



June 18, 2010

Mr. Andrew Fan
US EPA Region III, 3WC23
1650 Arch Street
Philadelphia, PA 19103-2029

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Blvd.
Baltimore, Maryland 21230

**Re: Consent Decree, Civil Action Nos. JFM-97-558, JFM-97-559
Coke Oven Area Interim Measures Work Plan
Response to EPA letter dated May 26, 2010**

Dear Mr. Fan and Ms. Brown:

Enclosed with this correspondence is supporting documentation for the Coke Oven Area (COA) Interim Measure (IM) work plan that has been developed in conjunction with comments received by the agencies to address identified environmental conditions at the COA Special Study Area at the Severstal Sparrows Point Facility. This document includes;

- Descriptions and progress summaries of COA Interim Measures (IMs) intended to support the scope of the COA IM work plan submitted by Severstal Sparrows in January of 2010 and as approved in part by U.S. EPA's March 2, 2010 letter;
- Modifications to IMs that address the additional conditions contained in U.S. EPA's March 2, 2010 letter, and the U.S. EPA's May 26, 2010 disapproval letter of Severstal's April 2, 2010 revision to the COA IM Scope of Work;
- Further clarifications to address the U.S. EPA's March 2, 2010 conditions as well as incorporating the revisions, corrections and modifications to U.S. EPA's May 26th disapproval letter, resulting from the June 3rd technical discussion with Andrew Fan of U.S. EPA and Barbara Brown of the Maryland Department of the Environment.

Submission of this supporting documentation for the January 2010 IM work plan is intended to satisfy the requirement to submit a revised work plan for the COA IM identified in the May 26, 2010 correspondence from EPA. The June 3, 2010 technical discussion with Andrew Fan and

Severstal Sparrows Point

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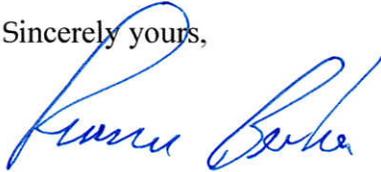
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Barbara Brown also resulted in the Agencies approving an extension of time until June 18, 2010 in which to submit this response. Please contact me at (410) 388-6622 should you have questions regarding this submittal.

Sincerely yours,



Russell Becker
Division Manager
Environmental Engineering and Affairs

Enclosure

**COKE OVEN AREA INTERIM MEASURES WORK PLAN
SUPPLEMENTAL INFORMATION
JUNE 2010**

1.0 INTRODUCTION

This document provides summary descriptions and implementation milestones for proposed interim measures that have been developed to address identified environmental conditions at the Coke Oven Area (COA) Special Study Area at the Severstal Sparrows Point Facility. This document includes;

- Descriptions and progress summaries of COA Interim Measures (IMs) intended to support the scope of the COA IM work plan submitted by Severstal Sparrows in January of 2010 and as approved in part by U.S. EPA's March 2, 2010 letter;
- Modifications to IMs that address the additional conditions contained in U.S. EPA's March 2, 2010 letter, and the U.S. EPA's May 26, 2010 disapproval letter of Severstal's April 2, 2010 revision to the COA IM Scope of Work;
- Further clarifications to address the U.S. EPA's March 2, 2010 conditions as well as incorporating the revisions, corrections and modifications to U.S. EPA's May 26th disapproval letter, resulting from the June 3rd technical discussion with Andrew Fan of U.S. EPA and Barbara Brown of the Maryland Department of the Environment.

More specifically, U.S. EPA's March 2, 2010 letter approved Severstal's air-sparge/soil vapor extraction (AS/SVE) interim measures for Cell 1 as originally proposed, and the in-situ anaerobic bio-treatment interim measure design concept for Cell 4 as originally proposed. The March 2, 2010 EPA letter also approved the AS/SVE concept proposed for Cell 2 and Cell 3. A summary of the additional conditions contained in U.S. EPA's March 3, 2010 letter follows:

1. Modification of vapor recovery wells into dual-phase groundwater and vapor extraction wells at the former Coal Storage Area (Cell 2);
2. Addition of ground water extraction wells near the Turning Basin (Cell 5);
3. Addition of dual-phase extraction wells to former Benzol Processing LNAPL Area (Cell 6).

