Perimeter Air Monitoring Plan

For

Soil Remediation Activities
BMI Upper and Lower Ponds
and Ditches
Clark County, Nevada

August 2006

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Basic Remediation
COMPANY

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ATTACHMENT A – EXAMPLE FORMS

LIST OF ACRONYMS

AIHA	American Industrial Hygiene Association
BRC	Basic Remediation Company
CAMU	Corrective Action Management Unit
CAP	Corrective Action Plan
CARB	California Air Resources Board
CCDAQM	Clark County Department of Air Quality Management
CFM	Cubic feet per minute
COC	Constituent of concern
GC	Gas chromatography
HSP	Health and Safety Plan
LPM	Liters per minute
$\mu g/m^3$	Micrograms per cubic meter
MD	Multi-detector detection
MS	Mass spectrometry
NDEP	Nevada Department of Conservation and Natural Resources, Division of Environmental Protection
NIOSH	National Institute for Occupational Safety and Health
PAH	Polynuclear aromatic hydrocarbon
PAMP	Perimeter Air Monitoring Plan
PCB	Polychlorinated biphenyl
PM10	Particulate matter, aerodynamic diameter of 10 microns or less
PUF	Polyurethane foam
OSHA PEL	Occupational Safety and Health Administration Permissible Exposure Limits
PRG	USEPA Region IX Preliminary Remediation Goals
QAPP	Quality Assurance Project Plan
RBC	Risk-Based Concentrations, USEPA Region III
SRC	Site-related chemical
SVOC	Semi-volatile organic compounds
TSP	Total suspended particulate
USEPA	United States Environmental Protection Agency
VFC	Volumetric flow controller
VOC	Volatile organic compound
XRF	X-Ray Flourescence Spectroscopy

1.0 INTRODUCTION

As part of the revised *Corrective Action Plan for the Basic Remediation Company (BRC) Common Areas Remediation Project* (BRC, July 2006) (CAP), Basic Remediation Company (BRC) has developed this *Perimeter Air Monitoring Plan* (PAMP) to be implemented during the soil remediation at the Basic Environmental Company property, located in Clark County, Nevada. The site consists of the Eastside Area (from where contaminated sediments and soils will be excavated) and the Corrective Action Management Unit or CAMU Area (wherein contaminated sediments or soils will be interred and capped). This PAMP has been developed to establish the procedures by which the project team will monitor the effectiveness of the engineering controls for mitigating off-site airborne emissions of particulate matter (and thereby, associated chemicals) found in the soil at the site.

The planned soil remediation activity includes the following tasks:

- Excavation of surface soil and potential stockpiling at the Eastside Area of the site;
- Loading of soil at the Eastside Area and transportation to the CAMU for disposal, and unloading of the soils at that CAMU; and
- Implementation of mitigation measures as required by local ordinances and in order to effectuate dust control. The planned dust control procedures are described in CAP Section 3.1.4 and Appendix C (*Dust Control and Mitigation Plan*).

It is anticipated that these activities will be performed for the duration of the remediation project, presently estimated to be roughly an eighteen-month period.

This PAMP has been developed to meet the requirements of interested governmental agencies such as the Clark County Department of Air Quality Management (CCDAQM) and the Nevada Division of Environmental Protection (NDEP). This PAMP establishes requirements for monitoring and sampling airborne constituents at the site perimeter and for controlling exposures to the general public. This PAMP consists of the following:

- Identification of constituents of concern (COCs);
- Air monitoring program;
- Action levels; and
- Reporting requirements.

Dust suppression controls shall be implemented during the project to comply with the air quality regulations administered and enforced by the CCDAQM, Sections 90-94 and to impede the generation of airborne dust due to intrusive on-site activities. These control measures are discussed in Appendix C of the CAP. Emission of particulate matter from the site will be monitored by BRC as described in this PAMP to assess the effectiveness of these dust control measures in mitigating potential impacts to the off-site general public. The BRC Project Manager will designate a Dust Control Monitor as required by Section 94. This individual shall have full authority to provide that dust suppression is implemented, including inspections, record keeping, deployment of resources, and shutdown of construction activities as needed. The Dust Control Monitor shall be present at all times that construction activities occur on the project site and shall devote the majority of his or her time specifically to managing dust prevention and control on the site. This individual will have successfully completed the required DAQM classes necessary to maintain certification as a Dust Control Monitor.

2.0 IDENTIFICATION OF CONSTITUENTS OF CONCERN

As previously stated, this PAMP has been developed to establish procedures for monitoring the effectiveness of dust control measures during remediation by mitigating the impact of potential airborne COCs on the general public located in the vicinity of the Eastside and CAMU locations. Exposure of on-site workers to COCs will be addressed in the site-specific Health and Safety Plan (HSP) to be developed by the contractor (the contents of this HSP are provided in Appendix D to the CAP). The following site-related chemicals have been identified at the site, and have been considered in the development of this PAMP:

- Metals;
- Semi-volatile organic compounds (SVOCs);
- Volatile organic compounds (VOCs);
- Polychlorinated biphenyls (PCBs);
- Pesticides;
- Dioxins and furans;
- Perchlorate;
- Radionuclides;
- Asbestos; and
- Total Suspended Particulate (TSP).

As noted earlier, several of the chemical classes listed above (i.e., metals, PCBs, pesticides, dioxins/furans, SVOCs, perchlorate, and radionuclides) adhere to soil particles that could become airborne and be transported off-site with the prevailing wind if dust mitigation were not implemented or were not effective. Asbestos has a fibrous composition and is present in some site soils to be remediated. Unmitigated, it may become airborne and be transported off-site. Dust suppression measures will be implemented to suppress dust and fiber emissions during excavation, loading, and disposal activities, as described in the Dust Control and Mitigation Plan (see Appendix C of the CAP). These measures involve a significant amount of particulate mitigation (such as watering and vacuuming of releases off of roadways etc.) to be implemented in conjunction with the remediation activities, which will lead to little or no emissions of fibers, particulates and associated COCs.

Volatile emissions are not expected during remediation. Despite this, if volatile constituents are in fact present in Eastside Area soils, Health and Safety direct

read-out monitoring will identify whether volatile compounds are released to the atmosphere during remediation activities. No additional monitoring of volatile emissions is proposed as part of this PAMP.

3.0 AIR MONITORING PROGRAM

This section covers the air monitoring program to be implemented at the site. To assist in implementing this program, the following elements are addressed:

- Air monitoring strategy;
- Monitoring locations;
- Monitoring and sampling methods;
- Monitoring schedule;
- Notification requirements; and
- Quality assurance and control measures.

3.1 AIR MONITORING STRATEGY

Air monitoring and/or sampling will be performed continuously during soil remediation activities at the site to assess the potential exposure of the general public in the neighboring communities due to airborne emissions resulting from remediation activities. Specifically, this PAMP pertains to air monitoring at pre-selected stations established across the work areas (both Eastside and CAMU Areas). The methodology by which this air monitoring strategy will be implemented is briefly summarized below and then discussed in greater detail in the following sections. It should be noted that as part of the implementation of earlier versions of this PAMP, Baseline Perimeter Air Monitoring as well as Phase I (involving monitoring across remediation conducted generally in the TIMET ponds, sewer line excavation, etc.) was conducted; however, the Baseline monitoring as well as the Phase I monitoring programs did not show any appreciable differences between upwind and downwind monitoring stations, indicating that dust control measures were effective. Further, perimeter monitoring conducted as part of the Baseline monitoring work also did not indicate appreciable differences between the various monitoring locations. As a result, the focus of this Plan is to monitor the ambient air across the actual work areas, where there is the greatest potential for dust generation. Subsequent to the Phase I monitoring, and as of this revision, BRC has also completed a Phase II monitoring effort and in now presently conducting a Phase IIA effort. A Phase III workplan is being submitted concurrently with this PAMP revision. It is expected that once Phase III is implemented, monitoring will revert to Phase IIA for the duration of remediation, assuming that satisfactory results are obtained (i.e., no appreciable differences between upwind and downwind monitoring locations).

- The selection of actual monitoring locations will be defined in the supplemental workplans. However, a list of pre-selected locations has been identified as shown in Figure 1. The actual locations to be selected will depend on the nature and of the work. Monitoring locations will be selected to provide upwind and downwind measurements across the work areas such that unambiguous data relating to the air quality impacts from the remediation activities can be obtained to the extent possible, without confounding impacts due to other (i.e., non-remediation) activities and sources.
-
- Periodic VOC monitoring will be performed with a direct read-out organic vapor analyzer (i.e., flame or photo ionization detector) as part of the Health and Safety monitoring.
- Meteorological conditions, especially wind direction and velocity, will be monitored on-site using a 3-meter meteorological tower during the work to assist in determining the proper location of the monitoring stations.
- Air monitoring for particulates will be performed on the site during the project activities. This monitoring will be performed by the Dust Control Monitor or Health and Safety Officer using a direct-reading instrument, such as a DataRAM dust monitor equipped with the necessary accessories (omnidirectional inlet, and a temperature conditioning heater).
- Air sampling for TSP will be performed using United States Environmental Protection Agency (USEPA) Compendium Method IO-2.1.
- BRC will collect TSP and polyurethane foam (PUF) samples for chemical analysis (see discussion below at 3.3.2.3). The analytes chosen will depend on the chemicals known or suspected of being present in the subject area, and the human toxicity of those chemicals (i.e., chemicals with a low human health exposure threshold. See discussion below at 3.3.2.3).
- Air sampling for asbestos will be performed using Method 7400, which was developed by the National Institute for Occupational Safety and Health (NIOSH) or an alternate method to attain the required action level.
- A laboratory certified by the NDEP and NELAC and/or accredited by the American Industrial Hygiene Association (AIHA) will perform analysis of the samples, as appropriate.

