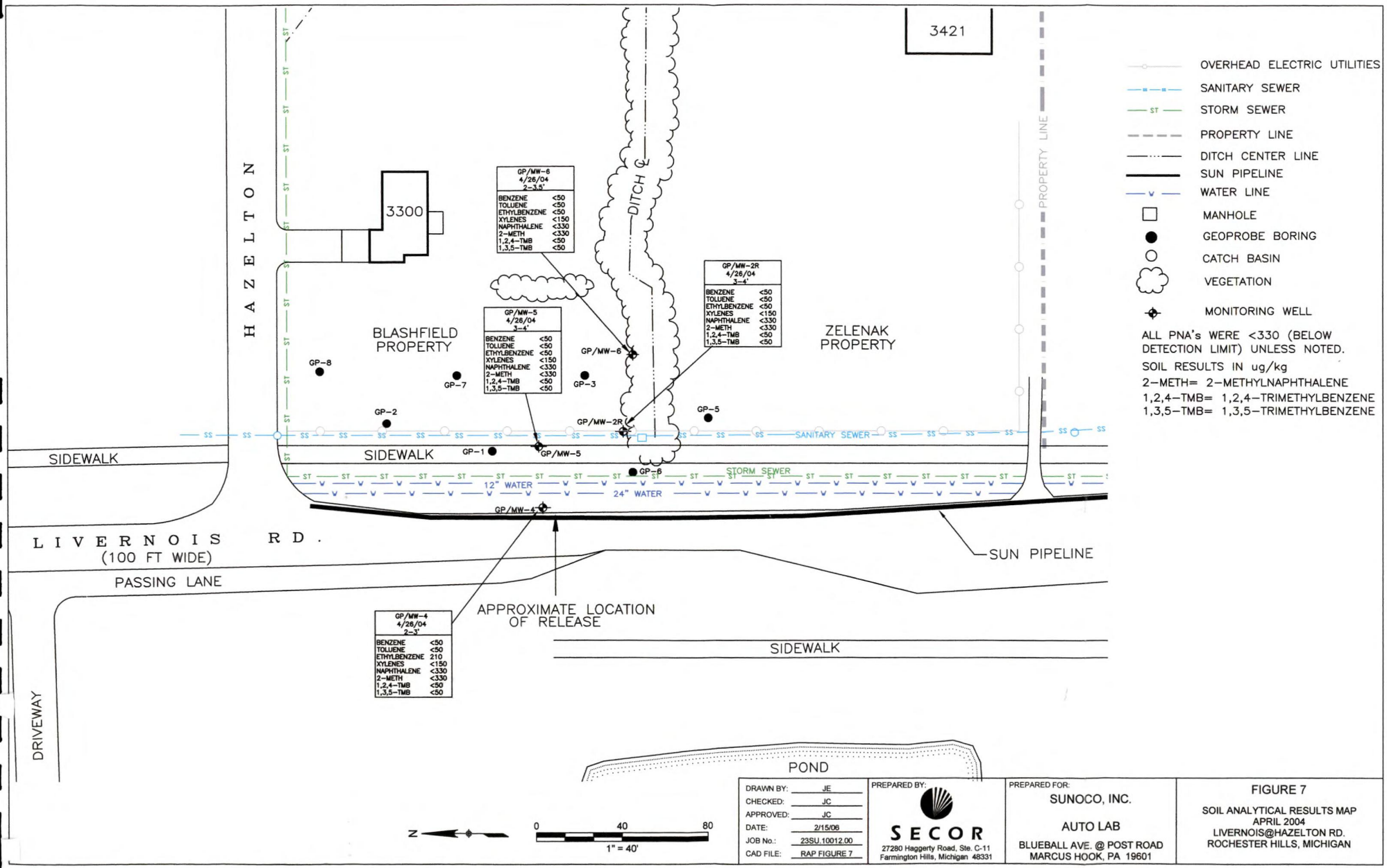

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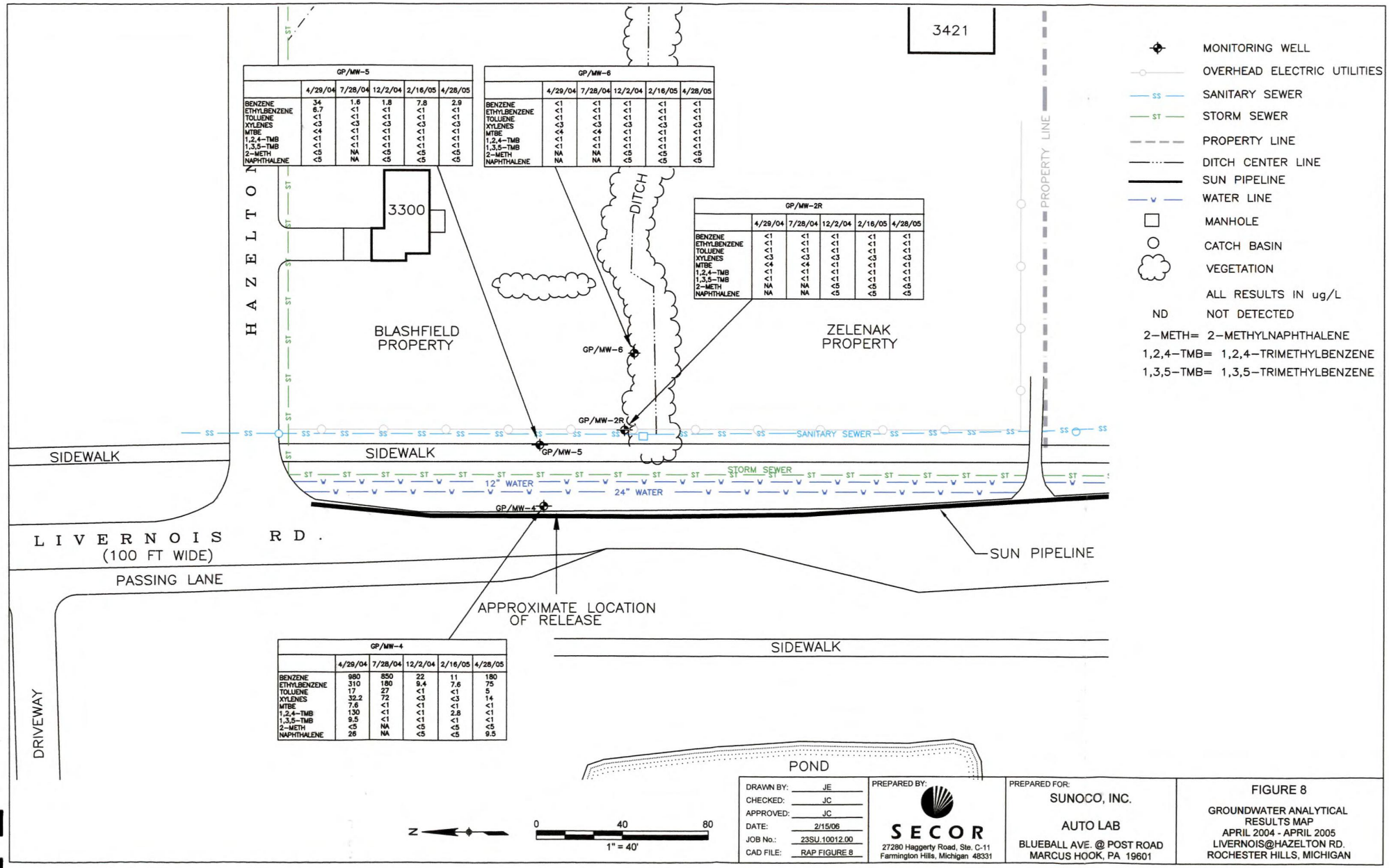
FIGURE 7

SOIL ANALYTICAL RESULTS MAP
APRIL 2004
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN



GP/MW-5	4/29/04	7/28/04	12/2/04	2/16/05	4/28/05
BENZENE	34	1.6	1.8	7.8	2.9
ETHYLBENZENE	8.7	<1	<1	<1	<1
TOLUENE	<1	<1	<1	<1	<1
XYLENES	<3	<3	<3	<3	<3
MTBE	<4	<1	<1	<1	<1
1,2,4-TMB	<1	<1	<1	<1	<1
1,3,5-TMB	<1	<1	<1	<1	<1
2-METH	<5	NA	<5	<5	<5
NAPHTHALENE	<5	NA	<5	<5	<5

