

Tables

Table 6-1
Performance Monitoring Airflow and Vacuum Measurement Schedule

| Measurement Location | | Pilot System Operation | | | | | | | | | Optional 6-Month System Operation |
|--|---------------|------------------------|-------|-------|-------|-------|--------|---------|---------|---------|--------------------------------------|
| | | Week 1 | | | | | Week 2 | Month 1 | Month 2 | Month 3 | Monthly |
| | | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | | | | | |
| Extraction Wells (Airflow and Vacuum) | MW-BW-62-A | X | X | X | X | X | X | X | X | X | X |
| | MW-BW-63-A | X | X | X | X | X | X | X | X | X | X |
| | MW-BW-68-A | X | X | X | X | X | X | X | X | X | X |
| | MW-BW-69-A | X | X | X | X | X | X | X | X | X | X |
| | MW-BW-70-A | X | X | X | X | X | X | X | X | X | X |
| Monitoring Probes (Vacuum) | Interior | | | | | | | | | | |
| | CTP-SGP-61 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-62 | X | X | X | X | X | X | X | X | X | X |
| | Perimeter | | | | | | | | | | |
| | CTP-SGP-51 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-52 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-53 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-54 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-55 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-56 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-57 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-58 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-59 | X | X | X | X | X | X | X | X | X | X |
| | CTP-SGP-60 | X | X | X | X | X | X | X | X | X | X |
| | Shallow | | | | | | | | | | |
| | CTP-SGP-35 | X | X | X | X | X | X | X | X | X | X |
| CTP-SGP-37 | X | X | X | X | X | X | X | X | X | X | |
| CTP-SGP-48 | X | X | X | X | X | X | X | X | X | X | |
| Treatment System | Total Airflow | X | X | X | X | X | X | X | X | X | X |

Note: Flow rate and vacuum will be monitored at least twice on Day 1, and may be monitored more than once on days 2 through 5 depending on observed trends

Table 6-2
Performance Monitoring Volatile Organic Compound Sampling Schedule

| Sampling Location | Phase 1 Operation | | | | | | | | | | Optional 6 Month System Operation | | | |
|-----------------------|-----------------------|--------|---|---|---|---|--------|---------|---------|---------|-----------------------------------|---------|------------|---------|
| | Baseline | Week 1 | | | | | Week 2 | Month 1 | Month 2 | Month 3 | Months 4-5 | Month 6 | Months 7-8 | Month 9 |
| Extraction Wells | MW-BW-62-A | 1 | | | | | 1 | 1 | 1 | 1 | | | | 1 |
| | MW-BW-63-A | 1 | | | | | 1 | 1 | 1 | 1 | | | | 1 |
| | MW-BW-68-A | 1 | | | | | 1 | 1 | 1 | 1 | | | | 1 |
| | MW-BW-69-A | 1 | | | | | 1 | 1 | 1 | 1 | | | | 1 |
| | MW-BW-70-A | 1 | | | | | 1 | 1 | 1 | 1 | | | | 1 |
| Monitoring Probes | Interior | | | | | | | | | | | | | |
| | CTP-SGP-61 | 3 | | | | | 3 | 3 | | 3 | | | 3 | 3 |
| | CTP-SGP-62 | 3 | | | | | 3 | 3 | | 3 | | | 3 | 3 |
| | Perimeter | | | | | | | | | | | | | |
| | CTP-SGP-51 | 3 | | | | | | | | 3 | | | | 3 |
| | CTP-SGP-52 | 3 | | | | | | 3 | | 3 | | 3 | | 3 |
| | CTP-SGP-53 | 3 | | | | | | | | 3 | | | | 3 |
| | CTP-SGP-54 | 3 | | | | | | | | 3 | | | | 3 |
| | CTP-SGP-55 | 3 | | | | | | 3 | | 3 | | 3 | | 3 |
| | CTP-SGP-56 | 3 | | | | | | | | 3 | | | | 3 |
| | CTP-SGP-57 | 3 | | | | | | | | 3 | | | | 3 |
| | CTP-SGP-58 | 3 | | | | | | 3 | | 3 | | 3 | | 3 |
| | CTP-SGP-59 | 3 | | | | | | | | 3 | | | | 3 |
| | CTP-SGP-60 | 3 | | | | | | 3 | | 3 | | 3 | | 3 |
| | Shallow | | | | | | | | | | | | | |
| | CTP-SGP-35 | 1 | | | | | | | | 1 | | | | 1 |
| | CTP-SGP-37 | 1 | | | | | | 1 | 1 | | 1 | | 1 | 1 |
| | CTP-SGP-48 | 1 | | | | | | 1 | 1 | | 1 | | 1 | 1 |
| | 6277 Lexington Court | | | | | | | | | | | | | |
| | CTP-SGP-49 (Sub-Slab) | | | | | | | 1 | 1 | | 1 | | 1 | 1 |
| CTP-SGP-50 (Exterior) | | | | | | | 1 | 1 | | 1 | | 1 | 1 | |
| Sub-total | 44 | 0 | 0 | 0 | 0 | 0 | 15 | 27 | 5 | 46 | 0 | 27 | 0 | 46 |