Quality assurance and control measures will be implemented to provide proper calibration of instrumentation, confirm that appropriate sample collection and handling procedures are used, and assess if additional air monitoring and sampling at the site perimeter stations are necessary.

3.2 MONITORING LOCATIONS

3.2.1 Air Monitoring Stations

This PAMP includes the establishment of various pre-selected air monitoring station locations at the CAMU and Eastside areas and at two off-site locations. The locations of these air monitoring stations are presented in Figure 1.. Since meteorological data have shown that wind direction can fluctuate from day to day, actual monitoring locations for the sampling day will be determined based on actual meteorological data anticipated for that day. It is expected that for the current monitoring in progress as of this revision of the PAMP (i.e., Phase IIA) along with the expected Phase III monitoring, there will be six monitors in operation covering both the Eastside and CAMU areas. It is likely that after Phase III monitoring is completed that the number of locations will be four, since activities such as Slit Trench area excavation will have been completed by then.

The details for which monitoring location will be used for specific sampling will be discussed in the supplemental workplan (e.g., the Phase III workplan being submitted concurrently).

As previously stated, the location of the stations will be chosen on the basis of where work activitiesare being performed on-site relative to wind direction. This approach is intentionally designed to provide a realistic representation of impacts to the air by the activities being performed at the work areasand not by the site alone (e.g., undisturbed areas) or due to non-site related factors (such as activities by others, including traffic, at the site boundary.

It is important to note that TSP monitoring has been selected to provide a reasonable indication of airborne particulate burdens being contributed to the ambient environment by intrusive activities in these areas. The measurement of these burdens across the work areas will provide an indication of the success and/or failure of the dust suppression program being employed on-site. Such monitoring is not intended to address VOCs (except in the case of the Slit Trench area), as these will be addressed by the employment of direct read-out organic vapor analyzers during site operations (see below) as part of Health and Safety monitoring. Rather, the TSP monitoring is intended to address the potential for exposure to chemicals and elements that are not volatile, but attenuate to soil particles. However inhalation exposure would only likely occur for the smaller respirable fraction of particulate matter (less than PM10) if the impacted particles became airborne and were either inhaled.

3.2.2 Site-Specific Meteorological Conditions

The prevailing wind direction at the site is from the southwest. However, local, daily meteorological conditions (wind direction, wind speed) will be obtained from the BRC 3-meter meteorological station located adjacent to the Eastside entrance. The meteorological conditions will be collected continuously and recorded in real-time by computer throughout the workday, including the monitoring time. In addition, the locations of the monitoring stations will be established and precisely recorded by GPS to establish upwind/downwind relationships.

3.3 AIR MONITORING AND SAMPLING METHODS

Air monitoring and sampling will be performed during the soil remediation activities performed at the Site (Eastside and CAMU Areas). These activities are expected to last up to eighteen months. The sampling monitors or collection media will be placed at a height of approximately 5 feet above ground surface to represent the breathing zone. Air monitoring and sampling will be performed daily during remediation activities (up to 24-hour duration). As such, the following monitoring and sampling will be performed during this work using the prescribed methods.

3.3.1 Real-Time Air Monitoring

Respirable fractions of dust will be monitored using real-time DataRAM monitors. These monitors have a detection limit of 0.1 micrograms of dust per cubic meter of air. However, to avoid erroneous results, the monitors will be equipped with an omni-directional inlet, and a temperature conditioning heater unit.

Monitoring will be performed continuously at the monitoring locations and the results will be logged approximately every 10 minutes. A record of the monitoring results will be maintained by BRC for a period consistent with the terms of the NDEP *Settlement Agreement and Order on Consent: BMI Common Areas, Phase 3*, dated 15 February 2006 ("AOC3") (Section XXIX *Retention of Records*). This record shall include the collection time, monitoring location, and the associated results. Calibration of instrumentation will be performed according to the manufacturer's specifications. The calibration requirements are discussed below at Section 3.6.

As described above, the dust monitoring on-site will provide an indication of the effectiveness of the dust suppression activities being employed on-site. Dust levels in excess of the action levels will result in a modification of the dust

suppression controls – i.e., in their enhancement until levels are lower than the action levels (see Section 4.0).

In addition, air monitoring for volatile compounds will be performed by, and at the discretion of, the on-site Health and Safety Officer as part of the Health and Safety program. This monitoring will be performed using a direct read-out organic vapor analyzer (i.e., flame or photo ionization detector), and measurements will be taken in the site workers' typical breathing zones. Factors influencing the monitoring will be the location and type of excavation activity being performed, data regarding the presence, or suspected presence of VOCs, indicators of impact, including odors or soil staining, and weather. Monitoring may be biased by these aforementioned factors or may be randomly performed (i.e., w/o bias). In the unlikely event that an area of elevated VOCs is encountered, personal protective equipment will be modified as appropriate in accordance with the project HSP, and work activities will be modified to reduce VOC emissions to the atmosphere.

3.3.2 Air Sampling

As noted above in Section 3.1, air samples will be collected for analysis of TSP, asbestos fibers, and site-related chemicals attenuated to particulates. These sampling and analysis procedures are summarized below. For all sample types, consistent with the project QAPP, field blanks on a frequency of 10 percent (one in 10 samples) will be collected and submitted for analysis for quality control purposes. The air samples will be submitted to a laboratory using proper chain-of-custody procedures. A laboratory certified by NDEP and NELAC, or accredited by AIHA will perform analysis of the samples, as appropriate.

3.3.2.1 Airborne Particulate

Air samples for particulate will be collected once per day at each of the monitoring stations. TSP samples will be collected using BGI, Inc. Model PQ100 USEPA-approved (approval Number RFPS-1298-124) portable samplers with 47 millimeter Teflon and cellulose filter media using USEPA Compendium Method IO-2.1 (gravimetric analysis), USEPA Compendium Method IO-3.3, and California Air Resources Board (CARB) SOP MDL039.

Upon completion of the sampling event, the samples and the associated information will be recorded on a chain-of-custody sheet (see example provided in Attachment A). This form will require a record of the sample identification number, pump number, sample location, sampling time, and flow rate to calculate the total sample volume and the required analysis.

3.3.2.2 Asbestos

If required per the supplemental workplans, air samples for asbestos fibers will be collected once per day at each of the monitoring stations. Upon completion of the sampling, the samples and the completed chain-of-custody sheet shall be submitted to a laboratory for analysis. These samples will be analyzed by NIOSH Method 7400. Per NIOSH Method 7400, the sampling train shall consist of a low-flow pump attached to a 25-millimeter diameter filter, which has a mixed cellulose ester membrane. The air samples will be collected at a flow rate of (up to) 5 liters per minute (LPM) using a low-flow pump. The sampling will be performed for a minimum of eight hours.

3.3.2.3 *Site-Related Chemicals*

In addition to the TSP and asbestos samplers, three polyurethane foam (PUF) samplers will be employed at each of the monitoring stations for sampling and subsequent analysis of:

- Dioxins/furans,
- SVOCs/PAHs,
- PCBs, and
- Organochlorine/organophosphorus pesticides.

The PUF samplers operate at a flow rate of approximately 20 CFM and incorporate a 4-inch diameter quartz glass filter followed by a polyurethane foam plug contained in a glass cartridge. Two sets of PUF samples (filter plus PUF plug) from each location will be analyzed for dioxins/furans and PAHs using gas chromatography/mass spectrometry (GC/MS) in accordance with EPA Methods TO-9A and TO-13A. The other set of PUF samples from each location will be analyzed for pesticides and PCBs using GC/Multi-Detector Detection (GC/MD) in accordance with EPA Method TO-4A.

Following gravimetric analysis, each TSP sample will also be analyzed for multiple metals of interest using USEPA Compendium Method IO-3.3 X-Ray Fluorescence (Protocol number 6) for total metals.

If required by the supplemental workplans, hexavalent cromium (CrVI) samples will be collected in a similar manner as the TSP samples. However the samples will collected using impregnated cellulose media and will be analyzed using CARB MDL039 *Standard Operating Procedures for the Analysis of Hexavalent Chromium at Ambient Atmospheric Levels by Ion Chromatography.*

These classes of compounds represent those chemicals on the BRC Site Related Chemicals (SRC) list with low health thresholds as defined by Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs), ambient USEPA Region IX ambient air Preliminary Remediation Goals (PRGs), and USEPA Region III ambient air Risk-Based Concentrations (RBCs) (Table 1, shaded entries). Soluble chlorine is also indicated in Table 1 as being a low threshold constituent, however, that assignment is based on the gaseous form, which does not pertain to the dry soils and sediments present on site. Therefore, this constituent will not be included in the analyses.

