

**Final Spring, 2006 Phase II RI Sampling Plan for Soil Sampling, Soil Gas Surveys, Clay
Barrier Sampling, Geologic Boring, and Well and Piezometer Installation**

May 25, 2006

CASMALIA SITE REMEDIATION PROJECT

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Project Manager

May 25, 2006

To: Russell Mechem – EPA
Lynda Deschambault – EPA

Subject: **Final** Spring, 2006 Phase II RI Sampling Plan for
Soil Sampling, Soil Gas Surveys, Clay Barrier Sampling,
Geologic Boring, and Well and Piezometer Installation

The Casmalia Steering Committee (CSC) submitted a draft *Spring, 2006 Phase II Sampling Memorandum* summarizing the Phase II RI soil sampling, clay barrier sampling, and piezometer installation work that we had anticipated completing in the Spring of 2006 to EPA on December 21, 2005. In their comments on the IPR Addendum (sent to the CSC on March 6, 2006), EPA requested that we revise the draft Spring 2006 Phase II RI Sampling memorandum to include additional Phase II RI sampling requirements identified in their comments but requested that we wait to re-submit the memorandum until they had provided us comments on the April 14, 2006 IPR Addendum Errata submittal. EPA conditionally approved the IPR in a letter dated May 9, 2006 and provided final comments at that time. The CSC addressed those comments and submitted a revised draft Spring 2006 Phase II RI Sampling Memorandum to EPA on May 19, 2006. EPA provided final comments on the sampling memorandum in an email dated May 23, 2006.

This Final Spring 2006 Phase II RI Sampling Memorandum addresses those EPA comments.

The Final Spring 2006 Phase II RI Sampling Memorandum discusses the Phase II RI sampling that has not otherwise already been completed in the Fall of 2005. The Phase II RI sampling that the CSC has already completed was discussed in three previous memorandums submitted to and approved by EPA which covered the following Phase II RI sampling:

- Soil vapor, surface water, and background soil sampling (addressed in the revised final Fall, 2005 Phase II RI Sampling Memorandum dated November 18, 2005)
- Additional groundwater sampling (addressed in the final Phase II RI Groundwater Sampling Memorandum dated November 18, 2005)
- Geophysical survey work that the CSC performed at the site (addressed in the Final Geophysical Survey Plan dated September 6, 2005).

This memorandum covers the remaining Phase II RI sampling that we expect to complete in 2006 including soil sampling, three additional soil vapor samples, collection of three samples of the P/S Landfill clay barrier for hydraulic conductivity testing, and installation of two wells and eight piezometers at the site (the CSC will also be installing three piezometers in the P/S Landfill

that were identified as Phase I work and discussed in the approved RI/FS Work Plan). This memorandum is formatted to include the same information that we had provided EPA in the two previous Phase II RI sampling memorandums which were in turn intended to be consistent with the June 3, 2004 Final RI/FS Work Plan that was approved by EPA. The memorandum summarizes the sampling program, sampling locations, expected analytical program for all samples, and refers back to the applicable SOPs, SAP, and QAPP of the revised Final RI/FS Work Plan.

Please note that we have not included the details for the additional off site well survey work that EPA had requested and which is currently ongoing. That survey work is being completed per the existing approved Work Plan and we will summarize those results in a revised Appendix N that will be submitted to EPA. In addition, this memorandum does not specifically include the groundwater sampling that we were requested to collect from RIPZ-15 and RIPZ-16 or the temporary piezometers installed near RISBON-59 or west of the Burial Trench Area. The CSC has collected groundwater samples from RIPZ-15 and RIPZ-16 during the Spring, 2006 RGWMEW sampling event and will also collect samples from these piezometers and the temporary piezometers during the Fall, 2006 sampling event.

The schedule for the 2006 Phase II RI sampling work is currently set to begin July 10, 2006. We expect to complete a sample location walk with EPA the week of May 29th to confirm all sample locations.

Soil Samples

The CSC will collect soil or sediment samples at a number of locations as was requested by EPA in either their IPR comments, IPR Addendum comments, or IPR Addendum Errata comments which include locations in RCRA Canyon Area (five additional Type 2 and four additional Type 3 soil samples), West Canyon Spray Area (one additional Type 2 and two additional Type 3 soil samples), Burial Trench Area (three additional Type 6 soil borings), Central Drainage Area (two additional Type 6 soil borings), RCF Pond (two Type 8a sediment samples in the shallow areas to the north and three Type 8a sediment samples in the pond), A-Series Pond (four Type 8a sediment samples in the pond), Pond A5 (one Type 8a sediment sample to the north), Pond 13 (one Type 8a sediment sample), Remaining Onsite Area (two additional Type 2 soil samples, four additional modified Type 3 samples, and three Type 6 soil borings), Former Ponds and Pads Area (six additional Type 3 soil samples, and four additional Type 5 borings), and Offsite Area (two additional Type 2 samples and two additional modified Type 3 samples). As requested by EPA the Type 6 borings located by RISSON-59 will include two borings. The first boring will be used to review lithology and observe possible contamination and the depths of sampling of the second boring will incorporate those observations. The locations for the Type 6 boring by RISSON-59 were modified to reflect EPA's comments on the IPR Addendum. The analytical work for all of the samples listed above also incorporates EPA's March 6, 2006 and May 9, 2006 comments.

The CSC has confirmed the location of the soil samples that we had previously proposed to analyze for TOC/FOC with EPA to ensure they are considered clean areas of the site as

requested by EPA in their comments. We have also revised the sample type to include 3 ft and 5 ft depths (which we have listed as a modified Type 3 soil sample).

The CSC has also added the collection of sediment samples so we may analyze for Acid Volatile Sulfides in the RCF and A-Series Ponds to allow us to assess the metals availability in these pond sediments.

