URS

August 19, 2008

Mr. Steven F. Nightingale, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794

Subject: **Route 111/Rand Avenue Subsurface Investigation Report**
Shell Oil Products U.S.
Roxana, Illinois

Dear Mr. Nightingale:

On behalf of Shell Oil Products U.S., URS Corporation is submitting the enclosed investigation report for your review. The due date for the report was extended based on a telephone call with the Agency on August 8, 2008 and letter dated August 11, 2008. The investigation was conducted according to a work plan submitted to the Agency on February 15, 2008. The Agency provided comments to this work plan in a letter dated April 18, 2008.

The report includes recommendations for additional delineation work, to be included in a work plan to be submitted to the Agency in early September.

We look forward to your feedback on this report, in particular information that would be useful as we prepare the work plan for additional delineation. If you have any questions during your review, please contact Kevin Dyer, SOPUS project manager, at kevin.dyer@shell.com (618/288-7237), or me at bob_billman@urscorp.com (314/743-4108).

Sincerely,

Robert B. Billman
Senior Project Manager

Enclosures (3 copies)

Cc: Kevin Dyer, SOPUS (letter and report)
Mara McGinnis, IEPA Springfield (letter and report)
Chris Cahnovsky, IEPA Collinsville (letter and report)

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REPORT

SUBSURFACE INVESTIGATION

Route 111/Rand Avenue Vicinity Investigation Roxana, Illinois

Prepared for:

Shell Oil Products US
17 Junction Drive
PMB#399
Glen Carbon, Illinois 62034

August 2008
Revised January 21, 2009

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EXECUTIVE SUMMARY

Shell Oil Products US (SOPUS) conducted subsurface investigation activities at and outside the WRB Refining LLC (WRB) Wood River Refinery (WRR) in Roxana, Illinois. The investigation area is generally located in a mixed use area (e.g., commercial/industrial and residential). The purpose of the investigation was to further assess a benzene release which apparently occurred from an underground line on January 30, 1986. URS Corporation (URS), on behalf of SOPUS, performed an initial study in 2006 to help gather information on the extent of the benzene impact. The work described in this report was conducted based on a work plan *provided* ~~submitted~~ to the Illinois Environmental Protection Agency (IEPA) on February 15, 2008. *The IEPA provided comments regarding implementation of the work.*

This report was initially submitted to IEPA in August 2008 and IEPA provided comments on this report in a letter dated November 25, 2008. Based on IEPA's November 25, 2008 letter, this report has been revised. The "Response to Comments" document summarizes the revisions to the report. Text additions as a result of those comments are shown in italic font, and text removed from the report as a result of those comments is shown in strike-through format.

The field investigation included direct-push rig soil sampling, small diameter well installation, well development, vapor monitoring point sampling, and monitoring well gauging and sampling. Field activities were conducted between May and July 2008.

The surface topography across the investigation area generally slopes downward to the west-southwest, with a total drop in elevation of approximately 15 feet across the area. The stratigraphy beneath the area consists of the following materials, from top down: fill (gravel, clay, cinders, etc.) extending to a maximum depth 6 feet below ground surface (bgs); clay extending to a maximum depth of 20 feet bgs; and sand, consisting of glacial outwash, primarily silty sand grading to poorly graded, fine grained sand which coarsens with depth. The sand unit is water saturated below a depth of approximately 35 to 50 feet bgs (approximately elevation 397 to 395). Groundwater contours for the sand indicate flow toward the northeast, toward WRR production water pumping centers.

Soil samples were collected from each boring and analyzed for volatile organic compounds (VOCs). The soil borings generally exhibited low levels of impact or were non-detect, consistent with that expected given their distance from the 1986 release point. The borings closest to the benzene line tended to exhibit relatively higher concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX) (less than 1 mg/kg). The highest concentrations were found in samples between depths of 14 and 24 feet bgs. This is in the area where the clayey soils are thickest, and may indicate residual hydrocarbons sorbed to the fine grained soils.

Groundwater samples were collected from six new monitoring wells and seven existing monitoring wells and analyzed for VOCs. The cumulative analytical information (i.e., including the 2006 data) depicts the highest concentrations generally in a band on the order of 200 feet wide extending between the 1986 release point and the refinery. This area generally underlies the Village Public Works yard and wastewater treatment facility. The core area of impact widens closer to the refinery, consistent with groundwater flow toward pumping centers on WRR North and Main properties. Benzene concentrations in the core area have been identified in the hundreds to thousands of parts per million (ppm). Wells on the north and south sides of this band bound the core area, exhibiting part per billion (ppb) or non-detect concentrations.

Soil vapor samples were collected from four existing probe locations that overlie the highest observed groundwater concentrations. The results show relatively low and sporadic BTEX concentrations. The highest detected benzene concentration was in a probe at the 20 foot depth (37 ppb). Concentrations in the shallower samples (from 5, 10 and 15 feet) were lower or non-detect. Benzene concentrations were non-detect in the other probe locations. This marked attenuation from groundwater to shallow soil vapor is attributed to the distance to groundwater (approximately 45 feet) and biodegradation in the subsurface. It is expected that soil vapor concentrations would be lower in areas where groundwater concentrations are lower (e.g., north or south of the "core").

Based on discussions with IEPA, and SOPUS' Proposed Compliance Commitment Agreement, a work plan is being developed to assess the nature and extent of any mixed hydrocarbons identified along the WRR's west fenceline, generally north of the area investigated for this report. This work plan will also address the following data needs identified in this investigation, including:

- Characterization of soils in the area of the 1986 release
- Refinement of the northern extent of benzene-related groundwater impact north of Eighth Street and east of Highway 111.
- Collection of additional soil vapor data in areas north of the existing vapor probes.
- Collection of reproducible groundwater data over time in the area of highest concentrations (i.e., installation of monitoring wells).

This work plan was initially submitted on September 5, 2008. IEPA provided comments in a letter dated November 25, 2008, and the revised work plan is being submitted to the IEPA concurrent with this report.

Shell Oil Products U.S. (SOPUS) conducted subsurface investigation activities at and outside the WRB Refining LLC (WRB)[1] Wood River Refinery (WRR) in Roxana, Illinois. The investigation area is generally located between the intersection of Illinois Route 111 and Rand Avenue and the west fenceline of the refinery (**Figure 1**).

The area is being investigated to further assess a benzene release which apparently occurred on January 30, 1986, from an underground pipeline located just northwest of the Route 111 and Rand Avenue intersection. The pipeline extended from the refinery to barge loading facilities on the Mississippi River, along a route parallel to and just north of Rand Avenue. Beginning in 2005, increased benzene concentrations in groundwater have been observed in the WRR P-93 monitoring well cluster (i.e., P-93A and P-93B) located along the west fenceline of the refinery's North Property. URS Corporation (URS), on behalf of SOPUS, performed a subsurface investigation in 2006 to help gather information on the extent of the benzene impact (URS, 2007). The 2006 investigation provided initial information on the distribution of benzene in groundwater in the area, focusing primarily on screening technologies (e.g., cone penetration testing (CPT), membrane interface probe (MIP) and groundwater profiling).

The work described in this report was conducted based on a work plan *provided* ~~submitted~~ to the Illinois Environmental Protection Agency (IEPA) on February 15, 2008. In an April 18, 2008 letter to SOPUS and the WRR, the IEPA ~~approved the work plan and~~ provided: 1) conditions related to information to be included in the report for this work; and 2) a condition requiring a Water Well Survey.

This report was initially submitted to IEPA in August 2008 and IEPA provided comments on this report in a letter dated November 25, 2008. Based on IEPA's November 25, 2008 letter, this report has been revised. The "Response to Comments" document summarizes the revisions to the report. Text additions based on those comments are shown in italic font, and text removed from the report based on those comments is shown in strike-through format.

[1] WRB, formed January 1, 2007, is a 50/50 joint venture between ConocoPhillips (ConocoPhillips) and EnCana US Refineries LLC. The facility is owned by WRB and operated by ConocoPhillips.

The field investigation was performed in accordance with the work plan developed for this project, and included direct push rig soil sampling, small diameter well installation, well development, vapor monitoring point sampling, and monitoring well gauging and sampling.

Soil sampling and well installation was conducted between May 14 and 23, 2008. Well development was conducted between May 27 and June 2, 2008. Soil vapor sampling was conducted on June 3 and 4, 2008. Groundwater sampling was conducted between June 9 and 13, 2008.

2.1 PREFIELD ACTIVITIES

A meeting was held on April 22, 2008 between representatives of SOPUS, ConocoPhillips, URS and the Village of Roxana to discuss logistical issues regarding the upcoming work (e.g., site access, underground utilities, work schedule, etc.).

On May 30, 2008, at the request of the Village of Roxana, URS (on behalf of SOPUS) mailed fact sheets to residents in the investigation area. The fact sheet provided background information on the release, described the planned field activities and provided contact information.

The field activities in Roxana were conducted on village property or rights-of-way. This work was performed in accordance with an access agreement, signed May 8, 2008, between SOPUS and the Village of Roxana.

A utility locate was arranged for the drilling locations using Illinois' Joint Utility Locating Information for Excavators (JULIE) services. The Roxana Public Works Department also provided information concerning utilities in the area.

Prior to beginning site work, and at the start of work each day, a daily safety meeting was held. The purpose of this meeting was to discuss the day's planned activities and to address any potential health and safety concerns. URS and subcontract employees attended these daily meetings.

2.2 SOIL SAMPLING, WELL INSTALLATION AND DEVELOPMENT AND IEPA OVERSIGHT

URS subcontracted Roberts Environmental Drilling Inc. (REDI) of Millstadt, Illinois to perform the drilling activities associated with this project. Prior to direct push advancement, non-mechanized advancement techniques (i.e., air vacuum, water jetting, and hand augering) were used from ground surface to a depth of approximately seven feet below ground surface (bgs) in order to clear subsurface utilities and/or other obstructions that were not uncovered with the hand auger, per SOPUS protocol.

Shallow soil samples were collected for logging (detected stratigraphic information) and sampling purposes by utilizing a hand auger to a depth of seven feet bgs. At seven feet bgs, the borings were further advanced with direct push, dual-tube advancement techniques (e.g., Geoprobe®). The eight borings that were advanced as part of this investigation are shown in **Figure 2** and described as follows:

- Borings B-1 through B-4 are located in alleys between Sixth Street and Eight Street.
- Borings B-5, GP-7(11) and GP-12(11) are located at the Roxana Public Works yard south of Eighth Street.
- Boring B-6 is located along the Route 111 frontage road, just south of the entrance to the WRR.

Borings B-1 through B-6 were advanced approximately 10 feet below the depth at which groundwater was observed during probing. Total boring depths ranged from 48 to 64 feet bgs.

Borings GP-7 (11) and GP-12 (11) were advanced at locations adjacent to two existing vapor monitoring points. These borings were advanced to a depth of 20 feet bgs to collect more detailed stratigraphic information.

Below seven feet bgs, soil samples were continuously collected using a 2-inch diameter by 4-foot long Dual-Tube® soil sampler with acetate liners. This technique uses an outer 2.25-inch diameter casing to maintain borehole integrity while samples are obtained using an 1.125 inch inner casing. The subsurface stratigraphy was logged by a qualified field scientist in accordance with the Unified Soil Classification System (USCS). Soil cores from each boring were visually evaluated for evidence of impact and screened in the field for organic vapors using a photoionization detector (PID). The field scientist noted attributes such as color, particle size, consistency, moisture content, structure, plasticity, odor and organic content. PID headspace measurements were obtained at approximately 2-foot intervals by placing a small amount of soil in a ziploc-type bag, and measuring the headspace after approximately 10 minutes (**Table 1)**. Boring logs for each of the borings are included in **Appendix A**.

In general, the surface of the project area is covered by a thin layer of fill material, including gravel, clay, and topsoil, with occasional cinders. This is generally underlain by a layer of clay and clayey sand ranging in thickness from 3 to 15 feet. Below the clay lies medium dense sand to the depth probed during this investigation.

For this investigation, URS collected one soil sample from the top seven feet and another soil sample at the depth of greatest apparent impact above the water table. Soil samples were not

collected for analysis from below the water table. Groundwater typically entered the boreholes at an approximate elevation of 390 feet (36 to 50 feet bgs).

The soil samples were collected for analysis of volatile organic compounds (VOCs) via Method 8260B. **Table 2** summarizes the soil samples collected for chemical analysis at each of the soil boring locations. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.7** of this report. IEPA personnel were onsite on May 20th and 22nd, 2008 to observe soil sampling and well installation activities.

Small diameter wells were installed at locations B-1 through B-6 to obtain fluid level data and groundwater samples. These wells were constructed of 1-inch diameter threaded PVC, schedule 40 casing, installed through the dual-tube casing. Each well was installed with 15-feet of 0.010-inch slotted PVC well screen extending from the bottom of each boring. The well screens were placed to intersect the groundwater surface. *This length of screen allowed for accurate determination of the water table under variable, but at the same time unknown, fluctuations of the water table.* The native sand was allowed to collapse to approximately 5 feet above the top of the well screen. The remainder of each boring's annulus was filled with a high solids bentonite cement grout and topped with an 8-inch diameter flush-mount well vault. Well construction diagrams are provided in **Appendix B** and **Table 3** provides a well completion summary.

The drill rods and tools were decontaminated between borings. Additional information regarding decontamination practices and waste disposal is provided in **Section 2.6** of this report.

Between May 27 and June 2, 2008, the newly installed small diameter wells were developed in an attempt to remove fines from the sand pack. Development was performed via pumping and/or bailing a minimum of five well volumes of water. During well development, water quality parameters, including pH, temperature, conductivity, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP), were measured and recorded on the field sheets (**Appendix C**) after each well volume was removed. Development continued until the water quality parameters stabilized over two consecutive well volumes after the removal of the required well volumes.

2.3 SOIL VAPOR SAMPLING

Eighteen soil vapor samples were collected at four different vapor monitoring point (VMP) locations on or adjacent to the Roxana Public Works yard. Six VMP locations were originally planned to be sampled, but only four were located and determined to be accessible. These four

VMP locations, designated GP-9, GP-11, GP-12 and GP-13 were installed by Equilon in 1999/2000. The two VMP locations which could not be located included GP-7 and GP-8.

Each VMP location consists of four separate *0.375-inch ($^3/_8$-inch) diameter thin-walled polyethylene* tubes with 6-inch long ~~sampling ports screened~~ *stainless steel screens* at *depths of* approximately 5, 10, 15, and 20 feet bgs. These different sample depths are designated as A, B, C, and D, respectively, in the sample IDs used during this field investigation.

Prior to sampling from a vapor port, the vacuum/pressure reading was collected utilizing a three-way plastic micro-valve and a digital manometer. Readings from the manometer were allowed to stabilize. These initial measurements were then recorded on vapor monitoring sampling field sheets, and any fluctuations during data collection were also noted.

After vacuum/pressure readings were determined, ~~a total of three well volumes~~ *one well volume* of air ~~were~~ *was* purged utilizing a 60 milliliter (mL) syringe.

Once purging was completed, a peristaltic pump, one-liter Tedlar bag, and one-liter Summa canister were readied for sampling.

The summa canister, regulator, and assembly were inspected for damage or defects. The Summa canister was prepared for sampling by labeling with the sample information. *A pressure gauge was used prior to sampling to verify there were no leaks in the sampling apparatus.* The 30-minute flow regulator and the initial vacuum of the canister were then verified to be at 25 to 30 inches of mercury (Hg). The canister identification number, flow regulator identification number, and initial inches of Hg were recorded on the field sampling sheets. The *flow regulator and summa canister are connected to the vapor port via rigid-walled Teflon tubing and the* setup was configured in order to allow extraction from the monitoring port only and shut off from the atmosphere. Once setup was complete, the valve on the canister was opened and the sample start time was recorded. The sample was collected with a minimum change of 15 inches of Hg while not allowing the canister vacuum to go below 2 inches of Hg. Once the sample collection was completed, the valve on the canister was closed and the sample end time was recorded. *Leak detection methods (e.g., using a tracer) were not used during sampling.*

The Tedlar bag was then filled using a peristaltic pump *and the Teflon tubing*. A rotometer was used to adjust the flow to a rate of less than or equal 200 mL/minute. The flow was adjusted as quickly as possible in order to reduce unnecessary purging. Once the flow rate was adjusted, the rotometer was removed and the Tedlar bag was attached, allowing the sample to be collected. Once the sample was collected, a PID meter and a 4-Gas (carbon monoxide, hydrogen sulfide,

oxygen, and the lower explosive limit) meter were inserted and the readings recorded on the field sampling sheets.

The field sampling sheets for this soil vapor sampling event are provided in **Appendix D**.

The soil vapor samples were collected for analysis of VOCs via Method TO-15 and for analysis of relevant natural gases (such as carbon dioxide, carbon monoxide, ethane, ethane, methane, nitrogen, and oxygen) via Method ASTM D-1946. **Table 2** summarizes the soil vapor samples collected for chemical analysis. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.7** of this report.

Once the sampling was complete, the micro-valve was left in place on the monitoring port, but was closed to ensure that the line was not open to the atmosphere. The remaining equipment was dismantled. Information regarding equipment decontamination and material disposal is provided in **Section 2.6** of this report.

2.4 GROUNDWATER GAUGING AND SAMPLING

After development of the newly installed small diameter monitoring wells, sufficient time was allowed for the new wells to equilibrate with the groundwater.

The wells were gauged utilizing a Heron interface probe in order to detect the presence of any free-phase hydrocarbons and determine groundwater levels. Fluid levels in the wells were gauged on June 9, 2008, prior to sampling. In addition, fluid levels were also gauged on July 2, 2008 following the investigation. **Table 3** displays the fluid level summary for both events.