It is assumed that focusing on the low health threshold chemicals listed in Table 1 will provide an indication of exposure risk associated with excavation activities for any other compounds likely to be present in the dust. Based on these results,

BRC will attempt to determine a correlation between these results and the concurrent results for TSP.

3.4 AIR MONITORING AND SAMPLING SCHEDULE

3.4.1 Monitoring Schedule

At each of the monitoring stations, samples will be collected at minimum of twice per week for 24 hours when work activity is occurring during that week. Samples will be analyzed for airborne particulate and asbestos fibers on a turnaround time of roughly ten business days. It should be noted that deviations from this will be discussed in the supplemental workplans if warranted. For example, for monitoring across haul roads (which are only expected to be conducted during nighttime hours), the 24-hour sampling approach may be modified.

Specific monitoring schedules and durations will be discussed in the supplemental workplans.

If the TSP or PUF samples indicate levels of chemicals at concentrations below those that could pose an unacceptable threat to human health, there will be no further need for additional chemical analyses of PUF samples for that work activity. Maintenance of TSP levels at or below those measured will be considered sufficiently protective of human health. If TSP levels increase appreciably relative to levels measured , additional chemical analyses will be considered if the initial results indicate an unacceptable risk to human health could be posed by such an increase.

3.4.2 Control Measures Governing Sampling Frequency

If at any time during the monitoring and sampling activities the airborne concentrations exceed the action levels as prescribed in Section 4.0 of the PAMP, the BRC Project Manager or his designee will immediately stop work and modify dust control measures. Furthermore, in accordance with the requirements of the dust control permit, work will be halted at the site if wind speed exceeds the specified value in the dust control permit, as measured by the site's meteorological station. Work will only resume once the wind speeds are below that specified in the dust control permit.

Dust control measures to be implemented during the soil remediation activities shall comply with applicable air quality regulations as administered and enforced by the CCDAQM, specifically Sections 90-94. Measures to be implemented to control dust emissions are described in the Dust Control and Mitigation Plan (Appendix C to the CAP).

3.5 NOTIFICATION REQUIREMENTS

Air monitoring and/or sampling results detected above the action levels will prompt notification of the BRC Project Manager or his designee. This notification will be performed within four hours of the assessment, and it will include a summary of any revisions to the control measures that were implemented in response to the exceedance and air monitoring/sampling completed to confirm that these revised control measures were effective in reducing emissions to below the action levels.

3.6 QUALITY ASSURANCE AND CONTROL MEASURES

Quality control and assurance measures will be implemented to ensure proper calibration of instrumentation, confirm that appropriate sample collection and handling procedures are used, and assess if additional air monitoring and sampling at the site perimeter is necessary.

All real-time instrumentation will be calibrated according to the manufacturer's specifications prior to and after use each day. A record of this calibration will be logged on an appropriate form and this information will include: equipment manufacturer and model, serial number, factory calibration date and time, methodology, and results of the daily field calibration. The meteorological monitoring instrumentation will be calibrated at project initiation and at least every six months thereafter in accordance with EPA's *Quality Assurance Handbook for Air Pollution measurement Systems, Volume IV: Meteorological Measurements.*

Air sampling will be performed using approved NIOSH and/or USEPA methods as discussed previously. Prior to sampling each day, the asbestos air sampling pumps will be properly calibrated to collect an adequate volume of air. As a consequence, a record of the calibration will be maintained and the information will include: equipment manufacturer, pump or canister identification number, calibrator type, time of calibration, and pre- and post-calibration results to assure the flow rate was maintained. The TSP/PUF samplers will be calibrated using NIST-certified calibration orifices or flow devices prior to initiation of the program and at least quarterly thereafter. Prior to sampling each day, the sampling flow rate will be verified to be operating at the proper set-point and the flow rate indicator reading will be recorded at the beginning and end of each day's sampling.

The air samples will be submitted to the appropriate laboratory using proper chain-of-custody procedures. A laboratory certified by NDEP and NELAC or accredited by AIHA will perform chemical analyses of the samples. As noted

above, consistent with the project QAPP field blanks will be collected and analyzed for quality control purposes on a frequency of 10 percent (one in 10 samples).

4.0 ACTION LEVELS

Specific limits have been established to monitor potential impacts to general public during soil excavation activities. Direct-read monitoring and continuous air sampling data will be compared to measured upwind levels and the perimeter action levels presented below for airborne particulate and asbestos. Additional dust and/or emission control measures will be necessary if the downwind perimeter monitoring results exceed the perimeter action levels.

The action level for inhalable particulate (a subset of TSP) is 50 micrograms per cubic meter of air (µg/m3) based on the difference between the highest downwind sampler result and the upwind sampler result. This value represents the recommended maximum impact attributable to site activities in the work areas. Air sampling for airborne particulate will be performed at the site perimeter using a high-flow pump and associated filter as described in Section 3.3, and monitoring will be completed using direct-reading instrumentation such as the MIE DataRAM (or equivalent). In addition, the chemical-specific action levels presented in Table 1 also apply. Multiple criteria are listed for this purpose in Table 1, including USEPA Region IX Ambient Air PRGs, USEPA Region III Ambient Air RBCs, and OSHA PELs; of these, the lowest value serves as the target screening level, unless otherwise noted.

The action level for asbestos is 100 fibers per day. The action level represents the exposure dose that does not pose a significant risk to the general public. A dose that does not pose a significant risk to the general public is also termed a safe harbor number.

4.1 APPLICATION OF ACTION LEVELS

Based on the action levels developed for the scope of work, the BRC project manager will use these levels to implement measures to reduce airborne emissions to below these levels or to cease work activities. Appropriate air sampling and monitoring will be performed to ensure that such measures have effectively reduced potential off-site emissions to acceptable limits. Work will only resume once the emissions meet the required action levels.

4.2 REPORTING

A daily log or set of logs of the monitoring results will be maintained (see examples provided in Attachment A). The logs shall include a map of the

monitoring locations, calibration information as specified in Section 3.6, a copy of the sampling collection record as specified in Section 3.6 (chain-of-custody sheet), and the monitoring results.

As described in the main body of the CAP (Section 4.0), BRC will submit daily and monthly reports to NDEP regarding remediation progress. These reports will include information regarding any circumstances associated with perimeter air monitoring that required the implementation of control measures and/or termination of work.

At the conclusion of the soil remediation activities, a report of the air monitoring program will be prepared. This report shall provide a compilation of all of the monitoring and sampling data, comparison of the data to the action levels, circumstances requiring the implementation of control measures and/or termination of work, and any observed discrepancies between the field and laboratory documentation. This report will be submitted as an appendix to the Corrective Action Plan Completion Report (see Section 4.2 of the CAP).