GP/MW-6	4/29/04	7/28/04	12/2/04	2/16/05	4/28/05
BENZENE	<1	<1	<1	<1	<1
ETHYLBENZENE	<1	<1	<1	<1	<1
TOLUENE	<1	<1	<1	<1	<1
XYLENES	<3	<3	<3	<3	<3
MTBE	<4	<4	<1	<1	<1
1,2,4-TMB	<1	<1	<1	<1	<1
1,3,5-TMB	<1	<1	<1	<1	<1
2-METH	NA	NA	<5	<5	<5
NAPHTHALENE	NA	NA	<5	<5	<5

GP/MW-2R	4/29/04	7/28/04	12/2/04	2/16/05	4/28/05
BENZENE	<1	<1	<1	<1	<1
ETHYLBENZENE	<1	<1	<1	<1	<1
TOLUENE	<1	<1	<1	<1	<1
XYLENES	<3	<3	<3	<3	<3
MTBE	<4	<4	<1	<1	<1
1,2,4-TMB	<1	<1	<1	<1	<1
1,3,5-TMB	<1	<1	<1	<1	<1
2-METH	NA	NA	<5	<5	<5
NAPHTHALENE	NA	NA	<5	<5	<5

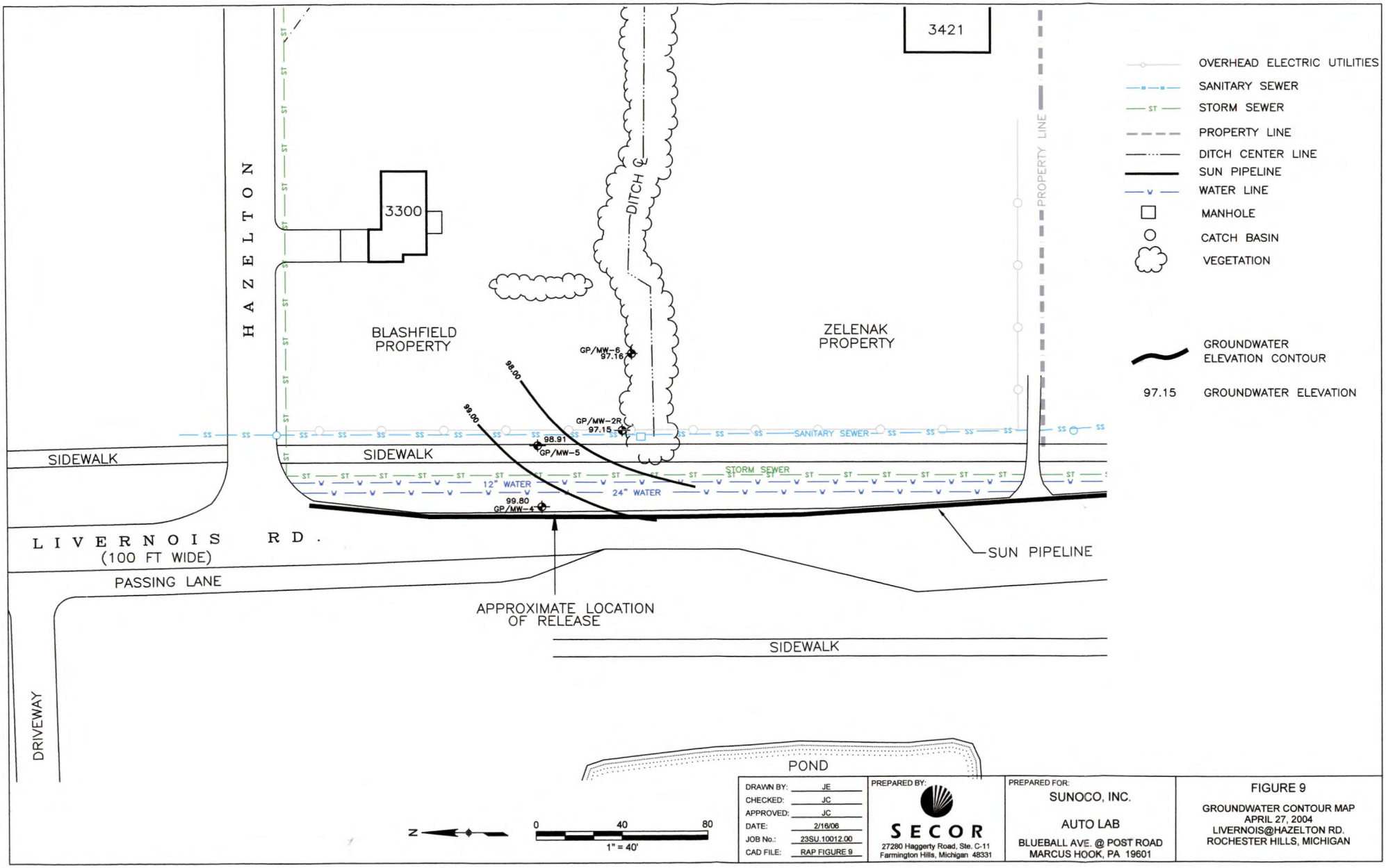
GP/MW-4	4/29/04	7/28/04	12/2/04	2/16/05	4/28/05
BENZENE	980	850	22	11	180
ETHYLBENZENE	310	180	9.4	7.6	75
TOLUENE	17	27	<1	<1	5
XYLENES	32.2	72	<3	<3	14
MTBE	7.6	<1	<1	<1	<1
1,2,4-TMB	130	<1	<1	2.8	<1
1,3,5-TMB	9.5	<1	<1	<1	<1
2-METH	<5	NA	<5	<5	<5
NAPHTHALENE	26	NA	<5	<5	9.5

DRAWN BY:	JE
CHECKED:	JC
APPROVED:	JC
DATE:	2/15/06
JOB No.:	23SU.10012.00
CAD FILE:	RAP FIGURE 8

PREPARED BY:
SECOR
27280 Haggerty Road, Ste. C-11
Farmington Hills, Michigan 48331

PREPARED FOR:
SUNOCO, INC.
AUTO LAB
BLUEBALL AVE. @ POST ROAD
MARCUS HOOK, PA 19601

FIGURE 8
GROUNDWATER ANALYTICAL RESULTS MAP
APRIL 2004 - APRIL 2005
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN



DRAWN BY:	JE
CHECKED:	JC
APPROVED:	JC
DATE:	2/16/06
JOB No.:	23SU.10012.00
CAD FILE:	RAP FIGURE 9

PREPARED BY:

SECOR

27280 Haggerty Road, Ste. C-11
Farmington Hills, Michigan 48331

PREPARED FOR:

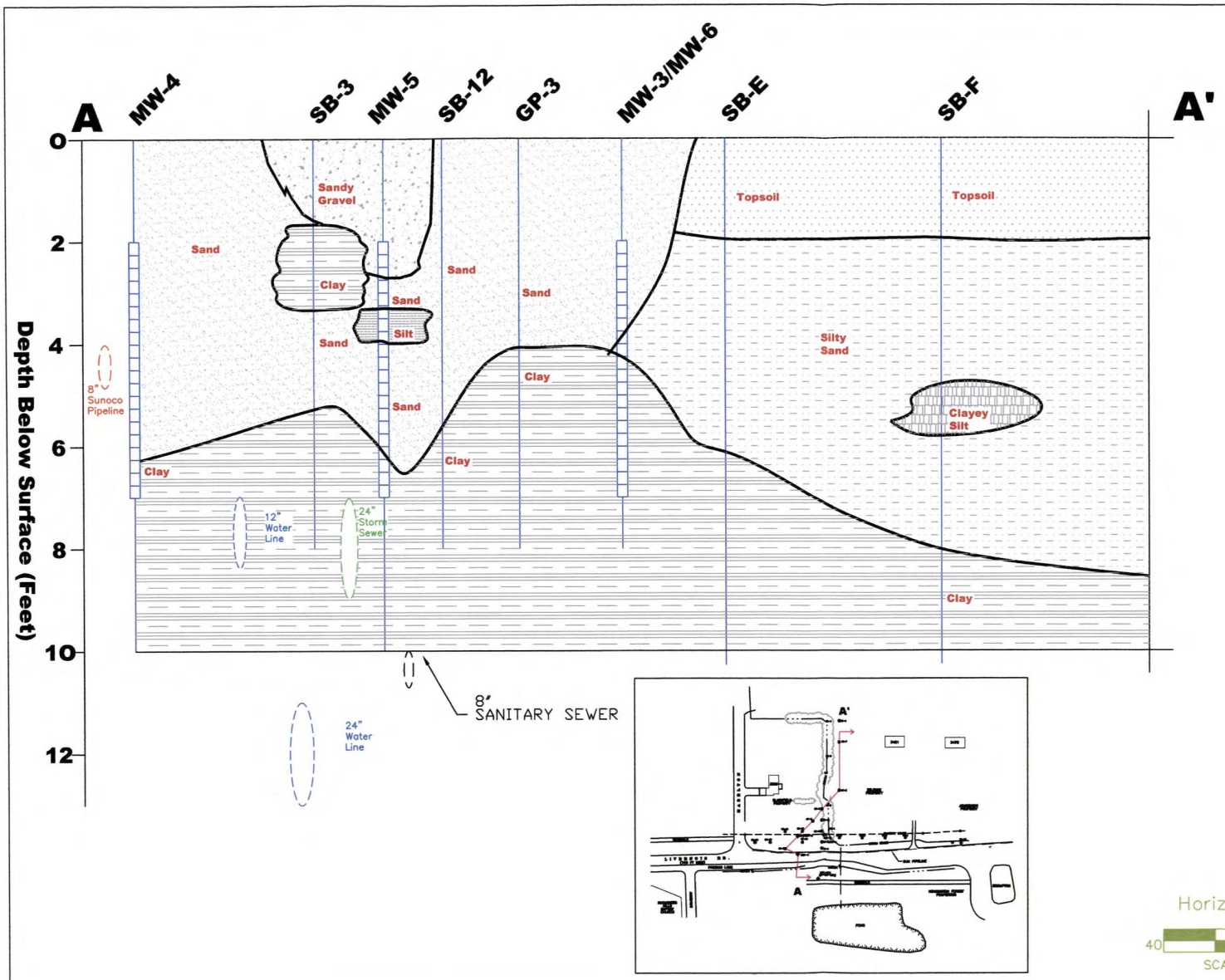
SUNOCO, INC.

AUTO LAB

BLUEBALL AVE. @ POST ROAD
MARCUS HOOK, PA 19601

FIGURE 9

GROUNDWATER CONTOUR MAP
APRIL 27, 2004
LIVERNOIS@HAZELTON RD.
ROCHESTER HILLS, MICHIGAN



Horizontal Scale
0
40
40
SCALE: 1" = 40'

NO.	DATE	INIT.	REVISION

NOTES/COMMENTS:

Soil Boring/Well

Well Screen

SIGNATURE	DATE
REVIEW ENGR:	
PROJECT ENGR:	
PROJECT MGR:	
CLIENT:	

PREPARED BY:
SECOR INTERNATIONAL INCORPORATED
SECOR
27280 HAGGERTY ROAD
SUITE C-11
FARMINGTON HILLS, MI 48331

SITE LOCATION:
Rochester Hills Pipeline

Livernois Ave & Hazelton Rd
Rochester Hills, Michigan

PREPARED FOR:
Sunoco, Inc.

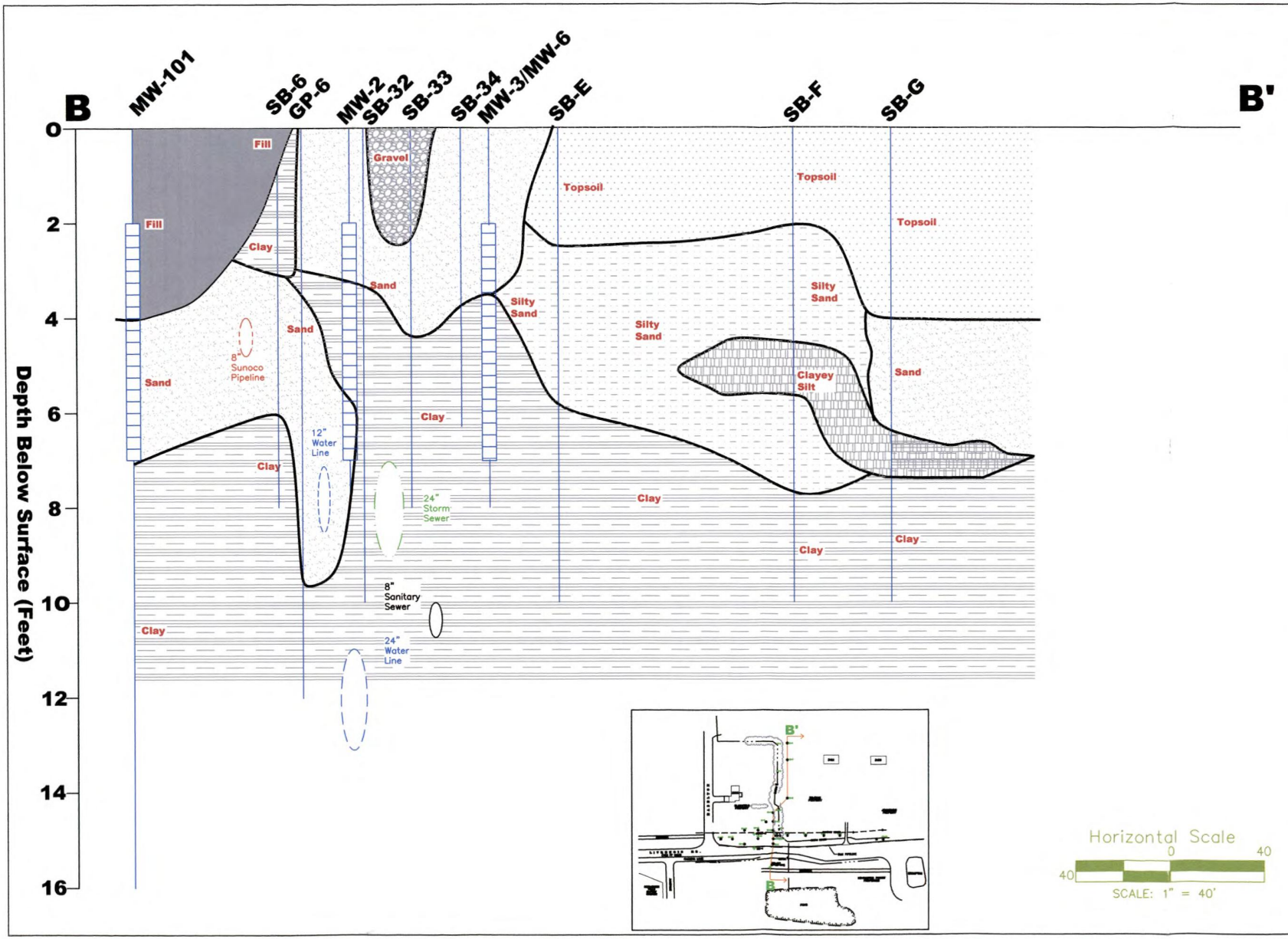
Auto Lab
Blueball Avenue & Post Road
Marcus Hook, PA 19601

Geologic
Cross Section A-A'

DESIGNED BY:	DETAILED BY:	CHECKED BY:
JE	JE	JF

DATE:	ACAD FILE:
9/19/05	X-SEC A-A'.dwg
PROJECT NO.: 23SU.10012.00	PLOT SCALE: 1" = 40'

FIGURE NO:
FIGURE 10



Horizontal Scale

0 40

40

SCALE: 1" = 40'

NO.	DATE	INT.	REVISION

NOTES/COMMENTS:

SOIL BORING/WELL

WELL SCREEN

SIGNATURE	DATE
REVIEW ENGR:	
PROJECT ENGR:	
PROJECT MGR:	
CLIENT:	

PREPARED BY:

SECOR INTERNATIONAL INCORPORATED

SECOR

27200 HAGGERTY ROAD
SUITE C-11
FARMINGTON HILLS, MI 48331

SITE LOCATION:

Rochester Hills Pipeline

Livernois Ave & Hazelton Rd
Rochester Hills, Michigan

PREPARED FOR:

Sunoco, Inc.

