URS

REVISED
SITE ASSESSMENT PLAN
5736 WEST JEFFERSON STREET
PHOENIX, ARIZONA

Prepared for:
VEOLIA ES TECHNICAL
SOLUTIONS, L.L.C.

URS Job No. 23444922
August 2007

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FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

ADEQ	Arizona Department of Environmental Quality
AHWMA	Arizona Hazardous Waste Management Act
AOC	Area of Concern
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene and total xylenes
COC	Chain-of-custody
DPT	Direct push technology
EPA	Environmental Protection Agency
FIRM	Flood Insurance Rate Maps
GPL	Groundwater Protection Level
HASP	Health and Safety Plan
HID	High intensity discharge
MCMAs	Mercury-containing lamps and manufactured articles
OSHA	Occupational Safety and Health Administration
PID	Photo-ionization detector
PPE	Personal Protective Equipment
PAH	Polynuclear aromatic hydrocarbons
QA/QC	Quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RPD	Relative percent difference
SP	Site Assessment Plan
SRL	Soil Remediation Level
SWMU	Solid Waste Management Unit
USGS	U.S. Geological Survey
Veolia	Veolia ES Technical Solutions, L.L.C.
VOCs	Volatile organic compounds

1.0 INTRODUCTION

URS Corporation (URS) has prepared this Site Assessment Plan (SP) for the Veolia ES Technical Solutions, L.L.C. (Veolia) facility ("the Site") in accordance with Part IV of the Arizona Hazardous Waste Management Act (AHWMA) permit. The Arizona Department of Environmental Quality (ADEQ) has determined that corrective action is required for one Solid Waste Management Unit (SWMU) and one Area of Concern (AOC) at the facility.

This SP includes site-specific methods and procedures that will be followed during the site assessment, including pre-mobilization activities, sampling rationale, sample collection, sample handling and preservation, sample analysis, quality assurance/quality control (QA/QC) requirements for sampling, site restoration, and reporting. A site-specific Health and Safety Plan (HASP) is included as an attachment to this SP. In addition, the following provisions are included in this SP:

- Provision for expanding the SP if contamination is found to have migrated;
- Provision for the submittal of a Site Assessment Report;
- Provision for the submittal of a Remedial Plan; and
- Provision for a request of a Finding of No Further Action from ADEQ.

1.1 PHYSICAL LOCATION AND DESCRIPTION OF PROPERTY

The approximately 1.83 acre Site is located at 5736 West Jefferson Street in Phoenix, Maricopa County, Arizona (Figure 1). The Site is located north of Jefferson Street and East of 59th Avenue and is approximately 6 miles west of downtown Phoenix and approximately 1 mile south of Interstate 10. The area surrounding the Site is currently used primarily for industrial, manufacturing, and distribution purposes. The Site is currently zoned A-1, Light Industrial District, by the City of Phoenix. Figure 2 provides a facility layout and site plan to scale.

A Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was conducted at the Site which identified eight SWMUs and one AOC. The SWMUs and AOC described in the AHWMA Permit include the following:

- SWMU 1: Former Lamp Storage ICU Area, northwest corner of the facility, north of building one, no further investigation is required;
- SWMU 2: Present Lamp Storage Building (Storage Area 1), no further investigation is required;

- SWMU 3: Present Lamp Storage Area in Building 1, no further investigation is required;
- SWMU 4: Drywells South of the Buildings, no further investigation is required;
- SWMU 5: Drywells in Truck Wells, no further investigation is required;
- SWMU 6: Drywells North of the buildings, no further investigation is required;
- SWMU 7: Waste Storage Areas in Building 4, no further investigation is required;
- SWMU 8: Former Outdoor Storage Area North of Building 4, SP required; and
- AOC 1: Former Outdoor Paint Booth North of Building 1, SP required.

The facility consists of four one-story buildings totaling 32,744 square feet of floor space. Buildings 1 and 2, as well as Buildings 3 and 4, share a common wall (Figure 2). The buildings are constructed of concrete masonry block exterior and separating walls. The buildings each have similar parking and landscaping to the front, single truck wells, fenced rear storage areas, and three service doors to the warehouse areas. The service doors include two 10-foot by 12-foot and one 10-foot by 14-foot overhead doors.

The Site is entirely enclosed. The Site is surrounded by a 6-foot high concrete wall topped with coiled barbed wire on the north, west, and east sides (Figure 2). The south side allows access to the truck wells but is enclosed by chain link gates that are topped with three strands of barbed wire.

Also constructed on the property is a lamp storage building which is located at the northwest corner of the property. The building measures 80 feet in length (west to east), 30 feet in depth (south to north), and 14 feet in height. The building is constructed of metal beam frame with sheet metal exterior and roofing. There is no constructed floor to the building, but rather asphaltic pavement. This pavement is bermed around the interior perimeter of the building frame, which prevents precipitation run-on into the building. Stored materials are placed on pallets or are drummed.

Except for the lamp storage building, floors are cast-in-place concrete slabs (Portland Type-II). The concrete floors have not been treated with an epoxy coating or other similar sealant; however, materials are not stored directly on any concrete surface. As stated above, the hazardous waste storage building has an asphalt base with a perimeter berm to prevent run-on into the building. The same berm system will prevent any surface migration of materials that may be generated from within the building. Asphalt is in place in the exterior storage areas.

The following permitted hazardous waste processing areas are located at the site (Figure 2):

- Building 1 contains mercury processing and maintenance areas that process, handle and store fluorescent lamps, high intensity discharge (HID) lamps, and miscellaneous mercury containing manufactured articles (MCMA) under a RCRA permit issued by ADEQ;

- Building 2 contains a polychlorinated biphenyl (PCB) processing and maintenance area for the processing, handling and storage of transformers that contain PCBs under a permit issued by the U.S Environmental Protection Agency (EPA);

- Building 3 contains a processing and maintenance area for the processing, handling and storage of ballasts that contain PCBs under the same EPA permit;

- Building 4 contains storage areas.

There are no water wells, sumps, septic tanks, surface waters, industrial sewers, storm sewers, canals, irrigation or discharge ditches on the property. The facility is connected to the City of Phoenix water distribution and sanitary sewer systems and discharges to the sanitary sewer located along Jefferson Street (Figure 2).

A total of 11 active and inactive drywells are located on the property (Figure 2). Four of the Class V dry wells have been welded and sealed shut to prevent any hazardous wastes or hazardous waste constituents from entering the wells. ADEQ was notified of the drywell closures in correspondence dated January 17, 2002. Another four of the Class V dry wells located within the truck loading docks were sealed over. Three of the drywells are currently active; they receive and drain storm water runoff from the south (non-industrial) side of the facility (e.g., employee parking area) as shown on the site drainage pattern (Figure 3). A berm between Buildings 2 and 3 prevents stormwater from the process areas from entering these drywells. Water drainage on the north (industrial) side of the property is influenced by the sloping of asphalt and concrete traffic control and parking areas. The drainage pattern on the north side directs storm water runoff to collect and evaporate on the asphalt-paved storage areas (Figure 3).

1.2 TOPOGRAPHY

According to the U.S. Geological Survey (USGS) Fowler, Arizona (1952, photorevised 1982) 7.5-minute topographic quadrangle map, the subject property is located in the southwest quarter of the northwest quarter of Section 8, Township 1 North, Range 2 East of the Gila and Salt River Base and Meridian. The elevation of the subject property is approximately 1,050 feet above mean sea level. The general topography of the site is flat.

1.3 GEOLOGY

The site is located in the Salt River Valley, which is a broad alluvial basin within the Basin and Range physiographic province. The basin is almost completely surrounded by mountains composed primarily of granitic, metamorphic, and volcanic rocks and minor amounts of consolidated sedimentary rocks. The valley floor is underlain by unconsolidated to semi-consolidated basin-fill sediments. Sedimentary deposits in Salt River Valley area the form the main water-bearing units and consist mainly of unconsolidated and weakly consolidated clay, silt, sand, and gravel. The main water-bearing unit ranges in thickness from a few tens of feet near the mountains to more than 1,200 feet in the central part of the area (Cooley 1973).

1.4 HYDROLOGY

The depth to groundwater in the area of the subject property is approximately 60 feet (Rascona 2005). The general direction of groundwater flow in the vicinity of the subject property is to the northwest.

According to the current Flood Insurance Rate Maps (FIRM), the Site is not located within the 100-year floodplain.

2.0 FIELD SAMPLING PLAN

2.1 SAMPLE LOCATION, DEPTH, AND ANALYSES RATIONALE

ADEQ has determined that corrective action is required for SWMU 8 and AOC 1 at the Site due to a moderate potential of a release to soil and groundwater. In order to further assess the potential for a release, soil borings will be advanced and soil samples will be collected and analyzed for select analytes. The number of soil borings and samples are based on the area for both SWMU 8 and AOC 1.

2.1.1 SWMU 8

As described in the RFA, SWMU 8 is the Former Outdoor Storage Area North of Building 4. Based on the Site map, the area is 3,850 square feet. According to Veolia ES management, the top layer of asphalt at the SWMU 8 area was replaced in March of 2003. There was no excavation of subsurface soils; only a new layer of asphalt was installed. To adequately cover the area, a total of six sample locations will be spaced in a grid system within this area (Figure 2). The southern east-west grid line containing three sample locations will be placed approximately 10 feet north of the northern wall of Building 4. The northern east-west grid line will be placed approximately 30 feet north from the central grid line. The three north-south grid lines containing two sample locations will be spaced at approximately 25 feet apart to cover the length of Building 4. Placing sample locations close to the bay doors of Building 4 and in middle of the storage area will assess spillage, if any, of waste that was placed in the outdoor storage area. If large cracks are observed near the sample locations, the location will be moved and drilling activities will be conducted at or near the crack, as the crack may be a conduit for suspected contamination to soil.

Soil sample analytes were chosen based on the RFA. According to the RFA, drums of waste oil and/or lubricants were stored in SWMU 8 in 1991. In addition, open boxes of baghouse filters, drums of lamps and mercury-containing lamps and manufactured articles (MCMAs), and boxes of retort residue, mercury debris, and PPE have been stored on the asphalt north of the buildings and/or along the west fence line. Therefore, analytes selected include eight RCRA metals by EPA Method 6010B/7471A, volatile organic compounds (VOCs) by EPA Method 8260B, and polynuclear aromatic hydrocarbons and semi-volatile organic compounds (SVOCs) by EPA Method 8270. Analysis of PAH and SVOC compounds is required due the possible presence of those constituents as additives in hydrocarbons and in waste lubricants that were previously stored in SWMU 8. VOC analysis is required due the possible presence of benzene, toluene, ethylbenzene and total xylenes (BTEX) constituents in hydrocarbons that were previously stored in SWMU 8. VOCs will be

analyzed at low level laboratory reporting limits to ensure that the reporting limits are below the appropriate regulatory standard and the reported data are meaningful for the site assessment.

It is anticipated that contamination, if any, would be relatively shallow due to the asphalt cover. Therefore, three samples will be collected at each location. The first sample will be collected at a depth interval of 6 inches to 1 foot below ground surface (bgs), or a 1-foot interval beginning at the bottom of the asphalt cover. The second sample will be collected at an interval of 3 feet to 4 feet bgs. The third sample will be collected at an interval of 9 feet to 10 feet bgs. As a contingency, a fourth sample will be collected at approximately 15 feet bgs. Three of the six samples collected at 10 feet bgs and all six samples collected at 15 feet bgs will be preserved for later analysis depending on the results of the shallower samples.

2.1.2 AOC 1

As described in the RFA, AOC 1 is the Former Outdoor Paint Booth North of Building 1. Based on the Site map, the area is approximately 100 square feet. According to Veolia ES management, the top layer of asphalt at the AOC 1 area was replaced in March of 2003. There was no excavation of subsurface soils; only a new layer of asphalt was installed. Because there is no physical indication where the former paint booth was located, and it no longer exists, the outline of the area will be marked and measured off of the northeastern corner of Building 1. Due to the uncertainty of the orientation and configuration of doors at the former paint booth, three sample locations will be placed outside of the approximate footprint (Figure 2). The exact locations will be placed based upon field investigation to determine surface water run-off direction of the area.

Soil sample analytes were chosen based on RFA. According to the RFA, a former occupant of Building 1, Graphic Technical Services, applied for an installation permit for a paint booth to be located north of Building 1 in 1997. Based on the limited information, analytes selected include eight RCRA metals by EPA Method 6010B/7471A, and VOCs by EPA Method 8260B due to the possible presence of lead-based paints or VOCs in the paint compounds. VOCs will be analyzed at low level laboratory reporting limits to ensure that the reporting limits are below the appropriate regulatory standard and the reported data are meaningful for the site assessment.

It is anticipated that contamination, if any, would be relatively shallow due to the asphalt cover. Therefore, three samples will be collected at each location on the east and west sides of the former paint booth and four samples will be collected at one location on the north (downgradient) side of the former paint booth. The first sample will be collected at a depth interval of 6 inches to 1 foot bgs, or a 1-foot interval beginning at the bottom of the asphalt cover. The second sample will be collected at an interval of 3 feet to 4 feet bgs. The third sample will be collected at an interval of 9 feet to 10 feet bgs. Also a contingency, a fourth sample will be collected at approximately 15 feet bgs on the north

(downgradient) side of the former paint booth. The third samples collected on the east and west sides and the fourth sample collected on the north side will be preserved for later analysis depending on the results of the shallower samples.

2.1.3 Background Samples

Historical analytical results for the site have not detected elevated concentrations of contaminants, and analyte detections for samples collected during this site assessment are anticipated to be near or below the laboratory reporting limits. With this in mind and the fact that the total number of samples required in this plan is relatively small, no background samples will be collected.

2.2 PRE-MOBILIZATION ACTIVITIES

The primary focus of pre-mobilization activities will be to establish safe Site access and provide for the health and safety of URS personnel, subcontractors and the surrounding area before the start of excavation activities. The components of pre-mobilization include the following tasks.

2.2.1 Site-Specific Health and Safety Plan (HASP)

A written HASP is required for hazardous waste investigations and remediation according to the Occupational Safety and Health Administration (OSHA), Code of Federal Regulations 1910.120(b). A project-specific HASP will be prepared to govern the field work activities at the Site. The discussion below provides brief descriptions of key elements of the Site-Specific HASP, which includes the decontamination procedures, dust control procedures, air monitoring procedures, and personal protective equipment (PPE) requirements. The HASP is included as Appendix A.

2.2.2 Utility Location and Services

The Arizona Blue Stake "one call" system will be contacted to locate active utilities up to the utility meters. In addition, a private utility locator service will be contacted to locate and mark private utilities. Located utilities will be feather flagged or offset staked, as necessary. If a proposed sample location is above a known utility corridor, the sample location will be offset to clear the utility.

2.3 SAMPLE COLLECTION AND ANALYSES

An Arizona-licensed drilling contractor will be selected to conduct soil sampling activities. The drilling contractor will core a 6-inch diameter hole in the asphalt at each sample location prior to drilling activities. Soil borings will be advanced using a direct push technology (DPT) drill rig. During drilling, the operator's breathing zone will be monitored for VOCs using a photo-ionization detector (PID). The soil boring will be terminated when one of the following conditions is realized:

- Refusal is encountered;
- The soil boring reaches the proposed depth for that specific location.