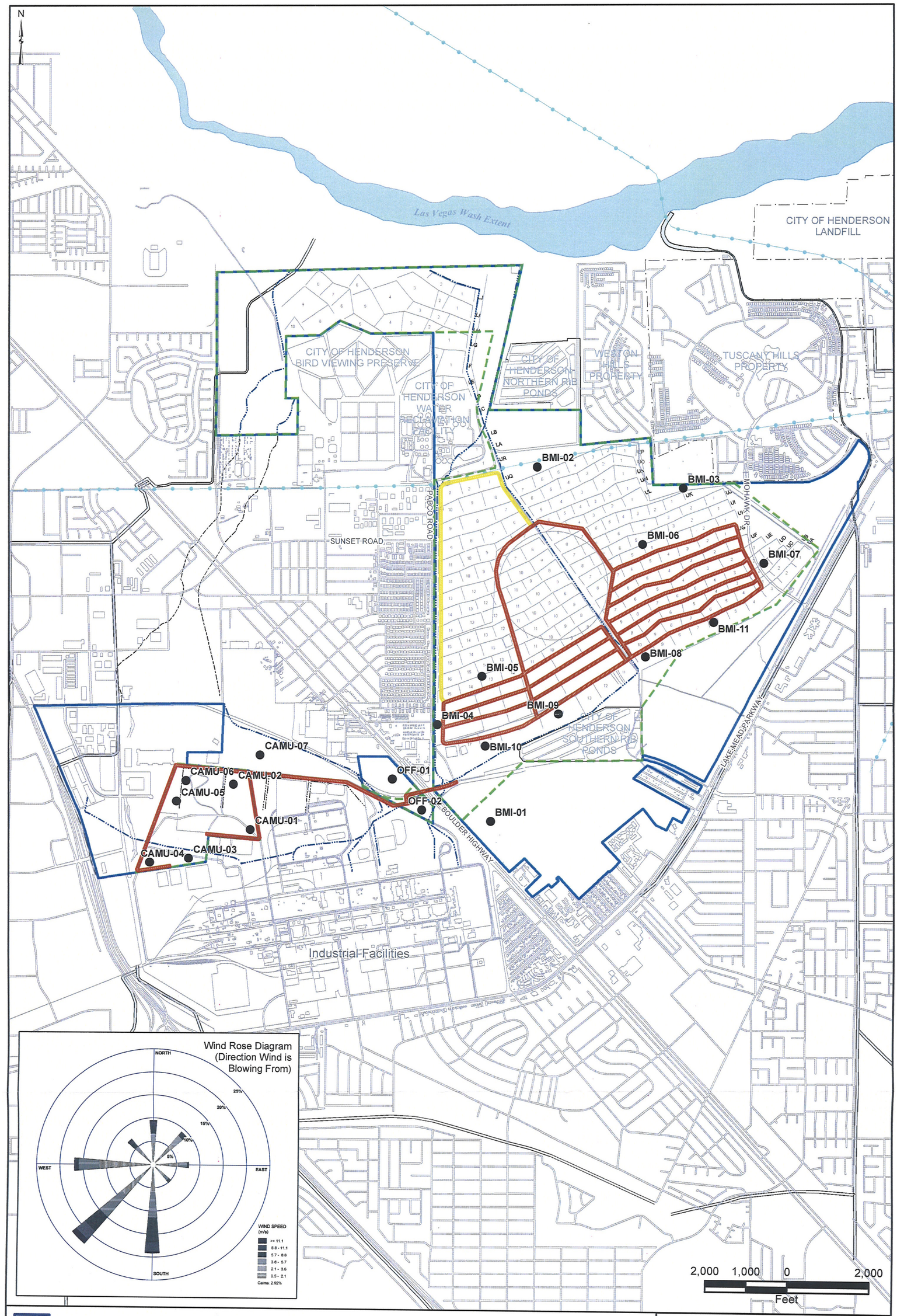
N
Las Vegas Wash Extent
CITY OF HENDERSON LANDFILL
CITY OF HENDERSON BIRD VIEWING PRESERVE
CITY OF HENDERSON WATER RECLAMATION FACILITY
CITY OF HENDERSON NORTHERN RIB PONDS
WESTON HILLS PROPERTY
TUSCANY HILLS PROPERTY
BMI-01
BMI-02
BMI-03
BMI-04
BMI-05
BMI-06
BMI-07
BMI-08
BMI-09
BMI-10
BMI-11
CAMU-01
CAMU-02
CAMU-03
CAMU-04
CAMU-05
CAMU-06
CAMU-07
OFF-01
OFF-02
PABCO ROAD
SUNSET ROAD
BOULDER HIGHWAY
LAKE MEAD PARKWAY
CITY OF HENDERSON SOUTHERN RIB PONDS
Industrial Facilities
Wind Rose Diagram (Direction Wind is Blowing From)
NORTH
EAST
SOUTH
WEST
WIND SPEED (m/s)
Calms: 2.92%
2,000 1,000 0 2,000
Feet
Site AOC3 Boundary
Site Soil Boundary
Proposed Haul Routes
Haul Route
Contingency Haul Route
Air Monitoring Stations
BMI Common Areas
Clark County, Nevada
FIGURE 1
AIR MONITORING STATION LOCATIONS
Basic Remediation Company
Prepared by MKJ (ERM)
Date 10/22/06
JOB No. 0064276
FILE: GIS/BRC/AIRMONITORING_FIGURE1.MXD

TABLE 1
PRELIMINARY PROJECT SCREENING LEVELS
PERIMETER AIR MONITORING PLAN
(Page 7 of 8)

Parameter of Interest	Compound List	CAS Number	Ambient Air PRG[1] (µg/m³)	Basis	Ambient Air RBC[3] (µg/m³)	Basis	OSHA PELs[2] (ppm / mg/m³)	Reporting Limit (µg/m³)
Volatile Organic Compounds (Continued)	1,2-Dichloropropane	78-87-5	0.10	C	0.092	C	75 / 350	0.094
	1,3,5-Trichlorobenzene	108-70-3	--	--	--	--	--	--
	1,3,5-Trimethylbenzene	108-67-8	6.2	NC	--	--	--	0.50
	1,3-Dichlorobenzene	541-73-1	110	NC	11	NC	--	0.61
	1,3-Dichloropropene (see cis-, trans-)	542-75-6	--	--	0.63	C	--	--
	1,3-Dichloropropane	142-28-9	73	NC	--	--	--	--
	1,4-Dichlorobenzene	106-46-7	0.31	C	0.28	C	75 / 450	0.12
	2,2-Dichloropropane	594-20-7	--	--	--	--	--	--
	2,2-Dimethylpentane	590-35-2	--	--	--	--	--	--
	2,2,3-Trimethylbutane	464-06-2	--	--	--	--	--	--
	2,3-Dimethylpentane	565-59-3	--	--	--	--	--	--
	2,4-Dimethylpentane	108-08-7	--	--	--	--	--	--
	2-Chlorotoluene	95-49-8	73	NC	73	NC	--	2.6
	2-Hexanone	591-78-6	--	--	--	--	100 / 410	2.1
	2-Methylhexane	591-76-4	--	--	--	--	--	--
	2-Nitropropane	79-46-9	0.00072	C	0.00067	C	25 / 90	--
	3,3-Dimethylpentane	562-49-2	--	--	--	--	--	--
	3-Ethylpentane	617-78-7	--	--	--	--	--	--
	3-Methylhexane	589-34-4	--	--	--	--	--	--
	4-Chlorobenzene (see Chlorobenzene)	108-90-7	--	--	51	NC	75 / 350	--
	4-Chlorotoluene	106-43-4	--	--	260	NC	--	2.6
	4-Methyl-2-pentanone (MIBK)	108-10-1	3,139	NC	3,100	NC	100 / 410	2.1
	Acetone	67-64-1	3,285	NC	3,300	NC	1000 / 2400	1.2
	Acetonitrile	75-05-8	62	NC	62	NC	40 / 70	--
	Benzene	71-43-2	0.25	C	0.23	C	10 / --	0.16
	Bromobenzene	108-86-1	10	NC	--	--	--	3.3
	Bromodichloromethane	75-27-4	0.11	C	0.1	C	--	0.68
	Bromoform	75-25-2	1.7	C	1.6	C	0.5 / 5	5.2
	Bromomethane	74-83-9	5.2	NC	5.1	NC	(C)20 / (C)80	0.39
	Carbon disulfide	75-15-0	730	NC	730	NC	20 / --	1.6
	Carbon tetrachloride	56-23-5	0.13	C	0.12	C	10 / --	0.13
	Chlorobenzene	108-90-7	62	NC	51	NC	75 / 350	0.47
	Chlorobromomethane	74-97-5	--	--	--	--	200 / 1050	--
	Chlorodibromomethane (see Dibromochloromethane)	124-48-1	--	--	0.075	C	--	--
	Chloroethane	75-00-3	2.3	C	2.2	C	1000 / 2600	0.27
	Chloroform	67-66-3	0.083	C	0.077	C	(C)50 / (C)240	0.099
	Chloromethane	74-87-3	95	NC	95	NC	100 / --	0.21
	cis-1,2-Dichloroethene	156-59-2	37	NC	--	--	--	0.40
	cis-1,3-Dichloropropene	10061-01-5	0.5	C	--	--	--	0.46
	Cymene (Isopropyltoluene)	99-87-6	--	--	--	--	--	2.8
	Dibromochloroethane	73506-94-2	--	--	--	--	--	--
	Dibromochloromethane	124-48-1	0.080	C	0.075	C	--	0.86
	Dibromochloropropane	96-12-8	0.21	NC	0.21	NC	0.001 / --	--
	Dibromomethane	74-95-3	37	NC	37	NC	--	3.6
	Dichloromethane (Methylene chloride)	75-09-2	4.1	C	3.8	C	25 / --	0.71
	Dimethyldisulfide	624-92-0	--	--	--	--	--	--
	Ethanol	64-17-5	--	--	--	--	1000 / 1900	0.96
	Ethylbenzene	100-41-4	1,059	NC	1,100	NC	100 / 435	0.44
	Freon-11 (Trichlorofluoromethane)	75-69-4	730	NC	730	NC	1000 / 5600	0.57
	Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	76-13-1	31,281	NC	31,000	NC	1000 / 7600	0.78
	Freon-12 (Dichlorodifluoromethane)	75-71-8	209	NC	180	NC	1000 / 4950	0.50
	Heptane	142-82-5	--	--	--	--	500 / 2000	2.1
	Isoheptane	31394-54-4	--	--	--	--	--	--
	Isopropylbenzene	98-82-8	402	NC	400	NC	50 / 245	2.5
	m,p-Xylene (see Xylenes (total))	mp-XYL	--	--	110	NC	--	0.44
	Methyl ethyl ketone (2-Butanone)	78-93-3	5,110	NC	5,100	NC	200 / 590	1.5