Auto Lab
Blueball Avenue & Post Road
Marcus Hook, PA 19601

Geologic Cross Section B-B'

DESIGNED BY:	DETAILED BY:	CHECKED BY:
JE	JE	JC

DATE:	ACAD FILE:
2/16/06	RAP FIGURE 11

PROJECT NO.:	PLOT SCALE:
23SU.10012.00	1" = 40'

FIGURE NO:

FIGURE 11

C

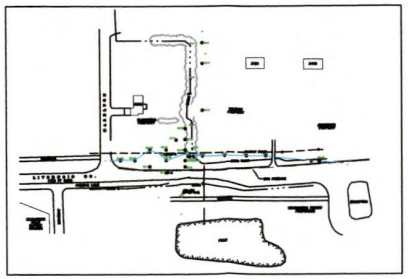
SB-38 SB-37 SB-18 MW-5 SB-36 MW-2 (SB-2) GP-5 SB-H SB-I SB-J SB-26

C'

Depth Below Surface

0 2 4 6 8 10 12 14 16

Gravel
Clay
Sand
Clay
Gravel
Sand
Clay
Gravel
Clay
Sand
Sand
Clay
Sand
Clay
Clayey Silt
Clay
Topsoil
Clayey Silt
Clayey Silt
Clayey Silt
Topsoil
Sand
Clay
Gravel
Sand
Clay
Clayey Silt



Horizontal Scale
40 0 40
SCALE: 1" = 40'

Soil Boring/Well

Well Screen

NO.	DATE	INIT.	REVISION

NOTES/COMMENTS:

SIGNATURE	DATE
REVIEW ENGR:	
PROJECT ENGR:	
PROJECT MGR:	
CLIENT:	

PREPARED BY:
SECOR INTERNATIONAL INCORPORATED
SECOR
27280 HAGGERTY ROAD
SUITE C-11
FARMINGTON HILLS, MI 48331

SITE LOCATION:
Rochester Hills Pipeline

Livernois Ave & Hazelton Rd
Rochester Hills, Michigan

PREPARED FOR:
Sunoco, Inc.

Auto Lab
Blueball Avenue & Post Road
Marcus Hook, PA 19601

Geologic Cross Section C-C'

DESIGNED BY:	DETAILED BY:	CHECKED BY:
JE	JE	JF

DATE:	ACAD FILE:
9/22/05	RAP FIGURE 12

PROJECT NO.:	PLOT SCALE:
23SU.10012.00	1" = 40'

FIGURE NO:
FIGURE 12

SECOR
INTERNATIONAL
INCORPORATED

SECOR

TABLES

Table 1

2004 Soil Analytical Results - BTEX, Trimethylbenzenes, Naphthalene, and 2-methylnaphthalene

Sunoco Inc.
Livernois and Hazelton Roads Pipeline
Rochester Hills, Michigan

Sample ID	Sampling Date	Extraction Date	Analysis Date	Sample Depth (feet below surface)	Benzene (ug/kg)	Toluene (ug/kg)	Ethylbenzene (ug/kg)	Xylenes (ug/kg)	1,2,4-TMB (ug/kg)	1,3,5 - TMB (ug/kg)	Naph (ug/kg)	2-Meth (ug/kg)
Groundwater/Surface Water Interface Protection Criteria					**4,000**	**2,800**	**360**	**700**	**570**	**1,100**	**870**	**ID**
Generic Residential Volitalization to Indoor Air Criteria					**1,600**	**250,000**	**140,000**	**150,000**	**110,000**	**94,000**	**250,000**	**ID**
Generic Residential Direct Contact Criteria					**180,000**	**250,000**	**140,000**	**150,000**	**110,000**	**94,000**	**16,000,000**	**8,100,000**
Generic Residential Groundwater Contact Protection Criteria					**220,000**	**250,000**	**140,000**	**150,000**	**110,000**	**94,000**	**2,100,000**	**5,500,000**
Generic Residential Volatilization to Ambient Air Inhalation Criteria					**13,000**	**2,800,000**	**720,000**	**46,000,000**	**21,000,000**	**16,000,000**	**300,000**	**ID**
GP/MW-2R	04/26/04	05/06/04	05/06/04	3-4'	<50	<50	<50	<150	<50	<50	<330	<330
GP/MW-4	04/26/04	05/06/04	05/06/04	2-3'	<50	<50	210	<150	<50	<50	<330	<330
GP/MW-5	04/26/04	05/06/04	05/06/04	3-4'	<50	<50	<50	<150	<50	<50	<330	<330
GP/MW-6	04/26/04	05/06/04	05/06/04	2-3.5'	<50	<50	<50	<150	<50	<50	<330	<330

Additional Comments:
ID - Insufficient Data
TMB - Trimethylbenzene
Naph - Naphthalene
2-Meth - 2-Methylnaphthalene

Table 2

2004 Soil Anaytical Results - Polynuclear Aromatic Compounds

Sunoco Inc.

Livernois and Hazelton Roads Pipeline

Rochester Hills, Michigan

Sample ID	Date Sampled	Extraction Date	Analysis Date	Sample Depth (feet below surface)	Naphthalene (ug/kg)	2-Methylnaphthalene (ug/kg)	Acenaphthene (ug/kg)	Acenaphthylene (ug/kg)	Anthracene (ug/kg)	Benzo (a) Anthracene (ug/kg)	Benzo (b) Fluoranthene (ug/kg)	Benzo (k) Fluoranthene (ug/kg)	Benzo (a) Pyrene (ug/kg)	Benzo (g,h,i) Perylene (ug/kg)	Chrysene (ug/kg)	Dibenzo (a,h) Anthracene (ug/kg)	Fluoranthene (ug/kg)	Fluorene (ug/kg)	Indeno (1,2,3-cd) Pyrene (ug/kg)	Phenanthrene (ug/kg)	Pyrene (ug/kg)
Groundwater/Surface Water Interface Protection Criteria					**870**	**ID**	**4,400**	**ID**	**ID**	**NLL**	**NLL**	**NLL**	**NLL**	**NLL**	**NLL**	**NLL**	**5,500**	**5,300**	**NLL**	**2,300**	**ID**
Generic Residential Volitalization to Indoor Air Criteria					**250,000**	**ID**	**190,000,000**	**1,600,000**	**1,000,000,000**	**NLV**	**ID**	**NLV**	**NLV**	**NLV**	**ID**	**NLV**	**1,000,000,000**	**580,000,000**	**NLV**	**1,800,000**	**1,000,000,000**
Generic Residential Direct Contact Criteria					**16,000,000**	**8,100,000**	**41,000,000**	**1,600,000**	**230,000,000**	**20,000**	**20,000**	**200,000**	**2,000**	**2,500,000**	**2,000,000**	**2,000**	**46,000,000**	**27,000,000**	**20,000**	**1,600,000**	**29,000,000**
Generic Residential Groundwater Contact Protection Criteria					**2,100,000**	**5,500,000**	**970,000**	**440,000**	**41,000**	**NLL**	**NLL**	**NLL**	**NLL**	**NLL**	**NLL**	**NLL**	**730,000**	**890,000**	**NLL**	**1,100,000**	**480,000**
Generic Residential Ambient Air Inhalation Criteria					**300,000**	**ID**	**81,000,000**	**2,200,000**	**1,400,000,000**	**NLV**	**ID**	**NLV**	**NLV**	**NLV**	**ID**	**NLV**	**740,000,000**	**130,000,000**	**NLV**	**160,000**	**650,000,000**
GP/MW-4	04/26/04	05/06/04	05/06/04	2-3'	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
GP/MW-5	04/26/04	05/06/04	05/06/04	3-4'	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
GP/MW-6	04/26/04	05/06/04	05/06/04	2-3.5'	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
GP/MW-2R	04/26/04	05/06/04	05/06/04	3-4'	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330

Additional Comments:

ID - Insufficient Data

NLL - Not Likely to Leach

NLV - Not Likely to Volatilize

Table 3

2004-2005 Groundwater Analytical Results- BTEX, MTBE, and TMBs

Sunoco, Inc.