If refusal is encountered before the depth at which the deepest sample is to be collected, the borehole will be moved a minimum of five feet and re-drilled. If refusal is encountered again, a soil sample will be collected directly above the depth of refusal.

Using the DPT rig, soil samples will be collected in a decontaminated coring tube with a clean 1-inch diameter by 4-foot long acetate liner. When the drill bit reaches the sampling point, the sampler assembly will be advanced into soil ahead of the drill bit by driving the assembly with a hydraulic hammer or a sliding hammer. The 4-foot long acetate liner will be removed from the coring tube and cut into approximately 9-inch lengths. The portion of the liner that contains soil from the appropriate sampling depth will be retained and packaged for analysis. The acetate sleeve retained for analysis will contain approximately 7 cubic inches (approximately 250 grams) of soil. Alternatively, soil samples may be collected using a decontaminated split spoon sampler lined with a set of three 1-inch diameter by 3-inch long clean brass sleeves. Each brass sleeve will contain approximately 83 grams of soil.

Soil collected in the acetate liner or brass sleeves will be packaged and preserved in accordance with ADEQ guidance (ADEQ 1997). Three 5-gram subcores of the sample in the acetate liner or brass sleeve will be extracted for VOC analysis using Encore™ samplers. The three Encore™ subcores and the acetate liner or brass sleeve containing the remaining soil will be packaged and preserved. The residual soil in the acetate liner or brass sleeve will be analyzed for RCRA metals, PAHs and/or SVOCs as described in Sections 2.1.1 and 2.1.2, and reserved for subsequent analysis if needed. The acetate liner or brass sleeve will be packaged by covering each end with a square of Teflon™ sheet, a square of aluminum foil, and a tight-fitting plastic end cap. The packaged sample will be labeled as described in Section 2.3.2 below, placed in a re-sealable plastic bag, then placed in a cooler with wet ice for preservation.

For each soil sample collected, soil from an adjacent 9-inch long section of acetate liner or three 3-inch long brass sleeves will be field screened for the presence of VOCs by testing gas headspace readings using the PID. The soil will be extruded from the container directly into a re-sealable plastic bag, the bag will be sealed, the soil sample will be disaggregated by gently kneading the soil. The sample will be allowed to set for approximately 10 minutes to allow vapors to equilibrate in the bag headspace. After equilibration the PID probe will be inserted into the head space of the re-sealable plastic bag and the highest PID reading recorded in the field notes in units of parts per million.

Samples will be submitted for analysis such that they will be extracted and analyzed prior to the maximum hold times allowed for the preservation method and analytical method selected, as shown in Table 1 below.

Table 1
Analytical Methods, Extraction and Analysis Hold Times

TEST NAME	METHOD	EXTRACT HOLD TIME	ANALYSIS HOLD TIME
VOCs	SW8260B	48 Hours	14 Days
SVOCs, PAHs	SW8270	7 days	14 Days
RCRA Metals (Except Hg)	SW6010B	N/A	6 Months
Mercury	SW7471A	N/A	28 Days

After sampling is completed, the core holes will be backfilled with bentonite and the asphalt will be backfilled and compacted with asphalt patch.

2.3.1 Sample Handling and Preservation

Sample containers will be placed in re-sealable plastic storage bags and wrapped in protective packing material, as necessary. Each soil sample will be stored in an iced cooler immediately after collection until the samples are delivered to the appropriate laboratory. The packaged soil samples will be covered with wet ice to maintain a temperature range of 2°C to 6°C until the samples are delivered to the appropriate laboratory. A temperature blank will be provided in each cooler so the laboratory can verify the sample temperatures upon receipt.

Contingency soil samples collected at a depth of approximately 15 feet will be held and preserved for later analysis depending on the results of the shallow samples. Contingency samples also will be extracted using three Encore™ samplers, and the Encore™ samples and acetate liners or brass sleeves will be packaged and preserved as described above in Sections 2.1 and 2.3. Contingency samples will be submitted to the analytical laboratory for preservation and storage at the appropriate temperature and security to insure that the sample quality and integrity are not compromised. When preliminary analytical results are received, or no longer than 14 days from the sample collection date, a decision will be made whether to analyze or dispose of the contingency samples.

Chain-of-custody forms (COC forms) will be provided by the contract laboratory. The sampler will document sample identification, time and date of collection, matrix, and analytical method or parameter to be used on the COC form. One COC form will be filled out per ice chest. When the COC form is completed the sampler will cross-check the COC form for possible errors. If any errors were made in the field, the sampler will make the necessary changes on the COC form prior to delivery to the laboratory.

When transferring samples, the individuals relinquishing and receiving will sign, date, and note the time on the COC form. This record documents sample custody transfer from the sampler, often through another person, to the analyst at the laboratory. The top two copies of the COC form accompany the sample cooler and the third copy is retained by the field sampler. COC forms for each cooler will be placed in a re-sealable plastic bag and delivered inside the cooler.

The decision to ship samples to an out of town laboratory may be warranted to obtain quicker turn-around time or lower analytical costs. If such is the case, samples will be shipped for overnight express delivery to an Arizona-licensed laboratory. The cooler will be packaged with double-bagged wet ice and wrapped with shipping tape at two locations to secure the lid. Custody seals with the sampler's signature and the date will be placed on the outside of each cooler to identify if the integrity of the containers has been compromised.

2.3.2 Field Documentation

A field supervisor will direct sampling activities and will be responsible for maintaining the following field documentation:

- A geologic log for each boring describing and classifying the soil and indicating the samples submitted for analyses
- The sample container labels and COC forms
- Health and safety documentation as required by the Health & Safety Plan
- A soil sampling data sheet to record the following:
  - Sampling date and time
  - Boring number and depth of sample
  - Sample identification as written on container labels, with blind QC samples identified and referenced to the respective primary sample or collection location
  - QC type (P0 = primary sample, D1 = duplicate sample, or EB = field equipment blank)
  - Other observations or comments such as sample odor, or sample color.

In addition, a daily field report will be made in a field notebook that records field activities and pertinent data that are not included on the other forms described above. Information in the field report will include the following: general site conditions, daily weather, arrival and departure of subcontractors and visitors, equipment used onsite, equipment problems, and other relevant information.

Sample labels will be filled out and numbered using waterproof ink. Labels may be partially completed prior to sample collection; however, the date, time, sampler's initials, and the sample identification number will not be completed until the time of sample collection. At a minimum, each label will include the following information:

- Project name
- Sample location
- Sample depth
- Sample type
- Sampler's company affiliation
- Date and time of sample collection
- Analyses required
- Sampler's initials

2.4 QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance (QA) parameters are the quantitative and qualitative indicators used to describe the quality of the site assessment effort. QA parameters include: precision, accuracy, representativeness, completeness, and comparability. Field quality control (QC) samples are designed to help identify potential sources of sample contamination in original field samples and evaluate potential errors introduced by sample collection and handling. Field QC samples include trip blanks, field blanks, equipment blanks, and field duplicates.

2.4.1 Trip Blanks

Trip blanks are analyzed with field samples to evaluate the accuracy of VOC analyses by demonstrating potential bias introduced during sample handling. Each cooler containing samples designated for VOC analyses will contain an aqueous trip blank provided by the laboratory. The trip blank will remain sealed and accompany the environmental samples throughout the sampling procedure.

2.4.2 Field Blanks

Field equipment blanks are intended to check for background contamination resulting from the sampling environment. Field blanks will not be collected for this task.

2.4.3 Equipment Blanks

Equipment blanks are analyzed to evaluate the effectiveness of field decontamination procedures. Equipment blanks will be collected by pouring distilled water over decontaminated equipment and collecting the rinsate directly into sample containers. Equipment blanks will be analyzed for all parameters evaluated in the associated samples. One equipment blank will be collected prior to the initiation of field activities at the Site.

2.4.4 Field Duplicates

Field duplicate samples are samples collected at the same time a field original sample is collected to check for the natural sample variance and the consistency of both field techniques and laboratory analyses. The field duplicate sample will be handled in the same manner as the field original sample. Agreement between duplicate sample results indicates good sampling and analytical precision. The precision goal for field duplicate analyses will be plus or minus a 35 relative percent difference (RPD). Field duplicates will be collected at a frequency of 10 percent of primary samples. Based on the number of proposed primary samples (30), three field duplicate samples will be collected and analyzed for the same analytes as the corresponding primary samples.

Each field duplicate sample will be packaged as an individual sample separate from the corresponding primary sample and labeled with a fictitious sample identification number and sample collection time such that the duplicate sample is "blind" and the analytical laboratory cannot identify it with the corresponding primary sample.

2.4.5 Cross Check Laboratory

Another method of checking quality assurance of laboratory analytical results is to submit duplicate samples to a different laboratory. Historical analytical results for the site have not detected elevated concentrations of contaminants, and analyte detections for samples collected during this site assessment are anticipated to be near or below the laboratory reporting limits. With this in mind and the fact that the total number of samples required in this plan is relatively small, no samples will be submitted to a different laboratory for cross checking of analytical results.

3.0 PROVISIONS

This section includes provisions to the SP, in accordance with Part IV, Section L of the AHWMA Permit. The following provisions will be discussed:

- Provision for expanding the SP if contamination is found to have migrated;
- Provision for the submittal of a Site Assessment Report;
- Provision for the submittal of a Remedial Plan; and
- Provision for a request of a Finding of No Further Action from ADEQ.

3.1 PROVISION TO EXPAND THE SP

In the event that contamination is found in the soil boring samples and is thought to have migrated from the source, the SP will be amended to add a revised sampling rationale and additional sample locations to define the lateral and vertical extent of contamination. The amendment will re-examine the surface water drainage direction based on field observations. This will assist in locating the additional sample locations. The SP will be expanded to examine whether contamination has migrated laterally, vertically, or both. Additionally, an assessment will be made to determine whether contamination has migrated offsite.

In the case that contamination is believed to have migrated laterally, additional borings will be added at a minimum distance of 20 feet from the original borings. In the case that contamination is believed to have migrated offsite, proper permits will be filed and access agreements obtained to continue the assessment on neighboring properties.

In the case that contamination is believed to have migrated vertically, the SP will be expanded to include additional borings at or near the location of the original borings. The borings will be drilled to a depth 30 feet above the expected depth to groundwater and soil samples collected at 10-foot intervals to assess for the vertical extent of contamination.

3.2 PROVISION TO SUBMIT A SITE ASSESSMENT REPORT

A Site Assessment Report will be submitted to ADEQ within 60 days of completion of the SP field activities, including the results of the provision to expand the SP, if necessary. The Site Assessment Report will include the following:

- A tabulated and narrative summary of analytical results for all samples and constituents tested, significant observations, and conclusions.
- A detailed discussion of the sampling method followed for each site.
- The equipment and procedures used to prevent hazards and protect field personnel.
- Field notes, drawings, and photographs, where appropriate.
- Description of any deviations from the approved SP.
- Data generated from sampling and analysis activities.

3.3 PROVISION TO SUBMIT A REMEDIAL PLAN

If any hazardous constituents are found above the applicable Arizona Soil Remediation Level (SRLs) or Groundwater Protection Levels (GPLs), a Remedial Plan will be submitted to ADEQ. The Remedial Plan will describe the methods and procedures to: remediate soil, collect and analyze confirmation samples to verify remediation is complete, profile and dispose of waste material in an appropriate manner, and report on the results of the remedial action.

3.4 PROVISION TO REQUEST A FINDING OF NO FURTHER ACTION

If the Site Assessment Report concludes that no hazardous constituents are found above the SRLs or GPLs, a request of a Finding of No Further Action will be filed with ADEQ.

4.0 REFERENCES

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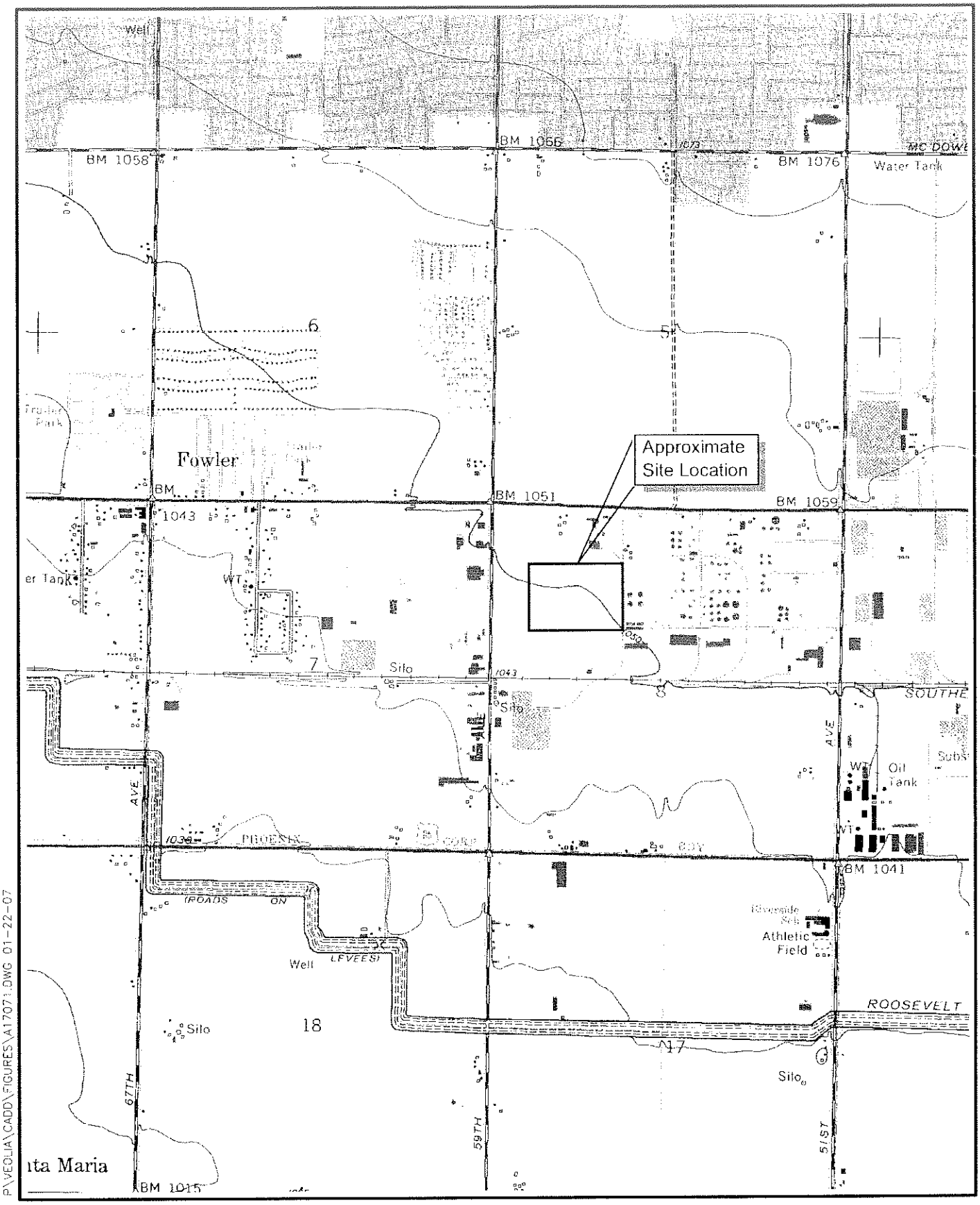
U.S. Geological Survey (USGS). 1952. 7.5-Minute Series Topographic Map, Fowler, Arizona, (photorevised 1982).