The comprehensive groundwater sampling event utilizing low-flow procedures was performed between June 9 and 13, 2008, utilized low-flow purging and sampling procedures. ConocoPhillips monitoring wells P-54, P-56, P-58, P-66, P-73, and P-75 were purged and sampled utilizing a 1.82-inch diameter Proactive Stainless Steel Monsoon submersible pump and disposable polyethylene tubing. The newly installed small diameter wells and ConocoPhillips well P-57 were purged and sampled utilizing a 0.850-inch diameter stainless steel submersible bladder pump, powered by the Geotech Geocontrol PRO™, and bonded disposable polyethylene tubing. New tubing was used at each well.

The submersible groundwater pump with the proper length of disposable polyethylene tubing was slowly lowered into the well to be sampled and set with the pump intake near the mid-point of the ~~screen or~~ water column, ~~whichever was deeper~~ *which was deeper than the mid-point of the screen (i.e., the water surface was within the well screen). For the WRR wells, the pump intake was positioned approximately 6.5 to 9.5 feet below the top of the water column. For the small diameter wells (in Roxana), the pump intake was positioned approximately 5 to 6.5 feet below*

the top of the water column. The tubing from the pump was connected to a flow-through cell, which discharged into a 5-gallon plastic bucket. Pumping was performed at a low flow rate (≤ 500 mL/minute) so as to not create drawdown of the water level within the well. During groundwater purging, water quality parameters (pH, temperature, conductivity, turbidity, DO and ORP) were measured and recorded on the field sheets (**Appendix C**) after every flow-through cell volume. Purging continued until a minimum of three flow-through cell volumes of water were removed and the water quality parameters stabilized.

Once stabilization was achieved, the groundwater flow was diverted from the flow-through cell and the groundwater sample was collected. The groundwater samples were collected for analysis of VOCs via Method 8260B. **Table 2** summarizes the groundwater samples collected for chemical analysis. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.7** of this report.

ConocoPhillips well P-54 was re-sampled on July 25, 2008 utilizing a HydraSleeve® groundwater sampler[2]. This passive sampler was lowered into the well and positioned to collect a groundwater sample from the midpoint of the well screen. When activated, the HydraSleeve® collected a representative water sample from an approximately two-foot interval without mixing fluid from other intervals. Once the sampler was full, the one-way reed valve collapsed, preventing mixing of extraneous, non-representative fluid during recovery. A short plastic discharge tube was then used to fill the sample containers. This sample was collected for analysis of VOCs via Method 8260B. This method of passive sampling does not create drawdown, and causes only minimal agitation or displacement of the water column.

Reusable equipment was decontaminated between well locations. Additional information regarding decontamination practices and waste disposal is provided in **Section 2.6** of this report.

2.5 SURVEYING

On July 2, 2008 Crawford, Murphy, and Tilly, Inc. (CMT) of Edwardsville, Illinois, conducted a closed circuit survey of points associated with the field activities (under contract to URS). The horizontal coordinates as well as the elevation were determined for each newly installed small diameter wells, four existing wells along the refinery's west fenceline, the four vapor points that were sampled, and the locations of five previously sampled investigation points (2006) in the Village of Roxana.

[2] Re-sampling to confirm the validity of the original sample result was discussed in the meeting with IEPA on July 3, 2008.

Each location was surveyed relative to Illinois State Plane Coordinates (NAD 83), while elevations were determined using the 1988 USGS datum.

The following general procedures were used for the survey.

- The top of the casing elevation and location were measured at each monitoring well. Typically, the measurement was taken on the north side of the well casing. Well casings were marked to indicate the measuring point. The ground surface elevation was also measured at each monitoring well. The ground surface measurement was taken one foot north of the center of the well completion.
- The location and elevation of each vapor monitoring point were measured. Each vapor monitoring point is completed flush with the surrounding ground surface. Therefore, the location and elevation of each vapor monitoring point were taken from the center of the flush mount vault cover while the cover was closed.
- The ground surface location and elevation for the former investigation points were surveyed near the approximate location of the investigation point.

Survey data supplied by CMT was used to develop soil borings, well completion logs, pertinent figures (groundwater and stratum contours), and geologic cross-sections included within this report.

2.6 DECONTAMINATION AND INVESTIGATION-DERIVED WASTE

The drill rods and tools were decontaminated between borings at a temporary decontamination pad located at the Public Works yard. Decontamination consisted of a high-pressure hot water wash. The soil cuttings and decontamination water was containerized in 55-gallon drums, labeled and staged on-site. The soil sampler was cleaned between each run at the boring location.

Non-disposable soil vapor and groundwater sampling equipment was dismantled and decontaminated prior to the collection of each analytical sample, between sample locations, and prior to leaving the site by washing with Alconox®, a desorbing agent (i.e., isopropyl alcohol), and a distilled water rinse.

Decontamination water and purge water accumulated while sampling ConocoPhillips wells within the WRR was disposed daily at Site 9 of the Main Property, in accordance with WRR procedures. Decontamination water and purge water accumulated during sampling activities outside the WRR was collected and containerized in 55-gallon drums, labeled and staged on-site.

Field personnel wore disposable, chemical resistant nitrile gloves when environmental media or equipment was handled, to reduce the potential for personal exposure to potential chemical hazards. Clean gloves were also worn for the collection of analytical samples. With a low probability of impact, disposable materials, such as sample liners, gloves, and other investigation derived waste (IDW), were bagged and disposed as municipal waste.

The water and soil cuttings generated during this investigation were characterized for waste disposal purposes and the results are provided in **Appendix E**. The soil and water will be properly disposed following SOPUS procedures.

2.7 QA/QC, LABORATORY TESTING AND DATA QUALITY REVIEW

Once samples were collected, they were logged onto a Chain-of-Custody (COC) noting all of the sample information. Duplicate samples were collected at a frequency of 10 percent for all samples collected. Equipment blank samples were collected at a frequency of 10 percent, and MS/MSD sample pairs were collected at a frequency of 5 percent for the groundwater samples collected.

Soil and groundwater samples were collected for analysis of VOCs via Method 8260B and were submitted to Xenco Laboratories (Xenco) in Stafford, Texas (under contract to SOPUS). One trip blank accompanied each sample cooler containing samples to be analyzed for VOCs.

Soil vapor samples were collected for analysis of VOCs via Method TO-15 and for relevant natural gases (such as carbon dioxide, carbon monoxide, ethane, ethane, methane, nitrogen, and oxygen) via Method ASTM D-1946. These vapor samples were submitted for analysis to Air Toxics laboratory in Folsom, California (under contract to SOPUS).

The samples, with their corresponding COCs, were packaged and shipped via overnight delivery service to the appropriate laboratory.

Laboratory data from both laboratories were provided in electronic form for Level 4 reporting format. URS conducted an independent review of the analytical data following procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 1999, and the work plan for this project. A total of 46 investigative samples (soil and groundwater), six duplicates, two equipment blanks, two MS and MSD pairs, and seven trip blanks *(each consisting of a set of two 40-mL vials)* were submitted as part of this sampling program. Qualifiers were assigned to data when results from the review were outside control limits. These qualifiers are included in the data tables (**Tables 4** through **7**) and the analytical reports included in **Appendix F**. Based on the above mentioned criteria, results reported for the analyses performed were accepted for their intended use. Acceptable levels of accuracy and precision, based on MS/MSD, laboratory control sample (LCS), surrogate and field duplicate

data, were achieved for the work orders to meet the project objectives. Completeness, which is defined to be the percentage of analytical results that are judged to be valid, including estimated (J/UJ) data, was 100 percent for the soil vapor analytical data, and 98.5 percent for the soil and groundwater analytical data.

The data for the investigative and field QA/QC samples for the various media (e.g., soil, soil vapor and groundwater) are provided in **Appendix F**. The **Appendix F** data are organized by investigative media type and then listed by sample delivery group (SDG) or work order associated with the sample media.

2.8 RELATED ACTIVITIES

Water Well Survey

As requested by IEPA (April 18, 2008 letter to SOPUS), URS conducted a Water Well Survey, in accordance with 35 Ill. Adm. Code, Part 1600. The survey identified water wells within 2,500 feet of the 1986 release site. No public water wells were identified within the survey area. Four wells were found to be active, with three being identified as being for commercial/industrial (i.e., non-potable) use and one for private (residential) use. The private (residential) well identified in the survey was found to be miss-located, with the actual location being outside the survey area in Wood River, Illinois. Nine additional wells within the survey area were identified as sealed or abandoned. There were no set-back zones, well head protection areas, or regulated recharge areas relating to public water supply wells identified within the water well survey area.

The well survey was submitted to IEPA on June 16, 2008.

Violation Notice

A Violation Notice (VN) was issued to SOPUS by the IEPA on May 2, 2008 regarding the groundwater conditions as presented in the investigation report dated September 28, 2007. After timely response, SOPUS and URS met with IEPA on July 3, 2008 to discuss the "suggested resolutions" described in the VN. Preliminary data from the subject investigation was conveyed. Subsequent to this meeting, SOPUS submitted a Compliance Commitment Agreement to IEPA on July 22, 2008.

Community Relations

As mentioned in Section 2.1, SOPUS mailed a fact sheet to residents in the investigative area on May 30, 2008, informing them of the basic history of the site, upcoming investigative activities, and contact information. A copy of the fact sheet was also sent to IEPA on May 15, 2008.

On June 13, 2008, IEPA notified SOPUS and WRR that it was their interpretation that the Illinois Administrative Code Part 1600 rules (aka Right to Know) apply to this site. SOPUS and URS met with IEPA on July 22, 2008 to discuss this topic. As a result of this meeting, IEPA stated that Shell would be issued a revised letter, allegedly expanding the area to be part of any community relations effort. Purportedly, this expanded boundary would include the area west of Route 111 to the western fence line of WRR and north of Eight Street to approximately 1st Street.

Village of Roxana Groundwater Ordinance

The Village of Roxana has enacted an ordinance which prohibits the installation and use of private potable water supply wells. The ordinance was adopted on June 2, 2008 (Ordinance No. 867). The ordinance applies to a portion of the Village which does not have private wells. The subject investigation area is contained within the ordinance area.

3.1 DESCRIPTION OF SITE CONDITIONS

A total of eight Geoprobe® soil probes and six groundwater monitoring wells were completed at the investigative area in May and June 2008 as part of the field activities. These, in addition to cone penetration testing (CPT) locations from URS investigative work performed in 2006, and monitoring well logs for monitoring wells in the vicinity of the investigation area were used to help refine the current understanding of the investigative site geologic and hydrogeologic conditions.

3.1.1 Site Geology

The investigative site and surrounding area are located on a broad floodplain of the Mississippi River known as the American Bottoms. The site is located approximately 0.7 miles east of the Mississippi River. The surface topography across the investigation area generally slopes downward to the west-southwest, with a total drop in elevation of approximately 15 feet across the area. The floodplain deposits consist of recent alluvial (i.e., river) deposits overlying Pleistocene (i.e., Ice Age) glacial outwash. The recent alluvial deposits consist of a complex, heterogeneous sequence of sands, silts, and clays. The underlying glacial outwash deposits consist of more uniform sands and gravels that extend to bedrock. The depth to bedrock in the area typically exceeds 100 feet.

The stratigraphy beneath the investigative site area consists of the following materials, from top down:

- Fill (gravel, clay, cinders, etc.) extending between 1 and 6 feet in depth
- Clay extending between 2 to 20 feet in depth, an intermittent layer of silty clayey sand (0 to 4 feet thick)
- Sand, consisting of glacial outwash, primarily silty sand grading to poorly graded, fine grained sand which coarsens with depth.

The depth to the top of the sand ranges between approximately 3 and 24 feet bgs. This unit was explored to a depth of about 60 feet bgs at the boring locations.

Cross-section locations can be viewed in **Figure 3** and typical subsurface cross-sections are shown in **Figures 4** through **7**.

3.1.2 Site Hydrogeology

The glacial outwash deposits (i.e., sands) underlying the area are the primary source for large volume water production in the area (e.g., industrial and municipal supply). Prior to development in

the area, the natural movement of groundwater through the valley material was toward the west (toward the Mississippi River) (Schicht, 1965).

Since development in the area, groundwater pumping has significantly altered this pattern. Regional groundwater flow in the area is directed toward pumping centers, locally the WRR to the east and the BP former Wood River refinery to the west.

The sand unit is water saturated below a depth of approximately 35 to 50 feet bgs (approximately elevation 397 to 395).

The groundwater contours for the sand are shown in **Figure 8**, based on gauging conducted on July 2, 2008. Groundwater flow in the sand is generally toward the northeast, toward WRR pumping wells.

Potentiometric surfaces are also interpreted on the cross sections shown in **Figures 4** through **7**.

3.2 SOIL ANALYTICAL RESULTS

The laboratory analytical results for the soil samples collected during this investigation can be viewed in **Appendix F.** A tabular summary of the analytical detections is presented in **Table 4** and the BTEX/MTBE results are also depicted in **Figure 9** of this report.

The following analytes were detected at concentrations ranging to a maximum of 5.59 mg/kg.

- Benzene
- Ethylbenzene
- Toluene
- m,p-Xylenes
- o-Xylenes
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- 2-Butanone (MEK)
- Acetone
- Isopropylbenzene
- Methylene Chloride
- Naphthalene
- n-Butylbenzene
- n-Propylbenzene
- p-Isopropyltoluene
- sec-Butylbenzene
- tert-Butylbenzene

These are hydrocarbon constituents, except for MEK, acetone and methylene chloride which are common laboratory artifacts.

The analytical detections were compared with Tier 1 soil remediation objectives for residential properties outlined in the Tiered Approach to Corrective Action Objectives (TACO) rules (35 IAC Part 742 Appendix B). This comparison is also presented in **Table 4**.

The analytical results for organics generally meet the residential property screening criteria except for two organic exceedances: B-2 at a depth of 41 feet; and GP-7(II) at a depth of 19 feet.

- The soil component of the groundwater ingestion pathway screening criterion for benzene (0.03 mg/kg) was exceeded in the soil sample at B-2 at a depth of 41 feet (0.0927 mg/kg). At this depth, the detection is likely related to residual groundwater impact (described in Section 3.4).
- The soil component of the groundwater ingestion pathway screening criterion for benzene (0.03 mg/kg) was exceeded in the soil sample and duplicate sample at GP-7(II) at a depth of 19 feet (0.344 and 0.795 mg/kg).

Soil data collected in 2007 for a subsurface investigation ConocoPhillips conducted were also reviewed for this report. These data were collected in early 2007 by ATC Associates Inc. and provided by ConocoPhillips to IEPA in a report dated April 24, 2007. These soil samples were analyzed by Teklab, Inc. in Collinsville, Illinois for BTEX and MTBE via USEPA Method 8260B. The table of soil analytical results from this investigation report is presented in **Appendix G** and the BTEX/MTBE results are depicted in **Figure 9** of this report. The analytical results generally meet the residential property screening criteria except for benzene exceedances at ConocoPhillips B-3 at depths of 14 to 16, 22 to 24, and 34 to 36 feet, and at ConocoPhillips B-5 at a depth of 38 to 40 feet.

3.3 SOIL VAPOR ANALYTICAL RESULTS

The laboratory analytical results for the soil vapor samples collected during this investigation can be viewed in **Appendix F**. A tabular summary of the volatile organic analytical detections is presented in **Table 5** and a tabular summary of the natural or fixed gas detections is presented in **Table 6**. The results for BTEX and MTBE are depicted in **Figure 10**.

The soil vapor analytical results indicate that benzene, the target constituent, is not present to any significant degree in the locations sampled. Benzene was only detected in 2 of the 16 samples, at concentrations of 1.4 and 37 parts per billion (ppb) in samples from location GP-12 at depths of 10 feet and 20 feet bgs (samples were non-detect at depths of 5 feet and 15 feet). Low ppb concentrations of toluene and xylenes were detected more frequently and at more locations.

3.4 GROUNDWATER ANALYTICAL RESULTS

The laboratory analytical results for the groundwater samples collected during this investigation can be viewed in **Appendix F**. A tabular summary of the analytical detections is presented in **Table 7** and the results for BTEX and MTBE are depicted in **Figure 11**. The analytical

detections were compared with the groundwater remediation objectives outlined in the TACO rules. This comparison is also presented in **Table 7** and in **Figure 11**.

The following analytes were detected at concentrations ranging to a maximum of 366 mg/L.

Benzene	Dibromomethane
Ethylbenzene	Dichlorodifluoromethane
Toluene	Isopropylbenzene
m,p-Xylenes	Methyl tert-Butyl Ether
o-Xylenes	Methylene chloride
1,2,4-Trimethylbenzene	Naphthalene
1,2-Dichloropropane	n-Butylbenzene
1,3,5-Trimethylbenzene	n-Propylbenzene
Acetone	p-Isopropylbenzene
Bromomethane	sec-Butylbenzene
Carbon disulfide	tert-Butylbenzene
Chlorobenzene	

The analytical results for organics generally meet the groundwater screening criteria except for exceedances of benzene, ethylbenzene, toluene, 1,2,4-trimethylbenzene, MTBE, methylene chloride and naphthalene.

- The groundwater screening criterion for benzene (0.005 mg/L) was exceeded in the samples from wells B-2 (1.1 and 1.12 mg/L) and B-5 (0.0338 mg/L), and in all but one of the ConocoPhillips wells sampled[3] (with a maximum of 366 mg/L).
- The groundwater screening criterion for ethylbenzene (0.7 mg/L) was exceeded in the samples from well B-2 (1.62 and 1.53 mg/L), and in ConocoPhillips well P-56 (1.67 mg/L), ConocoPhillips well P-58 (0.87 and 0.914 mg/L) and ConocoPhillips well P-73 (0.89 mg/L).
- The groundwater screening criterion for toluene (1.0 mg/L) was exceeded in the samples from well B-2 (3 and 3.03 mg/L), and in ConocoPhillips well P-73 (1.37 mg/L).
- The groundwater screening criterion for 1,2,4-trimethylbenzene (0.35 mg/L) was exceeded in the samples from well B-2 (0.718 and 0.689 mg/L), and in ConocoPhillips

[3] The sample collected from well P-54 on June 10, 2008 had a benzene detection of 0.00629 mg/L. The detection was considered suspect due to its location. It was resampled on July 25, 2008 and benzene was non-detect (<0.005 mg/L). The June 10th data is considered anomalous.

well P-56 (0.338 mg/L), ConocoPhillips well P-58 (0.734 to 0.82 mg/L), and ConocoPhillips well P-73 (0.596 mg/L).