Livernois and Hazelton Roads Pipeline

Rochester Hills, Michigan

Sample ID	Sample Date	Extraction Date	Analysis Date	Screen Interval	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Methyl Tert Butyl Ether	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
					(micrograms per liter)						
Groundwater/Surface Water Interface Criteria					**200**	**18**	**140**	**35**	**730**	**17**	**45**
Generic Residential Volatilization to Indoor Air Inhalation Criteria					**5,600**	**170,000**	**530,000**	**190,000**	**47,000,000**	**56,000**	**61,000**
Generic Residential Groundwater Groundwater Contact Criteria					**11,000**	**170,000**	**530,000**	**190,000**	**47,000,000**	**56,000**	**61,000**
MW-2R	04/29/04	05/02/04	05/02/04	2-7'	<1	<1	<1	<3	<4	<1	<1
	07/28/04	07/29/04	07/29/04	2-7'	<1	<1	<1	<3	<4	<1	<1
	12/02/04	12/06/04	12/07/04	2-7'	<1	<1	<1	<3	<1	<1	<1
	02/16/05	02/17/05	02/17/05	2-7'	<1	<1	<1	<3	<1	<1	<1
	04/28/05	05/03/05	05/03/05	2-7'	<1	<1	<1	<3	<1	<1	<1
MW-4	04/29/04	05/02/04	05/02/04	2-7'	**980**	**310**	17	32.2	7.6	**130**	9.5
	07/28/04	07/29/04	07/29/04	2-7'	**850**	**180**	27	**72**	<1	<1	<1
	12/02/04	12/06/04	12/07/04	2-7'	22	9.4	<1	<3	<1	<1	<1
	02/16/05	02/17/05	02/17/05	2-7'	11	7.6	<1	<3	<1	2.8	<1
	04/28/05	05/03/05	05/03/05	2-7'	180	**75**	5	14	<1	<1	<1
MW-5	04/29/04	05/02/04	05/02/04	2-7'	34	6.7	<1	<3	<4	<1	<1
	07/28/04	07/29/04	07/29/04	2-7'	1.6	<1	<1	<3	<1	<1	<1
	12/02/04	12/06/04	12/07/04	2-7'	1.8	<1	<1	<3	<1	<1	<1
	02/16/05	02/17/05	02/17/05	2-7'	7.8	<1	<1	<3	<1	<1	<1
	04/28/05	05/03/05	05/03/05	2-7'	2.9	<1	<1	<3	<1	<1	<1
MW-6	04/29/04	05/02/04	05/02/04	2-7'	<1	<1	<1	<3	<4	<1	<1
	07/28/04	07/29/04	07/29/04	2-7'	<1	<1	<1	<3	<4	<1	<1
	12/02/04	12/06/04	12/07/04	2-7'	<1	<1	<1	<3	<1	<1	<1
	02/16/05	02/17/05	02/17/05	2-7'	<1	<1	<1	<3	<1	<1	<1
	04/28/05	05/03/05	05/03/05	2-7'	<1	<1	<1	<3	<1	<1	<1

Additional Comments:

Shading - Exceeds Part 201 GSI Criteria

Table 4

2004-2005 Groundwater Analytical Results - Polynuclear Aromatic Compounds

Sunoco, Inc.

Livernois and Hazelton Roads Pipeline

Rochester Hills, Michigan

Sample ID	Sample Date	Extraction Date	Analysis Date	Screen Interval	Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
					(micrograms per liter)																
Groundwater/Surface Water Interface Criteria					19	ID	ID	NA	ID	NA	NA	ID	ID	ID	2	12	ID	ID	13	5	ID
Generic Residential Volatilization to Indoor Air Inhalation Criteria					4,200	3,900	43	NLV	NLV	NLV	NLV	NLV	ID	NLV	210	2,000	NLV	ID	31,000	1,000	140
Generic Residential Groundwater Contact Criteria					4,200	3,900	43	9	2	5	5	5	5	5	210	2,000	5	25,000	31,000	1,000	140
MW-2R	04/29/04	05/04/04	05/06/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	12/02/04	12/06/04	12/07/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	02/16/05	02/21/05	02/21/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	04/28/05	05/05/05	05/05/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
MW-4	04/29/04	05/04/04	05/06/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	26	<5	<5
	12/02/04	12/06/04	12/07/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	02/16/05	02/21/05	02/21/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	04/28/05	05/05/05	05/05/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
MW-5	04/29/04	05/04/04	05/06/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	9.5	<5	<5
	12/02/04	12/06/04	12/07/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	02/16/05	02/21/05	02/21/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	04/28/05	05/05/05	05/05/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
MW-6	04/29/04	NA	NA	2-7'	Not sampled - Insufficient groundwater																
	12/02/04	12/06/04	12/07/04	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	02/16/05	02/21/05	02/21/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5
	04/28/05	05/05/05	05/05/05	2-7'	<5	<5	<5	<1	<2	<5	<5	<2	<5	<2	<5	<5	<2	<5	<5	<5	<5

Additional Comments:

NA - Not Available

ID - Insufficient Data

NLV = Not Likely to Volatilize

Shading - Exceeds Part 201 GSI Criteria

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APPENDIX A
SOIL BORING LOGS

Handex of Michigan

BORING LOG: SB-1

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
						Brown, Medium SAND, Slightly Moist.
				0		Brown, Clayey SAND, Coarse Pebbles, Slightly Moist.
	SB-1*			8		Dark Brown, Sandy to Gravely Clay, Moist.
				0.3		Wet, Brown, Silty, Coarse Sand.
5				1		Silty, Brown, Fine to Coarse SAND.
						No sample, saturated.
10						Bottom of Boring at 10'.
15						

Boring Diagram: 5, 10, 15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-2

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Sandy GRAVEL, Silty Fill	
				5		CLAY, Sandy, Silty, Brown, Slightly Moist.	
				0		*Silty Brown, SAND, Fine becoming Coarse, Wet.*	
				0		Silty, Brown, SAND, Coarse.	
5							5
	SB-2*					CLAY, Silty Trace Pebbles.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-3

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				8		Sandy GRAVEL, Silty Brown, Moist.	
				60		CLAY, Sandy, Pebbles, Hard, Slightly Moist.	
				0		SAND, Silty, Dark Gray, Black, Stain, Wet.	
	SB-3*			0		CLAY, Silty, Sandy, Brown, Slightly Moist.	
5							5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-4

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						6 inches of Fill Sand Overlying Clay, Sandy, Pebbles, Slightly Moist.	
				50		SAND, Medium Silty Brown, Wet.	
5	SB-4*			3		CLAY, Brown Fractures, Silty, Pebbles, Slightly Moist, Hard.	5
				30		CLAY, Very Sandy, Silty, Brown, Black Stain,	
	SB-4*			4		Soft, Moist.	
						CLAY, Brown, Silty, Trace Pebbles, Slightly Moist.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-5

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 In.	OVA ppm	Graphic Log	Geologic Description
				0		6 inches of Fill Sand Overlying Clay, Gravely, Moist.
						SAND, Medium, Silty, Brown, Stained, Wet.
5						Saturated GRAVEL, Free Product.
	SB-5*			0		CLAY, Silty Sand, Brown, Fractures, Slightly Moist.
						Bottom of Boring at 8'.
10						
15						

Boring Diagram: 5, 10, 15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-6

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
				80		GRAVEL Fill, Silty, Brown, Dry.
						CLAY, Gravel, Dark Brown, Slightly Moist.
						CLAY, Less Gravel, Some Sand, Brown.
						SAND, Fine to Medium, Dark Brown, Silty, Moist.
5						SAND, Wet with Free Product at 5'.
	SB-6*			0		CLAY, Silty, Fine Sand, Brown, Moderately Soft, Slightly Moist.
						Bottom of Boring at 8'.
10						
15						

Boring Diagram

5

10

15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-7

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
	SB-7*			0		Clayey GRAVEL, Fill.	
				8			
				1		SAND, Clayey, Wet, Silty Black Stain at 3.5'.	
5				1		CLAY, Brown, Reddish in part, Pebbles, Moderately Soft, Slightly Moist.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-8

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				0		GRAVEL Fill, Silty Brown, Slightly Moist.	
				0		SAND, Silty, Medium to Coarse Pebbles, Brown, Wet.	
5	SB-8*			0		CLAY, Silty, Brown, Pebbles, Medium, Soft, Moist.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass	Driller: Fibertech