Rascona, S.J., 2005. Maps Showing Groundwater Conditions in the Phoenix Active Management Area, Maricopa, Pinal, and Yavapai Counties, Arizona - Nov. 2002-Feb. 2003. Arizona Department of Water Resources Hydrologic Map Series Report No. 35.

FIGURES



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Reference: USGS Topographic Quad,
Fowler, AZ 1952, Photorevised 1982.

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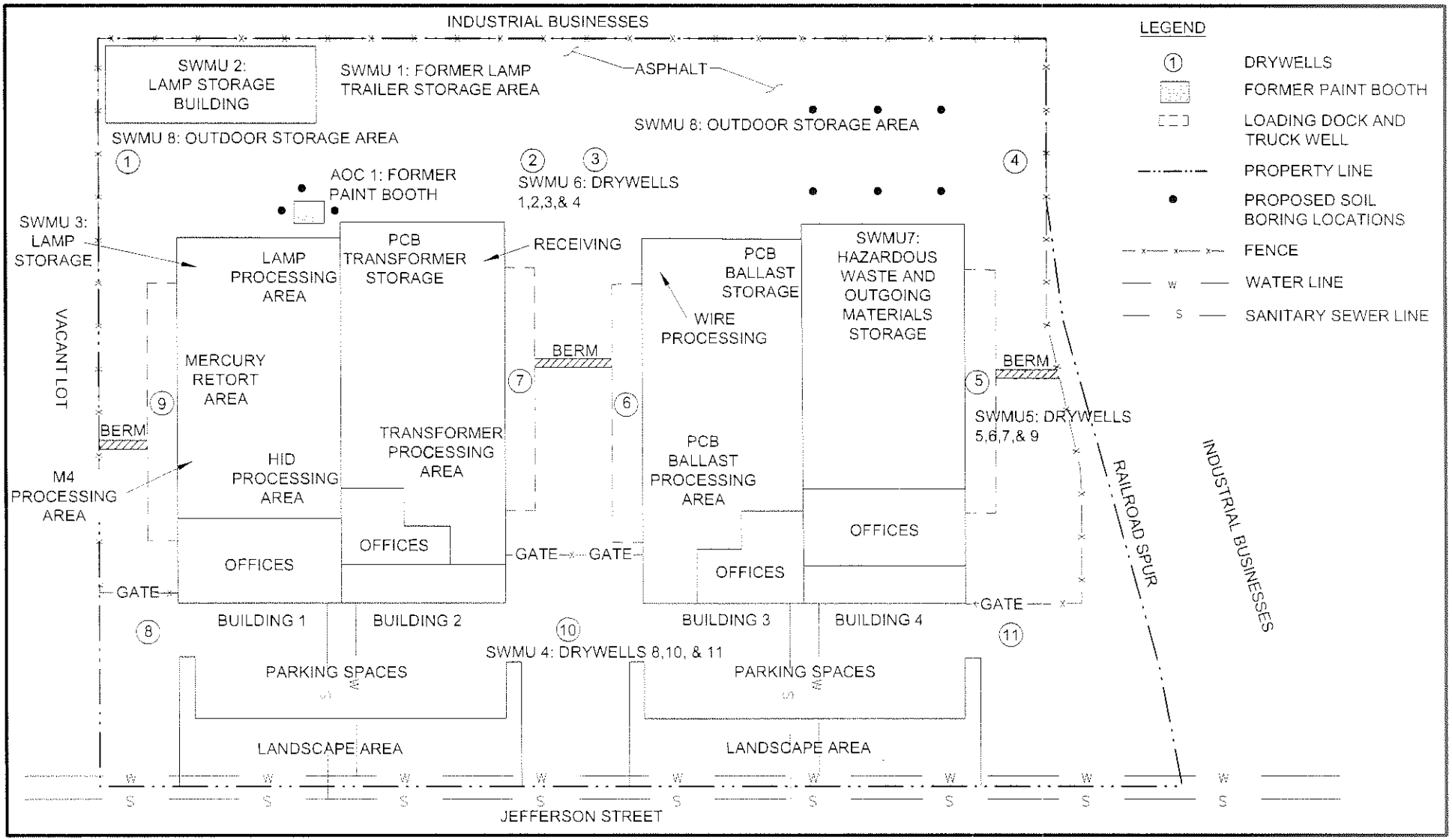
0 1/2

Scale in Miles

Site Location Map

Site Assessment Plan
Veolia ES Technical Solutions, LLC
5736 West Jefferson Street
Phoenix, AZ

Figure 1



N

0 50 100

SCALE IN FEET

Site Plan

Site Assessment Plan
Veolia ES Technical Solutions, LLC
5736 West Jefferson Street
Phoenix, AZ

Figure 2

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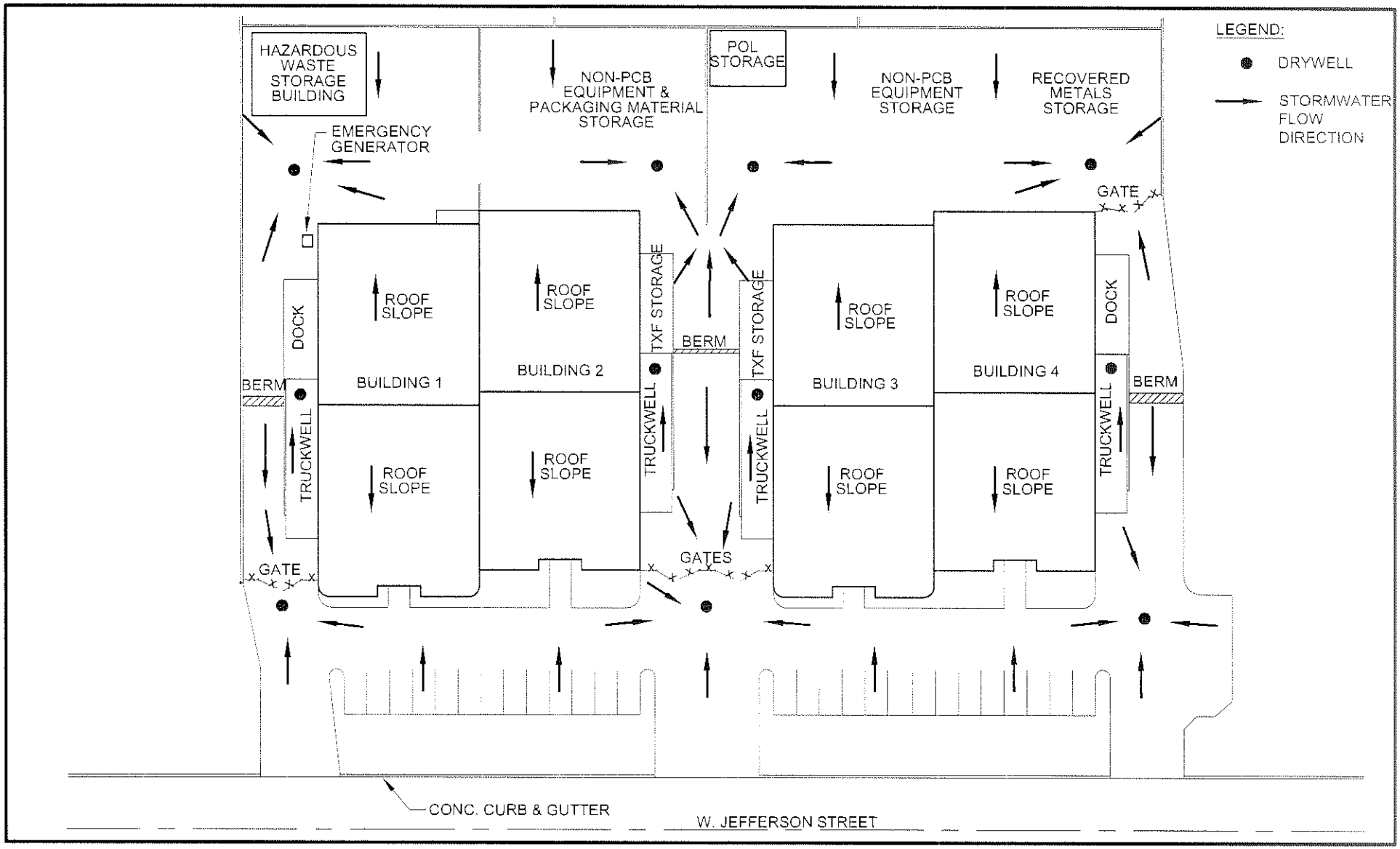

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Not to Scale

Site Drainage

Site Assessment Plan
Veolia ES Technical Solutions, LLC
5736 West Jefferson Street
Phoenix, AZ
Figure 3

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HEALTH AND SAFETY PLAN
SITE INVESTIGATION
VEOLIA ES TECHNICAL SOLUTIONS
5736 W JEFFERSON ST
PHOENIX, ARIZONA
85043

PREPARED BY:
URS CORPORATION

JANUARY 19, 2007

HEALTH AND SAFETY PLAN

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Project Manger:	**Adam Kneeling**
Site Manager:	
URS Site Safety Officer:	**Adam Kneeling**
Plan Preparer:	**Erik Bratz**
Preparation Date:	**January 19, 2007**
Expiration Date:	**January 19, 2008**

APPROVALS:

Timothy C. Joseph 8/10/07

Tim Joseph, CIH
Regional Health and Safety Representative Date

Lisa Gregory 8/10/07

Lisa Gregory
Health and Safety Representative Date

David Palmer 8/8/07

David Palmer
Project Manager Date

This Health and Safety Plan is valid only for this specific project as described in Section 1.0. It is not to be used for other projects or subsequent phases of this project without the written approval of the Regional Health and Safety Manager. **A copy of this plan will be maintained on site and readily available during site activities.**

TABLE OF CONTENTS

GLOSSARY OF TERMS, ACRONYMS, AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
°C	centigrade
Carcinogen	a substance that can cause cancer
CFR	Code of Federal Regulations
CRZ	contamination reduction zone
DERA	Designated Emergency Response Authority
DOT	Department of Transportation
°F	Fahrenheit
HSP	Health and Safety Plan
ICP	inductively coupled plasma
kg	kilogram
MSDS	Material Safety Data Sheet
mg	milligram
mg/m^3	milligrams per cubic meter
ND	not detected
NIOSH	National Institute for Occupational Safety and Health
OBZ	operator's breathing zone
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
PM	project manager
PVC	polyvinyl chloride
REL	Recommended Exposure Limit
RHSM	Regional Health and Safety Manager
RSRL/NRSRL	Residential Soil Remediation Level/Non-Residential SRL
SMS	Safety Management Standard
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
TCLP	Toxicity Characteristic Leaching Procedure
TLV	Threshold Limit Value
TSP/PM_{10}	total suspended particulates/ particulate matter less than 10 microns
URS	URS Corporation and Subsidiaries
µm	micrometer
VEMUR	Voluntary Environmental Mitigation Use Restriction

2.0 APPLICABILITY

The purpose of this Plan, which was developed specifically for operations at **5736 W Jefferson Phoenix, Arizona,** is to assign responsibilities, present hazard information, establish personal protection standards and mandatory safety procedures, and provide contingencies that may arise while operations are being conducted at the site. All site work will be conducted in accordance with requirements of the URS Health and Safety Program and Management System, which is available on the Internet at www.urshse.com. All site work will also be conducted in accordance with Occupational Safety and Health Administration (OSHA) regulations in the Code of Federal Regulations (CFR), Title 29, Parts 1900, 1910, and 1926, and applicable state regulations. This plan is to be used by URS personnel as a supplement to such rules, regulations, and guidance.

The provisions of the plan are mandatory for all onsite URS employees engaged in hazardous material remediation activities associated with this project, which may involve health and safety hazards. The elements and requirements of this plan also apply as minimum requirements to all URS subcontractors and URS-sponsored visitors.

Changing and/or unanticipated site conditions may require modification of this site-specific safety plan in order to maintain a safe and healthful work environment. Any proposed changes to this plan should be reviewed with an URS Health and Safety Professional prior to their implementation. If this is not feasible, the site/project manager may modify the plan and record all changes in the field log book; under no circumstances will modifications to this plan conflict with Federal, state, or other governmental health and safety regulations.

URS is providing a copy of this Health and Safety Plan to each site subcontractor in order to fulfill its obligation under 29 CFR 1910.120(b) to inform subcontractors of site hazards. Each subcontractor is to provide a health and safety plan that complies with 29 CFR 1910.120 and addresses the activities of its employees relative to this project.

4.0 JOB HAZARD ANALYSIS

4.1 CHEMICAL HAZARDS

There are two categories of chemical hazards associated with site activities:

- Site Constituents – Chemicals that exist at the site and are the cause for conducting site activities
- Chemicals Used to Conduct the Site Work – Chemicals that are brought on site in order to conduct the work may be hazardous and subject to regulation under OSHA's Hazard Communication Standard (29 CFR 1910.1200).

4.1.1 Site Constituents

The primary constituents of concern identified by previous site assessments for this site are Mercury and Oil-Range Hydrocarbons. A summary of the exposure data, including target organs, symptoms of exposure, and exposure limits, for the constituent of concern are presented in Table 1. The exposure limits indicated are the most recent published values of the OSHA permissible exposure limits (PELs) or the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs). The more conservative of the two values has been used to determine worker exposure limits for this HSP. The most likely route of exposure is inhalation of dust, but skin and eye exposure, as well as ingestion, is possible.

4.1.2 Hazard Communication Materials

Additional chemical hazards include materials that may be brought on site for use during the project. Hazards associated with these chemicals will be controlled through implementation of Safety Management Standard (SMS) 2, the URS Hazard Communication Program, and by using safe work practices. The Site Health and Safety Officer or the Field Supervisor will maintain MSDSs, which are included in Attachment D. Materials which are considered hazardous materials under the OSHA Hazard Communication Standard (29 CFR 1910.1200) that may be used during this project are listed below.

- Alconox (decontamination detergent)

The SSO will make copies of these Material Safety Data Sheets (MSDSs) available to any subcontractors (i.e., drillers, excavators) on this project. URS written Hazard Communication program is located in SMS 2, a copy of which shall be maintained on site.

5.0 EXPOSURE MONITORING PLAN

The field instrumentation described in this HSP has been specifically selected for the contaminants that may be reasonably encountered during the course of this project. Selection factors include anticipated airborne concentrations, potential interference, ionization potentials, instrument sensitivity, and occupational exposure limits.