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Semivolatile Organic Compounds (Continued)	bis(Chloromethyl) ether	542-88-1	0.00003	C	0.000028	C	--	--
	bis(p-Chlorophenyl) sulfone	80-07-9	--	--	--	--	--	--
	bis(p-Chlorophenyl)disulfide	1142-19-4	--	--	--	--	--	--
	Carbazole	86-74-8	0.34	C	0.31	C	--	--
	Chrysene (see Method 8310)	218-01-9	--	--	0.86	C	--	1.0*
	Dibenzo(a,h)anthracene (see Method 8310)	53-70-3	--	--	0.00086	C	--	1.0*
	Dibenzofuran	132-64-9	7.3	NC	--	--	--	1.0*
	Dichloromethyl ether	542-88-1	--	--	0.000028	C	--	--
	Diethyl phthalate	84-66-2	2,920	NC	2,900	NC	--	5.0*
	Dimethyl phthalate	131-11-3	36,500	NC	--	--	-- / 5	5.0*
	Di-n-butyl phthalate	84-74-2	365	NC	370	NC	-- / 5	5.0*
	Di-n-octyl phthalate	117-84-0	146	NC	--	--	--	5.0*
	Diphenyl disulfide	882-33-7	--	--	--	--	--	--
	Diphenyl sulfide	139-66-2	--	--	--	--	--	--
	Diphenyl sulfone	127-63-9	11.0	NC	--	--	--	--
	Fluoranthene	206-44-0	146	NC	150	NC	--	1.0*
	Fluorene	86-73-7	146	NC	150	NC	--	1.0*
	Hexachlorobenzene	118-74-1	0.0042	C	0.0039	C	--	1.0*
	Hexachlorobutadiene	87-68-3	0.086	C	0.08	C	--	5.4
	Hexachlorocyclopentadiene	77-47-4	0.21	NC	0.21	NC	--	20*
	Hexachloroethane	67-72-1	0.48	C	0.45	C	1 / 10	1.0*
	Hydroxymethyl phthalimide	118-29-6	--	--	--	--	--	--
	Indeno(1,2,3-cd)pyrene (see Method 8310)	193-39-5	--	--	0.0086	C	--	1.0*
	Isophorone	78-59-1	7.1	C	6.6	C	25 / 140	1.0*
	m,p-Cresol	106-44-5	18	NC	18	NC	5 / 22	--
	Naphthalene	91-20-3	3.1	NC	3.3	NC	10 / 50	1.0*
	Nitrobenzene	98-95-3	2.1	NC	2.2	NC	1 / 5	1.0*
	N-nitrosodi-n-propylamine	621-64-7	0.0010	C	0.00089	C	--	1.0*
	N-nitrosodiphenylamine	86-30-6	1.4	C	1.3	C	--	10*
	o-Cresol	95-48-7	183	NC	180	NC	5 / 22	5.0*
	Octachlorostyrene	29082-74-4	--	--	--	--	--	--
	p-Chloroaniline (4-Chloroaniline)	106-47-8	15	NC	15	NC	--	10*
	p-Chlorobenzenethiol (see 4-Chlorothiophenol)	106-54-7	--	--	--	--	--	--
	Pentachlorobenzene	608-93-5	2.9	NC	2.9	NC	--	--
	Pentachlorophenol	87-86-5	0.056	C	0.052	C	-- / 0.5	20*
	Phenanthrene (see Method 8310)	85-01-8	--	--	--	--	--	1.0*
	Phenol	108-95-2	1,095	NC	1,100	NC	5 / 19	5.0*
	Phthalic acid	88-99-3	3,650	NC	--	--	--	--
	Pyrene (see Method 8310)	129-00-0	--	--	110	NC	--	1.0*
	Pyridine	110-86-1	3.7	NC	3.7	NC	5 / 15	--
	Thiophenol	108-98-5	--	--	0.037	NC	--	--
	Tentatively Identified Compounds (TICs)		--	--	--	--	--	--
Volatile Organic Compounds	1,1,1,2-Tetrachloroethane	630-20-6	0.26	C	0.24	C	--	3.5
	1,1,1-Trichloroethane	71-55-6	2,300	NC	1,000	NC	350 / 1900	0.55
	1,1,2,2-Tetrachloroethane	79-34-5	0.033	C	0.031	C	5 / 35	0.14
	1,1,2-Trichloroethane	79-00-5	0.12	C	0.11	C	10 / 45	0.11
	1,1-Dichloroethane	75-34-3	521	NC	510	NC	100 / 400	0.41
	1,1-Dichloroethene	75-35-4	208	NC	220	NC	--	0.40
	1,1-Dichloropropene	563-58-6	--	--	--	--	--	2.3
	1,2,3-Trichlorobenzene	87-61-6	--	--	--	--	--	--
	1,2,3-Trichloropropane	96-18-4	0.0034	C	0.0031	C	50 / 300	3.1
	1,2,4-Trichlorobenzene	120-82-1	3.7	NC	37	NC	--	3.8
	1,2,4-Trimethylbenzene	95-63-6	6.2	NC	--	--	--	0.50
	1,2-Dichlorobenzene	95-50-1	209	NC	150	NC	(C)50 / (C)300	0.61
	1,2-Dichloroethane	107-06-2	0.074	C	0.069	C	50 / --	0.082
	1,2-Dichloroethene (see cis-, trans-)	540-59-0	--	--	33	NC	200 / 790	--

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Ions	Bromide	24959-67-9	--	--	--	--	--	--
	Bromine	7726-95-6	--	--	--	--	0.1 / 0.7	--
	Chlorate	14866-68-3	--	--	--	--	--	--
	Chloride	16887-00-6	--	--	--	--	--	--
	Chlorine (soluble)	7782-50-5	0.21	NC	--	--	(C)1 / (C)3	--
	Chlorite	14998-27-7	--	--	--	--	--	--
	Fluoride	16984-48-8	--	--	--	--	-- / 2.5	--
	Nitrate (as N)	14797-55-8	--	--	5,800	NC	--	--
	Nitrite (as N)	14797-65-0	--	--	372	NC	--	--
	Orthophosphate	14265-44-2	--	--	--	--	--	--
	Sulfate	14808-79-8	--	--	--	--	--	--
	Sulfite	14265-45-3	--	--	--	--	--	--
	Perchlorate	14797-73-0	--	--	2.6	NC	--	--
Dissolved Gases	Ethane	74-84-0	--	--	--	--	--	--
	Ethylene	74-85-1	--	--	--	--	--	--
	Methane	74-82-8	--	--	--	--	--	--
Chlorinated Compounds	Chloral	75-87-6	--	--	--	--	--	--
	Dichloroacetaldehyde	79-02-7	--	--	--	--	--	--
PCDDs/PCDFs	OCDF (see 2,3,7,8-TCDD TEQ)	39001-02-0	--	--	--	--	--	--
	OCDD (see 2,3,7,8-TCDD TEQ)	3268-87-9	--	--	--	--	--	--
	1,2,3,4,6,7,8-HpCDF (see 2,3,7,8-TCDD TEQ)	67562-39-4	--	--	--	--	--	--
	1,2,3,4,6,7,8-HpCDD (see 2,3,7,8-TCDD TEQ)	35822-46-9	--	--	--	--	--	--
	1,2,3,4,7,8,9-HpCDF (see 2,3,7,8-TCDD TEQ)	55673-89-7	--	--	--	--	--	--
	1,2,3,4,7,8-HxCDF (see 2,3,7,8-TCDD TEQ)	70648-26-9	--	--	--	--	--	--
	1,2,3,4,7,8-HxCDD (see 2,3,7,8-TCDD TEQ)	39227-28-6	--	--	--	--	--	--
	1,2,3,6,7,8-HxCDF (see 2,3,7,8-TCDD TEQ)	57117-44-9	--	--	--	--	--	--
	1,2,3,6,7,8-HxCDD (see 2,3,7,8-TCDD TEQ)	57653-85-7	--	--	--	--	--	--
	1,2,3,7,8,9-HxCDF (see 2,3,7,8-TCDD TEQ)	72918-21-9	--	--	--	--	--	--
	1,2,3,7,8,9-HxCDD (see 2,3,7,8-TCDD TEQ)	19408-74-3	--	--	--	--	--	--
	1,2,3,7,8-PeCDF (see 2,3,7,8-TCDD TEQ)	57117-41-6	--	--	--	--	--	--
	1,2,3,7,8-PeCDD (see 2,3,7,8-TCDD TEQ)	40321-76-4	--	--	--	--	--	--
	2,3,4,6,7,8-HxCDF (see 2,3,7,8-TCDD TEQ)	60851-34-5	--	--	--	--	--	--
	2,3,4,7,8-PeCDF (see 2,3,7,8-TCDD TEQ)	57117-31-4	--	--	--	--	--	--
	2,3,7,8-TCDF (see 2,3,7.8-TCDD)	51207-31-9	--	--	--	--	--	--
	2,3,7,8-TCDD (TEQ)	1746-01-6	4.5 E-8	C	--	--	--	--
Asbestos	Asbestos	1332-21-4	--	--	--	--	1 f per cc	--
General Chemistry Parameters	Ammonia (as N)	7664-41-7	104	NC	100	NC	50 / 35	--
	Cyanide (Total)	57-12-5	--	--	73	NC	-- / 5	--
	Iodine	7553-56-2	--	--	--	--	(C)0.1 / (C)1	--
	pH in soil	pH	--	--	--	--	--	--
	pH in water	pH	--	--	--	--	--	--
	Sulfide	18496-25-8	--	--	--	--	--	--
	Total inorganic carbon	7440-44-0	--	--	--	--	--	--
	Total Kjeldahl nitrogen (TKN)	TKN	--	--	--	--	--	--
	Total organic carbon (TOC)	7440-44-0	--	--	--	--	--	--
Metals	Aluminum	7429-90-5	5.1	NC	--	--	-- / 15(5)	--
	Antimony	7440-36-0	--	--	1.5	NC	-- / 0.5	--
	Arsenic	7440-38-2	0.0004	C	0.00041	C	-- / 0.01	--
	Barium	7440-39-3	0.52	NC	0.51	NC	-- / 0.5	--
	Beryllium	7440-41-7	0.0008	C	0.00075	C	-- / 0.002	--
	Boron	7440-42-8	21	NC	21	NC	--	--
	Cadmium	7440-43-9	0.0011	C	0.00099	C	-- / 0.2	--
	Calcium	7440-70-2	--	--	--	--	--	--
	Chromium	7440-47-3	--	--	--	--	-- / 0.5	--