All of the sampling noted above is being included in a revised Table 7.1 that will be sent to EPA as part of our response package to their May 9th conditional approval (scheduled for June 2, 2006). The preliminary locations of all of these samples are shown on a revised Figure 4.1-P2 which is included as part of this memorandum. That figure shows the locations of all Phase II RI sampling that the CSC is performing (i.e. this figure now shows the sample locations of Phase II RI work completed in the Fall of 2005). The CSC and representatives for EPA are scheduled to walk the proposed locations for the sampling not yet completed in the field the week of May 29th prior to Spring 2006 sampling to agree on these final locations.

We have also provided a revised Table 4.4-P2-Spring which summarizes all of the planned Phase II RI sampling not yet completed (with the exception of groundwater sampling that we noted in the above text). Please note that revised Table 4.4-P2-Spring accompanying this memorandum does not yet include the survey coordinates for all of the sample locations as they have not been finalized. The CSC will survey the locations after the final locations are agreed on and will provide all of those coordinates as part of our final reporting of the data.

The soil data listed above will be used to complement existing soil data. The Phase II soil samples will be analyzed for the suite of chemicals listed in revised Table A.2-P2-Spring and revised Table 4.4-P2-Spring attached to this memorandum. All of this analytical work will adhere to the same laboratory requirements for the respective analytical work that was required by the June 3, 2004 revised Final RI/FS Work Plan for this type of soil sampling (these requirements can be found in Appendix B or QAPP of the RI/FS Work Plan). The CSC expects to send the soil samples to the same laboratories that performed the equivalent Phase I RI work. In the event that we must change laboratories, we will notify EPA in advance and provide the agency appropriate lab qualifications, MDL studies, and QA/QC information so EPA may approve the laboratory change. At this time we expect to use Sequoia Laboratory (Morgan Hill) for most of the analysis. The soil samples will be archived and frozen at the labs for future analysis as requested by EPA.

Additional details on soil sampling such as sampling procedures (SOPs), etc can be found in Section A6.5.2 of the SAP (Appendix A) of the June 3, 2005 revised Final RI/FS Work Plan.

Clay Barrier Sample

The CSC will collect three samples along the length of the P/S Landfill clay barrier in order to test the clay barrier's hydraulic conductivity. The proposed clay barrier sample locations are shown on revised Figure 4.1-P2 attached to this memorandum. As was the case with the soil sampling, the CSC will walk the proposed locations with EPA prior to sampling so they may concur with our suggestion.

The clay barrier samples will be collected with the direct push sampling procedures discussed in Section 6.5.3.2 of Appendix A (SAP) of the June 3, 2004 RI/FS Work Plan. Further details of the sampling procedures can be found in SOP 1-1 of the revised Final RI/FS Work Plan. Please note that we will provide the field sampling crew a cross section of the clay barrier prior to beginning their work that will mark the anticipated depth location of the samples. That cross section is being sent to EPA as part of our response package to their May 9th conditional approval (scheduled for June 2, 2006).

The CSC will complete continuous coring starting at 5 feet above the top of the clay barrier and continuing to 5 feet below the top of the barrier. We will take three (3) core samples of the clay barrier at approximately 5 feet below the top of the clay barrier along the length of the barrier using a Shelby tube (approx 3" diameter). Vertical and horizontal subcores will be taken from each of the three samples in the lab and analyzed for permeability using ASTM D5084. The lab tests will be run using hydraulic gradients representative of those in the field.

The CSC has tentatively identified the laboratory we plan to use to do the hydraulic conductivity testing as GeoSyntec's Atlanta soil lab. GeoSyntec previously performed this type of analytical testing for soil cores we collected and analyzed as part of the P/S Landfill Cap construction project at the site in 1998.

Soil Vapor Samples

The CSC will collect soil vapor samples at three locations that were requested by EPA in their March 6, 2006 IPR Addendum comments on the north and east boundary of the site which are approximately 400 to 600 feet outside three previous step out Phase II soil vapor probes. The locations of all three soil vapor sample locations are shown on revised Figure 4.1-P2 attached to this memorandum.

The sampling locations shown on revised Figure 4.1-P2 were selected to incorporate EPA's comments on the IPR Addendum. The CSC and representatives for EPA will walk the proposed locations in the field the week of May 29th prior to completing the survey work to agree on these final locations.

The soil vapor samples will be collected using temporary driven probes that will be advanced to a depth of 7.5 feet (the midpoint of the depth range of 5 to 10 feet). Soil vapor samples will be collected as detailed in SOP 1-9 of the June 3, 2004 revised Final RI/FS Work Plan that uses the guidelines from the advisory on active soil gas investigations prepared by the DTSC and Los Angeles RWQCB (DTSC and LARWQCB, January 2003). The sample will be collected in SUMMA canisters provided by a certified laboratory and will be analyzed for VOCs using USEPA Method TO-15. The Phase II soil vapor work will adhere to the same laboratory requirements for analytical work for this type of sampling as was required by the June 3, 2004 revised Final RI/FS Work Plan (this can be found in Appendix B QAPP of the Work Plan).

The CSC has summarized the proposed soil vapor sampling in revised Table 4.4-P2-Spring attached to this memorandum. The table does not yet include the survey coordinates for all of the soil vapor locations as they were just recently selected. The CSC will survey the locations and

provide all of those coordinates as part of our final reporting of the data. Additional details on soil vapor sampling can also be found in Section A6.5.10 of the SAP (Appendix A) of the June 3, 2005 revised Final RI/FS Work Plan.