All monitoring data, including background readings, will be logged in the field logbook. The results of daily instrument calibrations will be logged in the field logbook. All monitoring instruments will be calibrated in accordance with the manufacturer's instructions prior to the start of each shift. Calibration should also be performed when inconsistent or erratic readings are obtained. If an instrument cannot be calibrated to specification, or becomes otherwise inoperable, all invasive site work (i.e., drilling, excavating) will cease until the instrument is appropriately repaired or replaced; the Project Manager (PM) or Regional Health and Safety Manager (RHSM) should be contacted for further guidance.

5.1 HEAT STRESS MONITORING

Heat stress monitoring will commence when ambient air temperatures exceed 90°F (32°C) for personnel wearing normal work clothes. Refer to Safety Management Standard 18 in Attachment E for more detailed information on signs and symptoms of heat related illnesses, body temperature monitoring, determining work/rest cycles, and engineering controls.

- Inspecting equipment prior to use to insure that it remains in good operating condition.
- Identifying a competent person to inspect the work site at least once each shift to identify hazardous conditions, document these inspections, and implement corrective actions promptly.
- Notifying other potentially affected parties of any noted imminent hazard.
- Performing pre-shift inspections of mobile equipment and vehicles and documenting these inspections using appropriate forms or logbook.
- Containers, such as drums, will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

6.1.1 DURATION OF WORK TASKS

The duration of work tasks in which personnel use PPE ensembles that include chemical protective clothing (including uncoated Tyvek®) will be established by the SSO. Variables to be considered include ambient temperature and other weather conditions, the capacity of individual personnel to work in the required level of PPE in heat and cold, and the limitations of specific PPE ensembles. The recommended rest breaks are as follows:

- Fifteen minutes midway between shift startup and lunch
- Lunch break (30-60 minutes)
- Fifteen minutes midway between lunch and shift end

Rest breaks are to be taken in the support zone or other clean area after personnel have completed the decontamination process, including soap and water wash of hands and face. In addition, work days will not be longer than 12 hours. Additional rest breaks will be scheduled according to heat stress monitoring protocols as described in SMS 18.

6.2 PERSONAL PROTECTIVE EQUIPMENT

As the various monitoring Action Levels are reached, additional PPE is required. Table 4 provides the description of the incremental PPE requirements relative to specific Action Levels, as well as the specific kinds of PPE to be use. Procedures for use and selection of personal protective equipment are located in Safety Management Standard 29, a copy of which is to be maintained on site. It is not anticipated that URS personnel will be required to wear Level B at this site.

6.2.4 LIMITATIONS OF PROTECTIVE CLOTHING

The protective equipment ensembles selected for this project are anticipated to provide protection against the types and concentrations of hazardous materials that may potentially be encountered during field operations. However, no protective garment, glove or boot is resistant to all chemicals at any concentration; in fact, chemicals may continue to permeate or degrade a garment even after the source of the contamination is removed.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all URS personnel:

1. When using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift.

2. Inspect all clothing, gloves and boots both prior to and during use for:

   - Imperfect seams
   - Non-uniform coatings
   - Tears
   - Poorly functioning closures

3. Inspect reusable garments, boots and gloves both prior to and during use for:

   - Visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness
   - Cracks or any signs of puncture or abrasion

Any reusable garments exhibiting any such characteristics will be discarded.

6.3 SITE CONTROL

The number of personnel and equipment in the exclusion zone should be minimized but only to the extent consistent with workforce requirements of safe site operations.

Contaminated protective equipment, such as respirators, hoses, boots, and disposable protective clothing, will not be removed from the work area/exclusion zone or decontamination area until it has been cleaned or properly packaged and labeled.

All wastes generated by URS activities at the site will be disposed of as directed by the PM.

7.0 RESPIRATORY PROTECTION

Engineering controls and safe work practices (e.g., elimination of the source of contamination, ventilation equipment, working upwind, limiting exposure time, etc.) must always be the primary control for air contaminants. Respirators will be used if engineering or work practice controls are not feasible for controlling airborne exposures below acceptable concentrations and as an interim control measure while engineering or work practice controls are implemented.

Once the need for respirators has been established, the respirators will be selected on the basis of the hazards to which the worker is exposed. Only NIOSH-approved respirators will be issued. Selection criteria established in 29 CFR 1910.134 have been used by the Health and Safety Plan Preparer in determining respirator requirements for this project. The respirator requirements for this project are a half-face or full- face air purifying respirator with n-, r-, or p-100 cartridges. Cartridges should be changed out for each 8 hours of use or when breathing becomes difficult.

CAUTION: Full-face piece or half-face piece air-purifying respirators are not to be used where there is an oxygen deficiency. Only air-supplied respirators with an emergency escape cylinder or self-contained breathing apparatus will be worn when an oxygen deficiency exists.

CAUTION: A respirator does not protect against excessive heat or against hazardous substance that can attack the body through the skin.

The forms of the airborne contaminants have been evaluated based upon the suspected contaminants of concern. Evaluation of the concentration of the airborne chemical hazard will be performed using direct reading instruments to determine what type respirator will be used. Additional information on the URS Respiratory Protection Program is located in Safety Management Standard 42, a copy of which is to be available on site.

It is expected that all tools will be constructed of non-porous, non-absorbent materials. This will aid the decontamination process. Any tool, or part of a tool, which is made of a porous/absorbent material will be discarded and disposed of as a hazardous waste if it cannot be properly decontaminated.

Tools will be placed on a decontamination pad or into a bucket and thoroughly washed using a soap solution and brushing, followed by a fresh water rinse. All visible particles are to be removed before the tool is considered clean.

8.3 SANITATION

Potable water will be made available at the site, either from a pressurized source or commercially available bottled water. Drinking cups will be supplied so personnel will neither drink directly from the source of water nor have to share drinking cups. Sources of non-potable water shall be clearly labeled as such.

Unless toilet facilities are available on site or transportation is readily available to transport personnel to nearby (within 5 minutes) toilet facilities, portable toilet facilities, such as chemical toilets, will be provided on site.

Washing facilities will be provided on site and will be located in the decontamination area or the support area. Soap, clean water, wash basins and single-use towels will be available for personnel use.

Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists. In addition, personnel will wash their hands and face thoroughly with soap and water prior to eating, drinking or smoking.

URS procedures for site sanitation are located in SMS 30, a copy of which is to be maintained on site.

establishing the communication network prior to the start of work, and for explaining it to all site personnel during the site safety briefing.

In the event of an emergency, personnel will use the following hand signals where voice communications are not feasible:

Signal	Definition
Hands clutching throat	Out of air/can't breathe
Hands on top of head	Need assistance
Thumbs up	OK/I'm alright/I understand
Thumbs down	No/negative
Arms waving upright	Send back support
Grip partner's wrist	Exit area immediately

9.3 EMERGENCY RESPONSE TEAM

The emergency response team will consist of employees who assume the following roles:

Emergency Care Provider(s) – Provide first aid/CPR as needed.

Communicator – The role of the communicator is to maintain contact with appropriate emergency services, providing as much information as possible, such as the number injured, the type and extent of injuries, and the exact location of the accident scene. The communicator should be located as close to the scene as possible in order to transmit to the emergency care providers any additional instructions that may be given by emergency services personnel in route.

Site Supervisor – The site supervisor (usually the SSO) should survey and assess existing and potential hazards, evacuate personnel as needed, and contain the hazard. Follow-up responsibilities include replacing or repairing damaged equipment, documenting the incident, and notifying appropriate personnel/agencies described under incident reporting. It also includes reviewing and revising site safety and contingency plans as necessary.

9.6 OPERATION SHUTDOWN

Under certain extreme hazardous situations, the SSO or SSR may request that site operations be temporarily suspended while the underlying hazard is corrected or controlled. During operation shutdown, all personnel will be required to stand upwind to prevent exposure to fugitive emissions. The SSO, with concurrence from the RHSM, will have ultimate authority for operations shutdown and restart.

9.7 SPILL OR HAZARDOUS MATERIALS RELEASE

Small spills are immediately reported to the SSO and are dealt with according to the chemical manufacturer's recommended procedures found on the MSDS. Steps will be taken to contain and/or collect small spills for approved storage and disposal.

In the unlikely event of a larger release of hazardous materials as a result of site activities, site personnel will evacuate to the predesignated assembly area. The local Designated Emergency Response Authority (DERA) will be notified by the SSO immediately and appropriate actions will be taken to protect the public health and mitigate the contaminant release. The DERA can be reached through the local police or fire department. The Site Manager will make the following emergency contacts found in Attachment B.

- Location and use of emergency equipment
- Evacuation signals and procedures

All site personnel, including subcontractor personnel, are to attend the briefings and sign the briefing form.

Subsequent site safety briefings will be conducted at least weekly, or whenever there is a change in task or significant change in task location. Briefings will also be conducted whenever new personnel report to the site.

10.2 SITE INSPECTIONS

The URS Site Manager or SSO is to conduct a daily site inspection prior to the start of each shift. It is the responsibility of the PM or Site Manager to resolve discrepancies immediately, contacting the RHSM if necessary for assistance. Inspections are to be documented and maintained on site until the completion of the project, at which time they are placed in the project files.

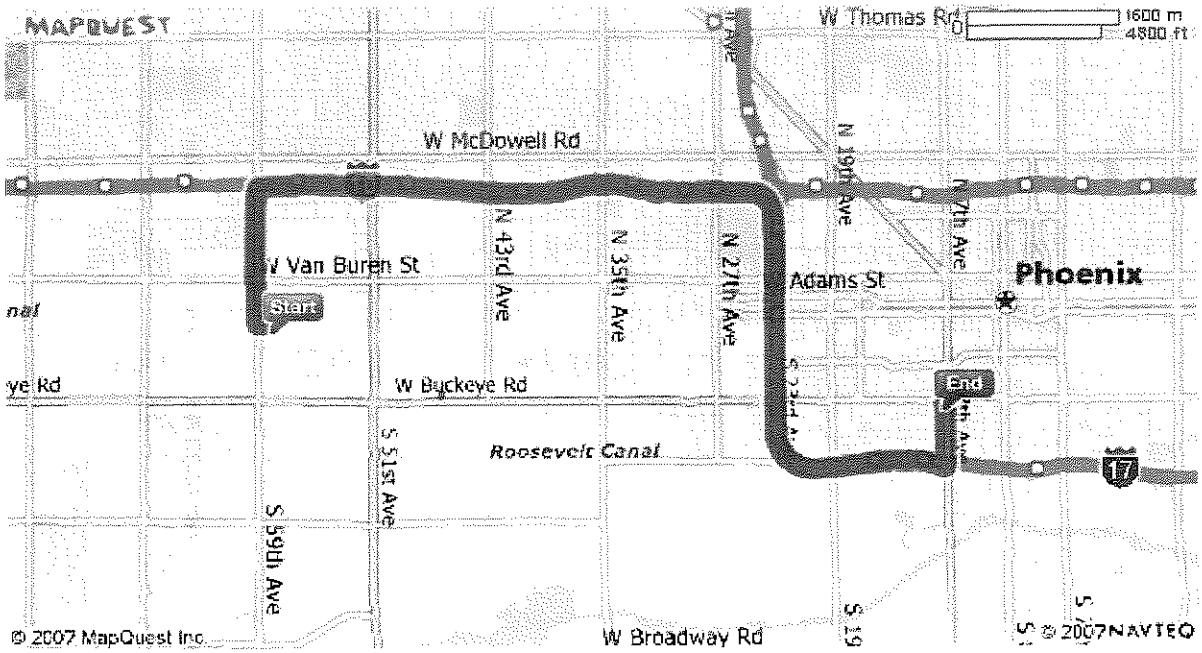
TABLES

TABLE 1
CONSTITUENTS OF CONCERN EXPOSURE DATA

Metal	OSHA PEL [mg/m^3]	ACGIH TLV [mg/m^3]	ACGIH STEL [mg/m^3]	NIOSH REL [mg/m^3]	IDLH [mg/m^3]	Target Organs	Symptoms of Over Exposure
Mercury	0.1	–	–	0.05	10	Eyes, skin, respiratory system, central nervous system, kidneys	Irritated eyes, skin; cough, chest pain, dyspnea, bronchitis, pneumonitis, tremor, insomnia, irritablility, indecision, headache, fatigue, weakness; stomatitis, salivation; gastrointestinal disorder, anorexia, weight loss, proteinuria
Oil-Range Hydrocarbons	–	–	–	–	Ca (ND)	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Irritated eyes, skin, mucus membrane; blurred vision, dizziness, slurred speech, confusion, consulsions, chemical pheumonitis, kidney damage, liver, fatigue, headache, dermatitis, nausea, vomiting, diarrhea

OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limits
IDLH = Immediately Dangerous to Life and Health
STEL = Short Term Exposure Limit
REL = Recommended Exposure Limit
ACGIH TLV = American Conference of Governmental Industrial Hygienists Threshold Limit Value

FIGURES



Start:
5736 W Jefferson St
Phoenix, AZ 85043-3633, US

End:
1201 S 7th Ave
Phoenix, AZ 85007-3913, US

ATTACHMENT A

SAFETY PLAN COMPLIANCE AGREEMENT

SAFETY PLAN COMPLIANCE AGREEMENT AND EMERGENCY CONTACT INFORMATION

5736 W Jefferson St, Phoenix, AZ, 85043

I, _____, have received a copy of the Health and Safety Plan for this Project. I have reviewed the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the health and safety requirements specified in the plan.

SIGNED: _____ _____

Signature Date

Firm: _____

This brief Medical Emergency Contact Sheet will be kept in the Support Zone during site operations. It is in no way a substitute for the Medical Surveillance Program requirements of the URS Health and Safety Program. This data sheet will accompany injured personnel when medical assistance or transport to hospital facilities is necessary.