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Metals (Continued)	Cobalt	7440-48-4	0.0007	C	--	--	-- / 0.1	--
	Copper	7440-50-8	--	--	150	NC	-- / 1	--
	Iron	7439-89-6	--	--	1100	NC	--	--
	Lead	7439-92-1	--	--	--	--	-- / 0.05	--
	Lithium	1313-13-9	--	--	--	--	--	--
	Magnesium	7439-95-4	--	--	--	--	--	--
	Manganese	7439-96-5	0.051	NC	0.052	NC	-- / (C)5	--
	Molybdenum	7439-98-7	--	--	18	NC	-- / 15	--
	Nickel	7440-02-0	--	--	73	NC	-- / 1	--
	Niobium	7440-03-1	--	--	--	--	--	--
	Palladium	7440-05-3	--	--	--	--	--	--
	Phosphorus	7723-14-0	--	--	0.073	NC	-- / 0.1	--
	Platinum	7440-06-4	--	--	--	--	-- / 0.002	--
	Potassium	7440-09-7	--	--	--	--	--	--
	Selenium	7782-49-2	--	--	18	NC	-- / 0.2	--
	Silicon	7440-21-3	--	--	--	--	-- / 15(5)	--
	Silver	7440-22-4	--	--	18	NC	-- / 0.01	--
	Sodium	7440-23-5	--	--	--	--	--	--
	Strontium	7440-24-6	--	--	2200	NC	--	--
	Sulfur	7704-34-9	--	--	--	--	--	--
	Thallium	7440-28-0	--	--	0.26	NC	-- / 0.1	--
	Tin	7440-31-5	--	--	2200	NC	-- / 2	--
	Titanium	7440-32-6	31	NC	--	--	--	--
	Tungsten	7440-33-7	--	--	--	--	--	--
	Uranium	7440-61-1	--	--	11	NC	-- / 0.05(0.25)	--
	Vanadium	7440-62-2	--	--	3.7	NC	-- / (C)0.5	--
	Zinc	7440-66-6	--	--	1100	NC	-- / 15(5)	--
	Zirconium	7440-67-7	--	--	--	--	-- / 5	--
	Chromium (VI)	18540-29-9	0.00002	C	0.00015	C	--	--
	Mercury	7439-97-6	--	--	0.31	NC	0.1 / --	--
Organophosphorous Pesticides	Azinphos-ethyl	264-27-19	--	--	--	--	--	--
	Azinphos-methyl	86-50-0	--	--	--	--	-- / 0.2	--
	Carbophenothion	786-19-6	--	--	--	--	--	--
	Chlorpyrifos	2921-88-2	11	NC	11	NC	--	--
	Coumaphos	56-72-4	--	--	--	--	--	--
	Demeton-O	298-03-3	0.15	NC	--	--	-- / 0.1	--
	Demeton-S	126-75-0	0.15	NC	--	--	-- / 0.1	--
	Diazinon	333-41-5	3.3	NC	3.3	NC	--	--
	Dichlorvos	62-73-7	0.023	C	0.022	C	-- / 1	--
	Dimethoate	60-51-5	0.73	NC	--	--	--	--
	Disulfoton	298-04-4	0.15	NC	0.15	NC	--	--
	EPN	2104-64-5	0.037	NC	--	--	-- / 0.5	--
	Ethoprop	13194-48-4	--	--	--	--	--	--
	Ethyl parathion	56-38-2	22	NC	--	--	-- / 0.1	--
	Fampphur	52-85-7	--	--	--	--	--	--
	Fenthion	55-38-9	--	--	--	--	--	--
	Malathion	121-75-5	73	NC	73	NC	-- / 15	--
	Methyl carbophenothion	953-17-3	--	--	--	--	--	--
	Methyl parathion	298-00-0	0.91	NC	0.91	NC	--	--
	Mevinphos	7786-34-7	--	--	--	--	-- / 0.1	--
	Naled	300-76-5	7.3	NC	7.3	NC	-- / 3	--
	O,O,O-Triethyl phosphorothioate (TEPP)	297-97-2	--	--	--	--	-- / 0.05	--
	Phorate	298-02-2	0.73	NC	--	--	--	--
	Phosmet	732-11-6	73	NC	--	--	--	--

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Organophosphorous Pesticides (Continued)	Ronnel	299-84-3	183	NC	--	--	-- / 15	--
	Stirophos (Tetrachlorovinphos)	22248-79-9	0.28	C	--	--	--	--
	Sulfotep	3689-24-5	1.8	NC	--	--	-- / 0.2	--
Chlorinated Herbicides	2,4,5-T	93-76-5	37	NC	37	NC	-- / 10	--
	2,4,5-TP (Silvex)	93-72-1	29	NC	29	NC	--	--
	2,4-D	94-75-7	37	NC	37	NC	-- / 10	--
	2,4-DB	94-82-6	29	NC	29	NC	--	--
	Dalapon	75-99-0	110	NC	110	NC	--	--
	Dicamba	1918-00-9	110	NC	110	NC	--	--
	Dichloroprop	120-36-5	--	--	--	--	--	--
	Dinoseb	88-85-7	3.7	NC	3.7	NC	--	--
	MCPA	94-74-6	1.8	NC	1.8	NC	--	--
	MCPP	93-65-2	3.7	NC	3.7	NC	--	--
Organic Acids	4-Chlorobenzene sulfonic acid	98-66-8	--	--	--	--	--	--
	Benzenesulfonic acid	98-11-3	--	--	--	--	--	--
	O,O-Diethylphosphorodithioic acid	298-06-6	--	--	--	--	--	--
	O,O-Dimethylphosphorodithioic acid	756-80-9	--	--	--	--	--	--
Nonhalogenated Organics	Ethylene glycol	107-21-1	7,300	NC	7,300	NC	--	--
	Ethylene glycol monobutyl ether	111-76-2	13,505	NC	14,000	NC	50 / 240	--
	Methanol	67-56-1	1,825	NC	1,800	NC	200 / 260	--
	Propylene glycol	57-55-6	3.1	NC	--	--	--	--
Organochlorine Pesticides	2,4-DDD	53-19-0	--	--	--	--	--	--
	2,4-DDE	3424-82-6	--	--	--	--	--	0.10*
	4,4-DDD	72-54-8	0.028	C	0.026	C	--	0.10*
	4,4-DDE	72-55-9	0.020	C	--	--	--	0.10*
	4,4-DDT	50-29-3	0.020	C	--	--	-- / 1	0.10*
	Aldrin	309-00-2	0.0004	C	0.00037	C	-- / 0.25	0.10*
	alpha-BHC	319-84-6	0.0011	C	0.00099	C	--	0.10*
	alpha-Chlordane	5103-71-9	0.019	C	--	--	-- / 0.5	0.10*
	beta-BHC	319-85-7	0.0037	C	0.0035	C	--	0.10*
	Chlordane	57-74-9	0.019	C	0.018	C	-- / 0.5	--
	delta-BHC	319-86-8	--	--	--	--	--	0.10*
	Dieldrin	60-57-1	0.0004	C	0.00039	C	-- / 0.25	0.10*
	Endosulfan I	959-98-8	22	NC	--	--	--	0.10*
	Endosulfan II	33213-65-9	22	NC	--	--	--	0.10*
	Endosulfan sulfate	1031-07-8	--	--	--	--	--	0.10*
	Endrin	72-20-8	1.1	NC	1.1	NC	-- / 0.1	0.10*
	Endrin aldehyde	7421-93-4	--	--	--	--	--	0.10*
	Endrin ketone	53494-70-5	--	--	--	--	--	0.10*
	gamma-BHC (Lindane)	58-89-9	0.0052	C	0.0048	C	-- / 0.5	0.10*
	gamma-Chlordane	5103-74-2	0.019	C	--	--	-- / 0.5	0.10*
	Heptachlor	76-44-8	0.0015	C	0.0014	C	-- / 0.5	0.10*
	Heptachlor epoxide	1024-57-3	0.0007	C	0.00069	C	--	0.10*
	Methoxychlor	72-43-5	18	NC	18	NC	-- / 15	1.0*
	Toxaphene	8001-35-2	0.0060	C	0.0057	C	-- / 0.5	1.0*
Polychlorinated Biphenyls	Aroclor 1016	12674-11-2	0.10	C	0.089	C	--	1.0*
	Aroclor 1221	11104-28-2	0.0034	C	0.0031	C	--	1.0*
	Aroclor 1232	11141-16-5	0.0034	C	0.0031	C	--	1.0*
	Aroclor 1242	53469-21-9	0.0034	C	0.0031	C	-- / 1	1.0*
	Aroclor 1248	12672-29-6	0.0034	C	0.0031	C	--	1.0*
	Aroclor 1254	11097-69-1	0.0034	C	0.0031	C	-- / 0.5	1.0*
	Aroclor 1260	11096-82-5	0.0034	C	0.0031	C	--	1.0*
	PCB-77 (see 2,3,7,8-TCDD TEQ)	32598-13-3	--	--	--	--	--	--
	PCB-81 (see 2,3,7,8-TCDD TEQ)	70362-50-4	--	--	--	--	--	--