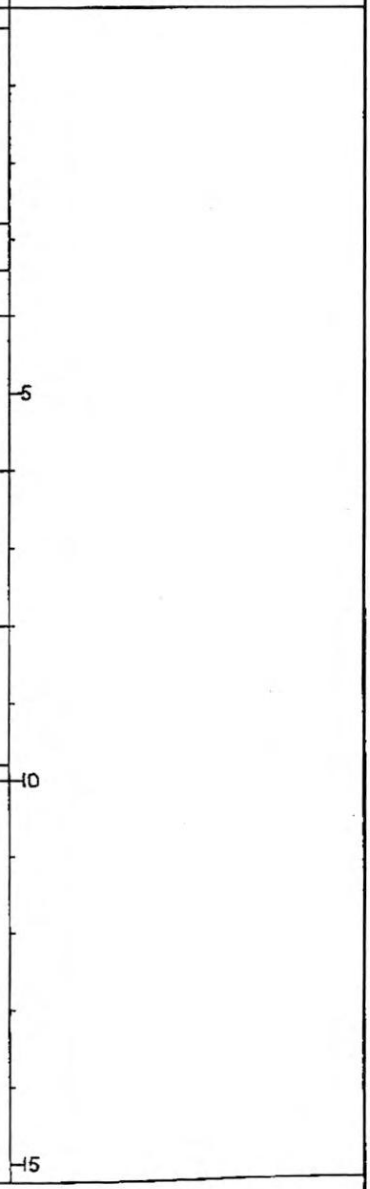
Handex of Michigan

BORING LOG: SB-10

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
				0		SAND and GRAVEL, Dry.
						Mid 8" Darker Color SAND.
						Bottom 8" Sandy SILT, Damp.
	SB-10*			2		SAND, Brown, Wet, Fine to Medium, Gray.
5						
						Bottom 2' SILT, Brown, Wet.
				1		Brown, SILT with SAND, Wet.
10						Last 2" Medium to Coarse Grained SAND.
						Bottom of Boring at 10'.
15						

Boring Diagram



NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-11

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						SAND and GRAVEL.	
				0		Darker Brown SAND.	
						Reddish-Brown SAND, Fine to Meidum Grained.	
				.75		SAND, Moist.	
5				1.75		Brown Clayey SILT with SAND, Some Gray Mottling, Damp.	5
	SB-11*						
	SB-11*			.25		Clayey SILT, Brown.	
10						Silt, Brown, Wet.	10
						Silty CLAY.	
						Bottom of Boring at 10'.	
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-12

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
	SB-12*			0		SAND, Brown, Silty, Pebbles, Dry.	
5				0		SAND, Silty, Brown, Moist.	5
						CLAY, Sandy, Silty, Dark Brown, Moist.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-16

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Topsoil, Brown, SAND, Fine to Medium Grained with Pebbles.	
	SB-16*			6.5		Brown SAND, Fine to Medium Grained, Wet at 7'.	
5							5
				0		Brown, Clayey SILT with SAND, Moist.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Mainial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-17

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				0		SAND and GRAVEL.	
				0		Dark Brown SAND.	
						Brown Fine to Medium Grained SAND.	
				.25			
5							5
	SB-17*			.75		Brown Sandy SILT.	
						Firm, Brown, Silty CLAY, Dry.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-18

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL and SAND, Dry.	
				0		Darker Brown SAND.	
						Reddish-Brown SAND, Damp.	
				.25		Reddish-Brown SAND, Wet.	
5				.25		Sandy, Silty CLAY with Little PEBBLES.	5
	SB-18*						
						Brown, Sandy SILT, Wet.	
				.5			
						Gray, Sandy CLAY.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial	Driller: Fibertech

Handex of Michigan

BORING LOG: SB-23

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL Fill, Clayey, Brown, Slightly Moist.	
	SB-23*			0		Dark Brown CLAY, Sandy, Pebbley, Moist, Soft.	
				0		SAND, Very Silty, Medium to Coarse, Wet.	
5				0		CLAY, Silty, Brown, Soft, Moist.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass	Driller: Fibertech

Handex of Michigan

BORING LOG: SB-24

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				0		Ground Till, CLAY, SILT, SAND, Pebbles, Brown, Dry.	
	SB-24*			0		SAND, Silty, Dark Brown, Moist.	
5				0		CLAY, Silty, Sandy, Dark Gray, Pebbles, Very Soft, Moist.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-25

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL, Brown to Dark Brown, Silty, Slightly Moist.	
	SB-25*			0		SAND, Well Sorted, Coarse to Fine Silty, Clayey.	
5				0		SAND, Medium to Coarse, Silty, Brown, Wet.	5
				0		CLAY, Silty, Gray, Trace, Pebbles, Slightly Moist.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass	Driller: Fibertech

Handex of Michigan

BORING LOG: SB-26

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *7 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL Fill, Silty, Brown, Moist.	
	SB-26*			0		Silty SAND, Soil, Organic, Dark Brown, Moist.	
				0		SAND, Silty, Coarse, Brown, Wet.	
5				0			5
				0		CLAY, Silty, Trace Pebbles, Brown, Slightly Moist.	
						CLAY, Very Silty, Pebbles, Gray, Slightly Moist.	
						Bottom of Boring at 7'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-30

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
				0		Fine to Medium Grained SAND with GRAVEL, Brown, Dry.
						Medium Grained, Brown, SAND with GRAVEL, Dry.
				0		
	SB-30*					Medium Grained, Brown, SAND with GRAVEL, *Silty, Moist.*
5				0		Brown, Sandy CLAY, Moist.
				0		CLAY, Silty, Brown-Gray, Hard, Silty, Moist with trace Pebbles.
						Bottom of Boring at 8'.
10						
15						

Boring Diagram

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass	Driller: Fibertech

Handex of Michigan

BORING LOG: SB-31

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Brown, Sandy CLAY with GRAVEL, Dry.	
	SB-31*			0		Brown-Gray, Silty SAND, Very Moist.	
				1			
5							5
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-32

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Medium Grained, Brown SAND with CLAY, Dry.	
				0		Brown, Sandy CLAY, Moist.	
	SB-32*			0			
5							5
						Silty, Brown CLAY, Very Moist.	
				0			
						Brown CLAY, Hard, Moist.	
10				0		Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-33

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 In.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				0		GRAVEL, Brown, Sandy, Slightly Moist.	
	SB-33*			0		SAND, Coarse, Silty, Wet.	
5				0		CLAY, Silty, Pebbles, Brown, Soft, Moist.	5
				0			
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-34

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 In.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 In.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL, Silty, Brown to Dark Brown at 1', Dry.	
				0		Clayey GRAVEL, Brown, Moist.	
	SB-34*			0		GRAVEL, Silty, Brown, Wet.	
5						Very Silty, Sandy CLAY, Brown, Trace, Pebbles.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-35

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
						GRAVEL, Fill, Sandy, Brown, Slightly Moist.
				0		SAND, Coarse, Brown, Slightly Silty, Slightly Moist.
	SB-35*			0		CLAY, Silty, Brown, Moderately Soft, Moist.
5				0		Silty and Very Fine SAND, Brown, Wet, Pebbles.
				0		
						Bottom of Boring at 8'.
10						
15						

Boring Diagram

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-36

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				0		GRAVEL, Silty, Brown, Slightly Moist.	
	SB-36*			0		Gravely CLAY, Brown, Slightly Moist.	
5				35		*Pushed Rock Recover, 4" of Soft Clayey SAND, Dark Gray.*	5
	SB-36*			0		CLAY, Brown, Hard, Slightly Moist.	
10						*Bottom of Boring at 10'.*	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-37

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL, Sandy, Silty, Clayey, Hard Dry.	
	SB-37*			70		Sandy, Silty, Very Fine, Gray, Brown, Wet.	
5				50		CLAY, Stiff, Silty, Brown, Pebbles.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass	Driller: Fibertech

Handex of Michigan

BORING LOG: SB-38

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						GRAVEL, Brown, Dry.	
				0		Sandy CLAY, Brown, Hard, Dry.	
				3		Silty SAND, Gray, Wet, Pastey.	
5	SB-38*			0			5
						Silty CLAY, Brown, Pebbles, Moist.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass | Driller: Fibertech