Severstal's April 2, 2010 response to the conditions contained within U.S. EPA's March 2, 2010 letter contained a technically supportable basis to disagree with U.S. EPA's conditions for groundwater extraction in Cells 2 and 5 which raised concern regarding the potential impact that additional groundwater pumping could have in inducing further plume movement and the likely associated increase in harm to the environment. This response also included a technically supportable basis to disagree with U.S. EPA's conditions contained in the March 2, 2010 letter for Cell 6 as dual phase groundwater pumping is not currently necessary due to acceptable

product recovery rates and the need to avoid potentially reducing that recovery rate due to over-aggressive withdrawal of oil leading to smear zones and bifurcation of the subsurface oil pool; an issue with which U.S. EPA ultimately agreed during the June 3, 2010 technical telephone call.

As a result of the June 3rd technical telephone call and as agreed to by U.S. EPA, MDE and Severstal, design modifications are outlined in this document to install a dual-phase ground water extraction system in the former Coal Storage Area (Cell 2). While U.S. EPA's May 26, 2010 letter also directed that Severstal propose an accelerated schedule to implement AS/SVE systems in Cells 2 and 3; as a result of the June 3, 2010 technical discussion U.S. EPA, MDE and Severstal mutually agreed to evaluate the performance of the Cell 1 AS/SVE system following submittal of three months of operating data. Evaluation of the three months of operating data from Cell 1 will be used to establish the basis to move forward with the AS/SVE in Cells 2 and 3. Upon U.S. EPA approval of the AS/SVE work in Cell 1, Severstal will support the implementation of AS/SVE in Cells 2 and 3 within approximately six months subject to the appropriate construction season constraints. Assuming U.S. EPA and the MDE approve and appropriately permit the AS/SVE operating performance for Cell 1 by the end of December 2010, Severstal will then be in a position to complete installation and operation of the AS/SVE in Cells 2 and 3 within six months of EPA approval, consistent with the cooperative goal of operation of all cells by July of 2011.

Submission of this supporting documentation for the January 2010 IM work plan is intended to satisfy the requirement to submit a revised work plan for the COA IM identified in the May 26, 2010 correspondence from EPA. The June 3, 2010 technical discussion with Andrew Fan and Barbara Brown also resulted in the Agencies approving an extension of time until June 18, 2010 in which to submit this response.

2.0 SUMMARY DESCRIPTION OF PROPOSED INTERIM MEASURES FOR THE COKE OVEN AREA

For mutual ease of understanding, and as agreed during the June 3, 2010 teleconference, the following designations are applied in this document to the six IM "Cells" (see attached **Figure 5-1 [revised]**) at the COA:

- "Cell 1": Prototype Air-Sparge/Soil Vapor Extraction (AS/SVE) System in the Former Benzol Processing Area
- "Cell 2": AS/SVE and Dual Phase Groundwater Extraction System in Former Coal Storage Area
- "Cell 3": AS/SVE System in "Cove" Area
- "Cell 4": In-Situ Anaerobic Bio-treatment Area in Coal Tar Area
- "Cell 5": Groundwater Extraction at the Turning Basin Area
- "Cell 6": LNAPL Recovery at the Former Benzol Processing Area

Figure 5-1 (revised) shows the locations and pertinent features of the proposed IM installations.

Cell 1: AS/SVE System in the Former Benzol Processing Area

This cell consists of a prototype IM, which includes AS/SVE coupled with vapor destruction via internal combustion engine (ICE). The design of this system includes air sparging groundwater wells and a perimeter vapor collection trench as further outlined in the January 2010 Work Plan submittal. The design was approved by EPA in its March 2, 2010 letter.

The prototype Cell 1 AS/SVE system is on schedule to be constructed during late June and July 2010 to support system startup in early August 2010. As required by EPA's March 2, 2010 letter, monthly progress reports will be submitted that summarize the system operation. Following submittal of the third monthly progress report (i.e., end of November 2010), EPA and Severstal will mutually evaluate the performance of the Cell 1 AS/SVE system to assess whether changes in the design and/or operation of the system may be required for the AS/SVE components proposed for Cell 2 and/or Cell 3. Cell 1 will continue to operate as initially constructed or as further modified as required by the review of performance data from the evaluation period.

