

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: St Marys Refining Company

Facility Address: 201 Barkwill Street, St Marys, West Virginia 26170

Facility EPA ID #: WVD004337135

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

- If yes - check here and continue with #2 below.
- If no - re-evaluate existing data, or
- if data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, (GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is groundwater known or reasonably suspected to be “contaminated”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?
- If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.
- If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The following USEPA approved reports apply to this EI:

“RCRA Facility Investigation Report”, Shaw Environmental, Inc., June 2003

Semi-annual Groundwater Sampling Reports from July 2005 through August 2009, Malcolm Pirnie, Inc.

“Interim Measures Work Plan for St Marys Refinery Remediation System (USEPA Docket Number RCRA-III-266), Malcolm Pirnie, May 2006.

“Interim Measures Implementation Report Soil Vapor Extraction – Bioventing Remediation System, St Marys Refining Company, Malcolm Pirnie, Inc., December 2007”

“St. Marys Refining Company, St Marys, WV, Sediment and Surface Water Sampling Results”, Malcolm Pirnie, Inc., September 28, 2008.

“Draft Phase I Corrective Measures Study, St Marys Refining Company, St Marys, WV”, Malcolm Pirnie, March 2006

The following reports currently under USEPA review apply to this EI:

“SVEB IM Completion Report, Malcolm Pirnie, October 2009”

“Enhanced Anaerobic Remediation IM Status Report”, Malcolm Pirnie, October 2009”

The following report was prepared by USEPA:

“RFI Report – Facility Wide Air Releases (AOC-1), St Marys Refining Company, St Marys, WV” USEPA, May 27, 2008.

Groundwater monitoring has been performed on-site for over 20 years. As stated above, approximately 4 years of routine semi-annual groundwater sampling has been completed in addition to the groundwater characterization data presented in the RFI report. The following organic and inorganic compounds are constituents of concern for the site:

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

Volatile Organic Compounds – benzene, ethylbenzene, toluene, xylenes, naphthalene, methyl tertiary butyl ether, and tert-butyl alcohol.

Inorganics arsenic,

The constituents most frequently found above the MCLs or risk-based standards are benzene and arsenic. Benzene concentrations are present in wells on the refinery site as well as one location down gradient. Arsenic concentrations are primarily elevated within the refinery groundwater monitoring wells.

Table 1 (attached) presents a tabular summary of the VOC and arsenic results in groundwater collected from 35 on-site and off-site groundwater monitoring wells for Spring 2009. As discussed under item 3, operation of the SVEB system has stabilized groundwater concentrations and recent trends confirm attenuation of parameters.

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination)?
- If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”²).
 - If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) – skip to #8 and enter “NO” status code, after providing an explanation.
 - If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The results of the recently completed Soil Vapor Extraction/Bioremediation (SVEB) program and the results of the Enhanced Anaerobic Bioremediation (EAB) program have demonstrated that residual groundwater sources have been remediated to the extent that no significant LNAPL is present on Site and dissolved concentrations of COC are decreasing in concentration and extent. The SV and EAB programs were implemented consistent with the findings of the Corrective Measures Study and the Interim Measures Work Plan for SVEB (May 2006).

In 1997, a door to door survey in the residential areas around the facility was conducted to evaluate if basements were impacted by groundwater constituents and to document the absence of private wells. An expanded survey was conducted in 2001. The surveys found that no basements exhibited volatile vapors, and no active private wells existed in the area surveyed. The July 2007 vapor intrusion and ambient air sampling performed by USEPA and reported in the May 27, 2008 report prepared by USEPA demonstrates that there is no unacceptable offsite vapor impacts.

In 2003 groundwater impacts were discovered as part of the City of St Marys wastewater treatment expansion near Creel Street Extension. These impacts were addressed via SVEB and closed under the West Virginia Department of Environmental Protection Voluntary Remediation Program. An adjacent property to the WWTP is being addressed via EAB, and has been entered into the West Virginia VRP program.

² “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation”.

**Migration of Contaminated Groundwater Under Control
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4. Does "contaminated" groundwater **discharge** into **surface water** bodies?
- If yes - continue after identifying potentially affected surface water bodies.
 - If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.
 - If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The approved sediment and surface water sampling report indicates no facility impacts to the Ohio River or nearby tributaries. Further, sampling of groundwater monitoring well 44E (located adjacent to the Ohio River) indicates no concentrations exceeding MCLs and/or concentrations exceeding values that would be considered detrimental to surface water.