Emergency Contact: _____ Phone #:_____

Relationship: _____

Do you wear contact lenses? _____

SITE SAFETY BRIEFING FORM

5736 W Jefferson St, Phoenix AZ, 85043

SAFETY ISSUES:

Discussed	**Yes**	**No**
Chemical and Physical Hazards		
Protective Clothing/Equipment		
Chemical and Physical Hazards		
Control Methods/Measures		
Air Monitoring Action Levels and Requirements		
Decontamination Procedures		
Location of Medical and Emergency Equipment		
Hospital Name/Address/Directions		
Evacuation Procedures/Place of Refuge		

Meeting conducted by: _____ Date: _____

Attendees' Names (print) **Signatures**

_____

_____

_____

_____

_____

_____

_____

_____

_____

ATTACHMENT B

EMERGENCY INFORMATION

EMERGENCY INFORMATION

5736 W Jefferson St, Phoenix, AZ, 85043

PHONE NUMBERS:

Ambulance/Fire/Police:		911
Hospital:	Phoenix Memorial Hospital	602-258-5111
Project Manager:	Adam Kneeling	602-371-1100 (o) 602-861-7429
Site Safety Officer:	Adam Kneeling	602-371-1100 (o) 602-861-7429 (direct)
Health and Safety Representative:	Lisa Gregory	602-648-2414 (direct) 602-549-7261 (mobile)
Regional Health and Safety Manager:	Tim Joseph	303-740-694-2770 (o) 303-740-2767 (direct)
URS Injury Reporting	Occupational Health Specialist Jeanette Schrimsher	866-326-7321
National Response Center:	Depending if a Reportable Quantity (RQ) is exceeded	800-424-8802

HOSPITAL DIRECTIONS FROM THE SITE (see Figure 1 for route to the hospital):

ATTACHMENT C

ACTIVITY HAZARD ANALYSES

ACTIVITY HAZARD ANALYSIS

ACTIVITY: Soil Borings

Principal Steps	Hazards	Controls
Drilling	Drill rig	• Know the location of the kill switches and verify that they work • Make eye contact with the operator prior to approaching equipment • Wear hard hat, eye protection, steel-toed boots and orange vest at a minimum • Be aware of the potential for cables to snap or hydraulic lines to brake or systems to fail • Keep the work area free from debris • Refer to SMS 19 *Heavy Equipment Operations*
	Noise	• Wear hearing protection during working near backhoe or other loud equipment • Refer to SMS 26 *Noise*
	Dust (respirable silica)	• Minimize generation of dust • Stay out of visible dust clouds • Wet soil if necessary to eliminate visible dust
	Underground Utilities	• Complete utility locates prior to drilling (One Call: (800) 321 ALERT and/or coordinate with Molycorp personnel) • Mark locations in white • Field verify utility locations • Document all utility locates • Observe the area for indications of utilities
Equipment Used	**Inspection Requirements**	**Training Requirements**
Drill rig	The drilling contractor must perform a pre-shift inspection of their equipment (drill rig and tools)	• Operators must be trained and qualified to operate equipment; CDL is required for operator • Hazard communication training is required where there is a potential for exposure to hazards substances; refer to SMS 2, *Hazard Communication* • Employees must be trained to use required protective equipment

ACTIVITY HAZARD ANALYSIS

ACTIVITY: Excavation and Consolidation

Principal Steps	Hazards	Controls
Digging with backhoe	Backhoe	• Know the location of the kill switches and verify that they work • Make eye contact with the operator prior to approaching equipment • Make sure all loads are properly tied down • Wear hard hat, eye protection, steel-toed boots and orange vest at a minimum • Be aware of the potential for cables to snap or hydraulic lines to brake or systems to fail • Do not work under or in the swing radius of the bucket • Set bucket on the ground when not in operation • Keep the work area free from debris • Fire extinguisher must be available in backhoe • Refer to SMS 19 Heavy Equipment Operations
	Noise	• Wear hearing protection during working near hackhoe or other loud equipment • Refer to SMS 26 Noise
	Excavations	• If possible, do not enter excavations; use remote sampling equipment • Pile excavated material at least two feet from excavations • Excavations of greater than 5 feet in depth require sloping or shoring prior to entry • If entry is required, follow SMS 13 Excavation Safety • If entry is required, Entry Authorization and Daily Inspections must be performed by a competent person and documented using proper forms • Backfill, cover or barricade excavations as soon as possible to avoid hazards • Barricade or cover excavations that are left unattended
	Fall Protection	• Stay away from open excavations when possible • Fall protection must be used if there is a potential for falls of greater than 6 feet • Refer to SMS 40 Fall Protection

ACTIVITY HAZARD ANALYSIS

ACTIVITY: Excavation and Consolidation

Physical and Biological Hazards and Controls	
Potential Hazards	**Controls**
Site Security	• Do not enter areas that you are not authorized to enter • Obey posted signs
Nails and other sharp objects	• Wear work boots and leather gloves as appropriate • Use caution when picking up any equipment, tools or debris
Work During Hours of Darkness (Night Work)	• Provide lighting to supply a minimum of 10 foot-candles of light. • The use of portable floodlights must be approved in advance by the Project Coordinator.
Work During Hours of Darkness (Night Work) (cont.)	• Portable lighting must be hooked to a ground fault circuit interrupter (GFCI). • All lights must be equipped with protective, nonconductive covers, and all light bulbs in light stringers must be shatterproof. • Exposed, empty light sockets or broken bulbs are not permitted. • Burned-out bulbs shall be replaced in a timely manner. • Portable lighting used in wet or in other conductive locations shall be hooked up to a GFCI.
Spills	• Maintain adequate quantities of spill clean-up materials (e.g., spill pads or pillows or absorbent) to handle small spills of vehicle fluids or fuels. • Follow all procedures detailed in the Spill Prevention Containment and Countermeasure (SPCC) Plan. • Follow incident reporting procedures as described in Section 11, Emergency Response Plan.
Heat stress	• Use vehicles or the office for shelter and take breaks as needed • Use the "buddy system" to monitor effects of heat stress • Create shaded work areas if appropriate • Drink plenty of fluids • Refer to SMS 18, Heat Stress
Slips, trips and falls	• Avoid steep and uneven terrain • Watch out for icy or wet surfaces; clean snow/ice from around drill rigs, etc. • Keep the work area free from debris • Plan your path and watch where you step • Wear sturdy boots with good traction
Hand tools and portable equipment	• Inspect tools prior to use • Use tools for their intended use • Don't use damaged tools • Push, don't pull wrenches • Power tools must be double-insulted or grounded • Power tools must be constant-pressure devices (i.e., no trigger locks)

ACTIVITY HAZARD ANALYSIS

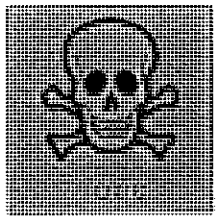
ACTIVITY: Excavation and Consolidation

Physical and Biological Hazards and Controls	
Potential Hazards	**Controls**
Driving/Vehicle Movement (including trucks, heavy equipment)	• Obey traffic rules • 15 miles per hour is the maximum speed allowed in the work area • Use caution when entering haul roads or roadways • Do not operate vehicles in unsafe conditions (e.g., on steep slopes, in deep mud) • Do not use cell phones when operating vehicles • Secure all loads, including equipment within the cab • Wear seat belts, including those provided in cabs of heavy equipment • Use caution and wear orange vests if working near active roads or around heavy equipment • Car pool whenever possible to avoid congestion at the work sites • Leave enough time to get to your destination without hurrying • Be aware of heavy equipment and do not park or conduct work in the blind spot of the equipment operator; remember that "blind spots" of some equipment can be very large • Perform and document vehicle inspection at the start of every shift, and take prompt action to correct any noted deficiencies • Do not leave mobile equipment unattended unless controls are placed in park and parking brake is set; use wheel chocks or turn into a bank or berm • Verify back-up alarms are functional for all heavy equipment; for pick-ups or SUVs with obstructed rear view, a back-up alarm or use a spotter when backing up • Make sure each vehicle or piece of mobile equipment is equipped with the required safety equipment (e.g., wheel chocks, fire extinguisher, first aid kit, etc.) • Drivers and/or operators of vehicles, including fuel trucks and water trucks, must have the appropriate commercial drivers license (CDL) certifying their qualifications to drive or operate each piece of equipment or vehicle. • The CDL of fuel truck operators will also be endorsed for tanks and hazardous materials. • Refer to SMS 57, Vehicle Safety Program
Refueling	• Open pouring of flammable/combustible liquids from one container to another is not permitted; all equipment shall be fueled through funnels or spouts to prevent spills. • Engines shall be turned off and allowed to cool prior to refueling. • A 20-lb ABC fire extinguisher shall be maintained at a maximum of 25 feet from an on-site refueling area. • Fuel cans will be removed from bedliners during reflecting operations or a bonding wire shall be connected from the fuel can to a metal part of the truck. • Smoking or open flames are not permitted during refueling operations.

ATTACHMENT D

MATERIAL SAFETY DATA SHEETS

Safety data for mercury



Glossary of terms on this data sheet.

General

Synonyms: quicksilver, colloidal mercury, liquid silver
Molecular formula: Hg
CAS No: 7439-97-6
EINECS No: 231-106-7

Physical data

Appearance: silvery liquid metal
Melting point: -39 C
Boiling point: 357 C
Vapour density:
Vapour pressure: 0.002 mm Hg at 20 C
Density (g cm^{-3}): 13.53
Flash point:
Explosion limits: n/a
Autoignition temperature:
Water solubility: negligible

Stability

Stable. Incompatible with strong acids, sodium thiosulfate, ammonium hydroxide.

Toxicology

Highly toxic. Long-term exposure to the metal may be fatal. Inhalation may lead to liver, kidney and CNS damage. Danger of cumulative effects. Harmful by ingestion and by skin contact. Typical TLV/TWA 0.05 mg/m3. Typical PEL 0.1 mg/m3.

Toxicity data

(The meaning of any abbreviations which appear in this section is given here.)
IHL-RBT LCLO 29 mg m^{-3}
IHL-RBT ACUTE 28 mg m^{-3}
IHL-RAT CHRONIC 0.3 mg m^{-3}
IHL-RBT CHRONIC 0.1 - 6 mg m^{-3}
IHL-MAN TCLO 150 microg/m3/46d: CNS, GIT

Risk phrases
(The meaning of any risk phrases which appear in this section is given here.)
R21 R22 R23 R33.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
Hazard class 8.0. Packing group III.

Personal protection

Good ventilation. Do not use in the open laboratory.

Safety phrases
(The meaning of any safety phrases which appear in this section is given here.)
R7 R44.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

International Chemical Safety Cards

POLYCHLORINATED BIPHENYL (AROCLOR 1254)

ICSC: 0939

POLYCHLORINATED BIPHENYL (AROCLOR 1254)
Chlorobiphenyl (54% chlorine)
Chlorodiphenyl (54% chlorine)
PCB
Molecular mass: 327 (average)

CAS # 11097-69-1
RTECS # TQ1360000
ICSC # 0939
UN # 2315
EC # 602-039-00-4

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Irritating and toxic gases may be generated in a fire.		Powder, carbon dioxide.
EXPLOSION			
EXPOSURE		PREVENT GENERATION OF MISTS! STRICT HYGIENE!	
• **INHALATION**		Ventilation.	Fresh air, rest. Refer for medical attention.
• SKIN	MAY BE ABSORBED! Dry skin. Redness. Chloracne (further see Inhalation).	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
• EYES	Redness. Pain.	Safety goggles, face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION	Headache. Numbness. Fever.	Do not eat, drink, or smoke during work.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Consult an expert! Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Separated from food and feedstuffs. Cool. Dry. Keep in a well-ventilated room.	Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. Xn symbol R: 33 S: 35 Note: C UN Hazard Class: 9 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

POLYCHLORINATED BIPHENYL (AROCLOR 1254)

ICSC: 0939

	PHYSICAL STATE; APPEARANCE:	ROUTES OF EXPOSURE:

IMPORTANT DATA	LIGHT YELLOW VISCOUS LIQUID. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes in a fire producing irritating and toxic gases. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV: ppm; 0.5 mg/m^3 (skin) (ACGIH 1991-1992).	The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance irritates the eyes (see Notes). **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis chloracne. The substance may have effects on the liver. Animal tests show that this substance possibly causes toxic effects upon human reproduction.
PHYSICAL PROPERTIES	Relative density (water = 1): 1.5 Solubility in water: none	Vapour pressure, Pa at 25°C: 0.01 Octanol/water partition coefficient as log Pow: 6.30 (estimated)
ENVIRONMENTAL DATA	In the food chain important to humans, bioaccumulation takes place, specifically in water organisms. It is strongly advised not to let the chemical enter into the environment.	

NOTES

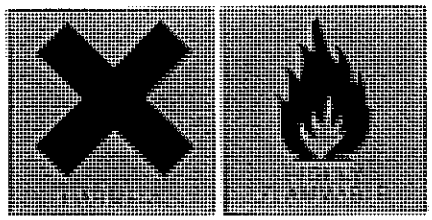
Changes into a resinous state (pour point) at 10°C. Distillation range: 365°-390°C. No open cup flash point to boiling. The symptoms other than the chloracne and liver effects may be in part due to contaminants of the PCB.

Transport Emergency Card: TEC (R)-914

ADDITIONAL INFORMATION

ICSC: 0939 **POLYCHLORINATED BIPHENYL (AROCLOR 1254)**

Safety data for aroclor 1254



Glossary of terms on this data sheet.

General

Synonyms: arochlor 1254, PCB-1254, polychlorinated biphenyl 1254, chlorodiphenol (54% Cl)
Use: previously widely used as a dielectric fluid; now less widely used
Molecular formula: $C_{12}H_5Cl_5$ (approximate)
CAS No: 11097-69-1
EINECS No:

Physical data

Appearance: light yellow viscous liquid
Melting point: 10 C
Boiling point: ca. 370 C
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 1.51
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: negligible

Stability

Stable. Highly flammable. Incompatible with strong oxidizing agents. Attacks some forms of plastics and rubber.

Toxicology

Harmful if swallowed. Possible carcinogen. May be a reproductive hazard. Harmful if inhaled or absorbed through the skin. Irritant.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)

ORL-RAT LD50 1010 mg kg^{-1}
IVN-RAT LD50 358 mg kg^{-1}
IPR-MUS LD50 880 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R11 R20 R21 R22 R36 R37 R38.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No. 2315. Packing group II. Hazard class 9.

Personal protection

Safety glasses, gloves, good ventilation. Handle as a possible carcinogen.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S9 S16 S23 S26.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

ATTACHMENT E

SAFETY MANAGEMENT STANDARDS

SAFETY MANAGEMENT STANDARDS REFERENCED BY THIS HSP

SMS	TOPIC
2	Worker Right to Know
12	Electrical Safety
16	Hand Tools and Portable Equipment
64	Hand Safety
18	Heat Stress
19	Heavy Equipment Operations
26	Noise and Hearing Conservation
29	Personal Protective Equipment
30	Sanitation
34	Utility Clearances
42	Respiratory Protection
46	Subcontractor Health and Safety Requirements
56	Drilling Safety Guidelines
69	Manual Material Handling
47	Biological Hazards
48	DOT Shipping
49	Incident Reporting
65	Injury Management

Copies of the SMSs referenced by this HSP are to be maintained on site. Project Managers are responsible to see that other SMSs relevant to field activities but not directly referenced by this HSP are also available on site.

URS SAFETY MANAGEMENT STANDARD
Worker Right-to-Know (Hazard Communication)

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The worker right-to-know program provides URS personnel with information and training about safety and health hazards associated with the chemicals they might encounter in the workplace. This procedure describes how chemical safety hazards are communicated to URS personnel and how information is to be provided to employees of other employers working at the location. The requirements include steps to acquire this information, maintain it, and train personnel in the hazard communication program.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure.

4. Requirements

A. Hazardous Material Inventory:

Maintain a hazardous material inventory that lists all of the hazardous materials used at each workplace (i.e., office/field location). Use chemical names consistent with the applicable material safety data sheet (MSDS).

B. Material Safety Data Sheets (MSDS)

1. Obtain a MSDS for each chemical before it is used.

2. Review each MSDS when it is received to evaluate whether the information is complete and to determine if existing protective measures are adequate.

3. Maintain a collection of all applicable and relevant MSDS where they are accessible by all employees at all times.

4. Replace MSDS when updated sheets are received. Communicate any significant changes to those who work with the chemical.

1. Conduct training of all employees potentially exposed to hazardous materials on the following schedule:

    a. Before new employees begin their jobs.

    b. Whenever new chemicals are introduced into the workplace, or

    c. Annually thereafter.