Cell 2: AS/SVE and Dual-Phase Groundwater Extraction System in Former Coal Storage Area

The conceptual AS/SVE components for Cell 2 and Cell 3 were approved by EPA in its March 2, 2010 letter. Based on the November 2010 mutual performance evaluation, Severstal assumes the performance of Cell 1 will enable EPA to approve the AS/SVE design components of Cell 2 and

Cell 3 by the end of December 2010 so Severstal has sufficient time to design and construct Cell 2 and 3 AS/SVE systems by July 2011.

The Cell 2 system will include: 1) groundwater extraction and vapor recovery from selected wells installed into the semi-confined intermediate sand unit below the slag groundwater zone, 2) groundwater treatment, 3) groundwater re-injection, and 4) AS/SVE in both the slag groundwater zone and the semi-confined intermediate sand unit below the slag zone, as shown on **Figure 5-1 (revised)** and **Figure 5-4 (revised)**. Groundwater will be extracted from selected wells in the semi-confined intermediate zone as necessary to capture groundwater along the recovery well alignment (**Figure 5-4 [revised]**).

Severstal's goal is to perform treatability evaluations on groundwater from the semi-confined intermediate sand unit below the slag groundwater zone during September and October 2010. A preliminary treatment design concept will be developed that will include re-injection of treated groundwater. As discussed during the June 3, 2010 teleconference with EPA and MDE, treated groundwater will be re-injected into the slag shallow groundwater zone, upgradient from Cell 2 and proximate to existing wells CO15 and CO02 (**Figure 5-1 [revised]**). The re-injected groundwater is intended to induce groundwater mounding to impede plume migration within the slag shallow groundwater, from the source area near Cell 1 toward the shoreline.

MDE authorization is understood to be required for the groundwater re-injection process. Accordingly, and because of the importance of obtaining timely authorization for groundwater re-injection on the overall IM implementation schedule, Severstal has identified a late-October 2010 milestone requirement to discuss treatability testing results with MDE. Re-injection requirements must be identified at that time in order to prepare appropriate permits and receive MDE approval of the groundwater re-injection process by mid-January 2011. Severstal will then be in a position to complete installation and operation of the Cell 2 system within six months of approval, consistent with the cooperative goal of operation of all cells by July of 2011. The groundwater treatment system design and implementation schedule described herein is based on incorporating treatment units that are commercially available, temporary or mobile, and reasonable in scope as outlined in the March 2 2010 EPA letter.

Cell 3: AS/SVE System in "Cove" Area

This IM will include AS/SVE coupled with vapor destruction via ICE located as shown on **Figure 5-1 (revised)**. The conceptual design of this system was outlined in the January 2010 Work Plan submittal and approved by EPA via its March 2, 2010 letter. The final design of this system may be modified based upon evaluation of results from operation of the Cell 1 Prototype system, as described in Section 3.1 above. Assuming U.S. EPA and the MDE approve and appropriately permit the AS/SVE operating performance for Cell 1 by the end of December 2010, Severstal will then be in a position to complete installation and operation of the AS/SVE in Cell 3 within six months of EPA approval, consistent with the cooperative goal of operation of all cells by July of 2011.

Cell 4: In-Situ Anaerobic Bio-treatment Area in Coal Tar Area

This IM includes anaerobic in-situ bio-treatment at the area shown on **Figure 5-1 (revised)** that has been identified as a potential source area for naphthalene groundwater contamination. The in-situ bio-treatment concept was approved by EPA in its March 2, 2010 letter.

The location and scope of the in-situ anaerobic bio-treatment area is shown in detail on **Figure 5-7 (revised)** and will incorporate existing wells to enhance implementation and evaluation of the concept. Additional wells are planned to be installed as necessary to develop a groundwater recirculation system in which water will be withdrawn from down-gradient wells, amended with nutrients/other additives to enhance microbial activity, and recirculated up-gradient to complete the recirculation system. The nutrient/additive mixture and other system design features (groundwater pumping/recirculation rate, etc.) will be developed based on the initial (i.e., baseline) “Bio-Trap” results.

Severstal’s goal is to evaluate the baseline microbial conditions (using the “Bio-Traps”) and develop a preliminary conceptual design by late October 2010. As discussed for Cell 2 above, review of this conceptual design is also projected as a late-October 2010 milestone requirement to discuss re-injection requirements with MDE.