Handex of Michigan

BORING LOG: SB-39

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Sandy GRAVEL, Brown, Dry.	
				0		Silty SAND, Clay, Dark Gray-Black, Organic, Moist.	
				0		Very Silty SAND, Dark Gray, Coarse to Fine, Wet.	
5	SB-39*			0		Silty CLAY, Brown, Pebbles, Moist.	5
				0		Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Randy Glass

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-A

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Dark Brown Soil.	
				1.25		*Brown, Sandy, Clayey SILT with Pebbles, Moist Bottom 4".*	
	SB-A*			8		*Darker SAND.*	
5				.25		*Brown, Sandy, Clayey, SILT, Moist.*	5
				0		Coarse Grained SAND.	
						SILT with SAND.	
						Brown SILT with Some to Little SAND.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for anlaysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-B

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
						Topsoil.
						Dark Brown, Organic SAND.
				.25		Brown, Clayey SILT.
						Medium Grained SAND.
5	SB-B*			12.		Brown, Clayey SILT with SAND.
						SILT with Medium Grained SAND.
				8.		SILT, Brown, Moist to Wet.
						Bottom of Boring at 8'.
10						
15						

Boring Diagram

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial | Driller: Fibertech

Handex of Michigan

BORING LOG: SB-C

Permit #:	Drill Date: *September 26, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Dark Brown (organics), SAND, Topsoil.	
				4		Medium to Coarse Grained SAND and SILT, Brown.	
				8			
5							5
				13		Brown SILT with SAND.	
	SB-C*					Mottled Brown and Gray Clayey SILT, Stiff.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial | Driller: Fibertech

Handex of Michigan

BORING LOG: SB-D

Permit #:	Drill Date: *September 28, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						TOPSOIL.	
						Darker Brown Organics.	
				2		Sandy SILT with GRAVEL, Moist, Coarser Grained Sand at Bottom 2".	
	SB-D*			7		Darker Color SILT with Coarser Grained SAND at 40" - 42".	
5							5
				1.5		Brown Clayey SILT, Stiff with Some Pebbles, Mottled 22" - 31".	
				.25		SAA Brown, Moist to Wet.	
						Brown-Gray, Clayey Silt.	
10							10
						Bottom of Boring at 10'.	
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-E

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
						TOPSOIL, Organics.
						Brown, Clayey, SILT.
				0		Fine to Medium Grained, Light Brown SAND.
				0		Silty CLAY with PEBBLES.
5						SAND, Brown-Gray, Fine to Medium Grained.
				0		Brown, SILT with SAND and PEBBLES.
	SB-E*					Brown, Silty CLAY with PEBBLES and ROCKS.
				0		
						Gray, Silty CLAY.
10						Bottom of Boring at 10'.
15						

Boring Diagram

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-F

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						TOPSOIL, Dark Brown Organic Soil.	
				0		Sandy, Silty Brown.	
						Clayey SILT, Brown.	
				0		SILT and SAND, Brown.	
				0		Brown, Clayey SILT with PEBBLES.	
5							5
	SB-F*			0		Gray, Silty CLAY.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-G

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				0		Topsoil, SAND and GRAVEL.	
						Darker Brown Organic Soils.	
				0		Brown Clayey SILT.	
5						Brown, Fine to Meldum Grained SAND, Wet.	5
				0		Brown, Clayey SILT.	
	SB-G*			0		Gray, Sandy, Silty CLAY.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

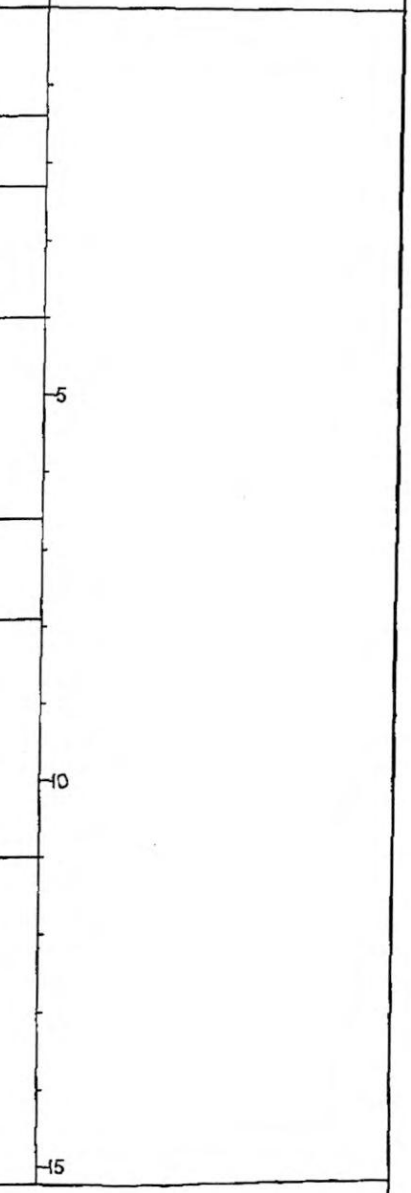
Handex of Michigan

BORING LOG: SB-H

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *11 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
						Topsoil.
						Dark Brown Organic SILT and SAND.
	SB-H*			.02		Brown, Sandy, Clayey SILT.
				.02		Brown, Clayey SILT with PEBBLES, Wet.
5						
				.02		Brown, Sandy SILT.
				.02		Brown, Clayey SILT with PEBBLES and SAND.
10						
						Bottom of Boring at 11'.
15						

Boring Diagram



NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB–I

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562–01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING – Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING – Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN – Length: *N/A*	
Static Water Level: *N/A*	WELL – Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Topsoil.	
				0		Dark Brown SILT and SAND.	
	SB–I*			0		Brown SAND, Fine to Medium Grained with SILT, Wet.	
5						SAND.	5
						Sandy SILT, Wet.	
				0		Brown, Clayey SILT with PEBBLES and SAND, Discolored, Mottled.	
						Brown, Clayey SILT with PEBBLES and SAND.	
				0		More Mottled.	
						Gray.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-J

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *10 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Topsoil, SAND and GRAVEL.	
	SB-J*			0		Fill SAND and CLAY.	
						Greenish Brown, Clayey SILT with SAND.	
				0		SAND, Fine to Medium Grained, Brown, Wet.	
5						SAND, Medium, Fine Coarse Grained, Wet.	5
				0		Sandy SILT, Wet.	
						Sandy, Clayey SILT.	
				0		Gray, Clayey SILT with SAND and PEBBLES.	
						Gray, Silty CLAY.	
10						Bottom of Boring at 10'.	10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-K

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
						Topsoil, SAND, Grass.
				ND		SILT and SAND, Organics.
						Brown, Sandy SILT.
	SB-K*			ND		SILT and SAND, Brown, Wet, Fine to Medium Grained.
5				ND		Dark Color, SILT and SAND, Moist, Wet.
				ND		Brown, Silty CLAY with PEBBLES.
						Bottom of Boring at 8'.
10						
15						

Boring Diagram

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-L

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Darker Brown SAND and SILT, Dry with PEBBLES.	
				ND		Darker Brown, Sandy SILT.	
				ND		Brown, Clayey SILT with PEBBLES and SAND.	
	SB-L*			ND			
5							5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

Handex of Michigan

BORING LOG: SB-M

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Organic, Darker Brown, TOPSOIL, Grass.	
				0		Brown, Sandy SILT, Wet.	
						No Recovery.	
				0		Brown, Sandy, Clayey SILT, Wet, Silty CLAY.	
5	SB-M*			0			5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial | Driller: Fibertech

Handex of Michigan

BORING LOG: SB–N

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562–01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING – Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING – Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN – Length: *N/A*	
Static Water Level: *N/A*	WELL – Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Darker Brown, Organic Topsoil, Dry, SILT and SAND with PEBBLES.	
						No Recovery.	
				0		Discolored Brown, Sandy SILT.	
5	SB–N*			5		Brown, Sandy SILT with Coarse (medium grained) SAND.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial | Driller: Fibertech

Handex of Michigan

BORING LOG: SB-O

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 In.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 In.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
	SB-O*			2		Dark Brown, SILT, Clayey, Moist.	
				0		Brown SILT.	
5				0		Sandy SILT, Brown, Moist to Wet.	5
				0		Discolored.	
						Brown, Sandy SILT with Coarse Grained SAND.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial | Driller: Fibertech

Handex of Michigan

BORING LOG: SB-P

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois & Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
						Brown SAND and GRAVEL FILL	
						Sandy SILT.	
				0			
				0		Brown, Clayey SILT, Gravel Lense, More Sand.	
	SB-P*						
5				0		Sandy, Clayey SILT.	5
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial | Driller: Fibertech

Handex of Michigan

BORING LOG: SB-Q

Permit #:	Drill Date: *September 27, 1994*	Use: *Soil Boring*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *2 in.*
Drilling Method: *Soil Probe*	CASING - Length: *N/A*	
Sampling Method: *Discrete & Open Core*	SCREEN - Length: *N/A*	
Static Water Level: *N/A*	WELL - Depth: *N/A*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description	Boring Diagram
				ND		Brown SAND and GRAVEL.	
				ND		Dark Brown, Clayey SILT.	
						Brown, Clayey SILT.	
				ND			
5							5
	SB-Q			ND		Dark Brown, Sandy SILT.	
						Brown, Silty CLAY.	
						Bottom of Boring at 8'.	
10							10
15							15

NOTES: * = Sample submitted for analysis.