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5. Is the discharge of “contaminated” groundwater into surface water likely to be “insignificant” (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentrations of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentrations of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

Skipped pursuant to Section # 4

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

**Migration of Contaminated Groundwater Under Control
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6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

If yes - continue after either:

1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR

2) providing or referencing an interim-assessment⁵, appropriate to the potential for impact that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

Skipped pursuant to Section # 4

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

- If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."
- If no - enter "NO" status code in #8.
- If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

Semi-annual groundwater sampling to continue through 2010as part of the Interim Measures program which is anticipated to be completed by October 2010. It is anticipated that EAB amendments to groundwater will ultimately re-establish natural sulfate concentrations such that natural attenuation will continue upon completion of the expanded EAB pilot system activities in 2010. Once EAB activities are completed, a compliance monitoring program will be developed to track re-establishment of natural sulfate and constituent concentration attenuation in response to completion of the EAB program.

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the St Marys Refining Company Site, 201 Barkwill Street, St Marys, WV 26170. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by (signature) *Barbara Smith* Date 10/20/2009
(print) Barbara Smith
(title) EPA Project Manager

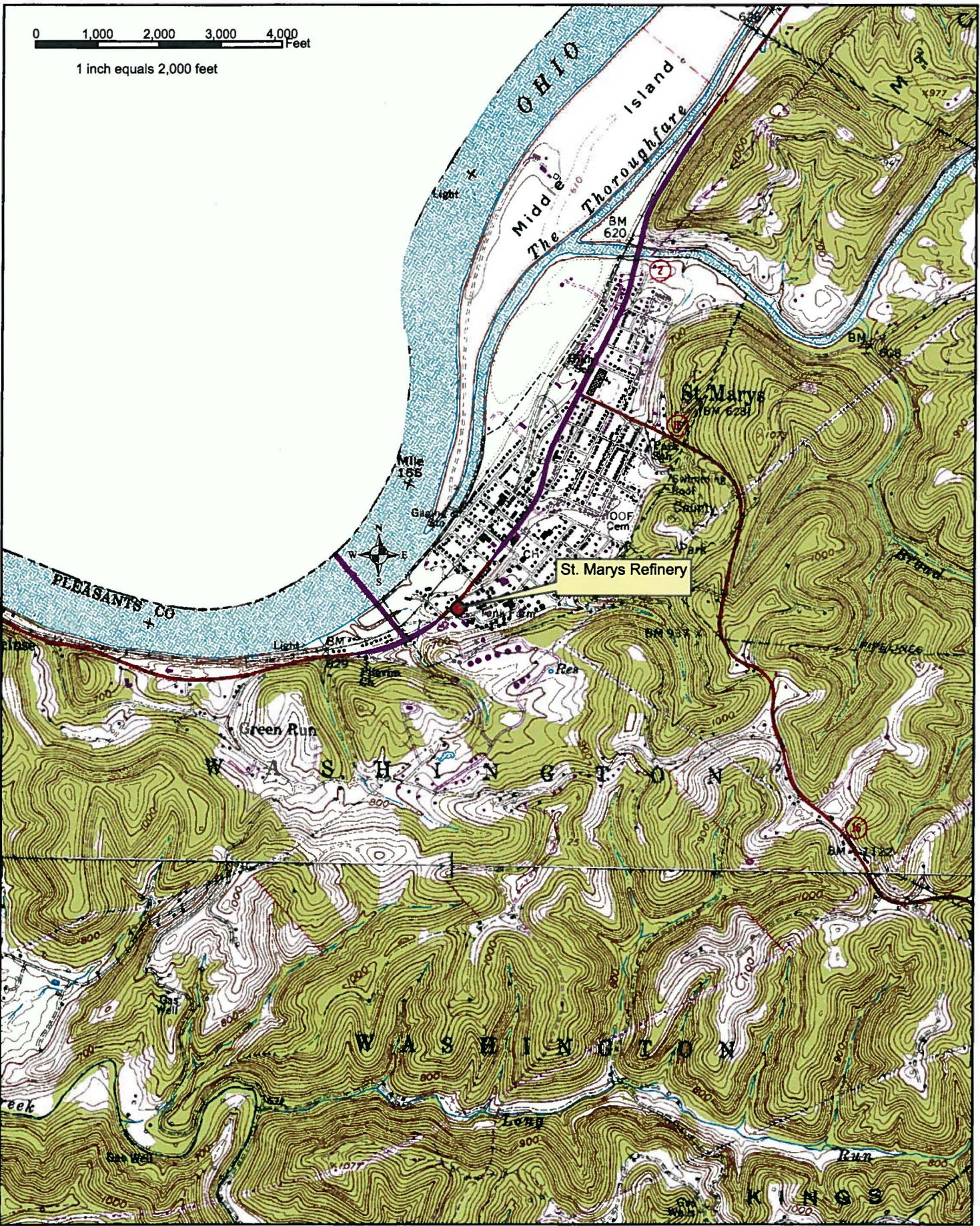
Supervisor (signature) *[Signature]* Date 10/20/2009
(print) Luis Pizarro
(title) Chief RCRA Operations Branch
(EPA Region) EPA-III (3LC20)