2. This training will include:

    a. Applicable regulatory requirements.

    b. Names of those responsible for implementing this program.

    c. Location of the program, inventory and MSDS.

    d. Chemicals used and their hazards (chemical, physical and health).

    e. How to detect the presence or release of chemicals.

    f. Safe work practices.

    g. How to read an MSDS.

3. Document the training.

4. Where non-English speaking workers are employed, provisions for training in the appropriate language shall be arranged.

5. Documentation Summary

A. File these records:

1. Chemical Inventory.

2. Location of the MSDS inventory.

3. Training records.

4. Contractor/Subcontractor notifications.

URS SAFETY MANAGEMENT STANDARD
Electrical Safety

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies, where electricity is used, electrical systems are installed or maintained, or where live electrical circuits are accessed. For work around overhead or underground utilities, see SMS 34, "Utility Clearances".

2. Purpose and Scope

This procedure describes requirements for working on electrical circuits with voltage greater than 50 volts. The primary hazards related to electricity are shock, burns, arc-blast, fire and explosions. This procedure is intended to reduce worker risk to electrical hazards.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure.

4. Requirements

A. Any work performed on live electrical systems must be done by a licensed or journeyman electrician.

B. Follow established lockout/tagout procedures. Refer to SMS 23, "Lockout and Tagout Safety".

1. Consider all electrical systems as live until verified de-energized and grounded.

2. Do not work on or in close proximity to electrical circuits unless the circuit is de-energized, grounded or guarded.

C. Hazardous Locations

Determine if electric equipment and wiring will be installed in locations that are classified depending on:

1. The properties of flammable vapors, liquids or gases, or combustible dusts or fibers that may be present; as well as the likelihood that a flammable or combustible concentration or quantity

j. Metal frames of non-electric elevators to which electric conductors are attached.

E. Circuits

1. Require that there are no missing blanks.

2. Close doors to circuit and fuse boxes when not in use.

3. Label every circuit located on a circuit breaker/fuse box and/or motor control center (MCC).

F. Temporary Wiring, Electrical Tools and Extension Cords

1. Require that temporary wiring is installed and used in accordance with references. Specifically:

   a. Guard, bury or isolate by elevation temporary wiring to prevent accidental contact by workers and equipment.

   b. Require that vertical clearance above walkways is not less than 10 feet (3 metres) from circuits carrying 600 volts or less.

   c. Support all exposed temporary wiring on insulators.

   d. Protect temporary wiring from accidental damage.

   e. Guard live parts of wiring.

   f. Mark temporary power lines, switch boxes, receptacle boxes, metal cabinets and enclosures around equipment to indicate the maximum operating voltage.

2. Require that lighting strings are installed and used in accordance with Resources A and B. Specifically:

   a. Use nonconductive lamp sockets and connections permanently molded to the conductor insulation.

   b. Require that lighting strings have lamp guards.

   c. Replace all broken or defective bulbs promptly.

J. Use of equipment that does not meet the requirements of this standard is not permitted.

K. Isolation of live electrical components

Isolate all live, unprotected electrical components through the use of barricades, fencing or other means to protect employees from contact.

L. Briefing

1. Brief workers on electrical hazards at the beginning of the job. Utilize Attachment 12-2 as a guide for proper PPE as applicable.

2. Brief new workers entering the site.

3. Brief workers when electrical conditions change or when hazards exist.

M. Inspection

Inspect the job site periodically using Attachment 12-3 to evaluate compliance with this standard.

5. Documentation Summary

Project Safety Files

A. Licensed/journeyman electrician for project (as necessary).

B. Attachment 12-3,"Audits."

C. Documented communications between URS, contractors, licensed/journeyman electricians, or others.

6. Resources

A. U.S. OSHA Standard - General Industry Electrical Safety - 29 CFR 1910, Subpart S

B. U.S. OSHA Standard - Construction Electrical Safety - 29 CFR 1926, Subpart K

C. U.S. OSHA Standard - Design Safety Standards for Electrical Systems - 29 CFR 1910, Subpart S

URS SAFETY MANAGEMENT STANDARD
Hand Tools and Portable Equipment

1. Applicability

This standard applies to URS operations involving the use of hand tools and/or power equipment, including chain saws, brush cutters, powder-actuated tools, and similar high-hazard implements.

2. Purpose and Scope

The purpose of this standard is to provide procedures for the safe use and handling of hand tools and power equipment.

Also refer to SMS 064, Hand Safety.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure.

4. Requirements

A. General

1. Keep hand and power tools in good repair and used only for the task for which they were designed.
2. Remove damaged or defective tools from service.
3. Keep surfaces and handles clean and free of excess oil to prevent slipping.
4. Do not carry sharp tools in pockets.
5. Clean tools and return to the toolbox or storage area upon completion of a job.
6. Wrenches must have a good bite before pressure is applied.
    a. Brace yourself by placing your body in the proper position so that that you will not fall in case the tool slips.
    b. Make sure hands and fingers have sufficient clearance in the event the tool slips.

5. Do not use the side of a grinding wheel unless the wheel is designed for side grinding.

6. Always stand to the side of the blade, never directly behind it.

7. Use grinding wheels only at their rated speed.

8. Grinding aluminum is prohibited.

9. For U.K. operations:

    a. No grinding wheels exceeding 55mm are to be used.

    b. All wheels are to be marked with their safe maximum speed.

    c. Abrasive wheels will only be operated by personnel who have been specifically trained and specified competent by URS.

    d. Abrasive wheels will only be operated by persons specified as competent, under the 'Abrasive Wheels" Regulations.

    e. Abrasive wheels must only be operated if the manufacturer's guard is fitted and they are in good working order.

C. Power Saws

1. Require that circular saws are fitted with blade guards.

2. Remove damaged, bent or cracked saw blades from service immediately.

3. Require that table saws are fitted with blade guards and a splitter to prevent the work from squeezing the blade and kicking back on the operator.

4. Require guards that cover the blade to the depth of the teeth on hand held circular saws. The guard should freely return to the fully closed position when withdrawn from the work surface.

F. Powder Actuated Fastener Tools

1. Use powder actuated tools that comply with the requirements of the American National Standards Institute (ANSI)/American Society of Safety Engineers(ASSE) Standard A10.3 - 1995.

2. Use only individuals that have been trained by a manufacturer's representative and possess the proper license to operate, repair, service and handle powder actuated tools.

3. Never use a powder actuated tool in a flammable or explosive atmosphere.

4. Require the use of goggles or a full face shield as well as safety glasses during operation of powder actuated tools.

5. Powder actuated tools must not be able to be fired unless the tool is pressed against the work surface.

6. The tool must not be able to fire if the tool is dropped when loaded.

7. Firing the tool should require two separate operations, with the firing movement being separate from the motion of bringing the tool to the firing position.

8. Never fire into soft substrate where there is potential for the fastener to penetrate and pass through, creating a flying projectile hazard.

9. Do not use powder actuated tools in reinforced concrete if there is the possibility of striking the re-bar.

10. Do not use on cast iron, glazed tile, surface hardened steel, glass block, live rock or face brick.

11. Never load and leave a powder actuated tool unattended. It should only be loaded prior to intended firing.

12. Test tools each day prior to loading by testing safety devices according to manufacturer's recommended procedure.

12. Do not operate a chain saw that is damaged, improperly adjusted, or is not completely and securely assembled. Always keep the teeth sharp and the chain tight. Worn chains should immediately be replaced.

13. Keep all parts of your body away from the saw chain when engine is running.

14. For all operations, only personnel specifically trained and certified as competent by URS may operate chain saws.

H. Hand Operated Pressure Equipment

1. Pressure equipment such as grease guns, paint and garden sprayers shall be directed away from the body and other personnel in the area. The person operating any equipment such as this, which has a potential for eye injury, must wear protective goggles.

2. The noise produced when using certain types of pressure equipment may require the use of hearing protection.

3. Never allow the nozzle of a pressurized tool to come in contact with any body parts while operating. There is potential for injection of a chemical directly into the user's body, resulting in severe injury or death.

I. Gasoline Powered Tools

1. Never pour gasoline on hot surfaces.

2. Never fuel around open flame or while smoking.

3. Shut down the engine before fueling.

4. Provide adequate ventilation when using in enclosed spaces.

5. Use only approved safety cans to transport flammable liquids.

J. Inspection

URS SAFETY MANAGEMENT STANDARD
HAND SAFETY

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

This procedure is intended to protect employees from activities that might or could expose them to injury. This procedure provides information on recognizing those conditions that require personal protective equipment or specific work practices to reduce hand injury risk.

Hand injuries represent over 25% of the medical treatment cases in URS and subsidiary operations. These injuries can be prevented by using the proper tool, body position, and PPE.

Also refer to SMS 016, Hand Tools and Portable Equipment.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure.

4. Requirements

A. Personal Protective Equipment

1. Perform hazard assessments for those work activities likely to require PPE.

   a. Use SMS 29-1 (PPE Hazard Assessment Certification Form) to perform the assessment. The Hazard Assessment Certification Form shall accompany URS personnel at job sites for use in the event of a job or task change.

   b. Reevaluate completed hazard assessments when the job or task changes.

2. If possible, eliminate the hazards identified through engineering or administrative controls. Examples of controls are: chemical substitution, machine guarding, and use of different tools.

iii. Always pull on a wrench, never push.

i. When working with tools overhead, place tools in a holding receptacle when not in use.

j. Do not throw tools from place to place, from person to person, or drop from heights.

k. Inspect all tools prior to start-up or use to identify any defects.

l. Powered hand tools should not be capable of being locked in the on position.

m. Require that all power-fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.

n. Do not allow loose clothing, long hair, loose jewelry, rings and chains to be worn while working with power tools.

o. Do not use cheater pipes.

p. Make provisions to prevent machines from restarting through proper lockout/tagout (refer to SMS 023 – Lockout and Tagout Safety).

2. Cutting Tools

a. Always use the specific tool for the task. Tubing cutters, snips, self-retracting knives, concealed blade cutters, and related tools are task specific and minimize the risk of hand injury. Sample tools may be seen in Attachment 64-1.

b. Fixed open blades knives (FOBK) are prohibited from use. Examples of fixed open blade knives include pocket knives, multi-tools, hunting knives, and standard utility knives.

c. Personnel when utilizing cutting tools shall observe the following precautions to the fullest extent possible:

i. Use the correct tool and correct size tool for the job,

ii. Cut in a direction away from yourself and not towards other workers in the area,

iii. Never clean an auger attached to the drill rig unless the transmission is in neutral or the engine is off, and the auger has stopped rotating.

c. Other Rotating Equipment (feed augers, chippers, conveyors, etc.)

i. Never place hands, fingers, extremities near hoppers and operational areas of machinery.

ii. When the equipment is rotating, stay clear of the rotating components and only operate equipment with proper machine guarding in place.

iii. Never clean a jammed piece of equipment unless the transmission is in neutral and the power source or the engine is off, and the moving parts of the equipment have stopped rotating. Refer to SMS 23, Lockout and Tagout Safety.

5. Physical Hazards – Non-tool

a. Activities such as drum handling, fencing, work near razor-wire, manhole cover removal and demolition also pose hazards to hands

b. The SMS 29 - Personnel Protective Equipment should be utilized to determine what type of PPE will be needed for a job.

c. Plan work to avoid pinch points for hands when moving drums, moving man-hole covers back in to position, and handling other heavy objects.

d. Work handling scrap metal or other sharp edges requires proper hand PPE (Kevlar® or leather gloves).

C. Ergonomics - Hand & Wrist Care

1. Keep your wrist in neutral. Avoid using your wrist in a bent (flexed), extended, or twisted position for long periods of time. Instead try to maintain a neutral (straight) wrist position. Ergonomic tools may be needed for long-term work.

2. Watch your grip. Gripping, grasping, or lifting with the thumb and index finger can put stress on your wrist. When practical, use the whole hand and all the fingers to grasp an object.

B. SMS 29 - Personal Protective Equipment

C. SMS 54 - Office Ergonomics

D. SMS 56 - Drilling Safety Guidelines

1. Monitor oral body temperature to determine if employees are adequately dissipating heat buildup. Ear probe thermometers which are adjusted to oral temperature are convenient and the preferred method of measurement. Determine work/rest regimen as follows:

    a. Measure oral body temperature at the end of the work period.

    b. If temperature exceeds 99.6 °F (37.5 °C), shorten the following work period by 1/3 without changing the rest period.

    c. If temperature still exceeds 99.6 °F (37.5 °C), shorten the following work period by 1/3.

    d. Do not allow a worker to wear impermeable PPE when his/her oral temperature exceeds 100.6 °F (38.1°C).

2. Oral body temperatures are to be obtained prior to the employee drinking water or other fluids.

D. Pulse Rate Monitoring

1. Take the radial (wrist) pulse as early as possible in the rest period.

    a. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third.

    b. If the heart rate still exceeds 110 beats per minute at the next rest cycle, shorten the following work cycle by an additional one-third.

E. Record monitoring results on Heat Stress Monitoring Form (Attachment 18-2).

F. Investigate the use of auxiliary cooling devices in extreme heat conditions.

G. Conduct briefings for employees regarding health hazards and control measures associated with heat stress whenever conditions require the implementation of heat stress monitoring. Review the information provided in Attachment 18-3.

URS SAFETY MANAGEMENT STANDARD
Heavy Equipment Operations

1. Applicability

This procedure applies to URS field projects where heavy equipment is in operation.

2. Purpose and Scope

The purpose of this procedure is to require that heavy equipment is operated in a safe manner, that the equipment is properly maintained and that ground personnel are protected.

3. Implementation

Field Activities - Implementation of this procedure is the responsibility of the Project Manager.

4. Requirements

A. Authorized Operators

1. Evaluate operators through documentable experience (resume) and a practical evaluation of skills.
2. Allow only qualified operators to operate equipment.
3. Prohibit equipment from being operated by any personnel who have not been specifically authorized to operate it.
4. Maintain a list of operators for the project and the specific equipment that they are authorized to operate.
5. Require operators to use seat belts at all times in all equipment and trucks.
6. Prohibit personnel other than the operator from riding in or on the equipment unless additional seating (with seat belts) is provided by the manufacturer.
7. Operators shall maintain three points of contact whenever entering and exiting a piece of equipment.
8. Brief operators on the following rules of operation:
    a. Operators are in control of their work area.

3. Require that all equipment is provided with roll-over protection systems (ROPS). Tracked excavators are exempt from ROPS requirements but must have a cab which provides protection from overhead hazards

4. Verify that seatbelts are present and functional in all equipment.

5. Prohibit the use of equipment which has cab glass which is cracked, broken or missing.

6. Require that backup alarms are functional on all trucks and equipment. Tracked excavators must have bidirectional alarms or the operator must be provided with a spotter whenever tracking in either direction.

7. Require all extensions such as buckets, blades, forks, etc. to be grounded when not in use.

8. Require brakes to be set and wheels chocked (when applicable) when not in use.

D. Inspection and Maintenance

1. Require daily inspections of equipment by operators using Attachment 19-1.

2. Prohibit use of equipment deemed to be unsafe as a result of daily inspection until required repairs or maintenance have been completed.