- The groundwater screening criterion for MTBE (0.07 mg/L) was exceeded in the sample from ConocoPhillips well P-75 (0.125 mg/L).

- The groundwater screening criterion for methylene chloride (0.005 mg/L) was exceeded in the samples from wells B-2 (0.0422 and 0.0472 mg/L) and B-5 (0.00518 mg/L). Methylene chloride is a common laboratory artifact and its presence is judged not to be site related.

- The groundwater screening criterion for naphthalene (0.14 mg/L) was exceeded in the samples from well B-2 (0.145 mg/L), and in ConocoPhillips well P-56 (0.18 mg/L), ConocoPhillips well P-58 (0.179 to 0.202 mg/L), ConocoPhillips well P-73 (0.145 mg/L) and ConocoPhillips well P-75 (0.162 mg/L).

Groundwater data collected during second quarter 2008 from ConocoPhillips wells (collected April 30, 2008) were also reviewed for this report[4]. These data will be included in the upcoming semiannual report to IEPA which ConocoPhillips submits on Shell's behalf. The analytical detections for VOCs are included in **Table 7** and the analytical results for BTEX and MTBE are depicted in **Figure 11** of this report. These analytical results for VOCs generally meet the groundwater criteria except for exceedances of benzene and MTBE at wells P-93A and P-93B.

Groundwater analytical data collected during the 2006 West Fenceline P-93 investigation were also reviewed for this report. These groundwater samples were collected during profiling (e.g., grab samples) in the spring of 2006 by URS and provided in a report dated September 2007. The samples were analyzed by TestAmerica Laboratories (TestAmerica) in Nashville, Tennessee for VOCs via USEPA Method 8260B. A table of these groundwater analytical results compared to the screening criteria is presented in **Appendix H** and the analytical detections for BTEX and MTBE are depicted in **Figure 11** of this report. These analytical results for organics generally meet the groundwater criteria except for exceedances of benzene, ethylbenzene, toluene, xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, MTBE, naphthalene, and n-propylbenzene at various wells and groundwater profile locations in the study area.

Groundwater data collected in 2007 for a subsurface investigation ConocoPhillips conducted were also reviewed for this report. These data were collected in early 2007 by ATC Associates

[4] Well P-93A was included in the subject sampling plan, however, obstructions in the well precluded the ability to sample using low-flow techniques.

Inc. and provided by ConocoPhillips to IEPA in a report dated April 24, 2007. These groundwater samples were analyzed by Teklab, Inc. in Collinsville, Illinois for BTEX and MTBE via USEPA Method 8260B. The table of groundwater analytical results from this investigation is presented in **Appendix G** and the BTEX/MTBE results are depicted in **Figure 11** of this report. These analytical results for organics generally meet the residential property screening criteria except for benzene exceedances at ConocoPhillips B-1 and ConocoPhillips B-5.

URS conducted a subsurface investigation on behalf of SOPUS at and outside the WRR. The activities performed during this subsurface investigation expanded upon the 2006 investigation and furthered information on the extent of the groundwater impacts for the area.

The following conclusions are based on the data collected as part of this work plan, as integrated with previous site work.

Soil

- Subsurface conditions generally consist of a variable thickness of surficial fill and lower permeability soils (e.g., clay, silt, clayey sand) underlain by the sands to the depths explored. The maximum thickness of lower permeability soils, up to 24 feet, occurs to the west and southwest, near the intersection of Rand Avenue and Route 111. This material thins toward the east, coincident with the rise in surface topography, and is approximately 4 to 7 feet thick beneath the rest of the investigation area.
- The soil borings generally exhibited low levels of impact or were non-detect, consistent with that expected given their distance from the 1986 release point[5]. The borings closest to the benzene line, e.g., GP-7(ll) and the ConocoPhillips borings, tended to exhibit relatively higher concentrations of BTEX (less than 1 mg/kg). The highest concentrations were found in samples between depths of 14 and 24 feet bgs. This is in the area where the clayey soils are thickest, and may indicate residual hydrocarbons sorbed to the fine grained soils. One exception to this was found in the sample at location B-2 from a depth of 41 feet bgs. The highest concentrations were in the low ppm range, and this likely reflects residual impact from groundwater.

Soil Vapor

- Soil vapor samples were collected from existing probe locations that overlie the highest observed groundwater concentrations. The results show relatively low and sporadic BTEX concentrations. The highest detected benzene concentration was in a probe at the 20 foot depth (37 ppb). Concentrations in the shallower samples (from 5, 10 and 15 feet) were lower or non detect. Benzene concentrations were non detect in the other probe locations. This marked attenuation from groundwater to shallow soil vapor is attributed to the distance to groundwater (approximately 45 feet) and biodegradation in the subsurface.

[5] It should be noted that characterization of soils in the immediate release area was not part of this scope of work.

It is expected that soil vapor concentrations would be lower in areas where groundwater concentrations are lower (e.g., north or south of the "core").

Groundwater

- Groundwater occurs at depths varying from approximately 35 to 50 feet bgs in the areas investigated, as a result of the change in surface elevation. This corresponds to a groundwater elevation of approximately 397 to 395 feet, from west to east. The groundwater contours show a clear gradient toward WRR pumping centers.
- The cumulative analytical information (i.e., including the 2006 data and 2007 ConocoPhillips' results) depicts the highest concentrations generally in a band on the order of 200 feet wide extending between the 1986 release point and the refinery. This area generally underlies the Village Public Works yard and wastewater treatment facility. The core area of impact widens closer to the refinery, consistent with groundwater flow toward pumping centers on WRR North and Main properties. Benzene concentrations in the core area have been identified in the hundreds to thousands of ppm. Wells on the north and south sides of this band bound the core area, exhibiting ppb or non detect concentrations.

Based on discussions with IEPA, and SOPUS' Compliance Commitment Agreement, a work plan is being developed to assess the nature and extent of the mixed hydrocarbons identified along the WRR's west fenceline, generally north of the area investigated for this report. This work plan will also address the following data needs identified in this investigation, including:

- Characterization of soils in the area of the 1986 release
- Refinement of the northern extent of benzene-related groundwater impact north of Eighth Street to approximately 1st Street and east of Route 111.
- Collection of additional soil vapor data in areas north of the existing vapor probes.
- Collection of reproducible groundwater data over time in the area of highest concentrations (i.e., installation of monitoring wells).

*As discussed in **Section 1**, IEPA commented on the work plan as submitted in September 2008, and the revised work plan is being submitted to the IEPA concurrent with this report.*

ATC Associates Inc., 2007; *Subsurface Investigation Report on #1 and #4 Dock Lines Report*; Prepared for ConocoPhillips – WRR; dated April 24, 2007.

Illinois Environmental Protection Agency (IEPA); Tiered Approach to Corrective Action Objectives (TACO); Title 35 of the Illinois Administrative Code, Part 742.

Illinois Environmental Protection Agency (IEPA); Notice of Violation L-2008-01134 letter; Issued to Shell Oil Products U.S. (SOPUS); dated May 2, 2008.

Illinois Environmental Protection Agency (IEPA); Letter regarding the review of submitted materials and planned future activities; Issued to Shell Oil Products U.S. (SOPUS); dated April 18, 2008.

Schicht, R.J., 1965; *Groundwater Development in the East St. Louis Area, Illinois*; Illinois State Water Survey Report of Investigation 51.

URS Corporation (URS), 2007; *West Fenceline P-93 Dissolved Phase Benzene Investigation Report – Roxana, Illinois*; Prepared for Shell Oil Products U.S. (SOPUS) and WRB Refining LLC (WRB) Wood River Refinery (WRR); dated September 2007.

URS Corporation (URS), 2008; *Route 111/Rand Avenue Vicinity Investigation Health and Safety Plan – Roxana, Illinois*; Prepared for Shell Oil Products U.S. (SOPUS); dated May 2008.

URS Corporation (URS), 2008; *Route 111/Rand Avenue Vicinity Investigation Work Plan – Roxana, Illinois*; Prepared for Shell Oil Products U.S. (SOPUS); dated February 15, 2008.

US Environmental Protection Agency (USEPA), 1999; Contract Laboratory Program National Functional Guidelines for Organic Data Review.

TABLE 1
ORGANIC VAPOR HEADSPACE MEASUREMENTS

Boring	Depth (ft bgs)	PID (ppm)
B-1	1	0.0
	3	0.0
	5	0.0
	7	0.0
	9	2.1
	11	3.7
	14	3.0
	17	0.9
	19	1.4
	21	2.1
	23	1.8
	25	0.2
	27	4.1
	29	1.8
	31	1.1
	33	1.7
	35	2.0
	37	1.8
	39	1.4
	41	1.8
	43	0.4
	45	0.3
	47	1.3
	49 v	0.4
	51	1.8
B-2	9	2.7
	11	11.0
	13	3.1
	15	31.4
	17	5.9
	19	6.1
	21	2.4
	23	4.5
	25	10.1
	27	18.5
	29	5.5
	31	7.3
	33	16.5
	35	9.5
	37	10.3
	39	39.9
	41	192
	43	167
	45	20.7
	47	11.1
	49	69.0
	51	530
	53 v	597
	55	1134
	57	1122

Boring	Depth (ft bgs)	PID (ppm)
B-3	1	0.0
	3	0.0
	9	0.9
	11	0.2
	13	1.3
	15	1.8
	17	1.6
	19	1.4
	21	2.4
	23	1.5
	25	0.8
	27	0.7
	29	1.3
	31	1.8
	33	2.7
	35 v	1.6
	37	1.8
	39	2.3
	41	2.7
	43	1.5
	45	12.1
	47	13.6
B-4	1	0.0
	3	0.0
	5	0.0
	7	0.0
	10	0.3
	13	1.2
	15	0.8
	17	0.8
	19	1.2
	21	1.2
	23	0.0
	25	1.2
	27	1.6
	29	0.8
	31	1.7
	33	1.4
	35	2.1
	39	1.5
	41	0.8
	43	0.2
	47	0.9
	49 v	9.5
	51	18.7
	53	28.4

Boring	Depth (ft bgs)	PID (ppm)
B-5	1	0.0
	3	0.0
	5	0.0
	7	3.6
	9	2.6
	11	1.8
	13	2.3
	15	2.6
	17	1.8
	19	2.3
	21	0.6
	23	1.8
	25	2.8
	27	4.7
	29	2.2
	31	2.5
	33	3.3
	35 v	4.2
	37	3.1
	39	2.8
	41	4.3
	43	6.5
	45	14.5
	47	19.2
B-6	1	0.0
	3	0.0
	5	0.0
	6.5	0.5
	7.5	1.4
	9	2.3
	11	2.2
	13	3.9
	15	4.3
	17	3.9
	19	3.4
	21	4.2
	23	4.7
	25	3.2
	27	2.3
	29	2.3
	31	2.0
	33	2.2
	35	2.3
	37	2.2
	39 v	1.8
	41	0.0
	43	0.0
	45	0.0
	47	0.0

Boring	Depth (ft bgs)	PID (ppm)
GP-7(II)	1	0.0
	3	0.0
	5	0.0
	9	0.7
	11	118
	13	537
	15	293
	17	403
	19	541
GP-12(II)	6.5	0.8
	9	1.2
	11	0.7
	13	1.8
	15	1.5
	17	2.3
	19	1.9

NOTES:
1) Headspace measurements were obtained using a photoionization detector (PID) with a 10.6-eV lamp.
2) v Denotes the level of groundwater in the boring at the time of drilling.

TABLE 2
SAMPLE SUMMARY FOR SOIL, SOIL VAPOR, AND GROUNDWATER

Sample Location	Sample ID	Sample Date	Sample Time	Analysis
SOIL SAMPLES COLLECTED				
B-1	B-1-03	5/14/2008		VOCs 8260 B
	B-1-27	5/20/2008	1445	VOCs 8260 B
B-2	B-2-04	5/14/2008		VOCs 8260 B
	B-2-41	5/20/2008	1000	VOCs 8260 B
B-3	B-3-06	5/14/2008		VOCs 8260 B
	B-3-33	5/21/2008	1100	VOCs 8260 B
B-4	B-4-06	5/15/2008	945	VOCs 8260 B
	B-4-35	4/22/2008	935	VOCs 8260 B
B-5	B-5-04.5	5/15/2008	1345	VOCs 8260 B
	B-5-27	5/21/2008	1400	VOCs 8260 B
B-6	B-6-04	5/15/2008	1250	VOCs 8260 B
	B-6-23	5/19/2008	1205	VOCs 8260 B
GP-7(II)	GP-7(II)-03	5/15/2008	1115	VOCs 8260 B
	GP-7(II)-19	5/19/2008	1635	VOCs 8260 B
	GP-7(II)-19-Dup	5/19/2008	1635	VOCs 8260 B
GP-12(II)	GP-12(II)-04	5/15/2008	1025	VOCs 8260 B
	GP-12(II)-17	5/22/2008	1425	VOCs 8260 B
	GP-12(II)-17-Dup	5/22/2008	1425	VOC 8260 B
SOIL VAPOR SAMPLES COLLECTED				
GP-9	GP-9-A-060408	6/4/2008	1045	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-9-B-060408	6/4/2008	1050	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-9-C-060408	6/4/2008	1055	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-9-C-060408-DUP	6/4/2008	1055	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-9-D-060408	6/4/2008	1115	VOCs by TO-15; Natural Gas by ASTM D-1946
GP-11	GP-11-A-060308	6/3/2008	1345	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-11-B-060308	6/3/2008	1350	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-11-B-060308-DUP	6/3/2008	1350	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-11-C-060308	6/3/2008	1355	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-11-D-060308	6/3/2008	1410	VOCs by TO-15; Natural Gas by ASTM D-1946
GP-12	GP-12-A-060308	6/3/2008	925	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-12-B-060308	6/3/2008	929	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-12-C-060308	6/3/2008	935	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-12-D-060308	6/3/2008	940	VOCs by TO-15; Natural Gas by ASTM D-1946
GP-13	GP-13-A-060408	6/4/2008	850	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-13-B-060408	6/4/2008	855	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-13-C-060408	6/4/2008	900	VOCs by TO-15; Natural Gas by ASTM D-1946
	GP-13-D-060408	6/4/2008	905	VOCs by TO-15; Natural Gas by ASTM D-1946
GROUNDWATER SAMPLES COLLECTED				
P-54	P54-061008	6/10/2008	1612	VOCs 8260 B
	P54072508	7/25/2008	1430	VOCs 8260 B
P-56	P56-060908	6/9/2008	1615	VOCs 8260 B
P-57	P57-061108	6/11/2008	1310	VOCs 8260 B
P-58	P58-060908	6/9/2008	1425	VOCs 8260 B
	P58-060908D	6/9/2008	1425	VOCs 8260 B
P-66	P66-061008	6/10/2008	1340	VOCs 8260 B
P-73	P73-061008	6/10/2008	943	VOCs 8260 B
P-75	P75-061008	6/10/2008	1040	VOCs 8260 B
P-93	USED COP MONITORING DATA FROM 2Q08			
B-1	B1-061208	6/12/2008	1045	VOCs 8260 B
B-2	B2-061208	6/12/2008	1245	VOCs 8260 B
	B2-061208D	6/12/2008	1245	VOCs 8260 B
B-3	B3-061208	6/12/2008	1500	VOCs 8260 B
B-4	B4-061208	6/12/2008	1630	VOCs 8260 B
B-5	B5-061308	6/13/2008	1005	VOCs 8260 B
B-6	B6-061308	6/13/2008	1200	VOCs 8260 B

NOTES:
1) The natural gases analyzed for include: Carbon Dioxide, Carbon Monoxide, Ethane, Ethene, Methane, Nitrogen, and Oxygen.
2) The sample times for samples B-1-03, B-2-04, and B-3-06 were inadvertantly not recorded at the time of sample collection.