TABLE 1
PRELIMINARY PROJECT SCREENING LEVELS
PERIMETER AIR MONITORING PLAN
(Page 4 of 8)

Parameter of Interest	Compound List	CAS Number	Ambient Air PRG[1] (µg/m³)	Basis	Ambient Air RBC[3] (µg/m³)	Basis	OSHA PELs[2] (ppm / mg/m³)	Reporting Limit (µg/m³)
Polychlorinated Biphenyls (Continued)	PCB-105 (see 2,3,7,8-TCDD TEQ)	32598-14-4	--	--	--	--	--	--
	PCB-114 (see 2,3,7,8-TCDD TEQ)	74472-37-0	--	--	--	--	--	--
	PCB-118 (see 2,3,7,8-TCDD TEQ)	31508-00-6	--	--	--	--	--	--
	PCB-123 (see 2,3,7,8-TCDD TEQ)	65510-44-3	--	--	--	--	--	--
	PCB-126 (see 2,3,7,8-TCDD TEQ)	57465-28-8	--	--	--	--	--	--
	PCB-156 (see 2,3,7,8-TCDD TEQ)	38380-08-4	--	--	--	--	--	--
	PCB-157 (see 2,3,7,8-TCDD TEQ)	69782-90-7	--	--	--	--	--	--
	PCB-167 (see 2,3,7,8-TCDD TEQ)	52663-72-6	--	--	--	--	--	--
	PCB-169 (see 2,3,7,8-TCDD TEQ)	32774-16-6	--	--	--	--	--	--
	PCB-189 (see 2,3,7,8-TCDD TEQ)	39635-31-9	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons	Acenaphthene	83-32-9	219	NC	220	NC	-- / 0.2[5]	1.0*
	Acenaphthylene	208-96-8	--	--	--	--	-- / 0.2[5]	1.0*
	Anthracene	120-12-7	1,095	NC	1,100	NC	-- / 0.2[5]	1.0*
	Benzo(a)anthracene	56-55-3	0.0092	C	0.0086	C	-- / 0.2[5]	--
	Benzo(a)pyrene	50-32-8	0.0009	C	0.002	C	-- / 0.2[5]	--
	Benzo(b)fluoranthene	205-99-2	0.0092	C	0.0086	C	-- / 0.2[5]	--
	Benzo(g,h,i)perylene	191-24-2	--	--	--	--	-- / 0.2[5]	1.0*
	Benzo(k)fluoranthene	207-08-9	0.092	C	0.086	C	-- / 0.2[5]	--
	Chrysene	218-01-9	0.92	C	0.86	C	-- / 0.2[5]	1.0*
	Dibenzo(a,h)anthracene	53-70-3	0.0009	C	0.00086	C	-- / 0.2[5]	1.0*
	Indeno(1,2,3-cd)pyrene	193-39-5	0.0092	C	0.0086	C	-- / 0.2[5]	--
	Phenanthrene	85-01-8	--	--	--	--	-- / 0.2[5]	--
	Pyrene	129-00-0	110	NC	110	NC	-- / 0.2[5]	--
Radionuclides	Gross alpha[4]	G_Alpha	--	--	--	--	1.25 rem/qtr	--
	Gross beta[4]	G_Beta	--	--	--	--		--
	Actinium-228	14331-83-0	--	--	--	--		--
	Bismuth-212	14913-49-6	--	--	--	--		--
	Bismuth-214	14733-03-0	--	--	--	--		--
	Cobalt-57	13981-50-5	--	--	--	--		--
	Cobalt-60	10198-40-0	--	--	--	--		--
	Lead-210	14255-04-0	--	--	--	--		--
	Lead-211	015816-77-0	--	--	--	--		--
	Lead-212	15092-94-1	--	--	--	--		--
	Lead-214	15067-28-4	--	--	--	--		--
	Potassium-40	13966-00-2	--	--	--	--		--
	Thallium-208	14913-50-9	--	--	--	--		--
	Thorium-227	15623-47-9	--	--	--	--		--
	Thorium-234	15065-10-8	--	--	--	--		--
	Thorium-232	7440-29-1	--	--	--	--		--
	Thorium-228	14274-82-9	--	--	--	--		--
	Thorium-230	14269-63-7	--	--	--	--		--
	Uranium-233/234	13966-29-5	--	--	--	--		--
	Uranium 235/236	15117-96-1	--	--	--	--		--
	Uranium-238	7440-61-1	--	--	--	--		--
	Radium-226	13982-63-3	--	--	--	--		--
	Radium-228	15262-20-1	--	--	--	--		--
	Actinium-227 (from Th-227)	14952-40-0	--	--	--	--		--
	Bismuth-210 (from Pb-210)	14331-79-4	--	--	--	--		--
	Bismuth-211 (from Pb-211)	15229-37-5	--	--	--	--		--
	Polonium-210 (from Pb-210)	13981-52-7	--	--	--	--		--
	Polonium-212 (from Bi-212)	13981-52-7	--	--	--	--		--
	Polonium-214 (from Bi-214)	15735-67-8	--	--	--	--		--
	Polonium-216 (from Pb-212)	15756-58-8	--	--	--	--		--
	Polonium-218 (from Pb-214)	15422-74-9	--	--	--	--		--
	Protactinium-231 (from U-235)	14331-85-2	--	--	--	--		--

TABLE 1
PRELIMINARY PROJECT SCREENING LEVELS
PERIMETER AIR MONITORING PLAN
(Page 5 of 8)