Piezometer and Well Installation

The CSC will install a total of eleven piezometers and two chemical quality groundwater monitoring wells as part of completing the Phase I program or for the Phase II RI program. The locations include the P/S Landfill (three Type 10 piezometers which were originally proposed as part of the June 3, 2004 RI/FS Work Plan), Former Ponds and Pads Area (one temporary piezometer located adjacent to the location of RISBON-59), Burial Trench Area (two chemical quality monitoring wells located west and southwest of RIMW-08, and two Type 10 LNAPL piezometers located in the BTA itself), and Central Drainage Area (five Type 10 LNAPL piezometers). As agreed with EPA, the second chemical quality monitoring well planned for west of the Burial Trench Area will be installed sequentially after the chemical quality data from the first well has been reviewed. The first well will be sampled as soon as possible after it is installed and developed (within two weeks if the well development and equilibrium allows) and the analytical results will be provided to EPA as soon as it is available. The CSC will then discuss the location of the second well with EPA and install that well once that location is agreed upon. As is the case with the first well, the second well will be sampled as soon as possible after it is installed and developed (within two weeks if the well development and equilibrium allows) and the analytical results will be provided to EPA as soon as it is available. It is the intent of the CSC to sample both of the new wells a second time during the Fall 2006 RGWMEW sampling event. Please also note that the final location and schedule for the three piezometers in the P/S Landfill remains deferred until we can discuss the results of the Phase II geophysical survey work with EPA.

All of the well and piezometer locations noted above are shown on a revised Figure 4.1-P2 attached to this memorandum. As was the case with the previous piezometers and chemical quality well locations, the CSC and representatives for EPA will walk the proposed locations in the field the week of May 29th prior to Spring 2006 installation to agree on these final locations.

The details for installation of the three piezometers listed above for the P/S Landfill were described in the revised Final RI/FS Work Plan, including RIPZ-13 (located on Bench 1 of the P/S Landfill), RIPZ-27 (located across from the Gallery Well in the P/S Landfill, and RIPZ-14 (located on the top deck of the P/S Landfill). The CSC will install these piezometers using the procedures already documented in the RI/FS Work Plan (i.e. using a CPT push technology). A discussion of these procedures can be found in Section 5.1.5 of the RI/FS Work Plan. In the case of RIPZ-13 and RIPZ-27, the proposed locations for these piezometers may be adjusted following discussions with EPA about the results of Phase II geophysical surveys completed in the fall of 2005.

The CSC will install all of the other new piezometers (including the LNAPL piezometers) using the direct push procedure that is also described in Section 5.1.5 of the RI/FS Work Plan. Additional details of the procedures can be found in Appendix A (SAP). The two new chemical

quality monitoring wells will be installed using the drilling and logging procedures described in the RI/FS Work Plan. Additional details of those procedures can be found in Appendix A (SAP). As requested by EPA in their comments on the IPR, the temporary piezometer installed in the Remaining Onsite Area will be sampled one time during the Fall of 2006 RGWMEW sampling event for a modified Appendix IX suite of chemicals. The piezometer installed west of the Burial Trench Area will also be sampled one time during the Fall of 2006 RGWMEW sampling event for a full Appendix IX suite of chemicals.

The monitoring requirements for the three piezometers located in the P/S Landfill is discussed in the June 3, 2004 RI/FS Work Plan.

Geologic Boring

The CSC will install one geologic boring at what EPA has called the “SE corner” as part of the Spring of 2006 RI work. The location of the geologic boring is shown on a revised Figure 4.1-P2 attached to this memorandum. As was the case with the previous boring locations, the CSC and representatives for EPA will walk the proposed location in the field prior to installation to agree on the final location.

The details for completing the geologic boring is described in the revised Final RI/FS Work Plan (Section 5.1.5 of the RI/FS Work Plan). Additional details of the procedures can be found in Appendix A (SAP) of the Work Plan.

Documentation

The CSC will document the Phase II RI data collected in 2006 using the same procedures and requirements as were required by the June 3, 2004 revised Final RI/FS Work Plan and the previous Fall 2005 Phase II RI Sampling memorandums.

The project documentation requirements of the RI/FS Work Plan are specifically discussed in Section 11.2 of the Work Plan. All data collected during the Phase II RI sampling will be added to the electronic database and copies of that database will be provided to EPA as part of the RI Report.

Field Supervision and Coordination with EPA

The CSC expects that the Phase II RI soil sampling and clay barrier sampling work will be performed by URS (using the same staff as we used to complete the previous soil sampling). The CSC expects to use the same staff from GeoSyntec (Robbie Ettinger) to complete the soil vapor sampling discussed above. The piezometer and well installation work will be done by Mactec under the direction of Dan Craig. At this time we hope to have the same URS supervisor (David Myer) that we had used for the Phase I soil sampling on site acting as field manager for the Phase II RI sampling. As required, the CSC’s Project Coordinator will also provide supervision of URS while they are in the field.

In all cases we will notify EPA's on site representative of our plans to conduct the sampling or to complete piezometer installation at least 48 hours in advance of beginning the work. The CSC will coordinate any field work with EPA using the same guidelines that are discussed in Section 11 of the June RI/FS Work Plan that we had established for the Phase I RI work. That coordination specifically includes the requirements to coordinate with EPA as discussed in Section 11.3 of the Work Plan (and in Section A6.1 of the Sampling Analysis Plan or Appendix A of the Work Plan) and to hold daily status meetings as discussed in Section 11.5 of the Work Plan. In addition, the CSC will continue to use the management of change procedures that we had agreed with EPA prior to beginning the Phase I RI work (please see Section 11.7 of the Work Plan). Any change in sampling procedures or analytical reporting that were documented in an approved RICH form for Phase I RI sampling will also apply to the Phase II RI sampling.

regards,

Corey Bertelsen
Casmalia Project Coordinator

Attachments

Table 4.4-P2-Spring-rev.05.25.06
Table A.2-P2-Spring-rev.05.25.06
Figure 4.1-P2-rev.05.25.06

cc Jim Dragna – BM
Glenn Anderson – Chevron
Dave Roberson - ExxonMobil
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TABLE 4-4-PHASE II 2006 Final
Soil, Sediment, and Clay Barrier Sampling Program Summary