Locations where References may be found:

US EPA Region III
Waste & Chemicals Management Division
1650 Arch Street
Philadelphia, PA 19103

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Legend

- SMRC Facility Limits
- Ohio River Staff Gauge
- Active Monitoring Wells (November 2008)
- Abandoned Well

SCALE:
1 inch equals 200 feet

LAYER 1 WELLS	LAYER 2 WELLS	LAYER 3 WELLS
OW-1 VE-1	MW-1D	MW-13D
OW-4 VE-2	MW-4D	MW-15D
OW-5 VE-3	MW-6D	MW-17E
OW-8 VE-4	MW-7D	MW-24E
OW-7 VE-5	MW-10D	MW-26E
OW-8 VE-5	MW-12D	MW-28E
OW-9 VE-7	MW-12D	MW-22E
MW-10 VE-8	MW-13	MW-29D
MW-11 VE-9	MW-15	MW-32D
MW-12 VE-10	MW-16D	CW-1
MW-16 VE-11	MW-17D	CW-2
MW-17 VE-12	MW-18D	
MW-18 VE-13	MW-20D	
MW-19 VE-14	MW-21D	
MW-20	MW-22E	
MW-21S	MW-24D	
MW-22S	MW-24S	
MW-23S	MW-25D	
MW-26S	MW-26D	
MW-27S	MW-27D	
MW-28S	MW-28E	
MW-29S	MW-29E	
MW-31S	MW-31D	
MW-32S	MW-32D	
MW-33S	MW-33D	
MW-34S	MW-34D	
MW-35S	MW-35D	
MW-36S	MW-36D	
MW-37	MW-37	
MW-38S	MW-38D	
MW-39S	MW-39D	
MW-40S	CW-3	
MW-41S		
MW-42S		
MW-43S		

THE APPROXIMATE TOP AND BOTTOM ELEVATIONS OF THE LAYERS:
 LAYER 1: 605.5 TO 505.5 FT. MSL
 LAYER 2: 585.5 TO 575.5 FT. MSL
 LAYER 3: 575.5 FT. MSL TO TOP OF BEDROCK

MALCOLM PIRNIE
 ST. MARYS REFINING COMPANY
 ST. MARYS, WEST VIRGINIA
 FIRST SEMI-ANNUAL 2008
 GROUNDWATER MONITORING REPORT

Figure 2
MONITORING WELL LOCATIONS
MAY 2009

Table 1
Groundwater Analytical Results
May 2009
St Marys, West Virginia

Analyte Group/ Name	Units	MW-07D			MW-10D			MW-11D			MW-12D			MW-17E			MW-18		
		MW-7D-090514			MW-10D-090513			MW-11D-090514			MW-12D-090514			MW-17E-090512			MW-18-090513		
		Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL
Volatile Organics																			
Benzene	ug/L	680	D	1.6	5.4		0.16	1.5		0.16	7.6		0.16	0	U	0.16	76		0.16
Toluene	ug/L	18		0.14	1.6		0.14	1.9		0.14	3.8		0.14	1.1		0.14	1.5		0.14
Ethylbenzene	ug/L	2.8		0.19	120		0.19	0	U	0.19	0	U	0.19	0	U	0.19	0	U	0.19
Xylenes, Total	ug/L	11.5		0.2	154.2		0.2	1.7		0.2	7.2		0.2	0	U	0.2	3.3		0.2
Naphthalene	ug/L	9.2		0.22	18.9		0.22	0	U	0.22	0	U	0.22	0	U	0.22	0	U	0.22
Methyl tert-butyl ether	ug/L	23		0.18	15		0.18	0	U	0.18	0	U	0.18	0	U	0.18	17		0.18
tert-Butyl alcohol	ug/L	0	U	1	0	U	1	0	U	1	0	U	1	0	U	1	64.4		1
Dissolved Metals																			
Arsenic (Dissolved)	mg/L	0.008	J	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007

Notes:

QL - Laboratory Qualifier

D - The sample(s) were diluted due to targets detected over the highest point of calibration curve, or due to matrix interference. Dilution factors are included in the final results. The sample is from a diluted sample.