| Sampling Location | Phase 1 Operation | | | | | | | | | | Optional 6 Month System Operation | | | |
|-----------------------------|--------------------|-----------------|-------|-----------------|-------|-------|--------|---------|---------|---------|-----------------------------------|---------|------------|---------|
| | Baseline | Day 1 (24-hour) | Day 2 | Day 3 (24-hour) | Day 4 | Day 5 | Week 2 | Month 1 | Month 2 | Month 3 | Months 4-5 | Month 6 | Months 7-8 | Month 9 |
| Soil Vapor Treatment System | Influent | na | 1 | 1 | 1 | 1 | na | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| | Lead Carbon Vessel | na | 1 | | | | na | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| | Effluent | na | 1 | 1 | 1 | 1 | na | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| | Sub-total | 0 | 3 | 2 | 2 | 2 | 2 | 0 | 3 | 3 | 3 | 6 | 3 | 6 |
| Total Samples | 44 | 3 | 2 | 2 | 2 | 2 | 15 | 30 | 8 | 49 | 6 | 30 | 6 | 49 |

| | |
|-----------------------------------|-----|
| 3 MONTH OPERATION | |
| TOTAL GAS SAMPLES = | 157 |
| FIELD DUPLICATES = | 9 |
| CUMULATIVE TOTAL = | 166 |
| OPTIONAL 6 MONTH OPERATION | |
| TOTAL GAS SAMPLES = | 91 |
| FIELD DUPLICATES = | 5 |
| CUMULATIVE TOTAL = | 96 |

Table 7-1
Practical Quantitation Limits for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a

| Parameter | Method | Analyte ^b | Reporting Limit (ppbv ^c) | PEL ^d (ppbv) | 1/420 th PEL ^e (ppbv) |
|----------------------------------|--------|----------------------|---|----------------------------|--|
| Volatile Organic Compounds | TO-15 | Carbon Tetrachloride | 0.5 | 2,000 | 4.76 |
| | | Chloroform | 0.5 | 2,000 | 4.76 |
| | | Trichloroethene | 0.5 | 25,000 | 59.52 |
| | | Tetrachloroethene | 0.5 | 25,000 | 59.52 |

Notes:

^a U.S. Environmental Protection Agency, 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, 2nd Edition, EPA/624/R-96/0106

^b Control will be maintained on all analytes

^c Parts per billion by volume

^d Permissible Exposure Limit. The maximum permitted 8-hour time-weighted-average (TWA) concentration of an airborne contaminant, California Code of Regulations (CCR) Title 8, Section 5155, Table AC-1, Permissible Exposure Limits for Chemical Contaminants.

^e Monterey Bay Unified Air Pollution Control District Rule 1000, Permit Guidelines and Requirements For Sources Emitting Toxic Air Contaminants

Table 7-2
Bromofluorobenzene Key Abundance Criteria for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a

| Mass | Ion Abundance Criteria |
|------|---|
| 50 | 15 to 40 percent of mass 95 |
| 75 | 30 to 60 percent of mass 95 |
| 95 | Base peak, 100 percent relative abundance |
| 96 | 5 to 9 percent of mass 95 |
| 173 | <2 percent of mass 174 |
| 174 | >50 percent of mass 95 |
| 175 | 5 to 9 percent of mass 174 |
| 176 | >95 percent but <101% of mass 174 |
| 177 | 5 to 9 percent of mass 176 |

Notes:

^a U.S. Environmental Protection Agency, 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, 2nd Edition, EPA/624/R-96/0106