3. Conduct maintenance as prescribed by the manufacturer in the Operations Manuals for each piece of equipment.

4. During maintenance/repair, require that:

   a. Motors are turned off.

   b. All extensions are grounded or securely blocked.

   c. Controls are in a neutral position.

   d. Brakes are set.

5. Documentation Summary

URS SAFETY MANAGEMENT STANDARD
Noise and Hearing Conservation

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where personnel may encounter noise exposures that may exceed 85 decibels, measured using an "A" weighted scale (dBA), as an 8-hour time weighted average (TWA).

For non U.S. operations, refer to the country/region specific SMS and regulations.

2. Purpose and Scope

The purpose of this procedure is to protect employees from hazardous noise exposures and to prevent hearing loss.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure.

4. Requirements

A. General

The use of hearing protectors is required in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. Use of hearing protectors may only be discontinued when noise levels are verified to be less than 85 dBA through a properly conducted noise survey. Whenever information indicates that any employee's exposure may equal or exceed an 8-hour TWA of 85 dBA, the project manager or location manager will be responsible to enforce the proper use of hearing protectors.

B. Hearing Protectors

1. Require that at least two (2) types of hearing protectors are available to employees free of charge, preferably a plug and a muff type.

Audiometric tests shall be performed by a person meeting the requirements described in 29 CFR 1910.95(g)(3). Within 6 months of an employee's first exposure at or above the action level, a valid baseline audiogram shall be established against which subsequent audiograms can be compared. Testing to establish a baseline audiogram shall be preceded by 14 hours without exposure to noise. Hearing protectors may be used as a substitute for the requirement that baseline audiogram shall be preceded by 14 hours without exposure to workplace noise. The medical surveillance provider shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination. For multi-year projects, an annual audiogram shall be obtained for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if there is a standard threshold shift (STS). A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. If the annual audiogram shows that an employee has suffered a STS, the employer will obtain a retest within 30 days and consider the results in assessing an STS as the annual audiogram. The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation. If an STS has occurred, the medical surveillance provider will notify the employee within 21 days of the determination.

2. Standard Threshold Shifts

   If an employee's test results show a confirmed STS, their hearing protection will be evaluated and refitted, and a medical evaluation may be required.

F. Training

Verify that each employee who must work in a noisy environment is current on required Hearing Conservation Training. Training must include the following topics:

1. The effects of noise on hearing.

URS Safety Management Standard
Personal Protective Equipment

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

This standard provides information on recognizing those conditions that require PPE as well as selecting PPE for hazardous activities.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure.

4. Requirements

A. Perform hazard assessments for those work activities that are likely to require the use of PPE.

   1. Use Attachment 29-1 to perform the assessment.

   2. Reevaluate completed hazard assessments when job conditions or duties change.

B. Eliminate the hazards identified in Attachment 29-1, if possible, through engineering or administrative controls.

C. Select PPE that will protect employees if hazards cannot be controlled or eliminated.

   1. See Attachment 29-1 for recommended PPE.

   2. Review Material Safety Data Sheets for chemicals used for PPE recommendations.

   3. If needed, consult with the URS Health, Safety, and Environment (HSE) Representative for assistance in selecting PPE.

D. Provide required PPE to employees free of charge (excluding, in some instances, components of standard work attire such as steel-toed boots),

H. Periodically inspect worksites where employees are using PPE using Attachment 29-2.

5.0 Documentation Summary

A. Records required in the Safety File:

1. Completed Hazard Assessment Certification Forms (Attachment 29-1)
2. Completed Personal Protective Equipment Inspection Sheet (Attachment 29-2)
3. Documentation of employee training.

B. Records required in the Office/Laboratory Safety Filing System:

1. Completed Hazard Assessment Certification Forms (Attachment 29-1)
2. Completed Personal Protective Equipment Inspection Sheet (Attachment 29-2)
3. Documentation of employee training.

6.0 Resources

A. U.S. OSHA Standards - Personal Protective Equipment -29 CFR 1910, Subpart I

B. U.S. OSHA Construction Standard - Personal Protective Equipment –29 CFR 1926 Subpart E

C. U.S. OSHA Technical Links - Personal Protective Equipment

D. Australian Standards SAA HB9-1994 - Occupational Personal Protection

E. American National Standards Institute, ANSI Z89.1-2003, Protective Headwear

F. American National Standards Institute, ANSI Z87.1 - 1989, Eye and Face Protection

G. American Society for Testing and Materials, ASTM F13-WK4519, Specification for Personal Protective Footwear

URS SAFETY MANAGEMENT STANDARD
Sanitation

1. Applicability

This procedure applies to URS field operations.

2. Purpose and Scope

The purpose of this program is to provide employees on field assignments with appropriate personal hygiene facilities, including toilets, wash rooms and eating facilities, and to protect employees from unsanitary conditions.

3. Implementation

Field Activities - Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. Arrange for the installation of adequate toilet and wash facilities during the planning stage of field projects. Note: Mobile crews having transportation readily available to nearby toilet facilities need not be provided with facilities.

1. For job sites without sanitary sewers, provide one of the following:
    a. Privies (where their use will not contaminate ground or surface water).
    b. Chemical toilets.
    c. Combustion toilets.
2. Provide toilets for employees of each sex at field sites according to the following ratio:

Number of Employees	Minimum # of toilets (1)
1 - 15	1
16 - 35	2
36 - 55	3
56 - 80	4
81 - 110	5
111 - 150	6
Over 150	(2)

Footnotes:
(1) Where toilet facilities will not be used by women, urinals may be provided instead of the minimum specified.
(2) One (1) additional fixture for each additional 40 employees.

G. Manage waste generated on site.

1. Release sanitary sewage into sanitary sewer lines or to other proper disposal channels.

2. Do not discharge hazardous waste into the sanitary sewer or storm sewer system.

3. Collect garbage and trash daily.

a. Garbage containers located outside buildings should have lids and remained closed. Transport garbage offsite at least weekly.

b. At remote field sites where bears and similar wild animals are a hazard, remove garbage from the site daily. Do not let garbage remain on site overnight.

H. Prevent pests and vermin from multiplying on site. Eliminate unsanitary conditions that propagate insects or vermin.

I. Inspect work sites using the inspection sheet provided as Attachment 30-1 for compliance at the beginning of the project and mid-project.

5. Documentation Summary

File completed inspection sheets in the Project Safety File.

6. Resources

A. U.S. OSHA Construction Standard - Sanitation - 29 CFR 1926.51

B. U.S. OSHA General Industry Standard - Sanitation - 29 CFR 1910.141

C. National Interim Primary Drinking Water Regulations 40 CFR 141

D. Attachment 30-1 - Sanitation Inspection Checksheet

E. Queensland Workplace Health and Safety - Construction Project Amenities

Research local and state codes and regulations regarding utility locating and isolation requirements. Utility companies and locating services are among the appropriate resources.

C. Overhead Power Lines

1. Proximity to Power Lines

   No work is to be conducted within 50 feet (15 meters) of overhead power lines without first contacting the utility company to determine the voltage of the system. No aspect of any piece of equipment is to be operated within 50 feet (15 meters) of overhead power lines without first making this determination.

2. Operations adjacent to overhead power lines are **PROHIBITED** unless one of the following conditions is satisfied:

   a. Power has been shut off, positive means (such as lockout) have been taken to prevent the lines from being energized, lines have been tested to confirm the outage, and the utility company has provided a signed certification of the outage.

   b. The minimum clearance from energized overhead lines is as shown in the table below, or the equipment will be repositioned and blocked so that no part, including cables, can come within the minimum clearances shown in the table.

MINIMUM DISTANCES FROM POWERLINES	
Nominal System kV	Minimum Required Distance
0-50	10 feet (3 meters)
51-100	12 feet (3.6 meters)
101-200	15 feet (4.6 meters)
201-300	20 feet (6.1 meters)
301-500	25 feet (7.6 meters)
501-750	35 feet (10.7 meters)
751-1000	45 feet (13.7 meters)

Note: For U.K. operations, the specific safe distance is determined by the utility company.

   c. The power line(s) has been isolated through the use of insulating blankets which have been properly placed by the utility. If insulating blankets are used, the utility will determine

6. Non-destructive clearance techniques (e.g. vacuum extraction) are required prior to drilling/excavating in higher risk locations including chemical plants, retail service stations, or other locations with complex underground utility systems.

7. Subsurface work within five feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure must be done by vacuum extraction (or related non-destructive technique) to the point where the obstruction is visually located and exposed. Once the obstruction location is confirmed in this manner, mechanical-assisted work may commence.

8. Reference SMS 013, "Excavation Safety" for additional information regarding subsurface operations.

E. Training

Conduct a briefing for site employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.

5. Documentation Summary

File these records in the Safety Filing System:

1. Documents requesting utility clearance.

2. Documents confirming utility clearance.

3. Training/briefing documentation of each isolation.

6. Resources

A. Utility Locating Services (typically under "Utility" in the Yellow Pages)

B. NIOSH Alert - Preventing Electrocutions from Contact Between Cranes and Power Lines

C. One Call Utility Locating List

D. National Utility Locating Contractor's Association

E. U.K. - Health and Safety Executive GS6

3. Follow instructions in Attachment 42-2 for employees who wish to voluntarily use dust masks.

4. Follow all the requirements of this procedure for employees who wish to voluntarily use tight-fitting (e.g., air purifying) respirators.

5. Required respirators will be paid for by URS and will be provided without cost to the employee.

B. Select the proper respirator for the job.

1. For those jobs identified in Attachment 42-1, contact a HSE Manager for assistance in respirator selection.

2. Contact a HSE Manager for follow up if there are any problems implementing the recommendations made.

C. Require employees who will use respirators to be medically qualified before fit testing and assigning them a respirator.

1. For program details, refer to SMS 24, Medical Screening and Surveillance.

2. Require that employees have a current and accurate Medical Surveillance form (Attachment 24-2).

3. Obtain a copy of the employee's Health Status Medical Report from the Office Health and Safety Representative. The consulting occupational physician of the medical service provider following each work related examination issues the Health Status Medical Report. Employees cannot be assigned respirators unless they are medically cleared for respirator use.

D. Require respirator users to receive appropriate training.

1. All respirator users must be trained:

a. Before they are assigned a respirator.

b. Annually thereafter.

c. Whenever a new hazard or job is introduced.

d. Whenever employees fail to demonstrate proper use or knowledge.

A qualitative fit test results form is available at Attachment 42-5. Documentation of quantitative fit tests should follow the recommendation of the manufacturer of the fit test equipment.

F. Provide qualified employees with respirator(s) and adequate amounts of parts and cartridges.

1. Assign employees whose duties require respirators their own respirator for which they have been fit tested.

2. Provide special eyeglass inserts designed for the respirator if an employee must wear eyeglasses with a full facepiece respirator. Contact lenses may be worn when wearing a full facepiece respirator.

G. Require respirators to be used properly.

1. Prohibit facial hair where the respirator-sealing surface meets the wearer's face.

2. Require employees to perform a positive and negative fit check every time the respirator is put on.

3. Employees will leave the area where respirators are being used:

a. Before removing the facepiece for any reason.

b. To change cartridges.

c. If any of the following is detected:

1. Vapor or gas breakthrough.

2. Leakage around the facepiece.

3. Changes in breathing resistance.

4. Use cartridges with End of Service Life Indicators or determine the respirator cartridge change out schedule. See Attachment 42-4 for Guidance.

H. Require respirators to be cleaned and stored properly.

1. Clean and disinfect respirators after each use.

3. Provide annual refresher training.

4. Provide annual fit testing.

5. Documentation Summary

A. Laboratory

1. File these records in the Laboratory Safety Filing System

   a. Completed forms:

      1. "Identifying When A Respirator Is Needed" - Attachment 42-1; and,

      2. "Respirator Standard Operating Procedure" - Attachment 42-3.

   b. Employee Health Status Medical Report includes clearance for respirator use.

   c. Employee Fit Test Records; and,

   d. Employee Respirator Training Records.

2. Send a copy of the following records to the Regional Health and Safety Manager:

   a. Completed "Voluntary Use of Respirators" form - Attachment 42-2.

   b. Employee Fit Test Records.

   c. Employee Respirator Training Records.

B. Field

1. File these records in the Project Health and Safety File:

   a. Completed forms:

      1. "Identifying When A Respirator Is Needed" - Attachment 42-1; and,

J. NIOSH Guide to Industrial Respiratory Protection

K. Attachment 42-1 - Identifying When a Respirator is Needed

L. Attachment 42-2 - Voluntary Use of Respirators

M. Attachment 42-3 - Respirator Standard Operating Procedure

N. Attachment 42-4 - Respiratory Cartridge Change Schedule

O. Attachment 42-5 - Fit Test Results Form

P. Medical Screening and Surveillance Program - SMS 24

8. Any near miss or incident occurring on projects undertaken for specific clients where URS has contractually agreed to participate in safety systems that dictate that all near miss and incidents undergo a root cause analysis.

9. Any near miss that the Corporate HSE Manager determines if taken to its logical conclusion would have resulted in a fatality, multi-day lost workday case, and/or hospitalization of one or more individuals.

C. Upon notification of a significant incident, the responsible URS Corporate HSE Manager or their designee shall initiate an investigation.

D. Actions: The following actions will be taken to investigate a significant incident:

1. The Occupational Health Manager will notify the responsible Corporate HSE Manager that a significant incident has occurred.

2. The responsible Corporate HSE Manager may solicit input from URS Legal regarding the investigation.

3. An investigation of a complex incident will typically require that an investigation team be assembled. The team shall be selected by the responsible Corporate HSE Manager with input from the affected URS line managers.

4. The responsible Corporate HSE Manager will complete the investigation under the direction of URS Legal Counsel and the Vice President of Health, Safety, and Environment.

5. A preliminary investigation report will be completed within 48-hours of notification of the event by the Corporate HSE Manager. The preliminary report shall include the known facts and a proposed schedule for completion of the investigation.

6. An Incident Summary (Attachment 66-1) shall be prepared for any significant investigation. The incident summary shall contain only basic facts and will be without reference to a site, location, or employee, and shall be developed solely for the purpose of conveying lessons learned to prevent a similar accident, illness, or injury.

URS SAFETY MANAGEMENT STANDARD
Subcontractor Health and Safety Requirements

1. Applicability

This procedure is applicable to subcontractors retained by URS Corporation and its subsidiary companies to perform intrinsically higher risk construction related activities (including drilling and excavation), significant building or infrastructure alteration, demolition, and/or repair activities utilizing their own workforce or equipment. This procedure applies to any activities performed on hazardous waste remediation sites. This procedure is applicable to the operations of subcontractors and sub-subcontractors of any tier.

This procedure does not apply to third party contractor operations where there is no subcontract relationship between the contractor and URS Corporation. Health, Safety, and Environment issues regarding third party contractor operations are governed by project specific contracts and are not covered by this standard.

2. Purpose and Scope

This procedure provides requirements on the pre-evaluation of subcontractor safety programs. It also provides requirements on contractual risk management, subcontractor safety performance on the job site, and the responsibilities of the Project Manager with respect to subcontractor jobsite safety performance.