Parameter of Interest	Compound List	CAS Number	Ambient Air PRG[1] (µg/m³)	Basis	Ambient Air RBC[3] (µg/m³)	Basis	OSHA PELs[2] (ppm / mg/m³)	Reporting Limit (µg/m³)
Radionuclides (Continued)	Protactinium-234 (from Th-234)	15100-28-4	--	--	--	--	1.25 rem/qtr	--
	Radium-223 (from Th-227)	15623-45-7	--	--	--	--		--
	Radium-224 (from Pb-212)	13233-32-4	--	--	--	--		--
	Thallium-207 (from Pb-211)	14133-67-6	--	--	--	--		--
	Thorium-231 (from U-235)	14932-40-2	--	--	--	--		--
Radon	Radon-220	22481-48-7	--	--	--	--	4 pCi/L (EPA)	--
	Radon-222	14859-67-7	--	--	--	--		--
Aldehydes	Acetaldehyde	75-07-0	0.87	C	0.81	C	200 / 360	0.10*
	Chloroacetaldehyde	107-20-0	--	--	--	--	(C)1 / (C)3	--
	Dichloroacetaldehyde	79-02-7	--	--	--	--	--	--
	Formaldehyde	50-00-0	0.15	C	0.14	C	0.75 / --	0.050*
	Trichloroacetaldehyde	75-87-6	--	--	--	--	--	--
Semivolatile Organic Compounds	1,2,4,5-Tetrachlorobenzene	95-94-3	1.1	NC	1.1	NC	--	--
	1,2-Diphenylhydrazine	122-66-7	0.0084	C	0.0078	C	--	--
	1,4-Dioxane	123-91-1	0.61	C	0.57	C	100 / 360	0.37
	2,2'/4,4'-Dichlorobenzil (see 4,4'-Dichlorobenzil)	3457-46-3	--	--	--	--	--	--
	2,4,5-Trichlorophenol	95-95-4	365	NC	370	NC	--	5.0*
	2,4,6-Trichlorophenol	88-06-2	0.37	NC	0.63	C	--	5.0*
	2,4-Dichlorophenol	120-83-2	11	NC	11	NC	--	5.0*
	2,4-Dimethylphenol	105-67-9	73	NC	73	NC	--	5.0*
	2,4-Dinitrophenol	51-28-5	7.3	NC	73	NC	--	20*
	2,4-Dinitrotoluene	121-14-2	0.0099	C	7.3	NC	-- / 1.5	5.0*
	2,6-Dinitrotoluene	606-20-2	0.0099	C	3.7	NC	-- / 1.5	5.0*
	2-Chloronaphthalene	91-58-7	292	NC	290	NC	--	1.0*
	2-Chlorophenol	95-57-8	18	NC	18	NC	--	5.0*
	2-Methylnaphthalene	91-57-6	--	--	15	NC	--	1.0*
	2-Nitroaniline	88-74-4	0.11	NC	--	--	--	10*
	2-Nitrophenol	88-75-5	--	--	--	--	--	5.0*
	3,3-Dichlorobenzidine	91-94-1	0.015	C	0.014	C	--	20*
	3-Nitroaniline	99-09-2	0.32	C	--	--	--	10*
	4,4'-Dichlorobenzil	3457-46-3	--	--	--	--	--	--
	4-Bromophenyl phenyl ether	101-55-3	--	--	--	--	--	1.0*
	4-Chloro-3-methylphenol	59-50-7	--	--	--	--	--	5.0*
	4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	--	--	1.0*
	4-Chlorothioanisole	123-09-1	--	--	--	--	--	--
	4-Chlorothiophenol	106-54-7	--	--	--	--	--	--
	4-Nitroaniline	100-01-6	0.32	C	--	--	1 / 6	10*
	4-Nitrophenol	100-02-7	--	--	--	--	--	20*
	Acenaphthene (see Method 8310)	83-32-9	--	--	220	NC	--	1.0*
	Acenaphthylene (see Method 8310)	208-96-8	--	--	--	--	--	1.0*
	Acetophenone	98-86-2	--	--	370	NC	--	--
	Aniline	62-53-3	1.0	NC	1.1	NC	5 / 19	--
	Anthracene (see Method 8310)	120-12-7	--	--	1,100	NC	--	1.0*
	Azobenzene	103-33-3	0.062	C	--	--	--	--
	Benzo(a)anthracene (see Method 8310)	56-55-3	--	--	0.0086	C	--	1.0*
	Benzo(a)pyrene (see Method 8310)	50-32-8	--	--	0.002	C	--	1.0*
	Benzo(b)fluoranthene (see Method 8310)	205-99-2	--	--	0.0086	C	--	1.0*
	Benzo(g,h,i)perylene (see Method 8310)	191-24-2	--	--	--	--	--	1.0*
	Benzo(k)fluoranthene (see Method 8310)	207-08-9	--	--	0.086	C	--	1.0*
	Benzoic acid	65-85-0	14,600	NC	15,000	NC	--	30*
	Benzyl alcohol	100-51-6	1,095	NC	1,800	NC	--	--
	Benzyl butyl phthalate	85-68-7	730	NC	730	NC	--	5.0*
	bis(2-Chloroethoxy)methane	111-91-1	--	--	--	--	--	1.0*
	bis(2-Chloroethyl) ether	111-44-4	0.0061	C	0.0057	C	(C)15 / (C)90	1.0*
	bis(2-Chloroisopropyl) ether	108-60-1	0.19	C	0.18	C	--	1.0*
	bis(2-Ethylhexyl) phthalate	117-81-7	0.48	C	0.45	C	-- / 5	5.0*

TABLE 1
PRELIMINARY PROJECT SCREENING LEVELS
PERIMETER AIR MONITORING PLAN
(Page 8 of 8)

Parameter of Interest	Compound List	CAS Number	Ambient Air PRG[1] (µg/m³)	Basis	Ambient Air RBC[3] (µg/m³)	Basis	OSHA PELs[2] (ppm / mg/m³)	Reporting Limit (µg/m³)
Volatile Organic Compounds (Continued)	Methyl iodide	74-88-4	--	--	--	--	5 / 28	--
	MTBE (Methyl tert-butyl ether)	1634-04-4	3.7	C	1.6	C	--	0.37
	n-Butylbenzene	104-51-8	146	NC	--	--	--	2.8
	n-Propylbenzene	103-65-1	146	NC	--	--	--	--
	Nonanal	124-19-6	--	--	--	--	--	
	o-Xylene (see Xylenes (total))	95-47-6	--	--	--	--	--	0.44
	sec-Butylbenzene	135-98-8	146	NC	--	--	--	2.8
	Styrene	100-42-5	1,059	NC	1,000	NC	100 / --	0.43
	tert-Butylbenzene	98-06-6	146	NC	--	--	--	2.8
	Tetrachloroethene	127-18-4	0.32	C	0.31	C	100 / --	0.14
	Toluene	108-88-3	402	NC	5,100	NC	200 / --	0.38
	trans-1,2-Dichloroethene	156-60-5	73	NC	73	NC	--	0.40
	trans-1,3-Dichloropropene	10061-02-6	0.5	C	--	--	--	0.46
	Trichloroethene	79-01-6	0.017	C	0.016	C	100 / --	0.016
	Vinyl acetate	108-05-4	209	NC	210	NC	--	--
	Vinyl chloride	75-01-4	0.11	C	0.072	C	1 / --	0.026
	Xylenes (total)	1330-20-7	106	NC	110	NC	100 / 435	--
	Tentatively Identified Compounds (TICs)		--	--	--	--	--	--
Water Quality Parameters	Conductivity	COND	--	--	--	--	--	--
	Hardness, total	Hardness	--	--	--	--	--	--
	Total dissolved solids	TDS	--	--	--	--	--	--
	Total suspended solids	TSS	--	--	--	--	--	--
	Alkalinity, Total (as $CACO_3$)	ALK	--	--	--	--	--	--
	Bicarbonate alkalinity	71-52-3	--	--	--	--	--	--
	Carbonate alkalinity	3812-32-6	--	--	--	--	--	--
	Hydroxide alkalinity	OH-ALK	--	--	--	--	--	--
Flashpoint	Flammables	NA	--	--	--	--	--	--
Total Petroleum Hydrocarbons	Diesel	64742-46-7	--	--	--	--	--	--
	Gasoline	8006-61-9	--	--	--	--	--	--
	Grease	68153-81-1	--	--	--	--	--	--
	Mineral Spirits	NA	--	--	--	--	--	--
White Phosphorus	White phosphorus	12185-10-3	--	--	--	--	--	--
Methyl Mercury	Methyl mercury	22967-92-6	--	--	0.37	NC	-- / 0.01	--

[1]From USEPA Region 9 preliminary remediation goals (PRG) table, October 2004 (and August 2004 for radionuclides).

[2]Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs) are from Tables Z-1 and Z-2 of 29 CFR 1910.1000. The values given are 8-hour time weighted averages (TWAs) in ppm and/or mg/m^3. A (C) designation denotes a ceiling limit value. PAH values are for coal tar pitch.

[3]From USEPA Region 3 risk-based concentrations (RBC) table, April 2006.

[4] For Gross Alpha and Gross Beta, the action levels are set at 25 millirem per year above background.

*In units of µg, for an unknown sample volume.

The specific action level for a given constituent shall be the more conservative of the listed criteria.

Cells with shading reflect those entries with relatively low risk thresholds, as discussed in the main text

Basis: C = carcinogenicity; NC = non-carcinogenicity; SAT = soil saturation (see USEPA Region 9 PRG Table); MAX = ceiling limit (see USEPA Region 9 PRG Table).

-- = Not applicable or no value has been established.
NE = No toxicity criteria established.

Attachment A

Example Forms

AIR MONITORING RECORD FOR DAILY AIR SAMPLES

CLIENT	LOCATION	JOB NUMBER
DATE COLLECTED	COLLECTED BY	CONTAMINANT
SAMPLING STATION	NAME OF CURRENT ACTIVE EXCAVATION OR REMEDIATION AREA	
SAMPLING METHOD OR MEDIA	CALIBRATION METHOD/DATE	

SAMPLE I.D.	EQUIPMENT MAKE/I.D.	TIME ON	TIME OFF	TOTAL TIME	START FLOW	END FLOW	AVG. FLOW	VOLUME	RESULTS

COMMENTS

SAMPLER

DATE

AIR MONITORING RECORD
RAM/MiniRAM MEASUREMENTS

Time	Date	LOCATION (upwind/downwind, reference figure for station location)	INSTRUMENT RAM/MiniRAM	Concentration (mg/m^3)	Recorded by

EQUIPMENT CALIBRATION RECORD

(Per Manufacturer's Instructions)

INSTRUMENT MANUFACTURER/NAME:					
MODEL:					
SERIAL NUMBER:					
CALIBRATION GAS OR STANDARD:					
DATE	CALIBRATED BY	STANDARD (±)	READING	INITIALS	COMMENTS

Note: Dust monitor only requires that the instrument be zeroed prior to each days use.