Table 7-3
Laboratory Control Limits for Surrogate Spikes for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a

| Analytical Method | Spiking Compounds | Percent Recovery (%) |
|-------------------|-----------------------------------|----------------------|
| TO-15 | 1,2-dichloroethane-d ₄ | 70-130 |
| | Toluene-d ₈ | 70-130 |
| | 4-Bromofluorobenzene | 70-130 |

Notes:

^aU.S. Environmental Protection Agency, 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, 2nd Edition, EPA/624/R-96/0106

Table 7-4
Laboratory Control Limits for Internal Standards for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a

| Analytical Method | Internal Standard | Percent Recovery (%) ^b |
|-------------------|------------------------------|-----------------------------------|
| TO-15 | Bromochloromethane | 50-200 |
| | 1,4-Difluorobenzene | 50-200 |
| | Chlorobenzene-d ₅ | 50-200 |

Notes:

^a U.S. Environmental Protection Agency, 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, 2nd Edition, EPA/624/R-96/0106

^b Internal standard area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated 12hr calibration standard (per EPA Functional Guidelines), however, if the recovery is high, and samples are non-detectable then no corrective action is required.

Table 7-5
Control Limits for Laboratory Control Samples for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a

| Analytical Method | Spiking Compounds ^b | Percent Recovery (%) |
|-------------------|--------------------------------|----------------------|
| TO-15 | Carbon Tetrachloride | 70-130 |
| | Chloroform | 70-130 |
| | Trichloroethene | 70-130 |
| | Tetrachloroethene | 70-130 |

Notes:

^a U.S. Environmental Protection Agency, 1999, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd Edition, EPA/624/R-96/0106

Table 7-6
Summary of Calibration Procedures for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a

| Method | Parameter | Calibration | Frequency | Acceptance Criteria | Corrective Action |
|--------|-------------------|-------------------------|--|-------------------------|--|
| TO-15 | Volatile Organics | Check instrument tuning | Every 12 hours criteria using BFB ^b | Refer to Table 7-2 | 1) Retune instrument 2) Repeat BFB analysis |
| | | Multipoint Calibration | Initially and as required (minimum 5 points) (ICAL) ^c | %RSD ^d ≤ 30% | 1) Evaluate system 2) Recalibrate |
| | | Continuing calibration | Every 12 hours check standard (CCV) ^e | %Difference ≤ 30% | 1) Evaluate system 2) Repeat calibration check 3) Recalibrate 4) Reanalyze affected samples |

Notes:

^a U.S. Environmental Protection Agency, 1999, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd Edition, EPA/624/R-96/0106

^b Bromofluorobenzene

^c Initial calibration

^d Relative Standard Deviation

^e Continuing calibration verification

**Table 7-7
Summary of Internal Quality Control Procedures for Volatile Organics
by U.S. Environmental Protection Agency Method TO-15^a**

| Method | Parameter | QC Element | Frequency | Acceptance Criteria | Corrective Action |
|--------|-------------------|-----------------------------|--|--|---|
| TO-15 | Volatile Organics | Method blank | 1/batch; batch is not to exceed 20 samples | < PQL ^b | 1) Check calculations 2) Inspect system 3) Reanalyze blank |
| | | Laboratory duplicate | 5 percent of the project samples | RPD ^c < 25% for detections >5 times the detection limit | 1) Reanalyze sample 2) Inspect system for anomalies 3) Flag data |
| | | Field duplicate | 5 percent of the project samples | RPD ^c < 50% for detections | 1) Evaluate sampling procedure to determine potential cause 2) No flagging, outlier noted. |
| | | Surrogate spike | Every sample and the method blank | Refer to Table 7-3 | 1) Check calculations 2) Evaluate batch for adverse trends 3) If no interference is evident, digest/reanalyze 4) Narrate any outliers 5) Reanalyze affected samples |
| | | Internal standard (IS) | Every continuing calibration standard and sample | Retention time must be within 30 seconds of the CCV ^d ; IS area in the sample must be within factor of 2 of the IS in the CCV (Table 6) | 1) Check sensitivity of instrument 2) Evaluate data 3) Reanalyze sample or standard once 4) Narrate any outliers |
| | | Laboratory Control Standard | 1/batch; not to exceed 20 samples | Refer to Table 7-4 | 1) Check calculations 2) Reanalyze LCS; if passes, report 3) Reanalyze samples as needed 4) Narrate any outliers |

Notes:

^a U.S. Environmental Protection Agency, 1997, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, 2nd Edition, EPA/624/R-96/0106