TABLE 3
MONITORING WELL COMPLETION SUMMARY AND GROUNDWATER GAUGING

Well ID	Surface Completion	Well Diameter (in)	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Height Above Ground Surface (ft)	Constructed Well Depth (ft btoc)	Bottom of Well Elevation (ft MSL)	Screened Interval (ft btoc)		Screen Length (ft)	Screened Interval Elevation (ft MSL)		Depth to Water 6/9/2008 (ft btoc)	Product Thickness (ft)	Corrected Water Elevation 6/9/2008 (ft MSL)	Depth to Water 7/2/2008 (ft btoc)	Product Thickness (ft)	Corrected Water Elevation 7/2/2008 (ft MSL)
SOPUS WELLS - VILLAGE OF ROXANA																		
B-1	FM	1	442.86	443 24	-0.38	58.18	384.68	42.93	57 93	15	399 93	384.93	47.78	NE	395.08	46.84	NE	396.02
B-2	FM	1	443.93	444 21	-0.28	63.46	380.47	48.21	63 21	15	395.72	380.72	49 38	NE	394.55	48.43	NE	395.5
B-3	FM	1	430.36	430 69	-0.33	45.99	384.37	30.74	45.74	15	399 62	384.62	34.16	NE	396 2	33.17	NE	397.19
B-4	FM	1	441.58	441 86	-0.28	57.70	383.88	42.45	57.45	15	399.13	384.13	46 03	NE	395.55	45.09	NE	396.49
B-5	FM	1	429.73	429 98	-0 25	46.20	383.53	30.95	45 95	15	398.78	383.78	33.49	NE	396.24	32.49	NE	397.24
B-6	FM	1	432.42	432.75	-0 33	47.64	384.78	32.39	47 39	15	400 03	385.03	35 89	NE	396.53	34.97	NE	397.45
COP WELLS - WRR & VILLAGE OF ROXANA																		
P-54	FM	2	442.44	442 62	-0.18	62.82	379.62	37.82	62 82	25	404.62	379.62	47 09	NE	395.35	46.16	NE	396.28
P-56	SU	2	446.22	444.41	1 81	65.31	380.91	40.31	65 31	25	405.91	380.91	52 08	NE	394.14	51.17	NE	395.05
P-57	SU	2	447.22	445 22	2 0	65.5	381.72	40.50	65 50	25	406.72	381.72	51 82	NE	395.4	50.91	NE	396.31
P-58	SU	2	445.60	NRA	NRA	*63.5*	382.10	*38.50*	*63.50*	25	407.10	382.10	49 93	0.34	395.92	48.84	0.12	396.85
P-59	SU	2	447.53	445.03	2 5	72.5	375.03	47.50	72 50	25	400.03	375.03	NM	NM	NA	52.25	NE	395.28
P-66	FM	2	436.91	437.23	-0 32	59.68	377.23	34.68	59 68	25	402.23	377.23	41 00	NE	395.91	40.11	NE	396.80
P-73	SU	4	444.51	442.01	2 5	67.5	377.01	42.50	67 50	25	402.01	377.01	49 82	NE	394.69	48.96	NE	395.55
P-75	SU	4	446.96	444.46	2 5	68.5	378.46	43.50	68.50	25	403.46	378.46	51 01	NE	395.95	50.14	NE	396.82
P-93A	SU	2	446.73	444.58	2.15	63.15	383.58	48.15	63.15	15	398.58	383.58	51.68	NE	395.05	50.79	NE	395.94
P-93B	SU	2	447.18	NRA	NRA	76.53	370.65	74.58	76.53	1.95	372.60	370.65	NM	NM	NA	NM	NM	NA
P-93C	SU	2	447.55	NRA	NRA	96.84	350.71	94.85	96.84	1.99	352.70	350.71	NM	NM	NA	NM	NM	NA
P-93D	SU	2	447.13	NRA	NRA	128.02	319.11	126.03	128.02	1.99	321.10	319.11	NM	NM	NA	50 6	NE	396.53
T-6	SU	4	447 37	NRA	NRA	66.83	380 54	NRA	NRA	NRA	NRA	NRA	NM	NM	NA	51.10	NE	396.27
T-12	SU	4	445 37	NRA	NRA	72.83	372 54	NRA	NRA	NRA	NRA	NRA	NM	NM	NA	50.72	NE	394.65

NOTES

1) The corrected water elevations presented in this table were corrected by a specific gravity of 0.74 for the wells in which product was identified.
2) Elevations presented in this table are relative to the 1988 USGS datum.
3) NA = Not Applicable
4) NE = Not Encountered
5) NM = Not Measured
6) NRA = Not Readily Available

TABLE 4
SUMMARY OF SOIL ANALYTICAL DETECTIONS AND SCREENING

EXCEEDANCES ARE HIGHLIGHTED IN YELLOW

Analyte (Results in mg/kg)			Benzene			Ethylbenzene			Toluene			m,p-Xylenes		o-Xylenes	1,2,4-Trimethylbenzene			1,3,5-Trimethylbenzene			2-Butanone (MEK)			Acetone		
Ingestion / Inhalation / Soil to GW Screening Values (mg/kg)			12	0.8	0.03	7,800	400	13	16,000	650	12	16,000	420	200	39,000*	73*	18*	39,000*	45*	10*	47,000*	25,000*	17*	70,000	100,000	25
Location	**Sample ID**	**Date**																								
B-1	B-1-03	5/14/2008	<0.00394			<0.00394			<0 00394			<0.00787		<0.00394	<0 00394			<0 00394			<0.0394			<0.0787		
	B-1-27	5/20/2008	<0.00575			**0.00208 J**			**0.00204 J**			<0.0115		<0.00575	<0 00575			<0 00575			<0.0575			<0.115		
B-2	B-2-04	5/14/2008	<0.00517			<0.00517			<0 00517			<0.0103		<0.00517	<0 00517			<0 00517			**0.0142 J**			**0.0404 J**		
	B-2-41	5/20/2008	**0.0927 J**			**4.39 D**			**0.0136**			**2.45 D**		**0.0246 J**	**5.59 D**			**0.184 J**			<0.0626			<0.125		
B-3	B-3-06	5/14/2008	<0 005			<0 005			<0.005			<0 010		<0 005	<0.005			<0.005			<0.050			<0.100		
	B-3-33	5/21/2008	<0.00567			<0.00567			**0.00137 J J**			<0.0113		<0.00567	<0 00567			<0 00567			<0.0567			<0.113		
B-4	B-4-06	5/15/2008	<0.00479			<0.00479			<0 00479			<0.00958		<0.00479	<0 00479			<0 00479			<0.0479			**0.0197 J**		
	B-4-35	5/22/2008	<0.00591			<0.00591			**0.00176 J**			<0.0118		<0.00591	<0 00591			<0 00591			<0.0591			<0.118		
B-5	B-5-04.5	5/15/2008	<0.00498			<0.00498			<0 00498			<0.00996		<0.00498	<0 00498			<0 00498			<0.0498			<0.0996		
	B-5-27	5/21/2008	<0.00533			<0.00533			<0 00533			<0.0107		<0.00533	<0 00533			<0 00533			<0.0533			<0.107		
B-6	B-6-04	5/15/2008	<0.00391			<0.00391			<0 00391			<0.00782		<0.00391	<0 00391			<0 00391			<0.0391			<0.0782		
	B-6-23	5/19/2008	<0.00513			<0.00513			<0 00513			<0.0103		<0.00513	<0 00513			<0 00513			<0.0513			<0.103		
GP-7(II)	GP-7(II)-19	5/19/2008	**0.344 E J**			<0.00529			**0.00115 J**			<0.0106		<0.00529	<0 00529			<0 00529			<0.0529			<0.106		
	GP-7(II)-19-Dup	5/19/2008	**0.795 E J**			<0.0051			**0.00109 J**			<0.0102		<0.0051	<0.0051			<0.0051			<0.051			<0.102		
GP-12(II)	GP-12(II)-17	5/22/2008	<0.00549			**0.00132 J**			**0.00206 J**			<0 011		<0.00549	<0 00549			<0 00549			<0.0549			<0.110		
	GP-12(II)-17-Dup	5/22/2008	<0.0055			<0.0055			**0.00116 J**			<0 011		<0.0055	<0.0055			<0.0055			<0.055			**0.0323 JB**		

Analyte (Results in mg/kg)			Isopropylbenzene	Methylene Chloride			Naphthalene			n-Butylbenzene	n-Propylbenzene	p-Isopropyltoluene			sec-Butylbenzene	tert-Butylbenzene
Ingestion / Inhalation / Soil to GW			570**	85	13	0.02	1,600	170	12	240**	240**				220**	390**
Location	**Sample ID**	**Date**														
B-1	B-1-03	5/14/2008	<0.00394		<0.0157		<0 00787			<0.00394	<0.00394	<0 00394			<0 00394	<0 00394
	B-1-27	5/20/2008	<0.00575		<0 023		<0.0115			<0.00575	<0.00575	<0 00575			<0 00575	<0 00575
B-2	B-2-04	5/14/2008	<0.00517		<0.0207		<0.0103			<0.00517	<0.00517	<0 00517			<0 00517	<0 00517
	B-2-41	5/20/2008	**0.115 J**		**0.0123 JB**		**0.0406 J**			**0.0913 J**	**1.73 D**	**0.0251 J**			**0.0413 J**	**0.0136 J**
B-3	B-3-06	5/14/2008	<0 005		<0 020		<0.010			<0 005	<0 005	<0.005			<0.005	<0.005
	B-3-33	5/21/2008	<0.00567		**0.00922 JB**		<0.0113			<0.00567	<0.00567	<0 00567			<0 00567	<0 00567
B-4	B-4-06	5/15/2008	<0.00479		<0.0192		<0 00958			<0.00479	<0.00479	<0 00479			<0 00479	<0 00479
	B-4-35	5/22/2008	<0.00591		**0.0136 JB**		<0.0118			<0.00591	<0.00591	<0 00591			<0 00591	<0 00591
B-5	B-5-04.5	5/15/2008	<0.00498		<0.0199		<0 00996			<0.00498	<0.00498	<0 00498			<0 00498	<0 00498
	B-5-27	5/21/2008	<0.00533		<0.0213		<0.0107			<0.00533	<0.00533	<0 00533			<0 00533	<0 00533
B-6	B-6-04	5/15/2008	<0.00391		<0.0156		<0 00782			<0.00391	<0.00391	<0 00391			<0 00391	<0 00391
	B-6-23	5/19/2008	<0.00513		<0.0205		<0.0103			<0.00513	<0.00513	<0 00513			<0 00513	<0 00513
GP-7(II)	GP-7(II)-19	5/19/2008	<0.00529		<0.0212		<0.0106			<0.00529	<0.00529	<0 00529			<0 00529	<0 00529
	GP-7(II)-19-Dup	5/19/2008	<0.0051		<0.0204		<0.0102			<0.0051	<0.0051	<0.0051			<0.0051	<0.0051
GP-12(II)	GP-12(II)-17	5/22/2008	<0.00549		**0.0109 JB**		<0.011			<0.00549	<0.00549	<0 00549			<0 00549	<0 00549
	GP-12(II)-17-Dup	5/22/2008	<0.0055		**0.00605 JB**		<0.011			<0.0055	<0.0055	<0.0055			<0.0055	<0.0055

NOTES

1) Screening values shown above are the Tier 1 Soil Remediation Objectives for Residential Properties.
2) <#.## Denotes the result was not detected below the indicated reporting limit.
3) **BOLD** indicates the analytical detection of the analyte.
4) Sample ID explanation --> X-XX-ZZ --> X-XX is the boring location at which the sample was collected;
ZZ is the depth at which the sample was collected.
5) The soil borings at GP-7(II) and GP-12(II) were located adjacent to the location of the vapor monitoring points GP-7 and GP-12, respectively.
6) The screening values provided are for Xylenes (total), which is the summation of m,p-Xylenes and o-Xylenes.

REFERENCES

Illinois Environmental Protection Agency (EPA); Tiered Approach to Corrective Action Objectives (TACO); Title 35 of the Illinois Administrative Code, Part 742, Appendix B, Table A.
* IEPA; Tiered Approach to Corrective Action Objectives (TACO); Chemicals not in TACO Tier 1 Tables; Table A; May 1, 2007.
** U.S. Environmental Protection Agency (USEPA), Region 9; Preliminary Remediation Goals (PRGs) Table; October 2004.

LAB QUALIFIERS

B = A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
D = The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
E = The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
J = The target analyte was positively identified below the RL and above the MDL.

URS QUALIFIERS

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

TABLE 5
SUMMARY OF SOIL VAPOR ANALYTICAL DETECTIONS

Location	Sample ID	Depth (ft)	Date	Analyte (Results in ppbV)								
				Benzene	Toluene	m,p-Xylene	1,2,4-Trimethylbenzene	1,3-Dichlorobenzene	2-Butanone (MEK)	2-Propanol	4-Ethyltoluene	Acetone
GP-9	GP-9-A-060408	5	6/4/2008	<5.6	**12**	<5.6	<5.6	**12**	<5.6	**2,800 E J**	<5.6	**71**
	GP-9-B-060408	10	6/4/2008	<2.9	**9.9**	<2.9	<2.9	**11**	**17**	**1,600 E J**	<2.9	**180**
	GP-9-C-060408	15	6/4/2008	<140	<140	<140	<140	<140	<140	**120,000 E J**	<140	**1,000**
	GP-9-C-060408-DUP	15	6/4/2008	<140	<140	<140	<140	<140	<140	**94,000 E J**	<140	**1,300**
	GP-9-D-060408	20	6/4/2008	<1.3	**10**	**2.2**	<1.3	**14**	**4.6**	**1,900 E J**	<1.3	**83**
GP-11	GP-11-A-060308	5	6/3/2008	<11	**24**	<11	<11	**18**	<11	**21,000 E J**	<11	**130**
	GP-11-B-060308	10	6/3/2008	<60	<60	<60	<60	<60	<60	**20,000**	<60	<240
	GP-11-B-060308-DUP	10	6/3/2008	<11	**13**	<11	<11	**18**	<11	**20,000 E J**	<11	**83**
	GP-11-C-060308	15	6/3/2008	<11	**18**	<11	<11	**16**	<11	**17,000 E J**	<11	**89**
	GP-11-D-060308	20	6/3/2008	<300	<300	<300	<300	<300	<300	**370,000 E J**	<300	<1200
GP-12	GP-12-A-060308	5	6/3/2008	<1.5	**2.5**	**1.8**	<1.5	<1.5	**4**	**10**	<1.5	**32**
	GP-12-B-060308	10	6/3/2008	**1.4**	**2.7**	**1.9**	<1.4	<1.4	**5.8**	**14**	<1.4	**43**
	GP-12-C-060308	15	6/3/2008	<1.4	**2.6**	**1.8**	<1.4	<1.4	**4.5**	**12**	<1.4	**40**
	GP-12-D-060308	20	6/3/2008	**37**	**2.6**	**2**	<1.3	<1.3	**12**	**12**	<1.3	**54**
GP-13	GP-13-A-060408	5	6/4/2008	<150	<150	<150	<150	<150	<150	**220,000 E J**	<150	**2,700**
	GP-13-B-060408	10	6/4/2008	<140	<140	**250**	**150**	<140	<140	**32,000**	**140**	<580
	GP-13-C-060408	15	6/4/2008	<130	<130	<130	<130	<130	<130	**280,000 E J**	<130	**2,800**
	GP-13-D-060408	20	6/4/2008	<140	<140	<140	<140	<140	<140	**38,000**	<140	<580

Location	Sample ID	Depth (ft)	Date	Analyte (Results in ppbV)							
				cis-1,2-Dichloroethene	Cyclohexane	Ethanol	Heptane	Hexachlorobutadiene	Hexane	Tetrahydrofuran	Trichloroethene
GP-9	GP-9-A-060408	5	6/4/2008	<5.6	<5.6	**610**	<5.6	<23	<5.6	**6.2**	<5.6
	GP-9-B-060408	10	6/4/2008	<2.9	<2.9	**550**	<2.9	<12	<2.9	**3.6**	<2.9
	GP-9-C-060408	15	6/4/2008	<140	<140	<580	<140	<580	<140	<140	<140
	GP-9-C-060408-DUP	15	6/4/2008	<140	<140	<580	<140	<580	<140	**140**	<140
	GP-9-D-060408	20	6/4/2008	<1.3	<1.3	**690 E**	<1.3	<5.4	<1.3	**3.7**	<1.3
GP-11	GP-11-A-060308	5	6/3/2008	<11	<11	**7,800 E J**	<11	<45	<11	<11	<11
	GP-11-B-060308	10	6/3/2008	<60	<60	**1,800**	<60	**240 UJ J**	<60	<60	<60
	GP-11-B-060308-DUP	10	6/3/2008	<11	<11	**2,500**	<11	**44 UJ UJ**	<11	<11	<11
	GP-11-C-060308	15	6/3/2008	<11	<11	**4,400**	<11	**45 UJ UJ**	<11	<11	<11
	GP-11-D-060308	20	6/3/2008	<300	<300	**2,100**	<300	**1,200 UJ UJ**	<300	<300	<300
GP-12	GP-12-A-060308	5	6/3/2008	**1.5**	<1.5	**37**	<1.5	**5.9 UJ UJ**	<1.5	**7.3**	**16**
	GP-12-B-060308	10	6/3/2008	<1.4	<1.4	**57**	<1.4	**5.5 UJ UJ**	<1.4	**8**	<1.4
	GP-12-C-060308	15	6/3/2008	<1.4	<1.4	**54**	**1.7**	**5.6 UJ UJ**	**2.1**	**7.8**	**2.1**
	GP-12-D-060308	20	6/3/2008	<1.3	**27**	**49**	<1.3	**5.4 UJ UJ**	**3.5**	**7.9**	<1.3
GP-13	GP-13-A-060408	5	6/4/2008	<150	<150	<610	<150	<610	<150	<150	<150
	GP-13-B-060408	10	6/4/2008	<140	<140	**1,100**	<140	<580	<140	<140	<140
	GP-13-C-060408	15	6/4/2008	<130	<130	<540	<130	<540	<130	<130	<130
	GP-13-D-060408	20	6/4/2008	<140	<140	<580	<140	<580	<140	**200**	<140

NOTES:
1) <#.## Denotes the result was not detected low the indicated reporting limit.
2) **BOLD** indicates the analytical detection of the analyte.
3) Sample ID explanation --> GP-XX-Y-DDDDDD --> GP-XX is he VMP location at which the sample was collected; Y is the VMP port at which the sample was collected; DDDDDD is the date on which the sample was collected.
4) VMP port A is screened at about 5 ft bgs; port B is screened at about 10 ft bgs; port C is screened at about 15 ft bgs; and port D is screened at about 20 ft bgs.

LAB QUALIFIERS
E = Exceeds instrument calibration range.
UJ = Non-detected compound associated with low bias in the CCV.

URS QUALIFIERS
J = The analyte was positively identified; however, the concentration given is approximate.
UJ = The analyte was not detected above the reported quantitation limit; however, the reported quantitation limit is approximate.