Area	Approximate # Samples				Approx. Boring Depth	VOC	Poor Purging Organics	Pest/PCB	Herb	PCB Congeners	AVS/SEM	TOC/FOC	Mod Appx IX*	Dioxin/Furans(2)	Hydraulic Conductivity	Comments
	# Loc'ns	# per Loc'n	Total	Type												
Capped Landfills Area																
Soil Vapor Sampling	3	1	3	1	7.5											
Sample ID	Nothing	Easting	Type													
RISVCL-3D	TBD	TBD	TYPE1			X										
RISVCL-5D	TBD	TBD	TYPE1			X										
RISVCL-8D	TBD	TBD	TYPE1			X										
Clay Barrier Sampling	3	1	3	6 mod	35											
Sample ID	Nothing	Easting	Type													
RISSCL-7	TBD	TBD	TYPE6													X
RISSCL-8	TBD	TBD	TYPE6													X
RISSCL-9	TBD	TBD	TYPE6													X
RCRA Canyon Area																
Shallow Soil Sampling	5	1	5	2	0.5											
Sample ID	Nothing	Easting	Type													
RISSRC-2b	TBD	TBD	TYPE2						X							X
RISBRC-20b	TBD	TBD	TYPE2						X							X
RISBRC-22b	TBD	TBD	TYPE2						X							X
RISBRC-5b	TBD	TBD	TYPE2						X							X
RISSRC-16b	TBD	TBD	TYPE2						X							X
Soil Sampling	4	2	8	3	5											
Sample ID	Nothing	Easting	Type													
RISSRC-1b	TBD	TBD	TYPE3						X							X
RISSRC-6b	TBD	TBD	TYPE3						X							X
RISBRC-16b	TBD	TBD	TYPE3						X							X
RISSRC-9b	TBD	TBD	TYPE3						X							X
Central Drainage Area																
Soil Sampling	2	5	10	6	35											
Sample ID	Nothing	Easting	Type													
RISBCD-14	TBD	TBD	TYPE6										X			
RISBCD-15	TBD	TBD	TYPE6										X			
Geologic Boring	1				125											
Sample ID	Nothing	Easting	Type													
RISB-02	TBD	TBD	NA													Geologic boring - no laboratory chemical testing
West Canyon Spray Area																
Shallow Soil Sampling	1	1	1	2	0.5											
Sample ID	Nothing	Easting	Type													
RISSEA-5b	TBD	TBD	TYPE2						X							X
Soil Sampling	2	2	4	3	5											
Sample ID	Nothing	Easting	Type													
RISSEA-4b	TBD	TBD	TYPE3						X							X
RISSEA-6b	TBD	TBD	TYPE3						X							X
Remaining Onsite Area																
Soil Sampling - Surface	2	1	2	2	0.5											
Sample ID	Nothing	Easting	Type													
RISSON-41	TBD	TBD	TYPE2				X	X	X	X						X
RISSON-42	TBD	TBD	TYPE2				X	X	X	X						X
Soil Sampling - Shallow	4	2	8	3 mod.	5											
Sample ID	Nothing	Easting	Type													
RISSON-43	TBD	TBD	TYPE3									X				Modified Type 3 location - samples collected at depths of 3 feet and 5 feet.
RISSON-44	TBD	TBD	TYPE3									X				Modified Type 3 location - samples collected at depths of 3 feet and 5 feet.
RISSON-45	TBD	TBD	TYPE3									X				Modified Type 3 location - samples collected at depths of 3 feet and 5 feet.
RISSON-46	TBD	TBD	TYPE3									X				Modified Type 3 location - samples collected at depths of 3 feet and 5 feet.

TABLE 4-4-PHASE II 2006 Final
Soil, Sediment, and Clay Barrier Sampling Program Summary

Area	Approximate # Samples				Approx. Boring Depth	VOC	Poor Purging Organics	Pest/PCB	Herb	PCB Congeners	AVS/SEM	TOC/FOC	Mod Appx IX*	Dioxin/Furans(2)	Hydraulic Conductivity	Comments
	# Loc'ns	# per Loc'n	Total	Type												
Soil Sampling	3	5	15	6	30											
Sample ID	Nothing	Easting	Type													
RISBON-83	TBD	TBD	TYPE6										X			Boring to extend to Upper HSU / Lower HSU contact, which may exceed 30 ft. depth.
RISBON-84	TBD	TBD	TYPE6										X			Boring to extend to Upper HSU / Lower HSU contact, which may exceed 30 ft. depth.
RISBON-85	TBD	TBD	TYPE6										X			Boring to extend to Upper HSU / Lower HSU contact, which may exceed 30 ft. depth.
Burial Trench Area																
Soil Sampling	3	5	15	6	25											
Sample ID	Nothing	Easting	Type													
RISBBC-6	TBD	TBD	TYPE6										X			
RISBBC-7	TBD	TBD	TYPE6										X			
RISBBC-8	TBD	TBD	TYPE6										X			
Former Ponds and Pads Area																
Soil Sampling	6	2	12	3	5											
Sample ID	Nothing	Easting	Type													
RISSON-35	TBD	TBD	TYPE3					X	X							
RISSON-36	TBD	TBD	TYPE3					X	X							
RISSON-37	TBD	TBD	TYPE3					X	X							
RISSON-38	TBD	TBD	TYPE3					X	X							
RISSON-39	TBD	TBD	TYPE3					X	X							
RISSON-40	TBD	TBD	TYPE3					X	X							
Soil Sampling	4	5	20	5	20											
Sample ID	Nothing	Easting	Type													
RISBON-79	TBD	TBD	TYPE5										X			
RISBON-80	TBD	TBD	TYPE5										X			
RISBON-81	TBD	TBD	TYPE5										X			
RISBON-82	TBD	TBD	TYPE5										X			
Stormwater Ponds (RCF, Pond 13, and A-Series Ponds)																
Sediment Sampling	10	1	10	8a	0.5											
Sample ID	Nothing	Easting	Type													
RISESP-14	TBD	TBD	TYPE8a										X			
RISESP-15	TBD	TBD	TYPE8a										X			
RISESP-16	TBD	TBD	TYPE8a										X			
RISESP-17	TBD	TBD	TYPE8a						X	X			X			
RISESP-18	TBD	TBD	TYPE8a						X	X			X			
RISESP-19	TBD	TBD	TYPE8a							X			X			
RISESP-20	TBD	TBD	TYPE8a							X			X			
RISESP-21	TBD	TBD	TYPE8a							X			X			
RISESP-22	TBD	TBD	TYPE8a							X			X			
RISESP-23	TBD	TBD	TYPE8a							X			X			