^b Practical Quantitation Limit

^c Relative Percent Difference

^d Continuing Calibration Verification standard

**Table 9-1
Summary of Project Team QC Responsibilities**

| | TASK MANAGER | CONTRACTOR QUALITY CONTROL SYSTEMS MANAGER (CQCSM) | FIELD TECHNICIAN | SITE SAFETY AND HEALTH OFFICER (SSHO) | USACE REP |
|--------------------------------|---|--|--|---|--|
| Preparatory Meeting | Coordinate prep meeting with CQCSM. Discuss task requirements and personnel responsibility. | Schedule and prepare package for the Prep Meeting. Invite USACE Rep a minimum of two days before the Prep Meeting. Discuss the overall QC process, including CQCSMs function as an extension of the Task Manager. | Must ensure that he/she understands the scope of work, assess task readiness, and prevent surprises. | Discuss Site-Specific Health and Safety Plan (SSHP) requirements and Activity Hazard Analyses (AHA). | He/She wants to understand scope of work, judge potential base impacts, and tell you how they would like to be involved on the task. |
| Preparatory Inspections | Prepare definable features of work. Coordinate with CQCSM. Ensure that plans are approved; materials and equipment are on-site, inspected and acceptable. Note: Prep Inspection status should be discussed at the Prep Meeting. | Ensure that plans, drawings, etc. are complete and approved with comments incorporated. Inspect submittals, materials, equipment, supplies, work areas, etc. prior to starting the task. Document inspection. | Understand the work plan. Communicate and resolve issues such as proposed exceptions or deviations with the Task Manager. Coordinate work schedule with Task Manager. | Inspect work area and other site health and safety requirements. Verify that workers have read and acknowledged the SSHP and AHA. Verify that workers have provided documentation or requisite training and physical exams. | Ensures approvals of submittals, materials, supplies, equipment, testing subs, etc. based on contract requirements. The CQCSM should coordinate and track status of all Government approvals. |
| Initial Inspection | Initial Phase often resembles on-the-job training. Never assume your task assumptions will be 100% valid. Expect to make procedure refinements based on the situation. Establish quality standards. | The CQCSM will coordinate independent USACE oversight activities. Notify USACE Rep a minimum of two days before the initial inspection. Observe Task Manager/USACE concerns during work performance, and formulate follow-up inspection strategy. Know the standard of quality expected. <u>Note:</u> Task Managers must be advised of proposed changes to Plan/Procedure. | Review task requirements and readiness before you depart to the job site. Are you properly equipped to do task? Don't arrive with expectation of being told what to do. Demonstrate you can follow the plan, effectively perform the work, and complete documentation. Establish an expected "quality standard" with the Task Manager and CQCSM. | The SSHO monitors the workers to independently verify that workers are effectively implementing SSHP procedures. The SSHO may modify AHAs to reflect any unanticipated hazards. | Government oversight may include any of the following; safety checks, task surveillance, material inspections, independent testing, etc., to verify conformance w/contract requirements. |
| Follow-Up Inspections | Review and discuss follow-up inspections with CQCSM based on results of initial phase inspection. | Perform daily follow-up inspections. Identify and document task inspected. As with Preparatory and Initial Inspections, attach inspection records to your Daily QC Report. Document, communicate and resolve task nonconformance(s) with Task Manager. | Continue to achieve expected quality and productivity. Offer suggestions to the Task Manager to improve productivity. Do not deviate from task procedures and requirements without receiving Task Manager authorization. | Implement Daily Tailgate Safety Meetings. Make sure workers continue to adhere to SSHP and AHA requirements. Evaluate any monitoring data relative to action levels established in the SSHP and AHA. | Coordinate and schedule independent follow-up inspections or testing of ongoing work with CQCSM. Review and approve daily and task-related submittals as required by contract requirements and the Project Submittal Register. |
| Completion Inspection | Verify that work performance and results will achieve contractual requirements and project objectives. | Notify USACE Rep a minimum of two working days before the Completion Inspection. Escort USACE Rep during Completion Inspection. Perform final review of submittals and testing required by contract (or subcontract). Take lead on Punch List. | Make sure that task completion inspection is scheduled prior to your departure or demobilization from the job site. Complete punch list (action items) based on completion inspection. | Ensure health and safety requirements and submittals (e.g., air monitoring data), if required, have been completed before workers demobilize from site. | Conduct site walk and completion Inspection with CQCSM. Develop punch list of rework items. Discuss schedule for re-inspection. |