TABLE 6
SUMMARY OF SOIL VAPOR NATURAL GAS DETECTIONS

Location	Sample ID	Depth (ft)	Date	Analyte (Results in %)			
				Carbon Dioxide	Methane	Nitrogen	Oxygen
GP-9	GP-9-A-060408	5	6/4/2008	**8.5**	ND	**83**	**8.9**
	GP-9-B-060408	10	6/4/2008	**9.2**	ND	**83**	**7.5**
	GP-9-C-060408	15	6/4/2008	**9.5**	ND	**84**	**7**
	GP-9-C-060408-DUP	15	6/4/2008	**9.4**	ND	**83**	**7.2**
	GP-9-D-060408	20	6/4/2008	**10**	ND	**84**	**5.6**
GP-11	GP-11-A-060308	5	6/3/2008	**6.1**	ND	**80**	**14**
	GP-11-B-060308	10	6/3/2008	**6.9**	ND	**80**	**13**
	GP-11-B-060308-DUP	10	6/3/2008	**7**	ND	**80**	**13**
	GP-11-C-060308	15	6/3/2008	**7.8**	ND	**80**	**12**
	GP-11-D-060308	20	6/3/2008	**10**	ND	**82**	**8.5**
GP-12	GP-12-A-060308	5	6/3/2008	**12**	ND	**81**	**7**
	GP-12-B-060308	10	6/3/2008	**15**	ND	**80**	**4.7**
	GP-12-C-060308	15	6/3/2008	**16**	**0.00047**	**80**	**3.4**
	GP-12-D-060308	20	6/3/2008	**17**	**0.0014**	**80**	**2.9**
GP-13	GP-13-A-060408	5	6/4/2008	**10**	**0.00039**	**81**	**9.3**
	GP-13-B-060408	10	6/4/2008	**12**	**0.0026**	**81**	**6.5**
	GP-13-C-060408	15	6/4/2008	**14**	**0.00084**	**81**	**4.9**
	GP-13-D-060408	20	6/4/2008	**16**	**0.003**	**81**	**3.2**

NOTES:
1) **BOLD** indicates the analytical detection of the analyte.
2) Natural gases which were analyzed for but not detected in any of the samples include Carbon Monoxide, Ethane, and Ethene.
3) ND = Not Detected

TABLE 7
SUMMARY OF GROUNDWATER ANALYTICAL DETECTIONS AND SCREENING

EXCEEDANCES HIGHLIGHTED IN YELLOW

Analyte (Results in mg/L)			Benzene	Ethylbenzene	Toluene	m,p-Xylene	o-Xylene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Chlorobenzene	Dichlorodifluoro methane
Ingestion Screening Values (mg/L)			0.005	0.7	1 0	10		0.35*	0 35*	0.1	1.4*
Location	Sample ID	Date									
SOPUS WELLS											
B-1	B1-061208	6/12/2008	**0.00101 J**	<0 005	<0.005	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
B-2	B2-061208	6/12/2008	**1.1 D**	**1.62 D**	**3 D**	**3.13 D**	**0.933 D**	**0.718**	**0.188**	< 0.025	< 0 025
	B2-061208D	6/12/2008	**1.12 D**	**1.53 D**	**3.03 D**	**3 D**	**0.867 D**	**0.689 D**	**0.202**	< 0.025	< 0 025
B-3	B3-061208	6/12/2008	**0.00159 J**	**0.00797**	**0.0501**	**0.0894**	**0.007**	<0.005	<0 005	<0 005	<0 005
B-4	B4-061208	6/12/2008	<0.005	<0 005	<0.005	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
B-5	B5-061308	6/13/2008	**0.0338**	**0.003 J**	**0.00617**	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
B-6	B6-061308	6/13/2008	<0.005	<0 005	<0.005	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
COP WELLS											
P-54	P54-061008	6/10/2008	**0.00629**	**0.00101 J**	<0.005	<0.010	<0 005	**0.00294 J**	<0.005	<0 005	<0 005
	P54072508	7/25/2008	<0.005	<0 005	<0.005	<0.010	<0 005	<0.005	<0.005	<0 005	<0 005
P-56	P56-060908	6/9/2008	**0.383 D**	**1.67 D**	**0.46 D**	**2.22 D**	**0.233 D**	**0.388 D**	**0.0937**	<0 005	<0 005
P-57	P57-061108	6/11/2008	**257 D**	**0.624**	**0.133**	**0.76**	**0.117**	**0.106**	**0.0285 J**	<0 050	**0.127 J**
P-58	P58-060908	6/9/2008	**349 D J**	**0.87 J**	**0.148 J**	**0.769 J**	**0.157 J**	**0.734 J**	**0.116 J**	<0 050	**0.115 J**
	P58-060908D	6/9/2008	**348 D J**	**0.914 J**	**0.155 J**	**0.805 J**	**0.168 J**	**0.82 J**	**0.129 J**	<0 050	**0.122 J**
P-66	P66-061008	6/10/2008	**0.659 D**	**0.288 D**	**0.00167 J**	**0.00387 J**	<0 005	**0.0903**	**0.00569**	<0 005	<0 005
P-73	P73-061008	6/10/2008	**4 D**	**0.89 D**	**1.37 D**	**1.76 D**	**0.52 D**	**0.596 D**	**0.137**	**0.00312 J**	<0 005
P-75	P75-061008	6/10/2008	**3.62 D**	**0.0836**	**0.0464**	**0.0345**	**0.00674 J**	**0.0382**	**0.0108**	<0 010	<0 010
P-93A	P-93A	4/30/2008	**366 D**	**0.238**	**0.0187**	**0.347**	**0.0255**	**0.105**	**0.0145**	<0 010	<0 010
P-93B	P-93B	4/30/2008	**232 D**	**0.0907**	**0.11**	**0.174**	**0.0394**	**0.0118**	<0.010	<0 010	<0 010

Analyte (Results in mg/L)			Isopropyl benzene	Methyl tert-Butyl Ether	Methylene chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene
Ingestion Screening Values (mg/L)			0 66**	0 07	0.005	0.14	0.24***	0 24***		0.24***	0.24***
Location	Sample ID	Date									
SOPUS WELLS											
B-1	B1-061208	6/12/2008	<0.005	**0.00438 J**	**0.00321 J**	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
B-2	B2-061208	6/12/2008	**0.0539**	< 0.025	**0.0422 B**	**0.129**	< 0 025	**0.117**	< 0 025	< 0.025	< 0 025
	B2-061208D	6/12/2008	**0.0546**	< 0.025	**0.0472 B**	**0.145**	< 0 025	**0.124**	< 0 025	< 0.025	< 0 025
B-3	B3-061208	6/12/2008	**0.0295**	<0 005	<0.005	< 0.010	**0.00269 J**	**0.0549**	<0 005	**0.00229 J**	**0.00216 J**
B-4	B4-061208	6/12/2008	<0.005	<0 005	**0.00482 J**	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
B-5	B5-061308	6/13/2008	**0.00193 J**	<0 005	**0.00518**	< 0.010	<0 005	**0.00257 J**	<0 005	<0 005	**0.00172 J**
B-6	B6-061308	6/13/2008	<0.005	**0.00104 J**	**0.00157 J**	< 0.010	<0 005	<0.005	<0 005	<0 005	<0 005
COP WELLS											
P-54	P54-061008	6/10/2008	<0.005	<0 005	**0.00207 JB**	<0 010	<0 005	<0.005	<0.005	<0 005	<0 005
	P54072508	7/25/2008	<0.005	<0 005	**0.00384 J**	<0 010	<0 005	<0.005	<0.005	<0 005	<0 005
P-56	P56-060908	6/9/2008	**0.0611**	<0 005	<0.005	**0.18 D**	**0.0094**	**0.0869**	**0.00415 J**	<0 005	<0 005
P-57	P57-061108	6/11/2008	**0.0183 J**	<0 050	<0.050	**0.065 J**	<0 050	**0.0171 J**	<0.050	<0 050	<0 050
P-58	P58-060908	6/9/2008	**0.0766 J**	<0 050	<0.050	**0.179 J**	**0.0189 J J**	**0.109 J**	<0.050	<0 050	**0.0371 J J**
	P58-060908D	6/9/2008	**0.0868 J**	<0 050	<0.050	**0.202 J**	**0.0212 J J**	**0.124 J**	**0.0118 J J**	<0 050	**0.0425 J J**
P-66	P66-061008	6/10/2008	**0.0915**	<0 005	<0.005	**0.0755**	**0.0175**	**0.114**	**0.00445 J**	**0.0196**	**0.00596**
P-73	P73-061008	6/10/2008	**0.0497**	<0 005	<0.005	**0.145**	**0.0255**	**0.0809**	**0.0124**	**0.0199**	**0.0478**
P-75	P75-061008	6/10/2008	**0.126**	**0.125**	<0.010	**0.162**	**0.0268**	**0.0607**	**0.00398 J**	**0.0241**	**0.00496 J**
P-93A	P-93A	4/30/2008	<0.010	**6.26 D**	<0.050	<0 050	<0 010	**0.0117**	<0.010	<0 010	<0 010

NOTES

1) Screening values shown above are the Tier 1 Groundwater Remediation Objectives for the Ingestion Route.
2) **BOLD** indicates the analytical detection of the analyte.
3) Sample ID explanation --> XX-DDDDDD --> XX is the well location at which the sample was collected; DDDDDD is the date on which the sample was collected.
4) The screening values provided are for Xylenes (total), which is the summation of m,p-Xylenes and o-Xylenes.
5) Analytical results for P-93A are from the 2Q08 monitoring event for the Wood River Refinery and were provided by COP.
6) The 6/10/2008 data for well P-54 are considered suspect.

REFERENCES

Illinois Environmental Protection Agency (EPA); Tiered Approach to Corrective Action Objectives (TACO); Title 35 of the Illinois Administrative Code, Part 742, Appendix B, Table E.

* IEPA; TACO; Groundwater Remediation Objectives for Chemicals not listed in TACO; May 1, 2007.

** U.S. Environmental Protection Agency (USEPA); Region 6 Human Health Medium Specific Screening Levels; December 2007.

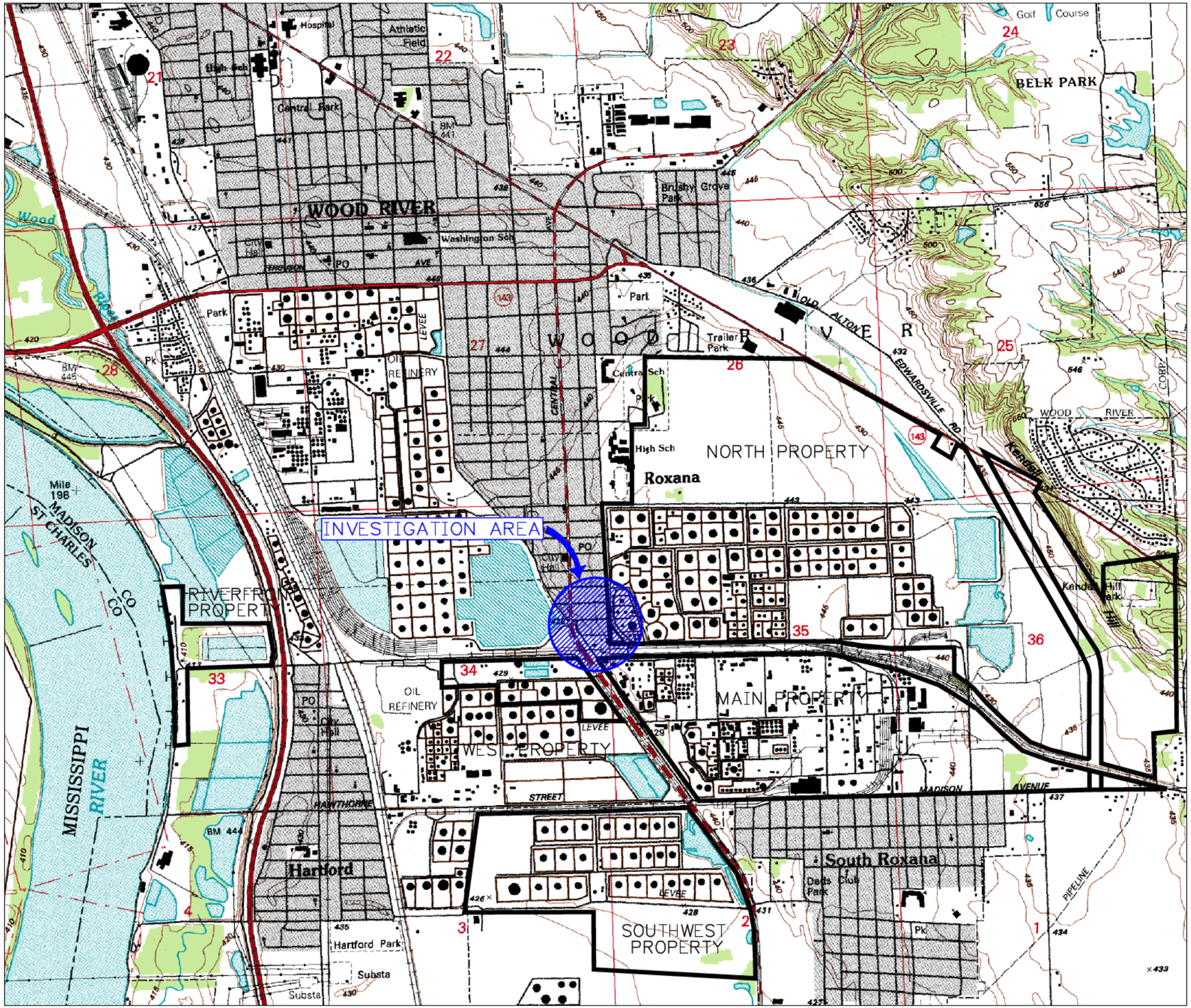
*** U.S. Environmental Protection Agency (USEPA), Region 9; Preliminary Remediation Goals (PRGs) Table; October 2004.

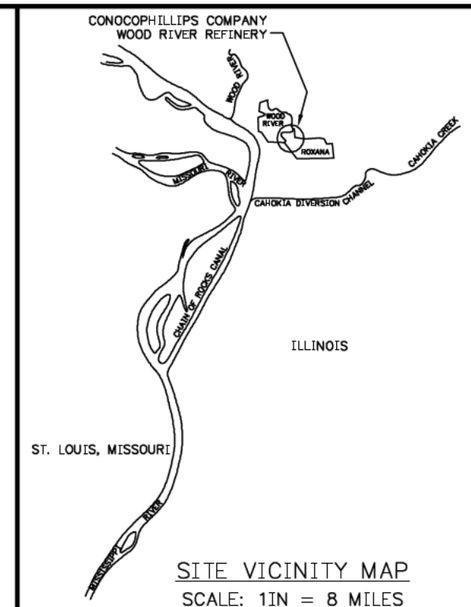
LAB QUALIFIERS

B = A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
D = The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
J = The target analyte was positively identified below the RL and above the MDL.

URS QUALIFIERS

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.





SITE VICINITY MAP
SCALE: 1IN = 8 MILES

LEGEND

WOOD RIVER REFINERY PROPERTY BOUNDARY

INVESTIGATION AREA

SOURCE: MAP TAKEN FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE TOPOGRAPHIC MAP OF WOOD RIVER, ILL–MO REVISED 1994.

CONTOUR INTERVAL = 10FT

0 2000

SCALE FEET

N

SHELL OIL PRODUCTS US ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS	PROJECT NO. 21561979
URS	
DRN. BY: djd 7/19/06 DSGN. BY: gh CHKD. BY: wmp	Site Location Map — FIG. NO. 1

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 1 SITE LOCATION MAP.DWG Last edited: 08/19/08 @ 10:16 a.m. @ WCC-ST.LOUIS

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 2 INVESTIGATION LOCATION MAP.DWG Last edited: AUG. 19, 08 @ 10:52 a.m. by: david_deguire

LEGEND

- URS SOIL/GROUNDWATER SAMPLING LOCATION (MAY–JUNE 2008)
- URS GROUNDWATER PROFILING LOCATION (MARCH–APRIL 2006)
- EXISTING COP MONITORING WELL SAMPLED (JUNE 2008)
- EXISTING VAPOR MONITORING POINT SAMPLED (JUNE 2008)
- COP SOIL/GROUNDWATER SAMPLING LOCATION (MARCH 2007)

NOTES:

1. LOCATION OF "COP" BORINGS PROVIDED BY CONOCOPHILLIPS.

N

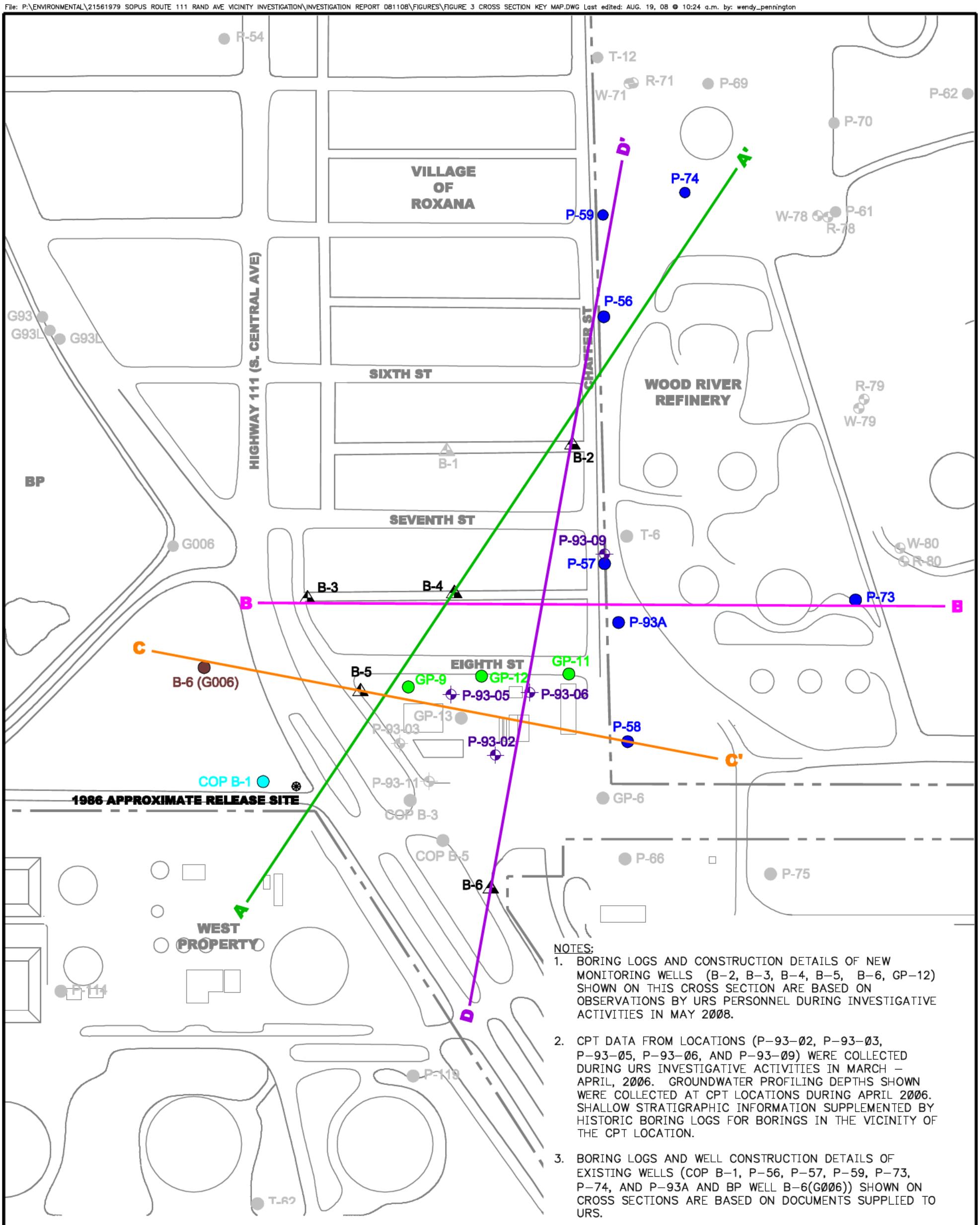
0 200

SCALE FEET

REFERENCE:
SHELL OIL COMPANY, WRB REFINING LLC 2008; RCRA PART B POST CLOSURE PERMIT APPLICATION; DATED JUNE 2008; PREPARED BY URS.