Severstal proposes to recirculate groundwater within the in-situ anaerobic bio-treatment area (Cell 4) that is amended with only nutrients or other amendments selected to enhance microbial activity. No treatment or permitting requirements to recirculate groundwater in this cell are anticipated for the following reasons:

- Treatment (e.g., non-biological removal of contaminants from the re-circulated water) would bias evaluation of microbiological contaminant utilization within the test cell volume,
- Groundwater re-circulation rates are expected to be both intermittent and low, and
- The Cell 4 bio-treatment area is relatively small by design to provide the level of control necessary to evaluate the efficacy of the in-situ anaerobic microbial contaminant degradation processes.

Assuming agreement is reached on the proposed in-situ biotreatment operating process in Cell 4 by December 2010, Severstal will then be in a position to install the Cell 4 well network and begin recirculation in February 2011. A second bio-trap deployment and overall evaluation of the process would follow with a goal to finalize and implement the process by July of 2011.

Cell 5: Groundwater Extraction in the Turning Basin Area

This IM will include groundwater extraction in the area shown on **Figure 5-1 (revised)** proximate to the Turning Basin shoreline of the COA. The purpose of Cell 5 groundwater extraction is to effect chemical(s) mass removal from the slag groundwater unit and to induce hydraulic influences to impede shallow groundwater migration past the shoreline. As indicated in Severstal’s April 2, 2010 response document to EPA’s March 2, 2010 comment and approval letter and discussed during the June 3, 2010 teleconference, Severstal remains concerned that

pumping groundwater near the Turning Basin shoreline will encourage contaminants to migrate from the higher contaminant concentration area toward the Turning Basin, thereby ultimately making control of contaminant discharge to the Turning Basin more difficult.

Nonetheless, and as required by EPA, groundwater extraction wells will be installed along an approximate alignment perpendicular to the groundwater flow direction between the Coal Tar Area and the eastern COA shoreline, to be screened across the water table and encompassing the full thickness of the slag zone (see attached **Figure 5-1 [revised]**). The exact alignment and number of wells installed will depend on site conditions and the presence of underground utilities to provide an approximate groundwater extraction capture length of 500 feet.

The extracted groundwater will be treated and managed by injecting it into a series of injection wells or a recharge gallery along the shoreline, east of the line of extraction wells (see **Figure 5-1 [revised]**). A groundwater mound resulting from injection of the treated water will develop a hydraulic “dam” that will help impede seepage of groundwater from the site into adjacent surface water.

Severstal’s goal is to perform treatability evaluations on groundwater from Well CO26-PZM007 (**Figure 5-6 [revised]**) and develop a preliminary design concept by late October 2010. Consistent with Cell 2; Severstal proposes a late-October 2010 meeting with MDE to discuss results of the treatability testing and MDE’s re-injection requirements in order to begin preparing the necessary permit application documents. Re-injection requirements must be identified at that time in order to prepare appropriate permits and receive MDE approval of the groundwater re-injection process by mid-January 2011. Severstal will then be in a position to complete installation and operation of the Cell 2 system within six months of approval, consistent with the cooperative goal of operation of all cells by July of 2011. The groundwater treatment system design and implementation schedule described herein is based on incorporating treatment units that are commercially available, temporary or mobile, and reasonable in scope as outlined in the March 2 2010 EPA letter.

Cell 6: LNAPL Extraction at the Former Benzol Processing Area

LNAPL is currently being recovered from an existing 2-inch diameter well (BP-MW-05) using a solar-powered and nitrogen gas-powered, automatic LNAPL recovery system. A total of approximately 500 gallons of LNAPL have been recovered at rates ranging up to 17 gallons per day.

In May 2010, two (2) new 4-inch-diameter recovery wells were installed between existing wells BP-MW-05 and BP-MW-08, as shown on **Figure 5-8 (new)**. Two larger-capacity, solar-powered LNAPL-recovery systems are being constructed and are scheduled for installation, during June 2010.

During the week of May 31, 2010 additional recovery tanks were delivered to Cell 6, for temporary on-site accumulation of up to 3,000 gallons of LNAPL. Severstal is evaluating options for management of the recovered LNAPL, including use as supplemental fuel at the plant.