TABLE 4-4-PHASE II 2006 Final
Soil, Sediment, and Clay Barrier Sampling Program Summary

Area	Approximate # Samples				Approx. Boring Depth	VOC	Poor Purging Organics	Pest/PCB	Herb	PCB Congeners	AVS/SEM	TOC/FOC	Mod Appx IX*	Dioxin/Furans(2)	Hydraulic Conductivity	Comments
	# Loc'ns	# per Loc'n	Total	Type												
Treated Liquid Impoundments (Pond A5)																
Sediment Sampling	1	1	1	8a	0.5											
Sample ID	Nothing	Easting	Type													
RISSETL-7	TBD	TBD	TYPE8a						X							
Offsite Area																
Soil Sampling - Surface	2	1	2	2	0.5											
Sample ID	Nothing	Easting	Type													
RISSEBK-13C	TBD	TBD	TYPE2						X					X		
RISSEBK-20C	TBD	TBD	TYPE2						X					X		
Soil Sampling - Shallow	2	1	2	3 mod.	5											
Sample ID	Nothing	Easting	Type													
RISSOF-04	TBD	TBD	TYPE3								X			X		Modified Type 3 location - sample collected in alluvium at depth of 5 feet only.
RISSOF-05	TBD	TBD	TYPE3								X			X		Modified Type 3 location - sample collected in alluvium at depth of 5 feet only.

Sample Depth / Sample Collection Notes:

Anticipated sampling methods -

Type 1 Samples: Direct Push Rig

Type 2 Samples: Manual Sampling Tools

Type 3, 4, 5, 6 Samples: Direct Push Rig (default) or Hollow Stem Auger Rig (if necessary)

Type 7 Borings: CPT Rig

Type 8a Samples: Manual Sampling Tools

SEM analysis will measure: total metals and SEM (for Cadmium, Copper, Lead, Nickel, Silver, and Zinc) as well as AVS, and redox potential in each sample

All Phase II RI soil samples will be archived for future dioxin/furan analysis

PCB Congeners will include the list provided by EPA in their March 6, 2006 comments on the IPR Addenda

**Table A-2-Phase II 2006 Final
Proposed Sampling and Analytical Program
Phase II Remedial Investigation
Appendix A SAP/FSP Addenda**

Study Area	Station Number	Matrix	Sample Number	Station Description	Sample Depth (ft)	Sample Type	VOC (TO-15)	Poor purging organic compounds (EPA 8015 Direct Inject)	Organochlorine Pesticides/PCBs (EPA 8081A/8082)	PCB Congeners (EPA Method 1668)	Chlorinated Herbicides (EPA 8151a)	Modified Appendix IX* (Appendix IX with additional COPCs less dioxins and furans) (e) Appendix IX	(Mod Appendix IX plus additional COPCs and dioxins and furans) (e)	Dioxins and Furans (EPA 8290)	Acid Volatile Sulfides/SEM (EPA Method 821/R-91-100)	Hydraulic Conductivity (EPA 5084)	TOC/FOC (Walkley/Black-ASTM D2974)	Comments	
																			2 oz jar
						Soil													
						Sediment													
						Air													
						Aqueous		3 x 40 mL VOA HCl	2 x 1L G	2 x 1L G	2 x 1L G	See bottle list in Appendix B, Table B-1	See bottle list in Appendix B, Table B-1	2 x 1L G	2 x 1L G	NA	2x1L G		
Former Ponds and Pads Area																			
Soil Sampling																			
	RISSON-35	soil		shallow soil (T3)	0.5	primary			x		x								
	RISSON-35	soil		shallow soil (T3)	5	primary			x		x								
	RISSON-36	soil		shallow soil (T3)	0.5	primary			x		x								
	RISSON-36	soil		shallow soil (T3)	5	primary			x		x								
	RISSON-37	soil		shallow soil (T3)	0.5	primary			x		x								
	RISSON-37	soil		shallow soil (T3)	5	primary			x		x								
	RISSON-37	soil		shallow soil (T3)	5	duplicate			x		x								
	RISSON-38	soil		shallow soil (T3)	0.5	primary			x		x								
	RISSON-38	soil		shallow soil (T3)	5	primary			x		x								
	RISSON-39	soil		shallow soil (T3)	0.5	primary			x		x								
	RISSON-39	soil		shallow soil (T3)	5	primary			x		x								
	RISSON-40	soil		shallow soil (T3)	0.5	primary			x		x								
	RISSON-40	soil		shallow soil (T3)	5	primary			x		x								
	RISBON-79	soil		soil boring (T5)	0.5	primary							x						
	RISBON-79	soil		soil boring (T5)	5	primary							x						
	RISBON-79	soil		soil boring (T5)	10	primary							x						
	RISBON-79	soil		soil boring (T5)	20	primary							x						
	RISBON-80	soil		soil boring (T5)	0.5	primary							x						
	RISBON-80	soil		soil boring (T5)	5	primary							x						
	RISBON-80	soil		soil boring (T5)	10	primary							x						
	RISBON-80	soil		soil boring (T5)	20	primary							x						
	RISBON-81	soil		soil boring (T5)	0.5	primary							x						
	RISBON-81	soil		soil boring (T5)	5	primary							x						
	RISBON-81	soil		soil boring (T5)	10	primary							x						
	RISBON-81	soil		soil boring (T5)	20	primary							x						
	RISBON-82	soil		soil boring (T5)	0.5	primary							x						
	RISBON-82	soil		soil boring (T5)	5	primary							x						
	RISBON-82	soil		soil boring (T5)	10	primary							x						
	RISBON-82	soil		soil boring (T5)	20	primary							x						
Piezometers																			
	RIPZ-28	NA		Direct Push	NA	NA													Install temporary piezometer adjacent to location RISBON-51
Capped Landfills Area																			
Soil Vapor Sampling																			
	RISVCL-3D	soil vapor		soil vapor (T1)	7.5		x												
	RISVCL-5D	soil vapor		soil vapor (T1)	7.5		x												
	RISVCL-8D	soil vapor		soil vapor (T1)	7.5		x												
Clay Barrier Sampling																			
	RISSCL-07	soil		clay sample	35	primary											x		Sample of Clay Barrier material
	RISSCL-08	soil		clay sample	35	primary											x		Sample of Clay Barrier material
	RISSCL-09	soil		clay sample	35	primary											x		Sample of Clay Barrier material
Piezometers																			
	RIPZ-13	NA		Direct Push	NA	NA													DNAPL monitoring. Location to be adjusted based upon results of Phase II geophysical survey
	RIPZ-14	NA		Direct Push	NA	NA													Water level monitoring in the P/S Landfill
	RIPZ-27	NA		Direct Push	NA	NA													DNAPL monitoring. Location to be adjusted based upon results of Phase II geophysical survey