Geologist: Wendy Manial

Driller: Fibertech

SECOR
27280 Haggerty Rd.
Farmington Hills, MI 48331

LOG OF BORING: **GP-1**

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **8**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **4**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		HA	M		0	Medium brown stiff, silty sand	SM			
					0					
5		4	S		0	Medium brown, fine sand	SM			
			M		0	Medium brown, stiff, low plasticity, silty clay with some fine-medium gravel	CL			
						EOB 8'				
10										
15										- concrete - sand - bentonite - riser - screen
20										- cave in

SECOR
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Farmington Hills, MI 48331

LOG OF BORING: **GP-2**

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **8**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **4**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0						Topsoil				
		HA	M		0	Medium brown, sand and silt	SM			
					0					
5		4	W		0	Medium brown, fine sand	SM			
			M		0	Medium brown, stiff, low plasticity, silty clay	CL			
						EOB 8'				
10										
15										- concrete - sand - bentonite - riser - screen - cave in
20										

SECOR
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Farmington Hills, MI 48331

LOG OF BORING: **GP-3**

PAGE: 1 of 1

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **8**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **NA**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		HA	M		0	Medium brown fine sand	SM			
					0					
5		4			0	Medium brown, stiff, low plasticity, silty clay	SM			
			M		0		CL			
						EOB 8'				
10										
15										- concrete - sand - bentonite - riser - screen - cave in
20										

SECOR
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Farmington Hills, MI 48331

LOG OF BORING: **GP-4**

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **4**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **NA**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		4	M		0	Medium brown, silty clay with some sand	CL			
					0	Medium brown, medium stiff, medium plasticity silty clay				
						EOB 4'				
5										
10										
15										- concrete - sand - bentonite - riser - screen - cave in
20										

SECOR
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Farmington Hills, MI 48331

LOG OF BORING: **GP-5**

PAGE: 1 of 1

Project Name:	Rochester Hills	Date Completed:	4/22/2004
Location:	Rochester Hills, Michigan	Casing Diameter (inch):	NA
Logged By:	T. Tackett	Total Depth (ft):	4
Drilling/Sampling Method:	Geoprobe/4.25 Hollow Stem Auger	Top-of-Casing Elev (ft):	NA
Driller/Drilling Company:	Terraprobe/Steve Bischoff	Ground Elevation (ft):	NA
		Boring Diameter (inch):	3
COMMENTS:	HA= Hand Auger	Initial Depth to Water (ft b.s.):	NA

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		4	M		0	Medium brown, medium stiff, medium plasticity, silty clay	CL			
					0					
						EOB 4'				
5										
10										
15										- concrete - sand - bentonite - riser - screen - cave in
20										

SECOR
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Farmington Hills, MI 48331

LOG OF BORING: **GP-6**

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **12**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **3.5**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		HA	M		0	Medium brown, fine sand	SM			
					0	grading to grey @ 4'				
			W							
5		4	S		0		SM			
					0					
			S							
					0					
10		4								
			M		0	Medium brown, stiff, low plasticity, silty clay	CL			
						EOB 12'				
15										- concrete - sand - bentonite - riser - screen
20										- cave in

SECOR
27280 Haggerty Rd.
Farmington Hills, MI 48331

LOG OF BORING: GP-7

PAGE: 1 of 1

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **8**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **NA**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		HA	M		0	Medium brown fine sand	SM			
					0					
5		4			0	Medium brown, stiff, low plasticity, silty clay	SM			
			M		0		CL			
						EOB 8'				
10										
15										- concrete - sand - bentonite - riser - screen - cave in
20										

SECOR
27280 Haggerty Rd.
Farmington Hills, MI 48331

LOG OF BORING: **GP-8**

Project Name: **Rochester Hills**
Location: **Rochester Hills, Michigan**
Logged By: **T. Tackett**
Drilling/Sampling Method: **Geoprobe/4.25 Hollow Stem Auger**
Driller/Drilling Company: **Terraprobe/Steve Bischoff**
COMMENTS: HA= Hand Auger

Date Completed: **4/22/2004**
Casing Diameter (inch): **NA**
Total Depth (ft): **8**
Top-of-Casing Elev (ft): **NA**
Ground Elevation (ft): **NA**
Boring Diameter (inch): **3**
Initial Depth to Water (ft b.s.): **5**

DEPTH feet	SAMPLE ID	Recovery (ft)	Moisture Content	Blow Counts	PID READINGS (ppmv)	GEOLOGIC DESCRIPTION	SOIL CLASS	Graphic Log: Lithology	WELL CONSTRUCTION	REMARKS
0		HA	M		0	Medium brown fine sand	SM			
					0					
5		4	W		0	Grey silt	SM			
						Medium brown, fine sand, with some gravel				
			M		0	Medium brown/grey, stiff, low plasticity, silty clay with some medium gravel	CL			
						EOB 8'				
10										
15										- concrete - sand - bentonite - riser - screen - cave in
20										

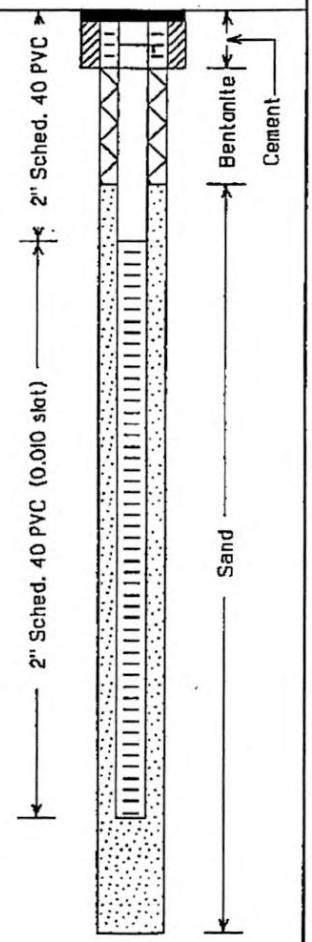
Handex of Michigan

WELL LOG: MW-1

Permit #:	Drill Date: *November 20, 1996*	Use: *Monitoring Well*
Location: *Livernois @ Hazelton Street*		Owner Loc #: *N/A*
Owner: *Sun Company, Inc.*		Handex Loc #: *108562-01*
Owner Address: *5733 Butler Street, Pittsburgh, PA*	BORING - Depth: *8 ft.*	Diameter: *6 in.*
Drilling Method: *Hand Auger*	CASING - Length: *2 ft.*	Diameter: *2 in.*
Sampling Method: *Discrete*	SCREEN - Length: *5 ft.*	Diameter: *2 in.*
Static Water Level: *N/A*	WELL - Depth: *7 ft.*	

Depth (ft.)	Sample ID	Sample Depth	Blows/6 in.	OVA ppm	Graphic Log	Geologic Description
	SB-1 2.5-3.5'					SAND: Darker Brown, Slightly Moist.
						Sandy SILT, Damp.
5						SAND, Brown, Fine to Medium, Wet.
	SB-1 7-8'					
10						Bottom of Boring at 8'

Well Diagram



Geologist: Randy Glass

Driller: Mark Riggle