Severstal plans to have the two larger-capacity LNAPL-recovery systems operational by the end of July 2010 and will continue to evaluate LNAPL recovery performance.

As discussed during the June 3, 2010 teleconference, LNAPL recovery is not necessarily enhanced by groundwater extraction or water table depression, and may actually be impeded in situations such as the present where robust LNAPL recovery rates are confirmed. Severstal proposes that the performance of the additional new LNAPL recovery systems be fully exploited before initiating any groundwater extraction at the LNAPL area. This is consistent with EPA LNAPL guidance, which states that initial efforts should focus on LNAPL recovery, to be followed by possible groundwater extraction and treatment in the later phases of an LNAPL recovery program, if such action is necessary to enhance LNAPL recovery.

Additional delineation of LNAPL occurrence in the COA will also be completed during the planned recovery effort in Cell 6. LNAPL recovery will be implemented as appropriate based on the results of delineation tasks.

3.0 IM PROGRESS TO DATE

This section documents IM progress that has made with the COA IMs since receipt of EPA's March 2, 2010 conditional approval letter of Severstal's January 2010 IM Work Plan. EPA approved the designs for Cell 1 and Cell 4 in the March 2, 2010 letter. In addition, recovery activities were initiated "at risk" in Cell 6 to provide immediate response to the identified subsurface LNAPL in this area.

- Cell 1 Prototype
 - Activities have included on-site reconnaissance and footprint mark-out of the proposed construction area for the AS/SVE prototype system at the Former Benzol Processing Area. Several test pits were excavated along the alignment of the proposed prototype AS/SVE system to evaluate subsurface conditions and identify any potential health and safety issues that may occur during system installation.
 - Detailed design of the former Benzol Processing Area prototype AS/SVE system is complete and construction activities to install the system are underway. System startup and shakedown is anticipated to occur in early August.

- Cell 4
 - Activities have included on-site reconnaissance and design of the proposed recirculation system for the in-situ anaerobic bio-treatment area in the former Coal Tar Storage Area.
 - "Bio-trap"..... activities have been initiated to assess natural attenuation parameters and provide analyses to establish a biological baseline for overall evaluation of bio-treatment performance.

- Cell 6
 - In January 2010, IM LNAPL recovery was initiated from an existing 2-inch diameter well (BP-MW-05) using a solar-powered and nitrogen gas-powered, automatic LNAPL recovery system. To date, approximately 500 gallons of LNAPL have been recovered at rates ranging up to 17 gallons per day.
 - During the week of May 31, 2010 additional recovery tanks were delivered to Cell 6, for temporary on-site accumulation of up to 3,000 gallons of LNAPL.
 - Two (2) new 4-inch-diameter recovery wells were installed in May 2010.
 - Two (2) larger-capacity, solar-powered LNAPL-recovery systems are being constructed and are scheduled for installation during June 2010.



Image source: World Imagery, ESRI, GeoEye, 2009.



Legend
 ◆ Existing Monitoring Well

INTERIM MEASURES TREATMENT CELLS

- "Cell 1": Prototype AS/SVE System in Benzol Area
- "Cell 2": AS/SVE and Dual Phase GW Treatment/Injection System in the Former Coal Storage Area
- "Cell 3": AS/SVE System in the "Cove" Area
- "Cell 4": In-Situ Anaerobic Bio-treatment System in the Coal Tar Area
- "Cell 5": Groundwater Extraction/Treatment/Injection at the Turning Basin Area
- "Cell 6": LNAPL Recovery at the Former Benzol Processing Area