**Table A-2-Phase II 2006 Final
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Study Area	Station Number	Matrix	Sample Number	Station Description	Sample Depth (ft)	Sample Type	VOC (TO-15)	Poor purging organic compounds (EPA 8015 Direct Inject)	Organochlorine Pesticides/PCBs (EPA 8081A/8082)	PCB Congeners (EPA Method 1668)	Chlorinated Herbicides (EPA 8151a)	Modified Appendix IX* (Appendix IX with additional COPCs less dioxins and furans) (e) Appendix IX	(Mod Appendix IX plus additional COPCs and dioxins and furans) (e)	Dioxins and Furans (EPA 8290)	Acid Volatile Sulfides/SEM (EPA Method 821/R-91-100)	Hydraulic Conductivity (EPA 5084)	TOC/FOC (WalkleyBlack-ASTM D2974)	Comments	
						Soil	2 oz jar	1-16oz jar or ss-sleeve								Shelbt tube	NA		
						Sediment	NA	16 oz G	16 oz G	16 oz G	16 oz G	16 oz G	NA	16 oz G		NA			
						Air	NA	NA	NA	NA	NA	NA	NA	NA		NA			
						Aqueous	3 x 40 mL VOA HCl	2 x 1L G	2 x 1L G	2 x 1L G	See bottle list in Appendix B, Table B-1	See bottle list in Appendix B, Table B-1	2 x 1L G	2 x 1L G		NA	2x1L G		
Central Drainage Area																			
Soil Sampling																			
	RISBCD-14	soil		soil boring (T6)	0.5	primary							x						
	RISBCD-14	soil		soil boring (T6)	5	primary							x						
	RISBCD-14	soil		soil boring (T6)	10	primary							x						
	RISBCD-14	soil		soil boring (T6)	GW	primary							x						
	RISBCD-14	soil		soil boring (T6)	contact	primary							x						
	RISBCD-15	soil		soil boring (T6)	0.5	primary							x						
	RISBCD-15	soil		soil boring (T6)	5	primary							x						
	RISBCD-15	soil		soil boring (T6)	10	primary							x						
	RISBCD-15	soil		soil boring (T6)	GW	primary							x						
	RISBCD-15	soil		soil boring (T6)	contact	primary							x						
Piezometers																			
	RIPZ-31	NA		Direct Push	NA	NA													LNAPL Monitoring
	RIPZ-32	NA		Direct Push	NA	NA													LNAPL Monitoring
	RIPZ-33	NA		Direct Push	NA	NA													LNAPL Monitoring
	RIPZ-34	NA		Direct Push	NA	NA													LNAPL Monitoring
	RIPZ-35	NA		Direct Push	NA	NA													LNAPL Monitoring
Geologic Boring																			
	RISB-02	soil		geologic boring	200 to 250	primary													Complete lithology and televiwer work as described in RI/FSP Work Plan. Conductor casing will be used from ground surface to claystone contact.
Burial Trench Area																			
Soil Sampling																			
	RISBBC-06	soil		soil boring (T6)	0.5	primary							x						
	RISBBC-06	soil		soil boring (T6)	5	primary							x						
	RISBBC-06	soil		soil boring (T6)	10	primary							x						
	RISBBC-06	soil		soil boring (T6)	GW	primary							x						
	RISBBC-06	soil		soil boring (T6)	contact	primary							x						
	RISBBC-07	soil		soil boring (T6)	0.5	primary							x						
	RISBBC-07	soil		soil boring (T6)	5	primary							x						
	RISBBC-07	soil		soil boring (T6)	10	primary							x						
	RISBBC-07	soil		soil boring (T6)	GW	primary							x						
	RISBBC-07	soil		soil boring (T6)	contact	primary							x						
	RISBBC-08	soil		soil boring (T6)	0.5	primary							x						
	RISBBC-08	soil		soil boring (T6)	5	primary							x						
	RISBBC-08	soil		soil boring (T6)	10	primary							x						
	RISBBC-08	soil		soil boring (T6)	GW	primary							x						
	RISBBC-08	soil		soil boring (T6)	contact	primary							x						
Piezometers and Wells																			
	RIPZ-15	NA		Existing piezomete	NA	NA							x						Sample existing piezometer on (2) events - Spring 2006 and Fall 2006. Add Perchlorate to analytical program
	RIPZ-16	NA		Existing piezomete	NA	NA							x						Sample existing piezometer for on (2) events - Spring 2006 and Fall 2006. Add Perchlorate to analytical program
	RIPZ-29	NA		Direct Push	NA	NA													LNAPL Monitoring
	RIPZ-30	NA		Direct Push	NA	NA													LNAPL Monitoring
	RIMW-10	NA		Drilled	NA	NA							x						
	RIMW-11	NA		Drilled	NA	NA							x						