SHELL OIL PRODUCTS U.S ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS		PROJECT NO. 21561979
URS		
DRN. BY:djd 7/1/08 DSGN. BY:taj CHKD. BY:bj	Investigation Locations	FIG. NO. 2

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 3 CROSS SECTION KEY MAP.DWG Last edited: AUG. 19, 08 @ 10:24 a.m. by: wendy_pennington



NOTES:

1. BORING LOGS AND CONSTRUCTION DETAILS OF NEW MONITORING WELLS (B-2, B-3, B-4, B-5, B-6, GP-12) SHOWN ON THIS CROSS SECTION ARE BASED ON OBSERVATIONS BY URS PERSONNEL DURING INVESTIGATIVE ACTIVITIES IN MAY 2008.
2. CPT DATA FROM LOCATIONS (P-93-02, P-93-03, P-93-05, P-93-06, AND P-93-09) WERE COLLECTED DURING URS INVESTIGATIVE ACTIVITIES IN MARCH – APRIL, 2006. GROUNDWATER PROFILING DEPTHS SHOWN WERE COLLECTED AT CPT LOCATIONS DURING APRIL 2006. SHALLOW STRATIGRAPHIC INFORMATION SUPPLEMENTED BY HISTORIC BORING LOGS FOR BORINGS IN THE VICINITY OF THE CPT LOCATION.
3. BORING LOGS AND WELL CONSTRUCTION DETAILS OF EXISTING WELLS (COP B-1, P-56, P-57, P-59, P-73, P-74, AND P-93A AND BP WELL B-6(G006)) SHOWN ON CROSS SECTIONS ARE BASED ON DOCUMENTS SUPPLIED TO URS.
4. CROSS SECTION TRACE LINE SHOWS DISTANCE AND DIRECTION EACH POINT WAS PROJECTED TO CONSTRUCT THIS CROSS SECTION.
5. GROUNDWATER ELEVATIONS WERE GAUGED ON JULY 2, 2008.

LEGEND

- URS GROUNDWATER SAMPLING LOCATION (JUNE 2008)
- EXISTING COP MONITORING WELL
- EXISTING VAPOR MONITORING POINTS
- EXISTING URS GROUNDWATER PROFILE / CPT LOCATION (2006)
- COP SOIL SAMPLING/GROUNDWATER SAMPLING LOCATION (MARCH 2007)
- EXISTING BP GROUNDWATER MONITORING WELL

0 200
SCALE FEET

N

REFERENCE:
SHELL OIL COMPANY, WRB REFINING LLC 2008; RCRA PART B POST CLOSURE PERMIT APPLICATION; DATED JUNE 2008; PREPARED BY URS.

SHELL OIL PRODUCTS U.S ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS	PROJECT NO. 21561979
URS	
DRN. BY:lrm 7/31/08 DSGN. BY:tja CHKD. BY:mm	Cross Section Key Map FIG. NO. 3

SOUTHWEST

NORTHEAST

1986 Release Site

PLAN VIEW (DEPICTING OFFSETS)

A

A'

COP B-1

B-5

B-4

B-2

P-56

P-74

440

430

420

410

400

390

380

Ground Surface

ELEVATION, FEET NGVD

P:\Environmental\21561979 SOPUS Route 111 Rand Ave Vicinity Investigation\Investigation Report 081108\Figures\Figure 4 Cross Section A-A'.vsd Last edit: 8/5/2008 4:42:50 PM

Legend:

- Fill (gravel, clay, etc.) projected between points
- Silt projected between points
- Clay projected between points
- Clayey Sand projected between points
- Sand projected between points
- Water Level
- Potentiometric Surface – estimated (7/2/08)
- Stratum boundary - estimated
- Well Screen

Notes:

1) The ground surface elevation for boring COP B-1 was estimated based on nearby elevation information.

Vertical Scale: 0 10

Plan View and Horizontal Scale: 0 100

SHELL OIL PRODUCTS U.S ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS		PROJECT NO. 21561979
URS		
DRN. BY: mpm 07/29/08 DSGN. BY: mpm CHKD. BY:	Cross Section A - A'	FIG. NO. 4

WEST

PLAN VIEW (DEPICTING OFFSETS)

EAST

B

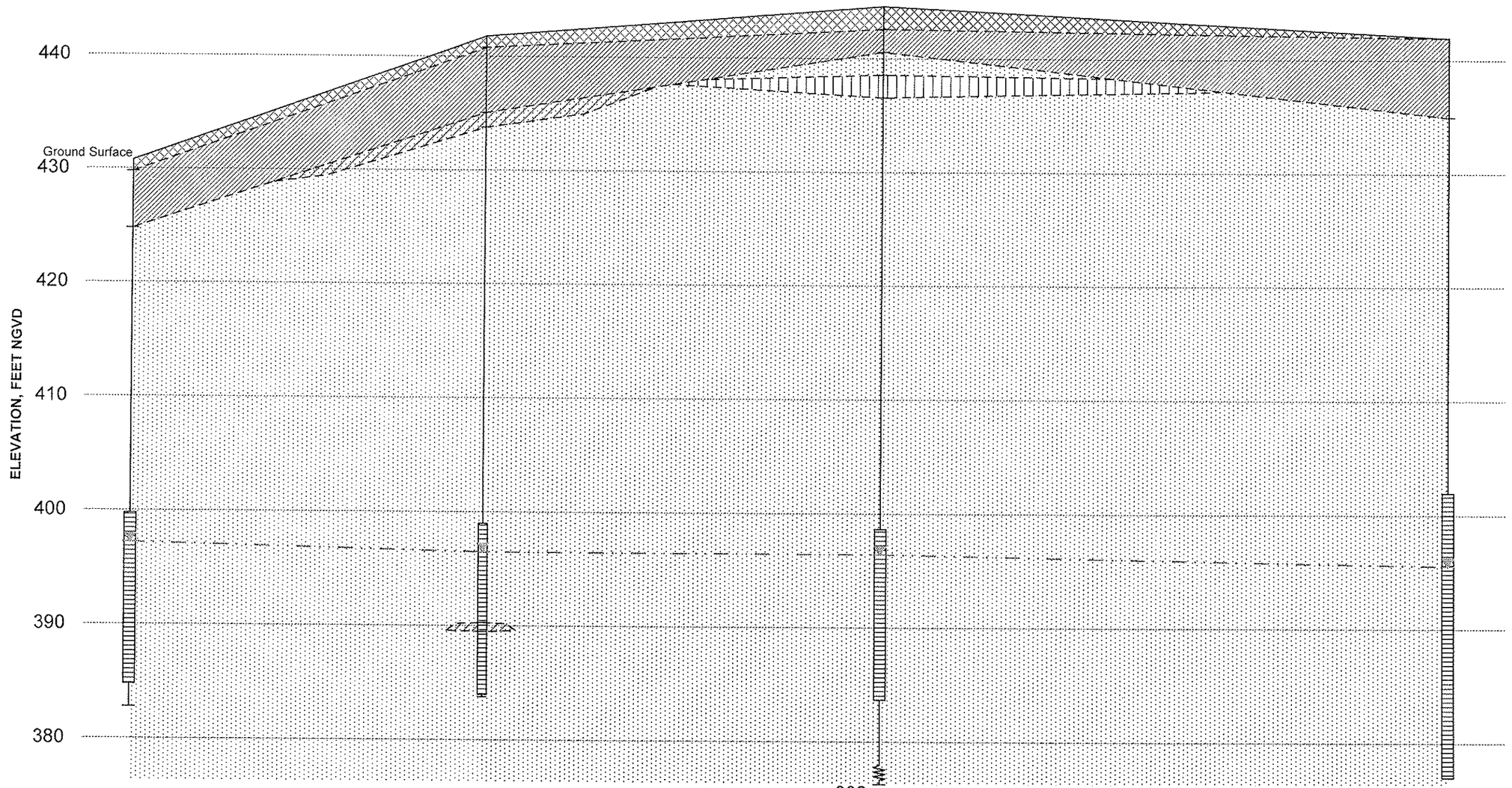
B-3

B-4

P-93 A

P-73

B'



Legend:

- Fill (gravel, clay, etc.) projected between points
- Silt projected between points
- Clay projected between points
- Clayey Sand projected between points
- Sand projected between points
- Water Level
- Potentiometric Surface - assumed
- Stratum boundary - assumed
- Well Screen

Vertical Scale: 0 10

Plan View and Horizontal Scale: 0 100

SHELL OIL PRODUCTS U.S. ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS		PROJECT NO. 21561979
URS		
DRN. BY: mpm 07/29/08 DSGN. BY: mpm CHKD. BY:	Cross Section B - B'	FIG. NO. 5

P:\Environmental\21561979 SOPUS Route 111 Rand Ave Vicinity Investigation\Investigation Report 081108\Figures\Figure 5 Cross Section B-B'.vsd Last edit: 8/5/2008 4:43:19 PM

WEST

PLAN VIEW (DEPICTING OFFSETS)

EAST

BP Boring B-6 (G006)

C

B-5

GP-9

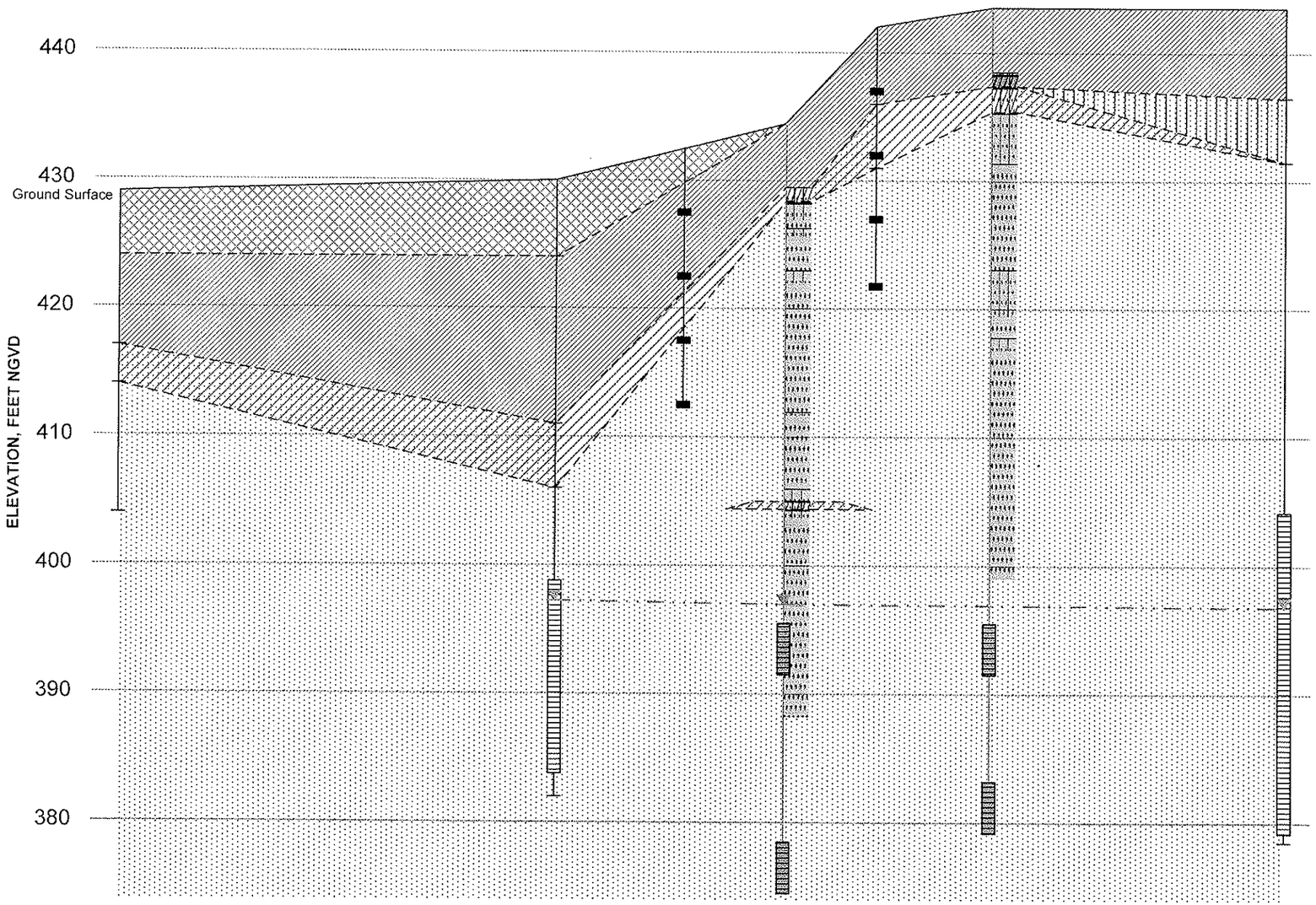
P-93-05

GP-12

P-93-06

P-58

C'



Legend:

- Fill (gravel, clay, etc.) projected between points
- Silt projected between points
- Clay projected between points
- Clayey Sand projected between points
- Sand projected between points
- CPT interpreted Clay
- CPT interpreted Sandy Clay
- CPT interpreted Sand
- Water Level
- Potentiometric Surface - assumed
- Stratum boundary - assumed
- Well Screen
- Groundwater Profiling Interval
- Vapor Port Screen

NOTES:

1) GP-9 is included to illustrate vapor screen depths. This boring was not used to create this cross section.

Vertical Scale: 0 10

Plan View and Horizontal Scale: 0 100

SHELL OIL PRODUCTS U.S.
ROUTE 111/RAND AVENUE VICINITY INVESTIGATION
ROXANA, ILLINOIS

PROJECT NO. 21561979

URS

DRN. BY: mpm 07/29/08
DSGN. BY: mpm
CHKD. BY:

Cross Section C - C'

FIG. NO. 6

P:\Environmental\21561979 SOPUS Route 111 Rand Ave Vicinity Investigation\Investigation Report 081108\Figures\Figure 6 Cross Section C-C' vsd Last edit: 8/8/2008 1:49:31 PM

SOUTH

D

NORTH

D'

PLAN VIEW (DEPICTING OFFSETS)

B-6

P-93-02

P-93-06

GP-11

P-93-09

B-2

P-56

P-59

ELEVATION, FEET NGVD

440

430

420

410

400

390

380

Ground Surface

Legend:

- Fill (gravel, clay, etc.) projected between points
- Silt projected between points
- Clay projected between points
- Clayey Sand projected between points
- Sand projected between points
- CPT interpreted Clay
- CPT interpreted Sandy Clay
- CPT interpreted Sand
- Water Level
- Potentiometric Surface - assumed
- Stratum boundary - assumed
- Well Screen
- Groundwater Profiling Interval
- Vapor Port Screen

NOTES:

1) GP-11 is included to illustrate vapor screen depths. This boring was not used to create this cross section.