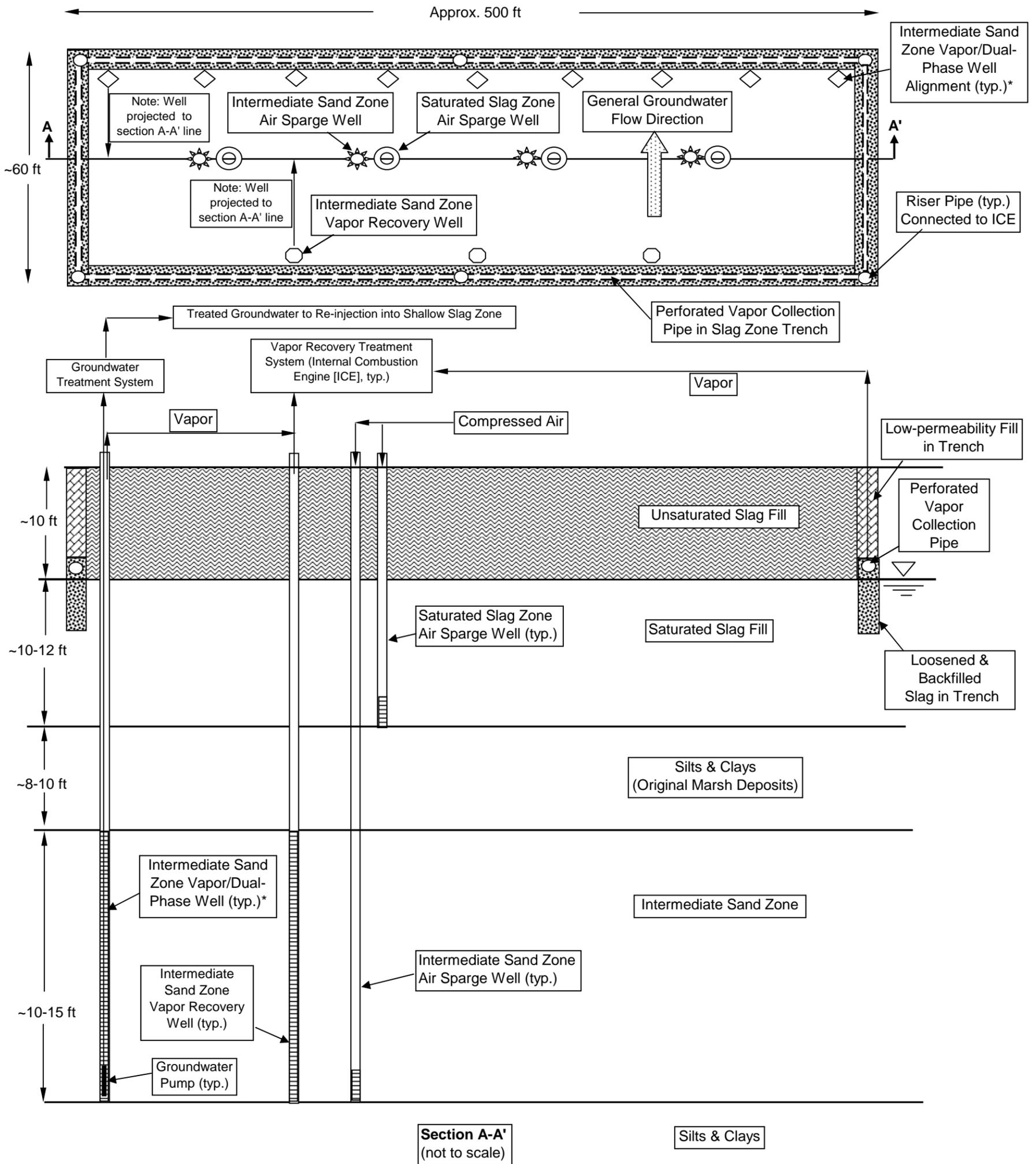
CLIENT	Sparrows Point	LOCATION	Baltimore, MD
DATE	08/11/10	FILE	\\sharepoint\server\pms\pms\pms\pms\CokeOven and C Cell\measures\pms\pms\pms\pms
NOI		SCALE	1:1000
AEP		PROJECT	200 Orchard Ridge Drive
CHARACTER		STATION	Galithersburg, MD 20878
REVISION		BY	BE

Figure 5-1 (revised)
 Interim Measures Treatment Areas



Figure 5-4 (revised)

Schematic Diagram - AS/SVE/Dual-Phase (Groundwater & Vapor) Extraction System
 Cell 2 (Former Coal Storage Area)
 Severstal Sparrows Point, LLC



* Groundwater pumping will be from selected wells as necessary to capture groundwater along the recovery well alignment.