J - The identification of the analyte is acceptable; the reported value is an estimate.

MDL - Minimum Detection Limit

U - Analyte was not detected.

- Indicate constituent was not analyzed this sampling round.

Table 1
Groundwater Analytical Results
May 2009
St Marys, West Virginia

Analyte Group/ Name	Units	MW-18D			MW-20D			MW-21D			MW-25D			MW-25E			MW-25S		
		MW-18D-090513			MW-20D-090514			MW-21D-090514			MW-25D-090511			MW-25E-090511			MW-25S-090511		
		Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL
Volatile Organics																			
Benzene	ug/L	1100		1.6	42		0.16	3.6		0.16	0	U	0.16	0	U	0.16	0	U	0.16
Toluene	ug/L	22		1.4	4.7		0.14	2.1		0.14	0	U	0.14	0	U	0.14	0	U	0.14
Ethylbenzene	ug/L	130		1.9	3.5		0.19	0	U	0.19	0	U	0.19	0	U	0.19	0	U	0.19
Xylenes, Total	ug/L	267		2	19.8		0.2	2.8		0.2	0	U	0.2	0	U	0.2	0	U	0.2
Naphthalene	ug/L	0	U	2.2	6.48		0.22	0	U	0.22	0	U	0.22	0	U	0.22	0	U	0.22
Methyl tert-butyl ether	ug/L	0	U	1.8	0	U	0.18	0	U	0.18	4.5		0.18	46		0.18	25		0.18
tert-Butyl alcohol	ug/L	0	U	10	0	U	1	0	U	1	0	U	1	87.1		1	0	U	1
Dissolved Metals																			
Arsenic (Dissolved)	mg/L	0.007	J	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007

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Table 1
Groundwater Analytical Results
May 2009
St Marys, West Virginia

Analyte Group/ Name	Units	MW-26E			MW-27D			MW-27E			MW-29D			MW-30D			MW-31D		
		MW-26E-090511			MW-27D-090511			MW-27E-090511			MW-29D-090511			MW-30D-090512			MW-31D-090513		
		Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL
Volatile Organics																			
Benzene	ug/L	0	U	0.16	1300	D	3.2	280	D	1.6	0	U	0.16	3.6		0.16	990		1.6
Toluene	ug/L	0	U	0.14	24		0.14	17		0.14	0	U	0.14	4.9		0.14	74		1.4
Ethylbenzene	ug/L	0	U	0.19	3.1		0.19	0	U	0.19	0	U	0.19	0	U	0.19	41		1.9
Xylenes, Total	ug/L	0	U	0.2	22.3		0.2	5.5		0.2	0	U	0.2	0	U	0.2	120		2
Naphthalene	ug/L	0	U	0.22	0	U	0.22	0	U	0.22	0	U	0.22	0	U	0.22	0	U	2.2
Methyl tert-butyl ether	ug/L	36		0.18	9.6		0.18	9.6		0.18	12		0.18	21		0.18	0	U	1.8
tert-Butyl alcohol	ug/L	72.1		1	0	U	1	0	U	1	79.8		1	92.7		1	0	U	10
Dissolved Metals																			
Arsenic (Dissolved)	mg/L	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0.013		0.007

Notes:

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Table 1
Groundwater Analytical Results
May 2009
St Marys, West Virginia

Analyte Group/ Name	Units	MW-31S			MW-33D			MW-34D			MW-35D			MW-35S			MW-36D		
		MW-31S-090513			MW-33D-090514			MW-34D-090513			MW-35D-090514			MW-35S-090514			MW-36D-090514		
		Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL
Volatile Organics																			
Benzene	ug/L	330	D	1.6	110		0.16	140		0.16	6500	D	8	4800	D	8	1200	D	1.6
Toluene	ug/L	21		0.14	5.6		0.14	4.9		0.14	66		0.14	15		0.14	9.6	D	0.14
Ethylbenzene	ug/L	73		0.19	1.2		0.19	27		0.19	380	D	9.5	45		0.19	290	D	1.9
Xylenes, Total	ug/L	28.4	D	0.2	13.9		0.2	210		0.2	708	D	0.2	155		0.2	220		0.2
Naphthalene	ug/L	30.1		0.22	0	U	0.22	1.05		0.22	50		0.22	22.4		0.22	61.2		0.22
Methyl tert-butyl ether	ug/L	13		0.18	0	U	0.18	46		0.18	33		0.18	17		0.18	0	U	0.18
tert-Butyl alcohol	ug/L	0	U	1	0	U	1	124		1	0	U	1	0	U	1	0	U	1
Dissolved Metals																			
Arsenic (Dissolved)	mg/L	0.076		0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007	0	U	0.007