Vertical Scale: 0 10

Plan View and Horizontal Scale: 0 100

SHELL OIL PRODUCTS U.S.
ROUTE 111/RAND AVENUE VICINITY INVESTIGATION
ROXANA, ILLINOIS

PROJECT NO. 21561979

URS

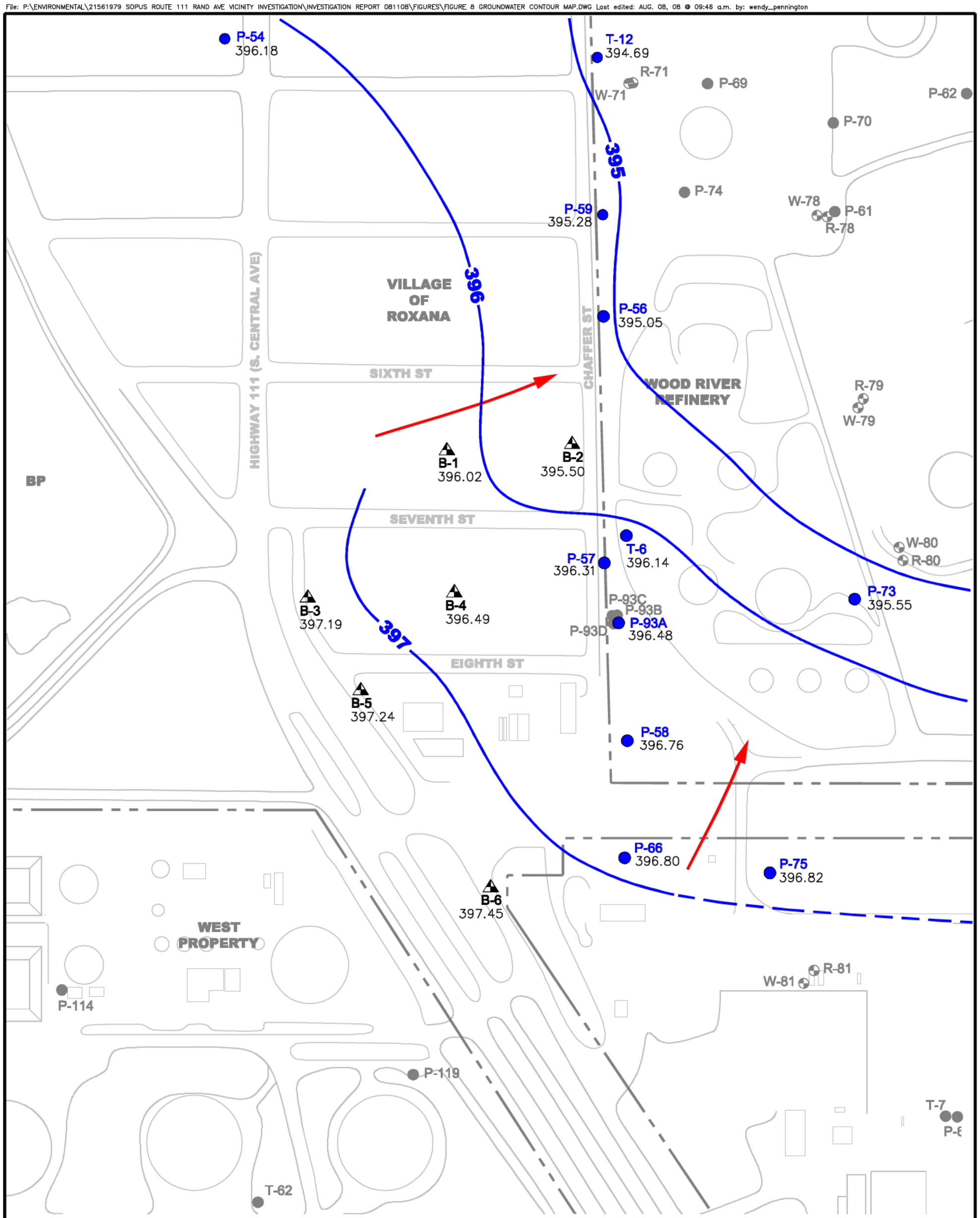
DRN. BY: mpm 07/29/08
DSGN. BY: mpm
CHKD. BY:

Cross Section D - D'

FIG. NO. 7

P:\Environmental\21561979 SOPUS Route 111 Rand Ave Vicinity Investigation\Investigation Report 081108\Figures\Figure 7 Cross Section D-D' vsd Last edit: 8/8/2008 1:51:44 PM

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 8 GROUNDWATER CONTOUR MAP.DWG Last edited: AUG. 08, 08 @ 09:46 a.m. by: wendy_pennington



LEGEND

- URS GROUNDWATER SAMPLING LOCATION (JUNE 2008)
- EXISTING COP MONITORING WELL GAUGED
- EXISTING COP WATER PRODUCTION WELLS/OIL RECOVERY WELLS
- GRADIENT
- 397 CONTOUR LINE (INFERRED WHERE DASHED)

NOTES:

1. GROUNDWATER GAUGING CONDUCTED ON JULY 2, 2008.

0 200 SCALE FEET N

REFERENCE:
SHELL OIL COMPANY, WRB REFINING LLC 2008; RCRA PART B POST CLOSURE PERMIT APPLICATION; DATED JUNE 2008; PREPARED BY URS.

SHELL OIL PRODUCTS U.S ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS		PROJECT NO. 21561979
URS		
DRN. BY:lrm 7/17/08 DSGN. BY:tja CHKD. BY:b3	Groundwater Contour Map	FIG. NO. 8

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 9 SOIL ANALYTICAL DETECTIONS MAP.DWG Last edited: AUG. 19, 08 @ 10:27 a.m. by: wendy_pennington

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
B-1	5/14/2008	3 ft bgs	Benzene	<0.00394
			Ethylbenzene	<0.00394
			Toluene	<0.00394
			m,p-Xylene	<0.00787
			o-Xylene	<0.00394
			Methyl tert-butyl ether	<0.00394
	5/20/2008	27 ft bgs	Benzene	<0.00575
			Ethylbenzene	**0.00208 J**
			Toluene	**0.00204 J**
			m,p-Xylene	<0.0115
			o-Xylene	<0.00575
			Methyl tert-butyl ether	<0.00575

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
B-2	5/14/2008	4 ft bgs	Benzene	<0.00517
			Ethylbenzene	<0.00517
			Toluene	<0.00517
			m,p-Xylene	<0.0103
			o-Xylene	<0.00517
			Methyl tert-butyl ether	<0.00517
	5/20/2008	41 ft bgs	Benzene	**0.0927 J**
			Ethylbenzene	**4.39 D**
			Toluene	**0.0136**
			m,p-Xylene	**2.45 D**
			o-Xylene	**0.0246 J**
			Methyl tert-butyl ether	<0.00626

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
B-4	5/15/2008	6 ft bgs	Benzene	<0.00479
			Ethylbenzene	<0.00479
			Toluene	<0.00479
			m,p-Xylene	<0.00958
			o-Xylene	<0.00479
			Methyl tert-butyl ether	<0.00479
	5/22/2008	35 ft bgs	Benzene	<0.00591
			Ethylbenzene	<0.00591
			Toluene	**0.00176 J**
			m,p-Xylene	<0.0118
			o-Xylene	<0.00591
			Methyl tert-butyl ether	<0.00591

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
B-5	5/15/2008	4.5 ft bgs	Benzene	<0.00498
			Ethylbenzene	<0.00498
			Toluene	<0.00498
			m,p-Xylene	<0.00996
			o-Xylene	<0.00498
			Methyl tert-butyl ether	<0.00498
	5/21/2008	27 ft bgs	Benzene	<0.00533
			Ethylbenzene	<0.00533
			Toluene	<0.00533
			m,p-Xylene	<0.0107
			o-Xylene	<0.00533
			Methyl tert-butyl ether	<0.00533

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
B-3	5/14/2008	6 ft bgs	Benzene	<0.005
			Ethylbenzene	<0.005
			Toluene	<0.005
			m,p-Xylene	<0.010
			o-Xylene	<0.005
			Methyl tert-butyl ether	<0.005
	5/21/2008	33 ft bgs	Benzene	<0.00567
			Ethylbenzene	<0.00567
			Toluene	**0.00137 J**
			m,p-Xylene	<0.0113
			o-Xylene	<0.00567
			Methyl tert-butyl ether	<0.00567

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
GP-12(II)	5/15/2008	4 ft bgs	Benzene	<0.00498
			Ethylbenzene	<0.00498
			Toluene	<0.00498
			m,p-Xylene	<0.00996
			o-Xylene	<0.00498
			Methyl tert-butyl ether	<0.00498
	5/22/2008	17 ft bgs	Benzene	<0.00549
			Ethylbenzene	**0.00132 J**
			Toluene	**0.00206 J**
			m,p-Xylene	<0.0110
			o-Xylene	<0.00549
			Methyl tert-butyl ether	<0.00549
	5/22/2008 (Duplicate)	17 ft bgs (Duplicate)	Benzene	<0.0055
			Ethylbenzene	<0.0055
			Toluene	**0.00116 J**
			m,p-Xylene	<0.0110
			o-Xylene	<0.0055
			Methyl tert-butyl ether	<0.0055

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
COP B-1	3/7/2007	12-14 ft	Benzene	0.0017
			Ethylbenzene	<0.0063
			Toluene	<0.0063
			Xylenes (total)	<0.0063
			Methyl tert-butyl ether	<0.0025
	3/7/2007	22-24 ft	Benzene	<0.0011
			Ethylbenzene	<0.0054
			Toluene	<0.0054
			Xylenes (total)	<0.0054
			Methyl tert-butyl ether	<0.0021

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
GP-7(II)	5/15/2008	3 ft bgs	Benzene	<0.00501
			Ethylbenzene	<0.00501
			Toluene	<0.00501
			m,p-Xylene	<0.010
			o-Xylene	<0.00501
			Methyl tert-butyl ether	<0.00501
	5/19/2008	19 ft bgs	Benzene	**0.344 E J**
			Ethylbenzene	<0.00529
			Toluene	**0.00115 J**
			m,p-Xylene	<0.0106
			o-Xylene	<0.00529
			Methyl tert-butyl ether	<0.00529
	5/19/2008 (Duplicate)	19 ft bgs (Duplicate)	Benzene	**<0.795 E J**
			Ethylbenzene	<0.0051
			Toluene	**0.00109 J**
			m,p-Xylene	<0.0102
			o-Xylene	<0.0051
			Methyl tert-butyl ether	<0.0051

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
COP B-3	3/1/2007	14-16 ft	Benzene	0.287
			Ethylbenzene	0.548
			Toluene	<0.141
			Xylenes (total)	<0.141
			Methyl tert-butyl ether	<0.0564
	3/1/2007	22-24 ft	Benzene	21.9
			Ethylbenzene	8.22
			Toluene	<0.972
			Xylenes (total)	7.89
			Methyl tert-butyl ether	<0.389
	3/1/2007	34-36 ft	Benzene	3.71
			Ethylbenzene	<0.138
			Toluene	<0.138
			Xylenes (total)	0.42
			Methyl tert-butyl ether	<0.0552

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
COP B-5	2/28/2007	14-16 ft	Benzene	0.001
			Ethylbenzene	<0.005
			Toluene	<0.005
			Xylenes (total)	<0.005
			Methyl tert-butyl ether	<0.002
	2/28/2007	38-40 ft	Benzene	165
			Ethylbenzene	1.5
			Toluene	1.26
			Xylenes (total)	4.17
			Methyl tert-butyl ether	<0.0647

Sample Location	Sample Date	Sample Depth	Analyte	Result (mg/kg)
B-6	5/15/2008	4 ft bgs	Benzene	<0.00391
			Ethylbenzene	<0.00391
			Toluene	<0.00391
			m,p-Xylene	<0.00782
			o-Xylene	<0.00391
			Methyl tert-butyl ether	<0.00391
	5/21/2008	23 ft bgs	Benzene	<0.00513
			Ethylbenzene	<0.00513
			Toluene	<0.00513
			m,p-Xylene	<0.0103
			o-Xylene	<0.00513
			Methyl tert-butyl ether	<0.00513

ROXANA
SIXTH ST
CHAFFER ST
SEVENTH ST
EIGHTH ST
B-1
B-2
B-3
B-4
B-5
B-6
GP-12(II)
GP-7(II)
COP B-1
COP B-3
COP B-5
1986 APPROXIMATE RELEASE SITE

NOTES:

1. NO ANALYTICAL DETECTIONS WERE OBSERVED IN SAMPLES COLLECTED FROM LOCATIONS B-5 AND B-6.
2. EXCEEDANCES OF THE RESIDENTIAL SCREENING CRITERIA ARE HIGHLIGHTED IN YELLOW ABOVE.
3. D = (LAB) DENOTES THE RESULT IS FROM A DILUTED SAMPLED.
   E = (LAB) DENOTES THE DATA EXCEEDS THE UPPER CALIBRATION LIMIT; CONCENTRATION IS ESTIMATED.
   J = (LAB) DENOTES THE ANALYTE WAS POSITIVELY IDENTIFIED BELOW THE REPORTING LIMIT AND THE RESULT IS ESTIMATED.
   J = (URS) DENOTES THE ANALYTE WAS POSITIVELY IDENTIFIED BELOW THE REPORTING LIMIT AND THE RESULT IS ESTIMATED.

REFERENCE:
SHELL OIL COMPANY, WRB REFINING LLC 2008; RCRA PART B POST CLOSURE PERMIT APPLICATION; DATED JUNE 2008; PREPARED BY URS.

LEGEND

▲ URS SOIL SAMPLING LOCATION (JUNE 2008)
● COP SOIL SAMPLING LOCATION (APRIL 2007)

N

Ø 200
SCALE FEET

SHELL OIL PRODUCTS U.S
ROUTE 111/RAND AVENUE VICINITY INVESTIGATION
ROXANA, ILLINOIS

PROJECT NO. 21561979

URS

DRN. BY:wmp 7/29/08
DSGN. BY:lrm
CHKD. BY:b3

Soil Analytical BTEX & MTBE Results Map

FIG. NO. 9

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 10 VAPOR ANALYTICAL DETECTIONS MAP.DWG Last edited: AUG. 19, 08 @ 11:01 a.m. by: wendy_pennington

Sample Location	Sample Date	Vapor Port	Analyte	Result (ppbV)
GP-9	6/4/2008	A (5 ft)	Benzene	<5.6
			Ethylbenzene	<5.6
			Toluene	**12**
			m,p-Xylene	<5.6
			o-Xylene	<5.6
			Methyl tert-butyl Ether	<5.6
	6/4/2008	B (10 ft)	Benzene	<2.9
			Ethylbenzene	<2.9
			Toluene	**9.9**
			m,p-Xylene	<2.9
			o-Xylene	<2.9
			Methyl tert-butyl Ether	<2.9
	6/4/2008	C (15 ft)	Benzene	<140
			Ethylbenzene	<140
			Toluene	<140
			m,p-Xylene	<140
			o-Xylene	<140
			Methyl tert-butyl Ether	<140
	6/4/2008 (Duplicate)	C (Duplicate)	Benzene	<140
			Ethylbenzene	<140
			Toluene	<140
			m,p-Xylene	<140
			o-Xylene	<140
			Methyl tert-butyl Ether	<140
	6/4/2008	D (20 ft)	Benzene	<1.3
			Ethylbenzene	<1.3
			Toluene	**10**
			m,p-Xylene	**2.2**
			o-Xylene	<1.3
			Methyl tert-butyl Ether	<1.3

Sample Location	Sample Date	Vapor Port	Analyte	Result (ppbV)
GP-12	6/3/2008	A (5 ft)	Benzene	<1.5
			Ethylbenzene	<1.5
			Toluene	**2.5**
			m,p-Xylene	**1.8**
			o-Xylene	<1.5
			Methyl tert-butyl Ether	<1.5
	6/3/2008	B (10 ft)	Benzene	**1.4**
			Ethylbenzene	<1.4
			Toluene	**2.7**
			m,p-Xylene	**1.9**
			o-Xylene	<1.4
			Methyl tert-butyl Ether	<1.4
	6/3/2008	C (15 ft)	Benzene	<1.4
			Ethylbenzene	<1.4
			Toluene	**2.6**
			m,p-Xylene	**1.8**
			o-Xylene	<1.4
			Methyl tert-butyl Ether	<1.4
	6/3/2008	D (20 ft)	Benzene	**37**
			Ethylbenzene	<1.3
			Toluene	**2.6**
			m,p-Xylene	**2**
			o-Xylene	<1.3
			Methyl tert-butyl Ether	<1.3

Sample Location	Sample Date	Vapor Port	Analyte	Result (ppbV)
GP-13	6/4/2008	A (5 ft)	Benzene	<150
			Ethylbenzene	<150
			Toluene	<150
			m,p-Xylene	<150
			o-Xylene	<150
			Methyl tert-butyl Ether	<150
	6/4/2008	B (10 ft)	Benzene	<140
			Ethylbenzene	<140
			Toluene	<140
			m,p-Xylene	**250**
			o-Xylene	<140
			Methyl tert-butyl Ether	<140
	6/4/2008	C (15 ft)	Benzene	<130
			Ethylbenzene	<130
			Toluene	<130
			m,p-Xylene	<130
			o-Xylene	<130
			Methyl tert-butyl Ether	<130
	6/4/2008	D (20 ft)	Benzene	<140
			Ethylbenzene	<140
			Toluene	<140
			m,p-Xylene	<140
			o-Xylene	<140
			Methyl tert-butyl Ether	<140

Sample Location	Sample Date	Vapor Port	Analyte	Result (ppbV)
GP-11	6/3/2008	A (5 ft)	Benzene	<11
			Ethylbenzene	<11
			Toluene	**24**
			m,p-Xylene	<11
			o-Xylene	<11
			Methyl tert-butyl Ether	<11
	6/3/2008	B (10 ft)	Benzene	<60
			Ethylbenzene	<60
			Toluene	<60
			m,p-Xylene	<60
			o-Xylene	<60
			Methyl tert-butyl Ether	<60
	6/3/2008 (Duplicate)	B (Duplicate)	Benzene	<11
			Ethylbenzene	<11
			Toluene	**13**
			m,p-Xylene	<11
			o-Xylene	<11
			Methyl tert-butyl Ether	<11
	6/3/2008	C (15 ft)	Benzene	<11
			Ethylbenzene	<11
			Toluene	**18**
			m,p-Xylene	<11
			o-Xylene	<11
			Methyl tert-butyl Ether	<11
	6/3/2008	D (20 ft)	Benzene	<300
			Ethylbenzene	<300
			Toluene	<300
			m,p-Xylene	<300
			o-Xylene	<300
			Methyl tert-butyl Ether	<300

VILLAGE OF ROXANA

SIXTH ST

SEVENTH ST

EIGHTH ST

GP-9

GP-12

GP-11

GP-13

1986 APPROXIMATE RELEASE SITE

LEGEND

● EXISTING VAPOR MONITORING POINT SAMPLED

N

Ø 200

SCALE FEET

REFERENCE:
SHELL OIL COMPANY, WRB REFINING LLC 2008; RCRA PART B POST CLOSURE PERMIT APPLICATION; DATED JUNE 2008; PREPARED BY URS.