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Study Area	Station Number	Matrix	Sample Number	Station Description	Sample Depth (ft)	Sample Type	VOC (TO-15)	Poor purging organic compounds (EPA 8015 Direct Inject)	Organochlorine Pesticides/PCBs (EPA 8081A/8082)	PCB Congeners (EPA Method 1668)	Chlorinated Herbicides (EPA 8151a)	Modified Appendix IX* (Appendix IX with additional COPCs less dioxins and furans) (e)	Appendix IX (Mod Appendix IX plus additional COPCs and dioxins and furans) (e)	Dioxins and Furans (EPA 8290)	Acid Volatile Sulfides/SEM (EPA Method 821/R-91-100)	Hydraulic Conductivity (EPA 5084)	TOC/FOC (Walkley/Black-ASTM D2974)	Comments	
																			2 oz jar
						Soil		NA	16 oz G	16 oz G	16 oz G	16 oz G	16 oz G	NA	16 oz G		NA		
						Sediment		NA	NA	NA	NA	NA	NA	NA	NA		NA		
						Air		NA	NA	NA	NA	NA	NA	NA	NA		NA		
						Aqueous		3 x 40 mL VOA HCl	2 x 1L G	2 x 1L G	2 x 1L G	See bottle list in Appendix B, Table B-1	See bottle list in Appendix B, Table B-1	2 x 1L G	2 x 1L G	NA	2x1L G		
Remaining Onsite Area	Soil Sampling																		
	RISSON-41	soil		shallow soil (T2)	0.5	primary		x	x	x	x				x				
	RISSON-42	soil		shallow soil (T2)	0.5	primary		x	x	x	x				x				
	RISSON-43	soil		shallow soil (T3 mc)	3	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-43	soil		shallow soil (T3 mc)	3	duplicate											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-43	soil		shallow soil (T3 mc)	5	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-44	soil		shallow soil (T3 mc)	3	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-44	soil		shallow soil (T3 mc)	5	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-45	soil		shallow soil (T3 mc)	3	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-45	soil		shallow soil (T3 mc)	5	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-46	soil		shallow soil (T3 mc)	3	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISSON-46	soil		shallow soil (T3 mc)	5	primary											x	Modified Type 3 location - Samples collected at depths of 3 and 5 feet	
	RISBON-83	soil		soil boring (T6)	0.5	primary							x						adjusted based on field observations in initial boring.
	RISBON-83	soil		soil boring (T6)	5	primary							x						adjusted based on field observations in initial boring.
	RISBON-83	soil		soil boring (T6)	10	primary							x						adjusted based on field observations in initial boring.
	RISBON-83	soil		soil boring (T6)	30 (GW)	primary							x						adjusted based on field observations in initial boring.
	RISBON-83	soil		soil boring (T6)	30 (GW)	duplicate							x						adjusted based on field observations in initial boring.
	RISBON-83	soil		soil boring (T6)	contact	primary							x						adjusted based on field observations in initial boring.
	RISBON-84	soil		soil boring (T6)	0.5	primary							x						adjusted based on field observations in initial boring.
	RISBON-84	soil		soil boring (T6)	5	primary							x						adjusted based on field observations in initial boring.
	RISBON-84	soil		soil boring (T6)	10	primary							x						adjusted based on field observations in initial boring.
	RISBON-84	soil		soil boring (T6)	30 (GW)	primary							x						adjusted based on field observations in initial boring.
	RISBON-84	soil		soil boring (T6)	contact	primary							x						adjusted based on field observations in initial boring.
	RISBON-85	soil		soil boring (T6)	0.5	primary							x						adjusted based on field observations in initial boring.
	RISBON-85	soil		soil boring (T6)	10	primary							x						adjusted based on field observations in initial boring.
	RISBON-85	soil		soil boring (T6)	20	primary							x						adjusted based on field observations in initial boring.

**Table A-2-Phase II 2006 Final
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Study Area	Station Number	Matrix	Sample Number	Station Description	Sample Depth (ft)	Sample Type	VOC (TO-15)	Poor purging organic compounds (EPA 8015 Direct Inject)	Organochlorine Pesticides/PCBs (EPA 8081A/8082)	PCB Congeners (EPA Method 1668)	Chlorinated Herbicides (EPA 8151a)	Modified Appendix IX* (Appendix IX with additional COPCs less dioxins and furans) (e)	Appendix IX (Mod Appendix IX plus additional COPCs and dioxins and furans) (e)	Dioxins and Furans (EPA 8290)	Acid Volatile Sulfides/SEM (EPA Method 821/R-91-100)	Hydraulic Conductivity (EPA 5084)	TOC/FOC (WalkleyBlack-ASTM D2874)	Comments
						Soil	NA	16 oz G	16 oz G	16 oz G	16 oz G	16 oz G	NA	16 oz G	NA	NA	NA	
						Sediment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
						Air	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
						Aqueous	3 x 40 mL VOA HCl	2 x 1L G	2 x 1L G	2 x 1L G	See bottle list in Appendix B, Table B-1	See bottle list in Appendix B, Table B-1	2 x 1L G	2 x 1L G	NA	2x1L G		
	RISBON-85	soil		soil boring (T6)	30 (GW)	primary						x						adjusted based on field observations in initial boring.
	RISBON-85	soil		soil boring (T6)	contact	primary						x						adjusted based on field observations in initial boring.
	Piezometers																	
	RIPZ-37	NA		Direct Push	NA	NA												Install temporary piezometer adjacent to location RISBON-59