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Table 1
Groundwater Analytical Results
May 2009
St Marys, West Virginia

Analyte Group/ Name	Units	MW-36S			MW-37			MW-38D			MW-38S			MW-39D			MW-39S		
		MW-36S-090514			MW-37-090514			MW-38D-090514			MW-38S-090514			MW-39D-090514			MW-39S-090514		
		Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL
Volatile Organics																			
Benzene	ug/L	3700	D	16	5600	D	16	94		0.16	420	D	1.6	3600	D	16	3300	D	8
Toluene	ug/L	55		1.4	21		1.4	0	U	0.14	2.1		0.14	2200	D	14	550	D	7
Ethylbenzene	ug/L	2000		1.9	190		1.9	2		0.19	24		0.19	3000	D	19	1800	D	9.5
Xylenes, Total	ug/L	2140		2	140		2	4.4		0.2	113		0.2	8500	D	20	2200	D	10
Naphthalene	ug/L	413		2.2	58.6		2.2	0	U	0.22	5.91		0.22	638	D	22	357	D	11
Methyl tert-butyl ether	ug/L	0	U	1.8	0	U	1.8	6.5		0.18	0	U	0.18	0	U	0.18	19		0.18
tert-Butyl alcohol	ug/L	0	U	10	0	U	10	0	U	1	0	U	1	0	U	1	0	U	1
Dissolved Metals																			
Arsenic (Dissolved)	mg/L	0	U	0.007	0.009	J	0.007	0.009	J	0.007	0.015		0.007	0	U	0.007	0.009	J	0.007

Notes:

QL - Laboratory Qualifier

D - The sample(s) were diluted due to targets detected over the highest point of calibration curve, or due to matrix interference. Dilution factors are included in the final results. The sample is from a diluted sample.

J - The identification of the analyte is acceptable; the reported value is an estimate.

MDL - Minimum Detection Limit

U - Analyte was not detected.

- Indicate constituent was not analyzed this sampling round.

Table 1
Groundwater Analytical Results
May 2009
St Marys, West Virginia

Analyte Group/ Name	Units	MW-40S			MW-41S			MW-43S			MW-44E			OW-07		
		MW-40S-090514			MW-41S-090514			MW-43S-090514			MW-44E-090514			OW-7-090514		
		Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL	Result	QL	MDL
Volatile Organics																
Benzene	ug/L	3100	D	8	7700	D	8	160		0.16	1.9		0.16	190		0.16
Toluene	ug/L	430	D	7	780	D	7	7.9		0.14	0	U	0.14	2.5		0.14
Ethylbenzene	ug/L	2900	D	9.5	1000	D	9.5	2300	D	3.8	0	U	0.19	5		0.19
Xylenes, Total	ug/L	7600	D	10	4000	D	20	354		0.2	0	U	0.2	14.1		0.2
Naphthalene	ug/L	458	D	11	123		0.22	299	D	4.4	0	U	0.22	7.94		0.22
Methyl tert-butyl ether	ug/L	31		0.18	3200	D	9	0	U	0.18	29		0.18	26		0.18
tert-Butyl alcohol	ug/L	0	U	1	0	U	1	0	U	1	0	U	1	20.2		1
Dissolved Metals																
Arsenic (Dissolved)	mg/L	0	U	0.007	0.01		0.007	0	U	0.007	0	U	0.007	0.015		0.007

Notes:

QL - Laboratory Qualifier

D - The sample(s) were diluted due to targets detected over the highest point of calibration curve, or due to matrix interference. Dilution factors are included in the final results. The sample is from a diluted sample.

J - The identification of the analyte is acceptable; the reported value is an estimate.

MDL - Minimum Detection Limit

U - Analyte was not detected.

- Indicate constituent was not analyzed this sampling round.