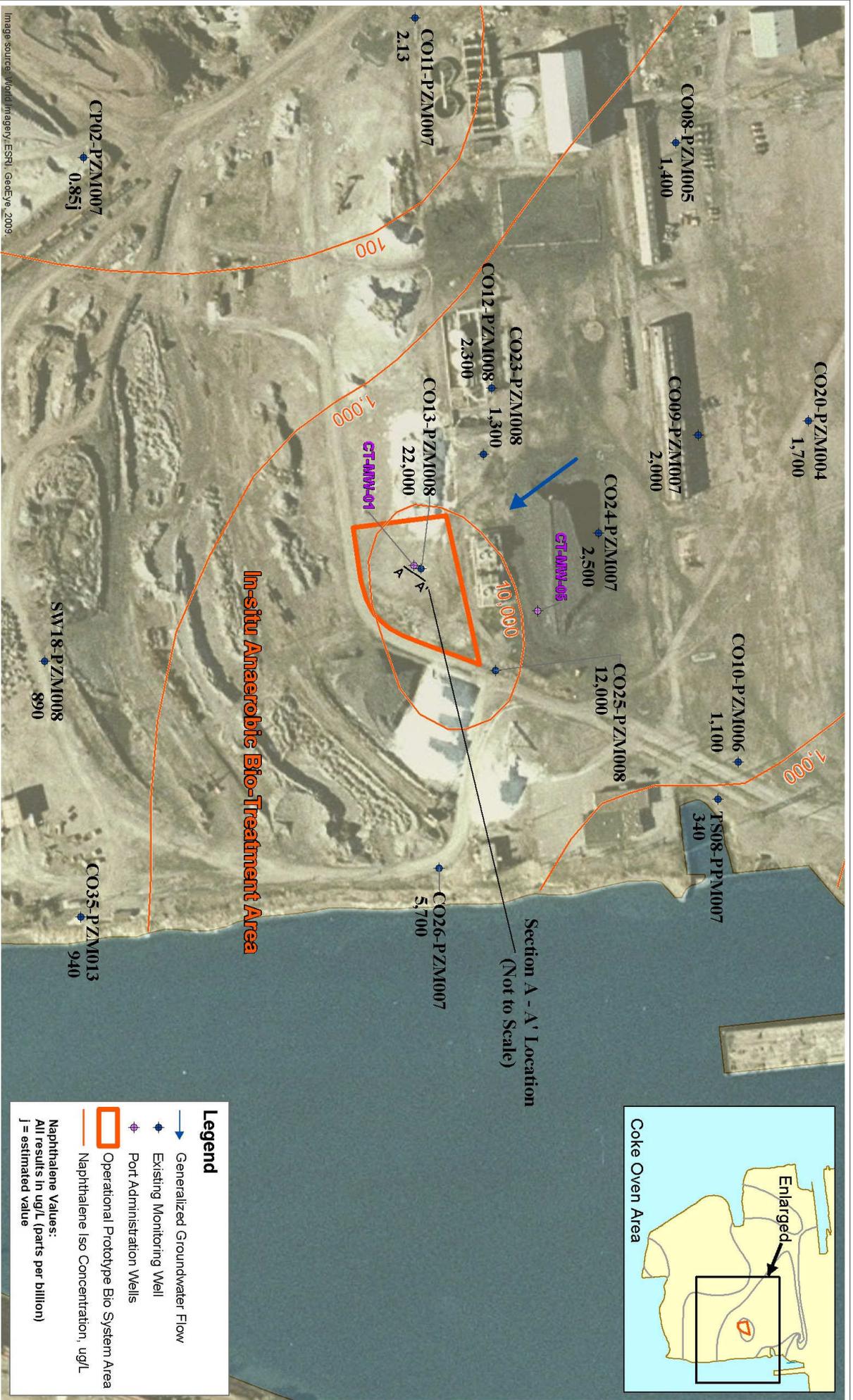
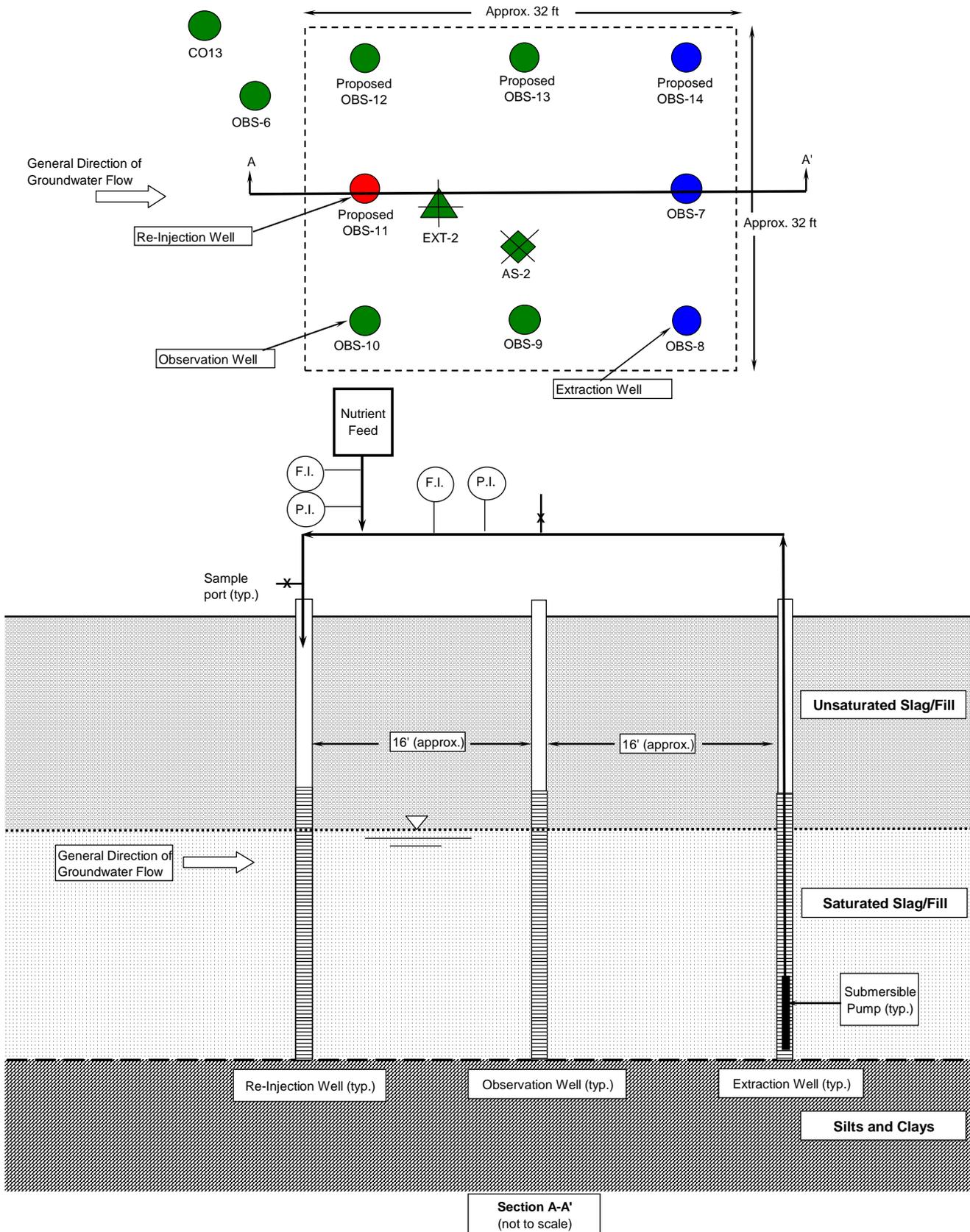


Figure 5-6 (revised)
 Coal Tar Area (Cell 4)
 In-situ Anaerobic Bio-Treatment Area^(a)
 Section A - A'

^(a) Injection and monitoring well locations may be adjusted based on subsurface conditions encountered during drilling.

Revised Figure 5-7
Schematic Diagram of Proposed Enhanced Anaerobic Bio-Treatment Re-Circulation Prototype System
Cell 4 (Former Coal Tar Storage Area)
Severstal Sparrows Point, LLC



F.I. = Flow Indicator
 P.I. = Pressure Indicator



CLIENT Sparrows Point

LOCATION Baltimore, MD

URS
 200 Orchard Ridge Drive
 Gaithersburg, MD 20878

GIS BY	AER	06/11/10
CHK BY	BE	06/11/10
PM	BE	06/11/10



Figure 5-8 (new)
 LNAPL Monitoring and Recovery Wells

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