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Study Area	Station Number	Matrix	Sample Number	Station Description	Sample Depth (ft)	Sample Type	VOC (TO-15)	Poor purging organic compounds (EPA 8015 Direct Inject)	Organochlorine Pesticides/PCBs (EPA 8081A/8082)	PCB Congeners (EPA Method 1668)	Chlorinated Herbicides (EPA 8151a)	Modified Appendix IX* (Appendix IX with additional COPCs less dioxins and furans) (e) Appendix IX	(Mod Appendix IX plus additional COPCs and dioxins and furans) (e)	Dioxins and Furans (EPA 8290)	Acid Volatile Sulfides/SEM (EPA Method 821/R-91-100)	Hydraulic Conductivity (EPA 5084)	TOC/FOC (WalkleyBlack-ASTM D2974)	Comments
						Soil		NA	16 oz G	16 oz G	16 oz G	16 oz G	16 oz G	NA	16 oz G		NA	
						Sediment		NA	NA	NA	NA	NA	NA	NA	NA		NA	
						Air		NA	NA	NA	NA	NA	NA	NA	NA		NA	
							Aqueous	3 x 40 mL VOA HCl	2 x 1L G	2 x 1L G	2 x 1L G	See bottle list in Appendix B, Table B-1	See bottle list in Appendix B, Table B-1	2 x 1L G	2 x 1L G	NA	2x1L G	
RCRA Canyon	Soil Sampling																	
	RISSRC-1b	soil		shallow soil (T3)	0.5	primary				x					x			
	RISSRC-1b	soil		shallow soil (T3)	5	primary				x					x			
	RISSRC-2b	soil		shallow soil (T2)	0.5	primary				x					x			
	RISBRC-20b	soil		shallow soil (T2)	0.5	primary				x					x			
	RISBRC-20b	soil		shallow soil (T2)	0.5	duplicate				x					x			
	RISBRC-22b	soil		shallow soil (T2)	0.5	primary				x					x			
	RISSRC-6b	soil		shallow soil (T3)	0.5	primary				x					x			
	RISSRC-6b	soil		shallow soil (T3)	5	primary				x					x			
	RISBRC-5b	soil		shallow soil (T2)	0.5	primary				x					x			
	RISBRC-16b	soil		shallow soil (T3)	0.5	primary				x					x			
	RISBRC-16b	soil		shallow soil (T3)	5	primary				x					x			
	RISSRC-9b	soil		shallow soil (T3)	0.5	primary				x					x			
	RISSRC-9b	soil		shallow soil (T3)	5	primary				x					x			
	RISSRC-16b	soil		shallow soil (T2)	0.5	primary				x					x			
West Canyon Spray Area	Soil Sampling																	
	RISSSA-4b	soil		shallow soil (T3)	0.5	primary				x					x			
	RISSSA-4b	soil		shallow soil (T3)	5	primary				x					x			
	RISSSA-5b	soil		shallow soil (T2)	0.5	primary				x					x			
	RISSSA-6b	soil		shallow soil (T3)	0.5	primary				x					x			
	RISSSA-6b	soil		shallow soil (T3)	0.5	duplicate				x					x			
	RISSSA-6b	soil		shallow soil (T3)	5	primary				x					x			
Stormwater Ponds	Sediment Sampling																	
	RISESP-14	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-15	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-16	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-17	sediment		sediment (T8a)	0.5	primary				x					x			
	RISESP-18	sediment		sediment (T8a)	0.5	primary				x					x			
	RISESP-19	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-20	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-21	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-22	sediment		sediment (T8a)	0.5	primary									x			
	RISESP-22	sediment		sediment (T8a)	0.5	duplicate									x			
	RISESP-23	sediment		sediment (T8a)	0.5	primary									x			
Treated Liquids Impoundments	Sediment Sampling																	
	RISETL-7	sediment		sediment (T8a)	0.5	primary				x								
Offsite Area	Soil Sampling																	
	RISSBK-13	soil		shallow soil (T2)	0.5	primary				x					x			
	RISSBK-20	soil		shallow soil (T2)	0.5	primary				x					x			
	RISSOF-04	soil		shallow soil (T3 md	5	primary											x	Modified Type 3 location - sample collected in alluvium at depth of 5 feet only.
	RISSOF-05	soil		shallow soil (T3 md	5	primary											x	Modified Type 3 location - sample collected in alluvium at depth of 5 feet only.

G Glass.
oz Ounce.
L Liter.
Pl Plastic.
mL Milliliter.
HCL Hydrochloric acid.

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						Soil		2 oz jar	1-16oz jar or ss-sleeve							Shelbt tube	NA	
						Sediment		NA	16 oz G	16 oz G	16 oz G	16 oz G	16 oz G	NA	16 oz G	NA	NA	
						Air		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
						Aqueous		3 x 40 mL VOA HCl	2 x 1L G	2 x 1L G	2 x 1L G	See bottle list in Appendix B, Table B-1	See bottle list in Appendix B, Table B-1	2 x 1L G	2 x 1L G	NA	2x1L G	

TOC Total organic carbon
 FOC Free organic carbon
 AVS Acid volatile sulfides
 SEM Selective extraction method