SHELL OIL PRODUCTS U.S/WRB REFINING LLC
ROUTE 111/RAND AVENUE VICINITY INVESTIGATION
ROXANA, ILLINOIS

PROJECT NO. 21561979

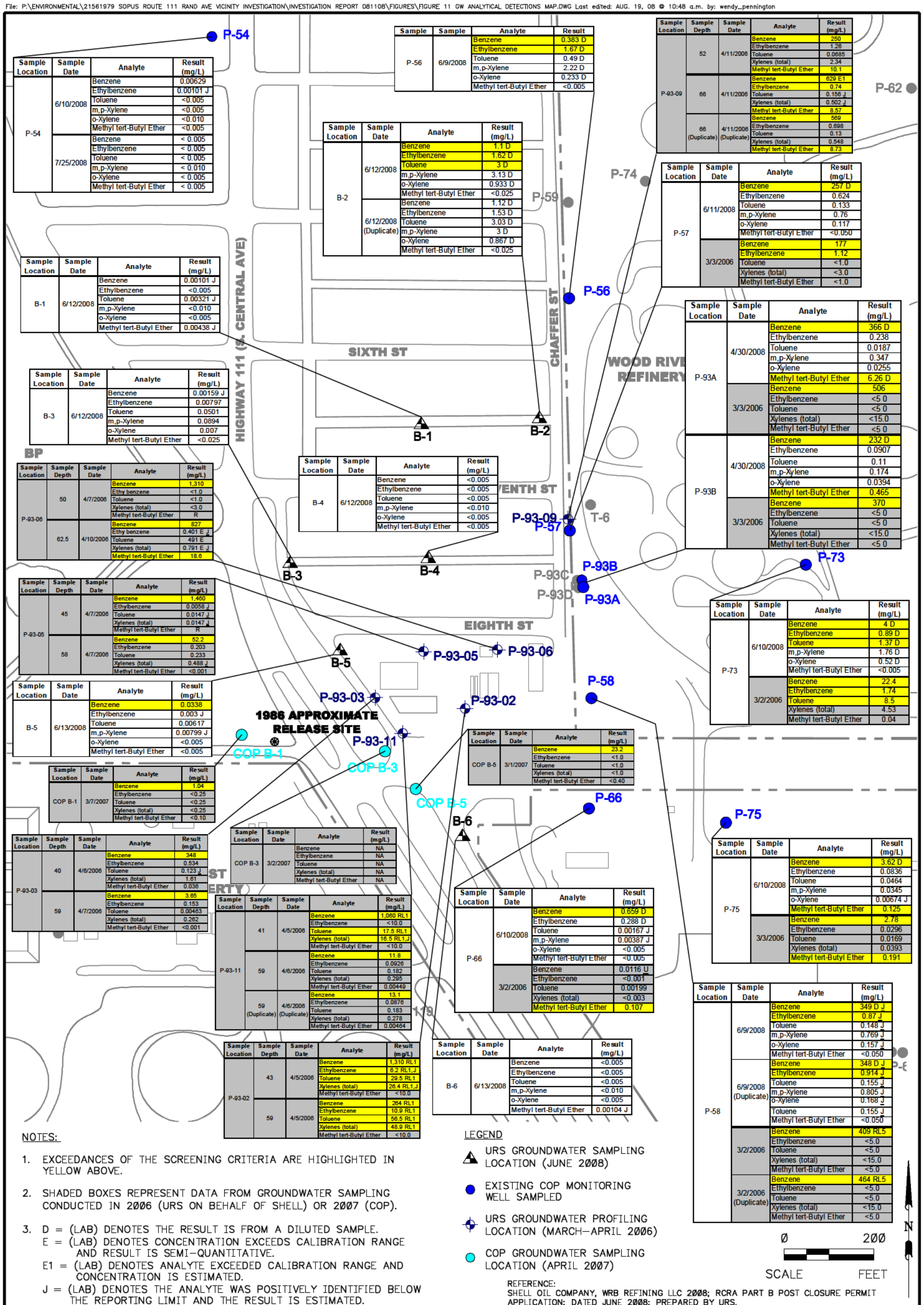
URS

DRN. BY:wmp 7/29/08
DSGN. BY:lrm
CHKD. BY:bJ

Soil Vapor Analytical BTEX & MTBE Results Map

FIG. NO. 10

File: P:\ENVIRONMENTAL\21561979 SOPUS ROUTE 111 RAND AVE VICINITY INVESTIGATION\INVESTIGATION REPORT 081108\FIGURES\FIGURE 11 GW ANALYTICAL DETECTIONS MAP.DWG Last edited: AUG. 19, 08 @ 10:48 a.m. by: wendy_pennington



Sample Location	Sample Date	Analyte	Result (mg/L)
P-54	6/10/2008	Benzene	0.00629
		Ethylbenzene	0.00101 J
		Toluene	<0.005
		m,p-Xylene	<0.005
		o-Xylene	<0.010
		Methyl tert-Butyl Ether	<0.005
	7/25/2008	Benzene	< 0.005
		Ethylbenzene	< 0.005
		Toluene	< 0.005
		m,p-Xylene	< 0.010
		o-Xylene	< 0.005
		Methyl tert-Butyl Ether	< 0.005

Sample Location	Sample Date	Analyte	Result (mg/L)
P-56	6/9/2008	Benzene	0.383 D
		Ethylbenzene	1.67 D
		Toluene	0.49 D
		m,p-Xylene	2.22 D
		o-Xylene	0.233 D
		Methyl tert-Butyl Ether	<0.005

Sample Location	Sample Depth	Sample Date	Analyte	Result (mg/L)
P-93-09	52	4/11/2006	Benzene	250
			Ethylbenzene	1.26
			Toluene	0.0685
			Xylenes (total)	2.34
			Methyl tert-Butyl Ether	10.1
	66	4/11/2006	Benzene	629 E1
			Ethylbenzene	0.74
			Toluene	0.156 J
			Xylenes (total)	0.502 J
			Methyl tert-Butyl Ether	8.57
	66 (Duplicate)	4/11/2006 (Duplicate)	Benzene	569
			Ethylbenzene	0.698
			Toluene	0.13
			Xylenes (total)	0.548
			Methyl tert-Butyl Ether	8.73

Sample Location	Sample Date	Analyte	Result (mg/L)
B-2	6/12/2008	Benzene	1.1 D
		Ethylbenzene	1.62 D
		Toluene	3 D
		m,p-Xylene	3.13 D
		o-Xylene	0.933 D
		Methyl tert-Butyl Ether	<0.025
	6/12/2008 (Duplicate)	Benzene	1.12 D
		Ethylbenzene	1.53 D
		Toluene	3.03 D
		m,p-Xylene	3 D
		o-Xylene	0.867 D
		Methyl tert-Butyl Ether	<0.025

Sample Location	Sample Date	Analyte	Result (mg/L)
P-57	6/11/2008	Benzene	257 D
		Ethylbenzene	0.624
		Toluene	0.133
		m,p-Xylene	0.76
		o-Xylene	0.117
		Methyl tert-Butyl Ether	<0.050
	3/3/2006	Benzene	177
		Ethylbenzene	1.12
		Toluene	<1.0
		Xylenes (total)	<3.0
		Methyl tert-Butyl Ether	<1.0

Sample Location	Sample Date	Analyte	Result (mg/L)
B-1	6/12/2008	Benzene	0.00101 J
		Ethylbenzene	<0.005
		Toluene	0.00321 J
		m,p-Xylene	<0.010
		o-Xylene	<0.005
		Methyl tert-Butyl Ether	0.00438 J

Sample Location	Sample Date	Analyte	Result (mg/L)
P-93A	4/30/2008	Benzene	366 D
		Ethylbenzene	0.238
		Toluene	0.0187
		m,p-Xylene	0.347
		o-Xylene	0.0255
		Methyl tert-Butyl Ether	6.26 D
	3/3/2006	Benzene	506
		Ethylbenzene	<5 0
		Toluene	<5 0
		Xylenes (total)	<15.0
		Methyl tert-Butyl Ether	<5 0
P-93B	4/30/2008	Benzene	232 D
		Ethylbenzene	0.0907
		Toluene	0.11
		m,p-Xylene	0.174
		o-Xylene	0.0394
		Methyl tert-Butyl Ether	0.465
	3/3/2006	Benzene	370
		Ethylbenzene	<5 0
		Toluene	<5 0
		Xylenes (total)	<15.0
		Methyl tert-Butyl Ether	<5 0

Sample Location	Sample Date	Analyte	Result (mg/L)
B-3	6/12/2008	Benzene	0.00159 J
		Ethylbenzene	0.00797
		Toluene	0.0501
		m,p-Xylene	0.0894
		o-Xylene	0.007
		Methyl tert-Butyl Ether	<0.025

Sample Location	Sample Date	Analyte	Result (mg/L)
B-4	6/12/2008	Benzene	<0.005
		Ethylbenzene	<0.005
		Toluene	<0.005
		m,p-Xylene	<0.010
		o-Xylene	<0.005
		Methyl tert-Butyl Ether	<0.005

Sample Location	Sample Depth	Sample Date	Analyte	Result (mg/L)
P-93-06	50	4/7/2006	Benzene	1,310
			Ethy benzene	<1.0
			Toluene	<1.0
			Xylenes (total)	<3.0
			Methyl tert-Butyl Ether	R
	62.5	4/10/2006	Benzene	827
			Ethy benzene	0.401 E J
			Toluene	491 E
			Xylenes (total)	0.791 E J
			Methyl tert-Butyl Ether	18.6

Sample Location	Sample Depth	Sample Date	Analyte	Result (mg/L)
P-93-05	45	4/7/2006	Benzene	1,460
			Ethylbenzene	0.0058 J
			Toluene	0.0147 J
			Xylenes (total)	0.0147 J
			Methyl tert-Butyl Ether	R
	58	4/7/2006	Benzene	52.2
			Ethylbenzene	0.203
			Toluene	0.233
			Xylenes (total)	0.488 J
			Methyl tert-Butyl Ether	<0.001

Sample Location	Sample Date	Analyte	Result (mg/L)
P-73	6/10/2008	Benzene	4 D
		Ethylbenzene	0.89 D
		Toluene	1.37 D
		m,p-Xylene	1.76 D
		o-Xylene	0.52 D
		Methyl tert-Butyl Ether	<0.005
	3/2/2006	Benzene	22.4
		Ethylbenzene	1.74
		Toluene	8.5
		Xylenes (total)	4.53
		Methyl tert-Butyl Ether	0.04

Sample Location	Sample Date	Analyte	Result (mg/L)
B-5	6/13/2008	Benzene	0.0338
		Ethylbenzene	0.003 J
		Toluene	0.00617
		m,p-Xylene	0.00799 J
		o-Xylene	<0.005
		Methyl tert-Butyl Ether	<0.005

Sample Location	Sample Date	Analyte	Result (mg/L)
COP B-5	3/1/2007	Benzene	23.2
		Ethylbenzene	<1.0
		Toluene	<1.0
		Xylenes (total)	<1.0
		Methyl tert-Butyl Ether	<0.40

Sample Location	Sample Date	Analyte	Result (mg/L)
COP B-1	3/7/2007	Benzene	1.04
		Ethylbenzene	<0.25
		Toluene	<0.25
		Xylenes (total)	<0.25
		Methyl tert-Butyl Ether	<0.10

Sample Location	Sample Depth	Sample Date	Analyte	Result (mg/L)
P-93-03	40	4/6/2006	Benzene	348
			Ethylbenzene	0.534
			Toluene	0.123 J
			Xylenes (total)	1.61
			Methyl tert-Butyl Ether	0.036
	59	4/7/2006	Benzene	3.65
			Ethylbenzene	0.153
			Toluene	0.00463
			Xylenes (total)	0.262
			Methyl tert-Butyl Ether	<0.001

Sample Location	Sample Date	Analyte	Result (mg/L)
COP B-3	3/2/2007	Benzene	NA
		Ethylbenzene	NA
		Toluene	NA
		Xylenes (total)	NA
		Methyl tert-Butyl Ether	NA

Sample Location	Sample Depth	Sample Date	Analyte	Result (mg/L)
P-93-11	41	4/5/2006	Benzene	1,060 RL1
			Ethylbenzene	<10.0
			Toluene	17.5 RL1
			Xylenes (total)	16.5 RL1,J
			Methyl tert-Butyl Ether	<10.0
	59	4/6/2006	Benzene	11.8
			Ethylbenzene	0.0926
			Toluene	0.182
			Xylenes (total)	0.295
			Methyl tert-Butyl Ether	0.00449
	59 (Duplicate)	4/6/2006 (Duplicate)	Benzene	13.1
			Ethylbenzene	0.0876
			Toluene	0.183
			Xylenes (total)	0.278
			Methyl tert-Butyl Ether	0.00464

Sample Location	Sample Date	Analyte	Result (mg/L)
P-66	6/10/2008	Benzene	0.659 D
		Ethylbenzene	0.288 D
		Toluene	0.00167 J
		m,p-Xylene	0.00387 J
		o-Xylene	<0.005
		Methyl tert-Butyl Ether	<0.005
	3/2/2006	Benzene	0.0116 U
		Ethylbenzene	<0.001
		Toluene	0.00199
		Xylenes (total)	<0.003
		Methyl tert-Butyl Ether	0.107

Sample Location	Sample Depth	Sample Date	Analyte	Result (mg/L)
P-93-02	43	4/5/2006	Benzene	1,310 RL1
			Ethylbenzene	6.2 RL1,J
			Toluene	29.5 RL1
			Xylenes (total)	26.4 RL1,J
			Methyl tert-Butyl Ether	<10.0
	59	4/5/2006	Benzene	264 RL1
			Ethylbenzene	10.9 RL1
			Toluene	56.5 RL1
			Xylenes (total)	48.9 RL1
			Methyl tert-Butyl Ether	<10.0

Sample Location	Sample Date	Analyte	Result (mg/L)
B-6	6/13/2008	Benzene	<0.005
		Ethylbenzene	<0.005
		Toluene	<0.005
		m,p-Xylene	<0.010
		o-Xylene	<0.005
		Methyl tert-Butyl Ether	0.00104 J

Sample Location	Sample Date	Analyte	Result (mg/L)
P-75	6/10/2008	Benzene	3.62 D
		Ethylbenzene	0.0836
		Toluene	0.0464
		m,p-Xylene	0.0345
		o-Xylene	0.00674 J
		Methyl tert-Butyl Ether	0.125
	3/3/2006	Benzene	2.78
		Ethylbenzene	0.0296
		Toluene	0.0169
		Xylenes (total)	0.0393
		Methyl tert-Butyl Ether	0.191

Sample Location	Sample Date	Analyte	Result (mg/L)
P-58	6/9/2008	Benzene	349 D J
		Ethylbenzene	0.87 J
		Toluene	0.148 J
		m,p-Xylene	0.769 J
		o-Xylene	0.157 J
		Methyl tert-Butyl Ether	<0.050
	6/9/2008 (Duplicate)	Benzene	348 D J
		Ethylbenzene	0.914 J
		Toluene	0.155 J
		m,p-Xylene	0.805 J
		o-Xylene	0.168 J
		Toluene	0.155 J
		Methyl tert-Butyl Ether	<0.050
	3/2/2006	Benzene	409 RL5
		Ethylbenzene	<5.0
		Toluene	<5.0
		Xylenes (total)	<15.0
		Methyl tert-Butyl Ether	<5.0
	3/2/2006 (Duplicate)	Benzene	464 RL5
		Ethylbenzene	<5.0
		Toluene	<5.0
		Xylenes (total)	<15.0
		Methyl tert-Butyl Ether	<5.0

NOTES:

1. EXCEEDANCES OF THE SCREENING CRITERIA ARE HIGHLIGHTED IN YELLOW ABOVE.
2. SHADED BOXES REPRESENT DATA FROM GROUNDWATER SAMPLING CONDUCTED IN 2006 (URS ON BEHALF OF SHELL) OR 2007 (COP).
3. D = (LAB) DENOTES THE RESULT IS FROM A DILUTED SAMPLE.
   E = (LAB) DENOTES CONCENTRATION EXCEEDS CALIBRATION RANGE AND RESULT IS SEMI-QUANTITATIVE.
   E1 = (LAB) DENOTES ANALYTE EXCEEDED CALIBRATION RANGE AND CONCENTRATION IS ESTIMATED.
   J = (LAB) DENOTES THE ANALYTE WAS POSITIVELY IDENTIFIED BELOW THE REPORTING LIMIT AND THE RESULT IS ESTIMATED.
   J = (URS) DENOTES THE ANALYTE WAS POSITIVELY IDENTIFIED BELOW THE REPORTING LIMIT AND THE RESULT IS ESTIMATED.
   NA = NOT ANALYZED.
   RL1 = (LAB) DENOTES THE REPORTING LIMIT WAS RAISED DUE TO SAMPLE MATRIX EFFECTS.
   RL5 = (LAB) DENOTES THE REPORTING LIMIT WAS RAISED DUE TO HIGH SINGLE PEAK ANALYTE.
   U = (URS) THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED.
   R = DATA REJECTED DURING VALIDATION EFFORTS.

LEGEND

- URS GROUNDWATER SAMPLING LOCATION (JUNE 2008)
- EXISTING COP MONITORING WELL SAMPLED
- URS GROUNDWATER PROFILING LOCATION (MARCH–APRIL 2006)
- COP GROUNDWATER SAMPLING LOCATION (APRIL 2007)

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SCALE FEET

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REFERENCE:
SHELL OIL COMPANY, WRB REFINING LLC 2008; RCRA PART B POST CLOSURE PERMIT APPLICATION; DATED JUNE 2008; PREPARED BY URS.

SHELL OIL PRODUCTS U.S ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS	PROJECT NO. 21561979
URS	
DRN. BY:wmp 7/29/08 DSGN. BY:lrm CHKD. BY:b3	Groundwater Analytical BTEX & MTBE Results Map FIG. NO. 11