It is required that each URS Corporation subcontractor be evaluated at least annually using Attachment 46-1, "Subcontractor Safety Evaluation Form," in order to perform work on any new URS Corporation projects.

3. Implementation

Implementation of this standard is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) Health, Safety, and Environment (HSE) Manager must approve deviations from this procedure.

4. Requirements

A. Pre-qualification of Subcontractor - The Project Manager shall complete the following procedures for all subcontractors retained on projects covered by this standard (the PM should also require subcontractors to follow these procedures with respect to pre-qualification of sub-subcontractors of any tier):

work in the event of any violations of the applicable Health & Safety Plan.

C. Subcontractor Safety Representative

1. Require each subcontractor to appoint a Subcontractor Safety Representative (SSR) who:

    a. Is knowledgeable of the subcontractor's activities.

    b. Understands the safety requirements of the subcontractor's activities.

    c. Has the ability to recognize and the authority to correct safety deficiencies and execute a stop work order should an imminent danger arise.

    d. Has the responsibility for the administration of the subcontractor Health and Safety Program.

    e. Will serve as the direct contact with URS Corporation regarding resolution of Health and Safety issues.

D. Communication

1. Provide the SSR with information regarding Site Safety Program including but not limited to:

    a. Client Requirements.

    b. URS Corporation Site Safety Program.

    c. Site Hazard Communication Program.

    d. Site Emergency Action Plan.

    e. Any additional safety information from other contractors or subcontractors working on the site.

2. Provide SSR with name of URS Corporation project contact and alternate for addressing site Health and Safety issues.

3. Require the participation of subcontractors in all Site Safety Briefings.

7. Subcontractor safety plan, incident reports and resolution reports.

6. Resources

A. "Occupational Injury and Illness Rates by SIC", Bureau of Labor Statistics, U. S. Department of Labor (http://www.bls.gov/iif/oshsum.htm)

B. Managing Subcontractor Safety, Prepared by The Construction Industry Institute, Safety Task Force, Publication 13-1, The University of Texas at Austin, Austin, Texas, 1991 (http://www.construction-institute.org/)

C. American National Standard Construction and Demolition Operations -- Safety and Health Program Requirements for Multi-Employer Projects, ANSI A10.33-1992, National Safety Council, Itasca, Illinois 60143-3201 (http://www.nsc.org)

D. "Liability, OSHA and the Safety of Outside Contractors," Professional Safety, American Society of Safety Engineers, January 1993 (http://www.asse.org)

E. "Proactive Construction Management; Dealing With the Problem of Subcontractor Safety," Professional Safety, American Society of Safety Engineers, January 1990 (http://www.asse.org)

F. Attachment 46-1 - Subcontractor Safety Evaluation Form

G. Attachment 46-2 - Subcontractor Evaluation Criteria

H. Attachment 46-3 - Subcontractor Variance Form

- URS engineers, technician, and geologists shall not assist the drillers with the drilling equipment or supplies and shall not at any time operate the drill rig controls.

B. Movement of Drill Rigs

Before moving a rig, the operator must do the following:

- To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.
- Check the brakes of the truck/carrier, especially if the terrain along the route of travel is rough or sloped.
- Discharge all passengers before moving on rough or steep terrain.
- Engage the front axle (on 4x4, 6x6, etc. vehicles) before traversing rough or steep terrain.

Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator must conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility must be considered that the presence of drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).

Logs, ditches, road curbs, and other long and horizontal obstacles should be normally approached and driven over squarely, not at an angle.

When close lateral or overhead clearance is encountered, the driver of the rig should be guided by another person on the ground.

Loads on the drill rig and truck must be properly stored while the truck is moving, and the mast must be in the fully lowered position.

After the rig has been positioned to begin drilling, all brakes and/or locks must be set before drilling begins. If the rig is positioned on a steep grade and leveling of the ground is impossible or impractical, the wheel of the transport vehicle should be blocked and other means of preventing the rig from moving or topping over employed.

C. Buried and Overhead Utilities

The location of overhead and buried utility lines must be determined before drilling begins, and the locations should be noted on boring plans and/or assignment sheets.

When overhead power lines are close by, the drill rig mast should not be raised unless the distance between the rig and the nearest power line is at

those in the work area as it rotates with the drill stem. URS does not permit drillers to use manual tools (e.g. pipe wrenches) in combination with a rotating drill stem to break rods. Manual tools may be used if the drill stem is isolated/positively disengaged.

Mechanical means of rod separation that are permitted include:

- Opposing hydraulic controls
- Rod locking devices
- Hydraulic breakout tools
- Hydraulic foot clamps

G. Safe Use of Hand Tools

Regulations regarding hand tools should be observed in addition to the guidelines provided below:

- Each tool should be used only to perform tasks for which it was originally designed.
- Damaged tools should be repaired before use or discarded.
- Safety goggles or glasses should be worn when using a hammer or chisel. Nearby co-workers and by-standers should be required to wear safety goggles or glasses also, or move away.
- Tools should be kept cleaned and stored in an orderly manner when not in use.

H. Safe use of Wire Line Hoists, Wire Rope, and Hoisting Hardware

Safety rules described in Title 29 Code of Federal Regulations (CFR) 1926.552 and guidelines contained in the Wire Rope User's Manual published by the American Iron and Steel Institute shall be used whenever wire line hoists, wire rope, or hoisting hardware are used. The driller should provide written reports (upon request) documenting inspections of equipment.

I. Traffic Safety

Drilling in streets, parking lots or other areas of vehicular traffic requires definition of the work zones with cones, warning tape, etc. and compliance with local police requirements. Refer to SMS 32 "Work Zone Traffic Control".

- Once a drilling site has been surface cleared and a pilot hole established as described above, the drilling contractor will be notified that the site is available for subsurface drilling.
- Additional guidance for MEC/UXO support during drilling activities is provided in URS SMS 039.

L. Protective Gear

1. Minimum Protective Gear

Items listed below should be worn by all staff working within 30 feet (10 meters) of drilling activities.

- Hearing Protection;
- Hard Hat;
- Eye Protection (safety glasses, goggles, or face-shield)
- Safety Shoes (shoes or boots with steel toes)

2. Other Gear

Items listed below should be worn when conditions warrant their use. Some of the conditions are listed after each item.

- **Safety Harnesses and Lifelines:** Safety harnesses and lifelines shall be worn by all persons working on top of an elevated derrick beam or mast. The lifeline should be secured at a position that will allow a person to fall no more than six feet (2 meters). OSHA Fall Protection (1926 Subpart M) requirements apply.
- **Life Vests**: Use for work over water.

5. Resources

A. International Association of Drilling Contractors Safety Alerts
http://iadc.org/alerts.htm

B. Fall Protection - SMS 040

C. Hearing Conservation - SMS 026

D. Subcontractor Health and Safety Requirements - SMS 046

E. Utility Clearances and Isolation - SMS 034

URS SAFETY MANAGEMENT STANDARD
Manual Material Handling

1. Applicability

This standard applies to URS operations where personnel perform manual handling of materials. For this procedure, manual material handling (MMH) is defined as the movement of items by lifting, lowering, pushing, pulling, carrying, holding, or restraining.

2. Purpose and Scope

The purpose of this procedure is to prevent common injuries caused by the practice of MMH. Immediate or short-term effects include lacerations, bruises, and muscle fatigue. Long-term effects include chronic pain, typically in the lower back.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility or site.

A Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager must approve deviations from this procedure

4. Requirements

A. General

1. Prior to lifting, lowering, pushing, pulling, carrying, holding, or restraining an object of any significant size or weight, employees must evaluate the object and the required task to determine if they can handle the object safely.
2. If the employee has any doubt about whether than can safely move the object by themselves, additional manual or mechanical help should be obtained.
3. Healthy employees with no physician imposed restrictions should lift and carry a maximum of 50 pounds (23 kilograms) using proper lifting and carrying techniques. Physical and workplace factors may reduce this recommended weight limit (RWL) significantly and should be considered prior to attempting lifts of this magnitude.
4. An employee's personal "safe" MMH capability is defined as the employee's personal capability to manually lift, carry, push, or pull an object alone. This "safe" limit must consider the employee's past experience and training with MMH, health status, and any other personal or environmental characteristics affecting the

2. The recommended technique for manual lifting/lowering involves five maneuvers:
   a. Get a firm footing. Keep your feet apart for a stable base. Put one foot slightly in front of the other.
   b. Bend your knees. Do not bend at the waist. When grasping the object, a firm grip should be obtained before lifting/lowering.
   c. Lift/lower with your legs. Lift/lower the load slowly and in a straight line, avoiding sudden movements.
   d. Keep the load close to the body. Generally, the closer the load is to the body, the less force it exerts on your back.
   e. Keep your back straight. Do not add the weight of your body to the load. Avoid twisting.
3. When a turn or change of direction is necessary, the object should be lifted or lowered into a carrying position, then the whole body should be turned with the feet, avoiding any trunk twisting motion.
4. Objects to be lifted to shoulder height should first be lifted to waist height, then rested on a level surface so the grasping position can be changed prior to lifting to a higher level.
5. Employees should never lift a load above their head.

D. Carrying/Holding Guidelines

1. Manual carrying is an inefficient way of transporting materials in the work place. Where possible, reduce or eliminate manual carrying tasks.
2. Employees should never carry a load above their head.
3. Carry an object close to the body using both hands. One-handed carries are awkward and tend to unbalance the employee.
4. Do not carry objects that are so large they will obstruct visibility.
5. Grips on an object should not be changed while carrying or holding an object. Rest the object on a secure surface prior to changing grip.
6. Avoid two person carries where possible. If an object is of a size, shape, or mass that it requires two people to carry, use two people of similar size and physique. Perform lifting of the item in unison.
7. Avoid carrying objects on stairs, particularly where the line of sight may be obstructed or the object can interfere with leg movement.

b. Teaching personnel to become aware of what they can comfortably handle without undue strain.

c. Instructing personnel on the proper use of equipment.

d. Teaching personnel to recognize potential hazards and how to prevent or correct them.

2. This training must be completed prior to an employee being assigned to a task that involves MMH activities.

5. Documentation Summary

Training rosters or other proof of completion of MMH training will be filed in the Health and Safety File.

6. Resources

A. Recommended Weight Limit Calculations (RWL) – Attachment 69-1

B. Work Practices Guide for Manual Lifting, NIOSH
http://www.cdc.gov/niosh

C. Canadian Centre for Occupational Health and Safety
http://www.ccosha.ca/oshaanswers/ergonomics/mmh/

D. Oregon OSHA "Ergonomics of Manual Materials Handling"
http://www.cbs.state.or.us/external/osha/pdf/workshops/206w.pdf

E. North Carolina Department of Labor "A Guide to Manual Materials Handling and Back Safety
http://www.nclabor.com/osha/etta/indguide/ig26.pdf

F. European Agency for Safety and Health at Work
http://uk.osha.eu.int/good_practice/msd.stm

Rocky Mountain Spotted Fever is an infection caused by the bacteria *Rickettsia rickettsii*. The disease occurs in North, Central, and South America. Other Rickettsia organisms cause disease worldwide (Mediterranean, Japan, Africa, North Asia). Symptoms which occur 2-6 days following a tick bite include: fever, nausea, vomiting, diarrhea, rash, muscle and joint pain. The disease is treated with antibiotics.

Babesiosis is caused by hemoprotozoan parasites of the genus *Babesia*. It is transmitted by the ixodid tick. The geographic distribution is worldwide. Symptoms include fever, chills, fatigue, muscle aches, and an enlarged spleen and liver. The disease is treated with anti-protozoan drugs.

Ehrlichiosis is caused by several bacteria of the genus *Ehrlichiae*. The geographic distribution is global, primarily in temperate regions. Symptoms which occur 5-10 days following a tick bite include fever, headache, fatigue, muscle aches, nausea, vomiting, diarrhea, confusion, and occasionally a rash. The disease is treated with antibiotics.

a. Avoidance of tick habitats

Whenever possible, persons should avoid entering areas that are likely to be infested with ticks, particularly in spring and summer when nymphal ticks feed. Ticks favor a moist, shaded environment, especially that provided by leaf litter and low-lying vegetation in wooded, brushy, or overgrown grassy habitat. Both deer and rodent hosts must be abundant to maintain the life cycle of the tick.

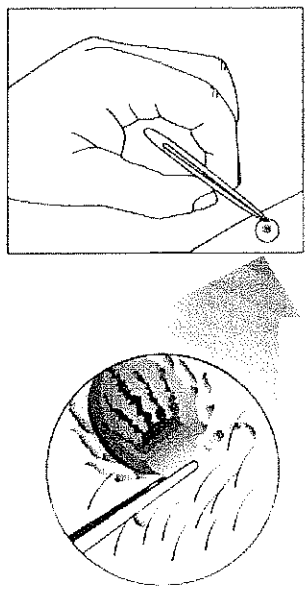
b. Personal Protective Equipment

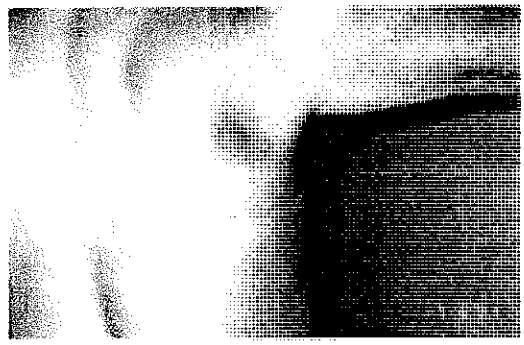
1. Wear light colored clothing or white Tyvek® to allow you to see ticks that are crawling on your clothing.

2. Tuck your pant legs into your socks or boots, wear high rubber boots, or use tape to close the opening where they meet so that ticks cannot crawl up the inside of your pant legs.

3. Wear a hat, tie back long hair.

4. Apply repellents to discourage tick attachment. Repellents containing permethrin can be sprayed on boots and clothing and will last for several days. Repellents containing DEET (n,n-diethyl-





a. Use fine-tipped tweezers. When possible, avoid removing ticks with bare hands.

b. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens, remove mouthparts with the tweezers.

c. Do not squeeze, crush, or puncture the body of the tick because its fluids (saliva and gut contents) may contain infectious organisms.

d. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

e. Disinfect the tweezers.

f. Save the tick for identification in case you become ill. This may help the doctor make an accurate diagnosis. Place the tick in a vial or plastic zip lock bag and put it in the freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.

3. Medical Follow-Up

In most circumstances, medical treatment of persons who only have a tick bite is not recommended. However, individuals who are bitten by a tick

Poison Ivy grows as a small plant, vine, and as a shrub. Leaves always consist of three glossy leaflets.

Poison Ivy

Poison Oak grows as a shrub or vine. It has three leaflets that resemble oak leaves.

Eastern Poison Oak

Poison Sumac grows as a woody shrub or small tree from 5 to 25 feet tall. It has 7 to 13 leaves that grow opposite each other with a leaflet at the tip.

Poison Sumac

1. Precautionary Measures

   The best approach is to learn to identify the plants and avoid them.

   Wear long pants and long sleeves, boots and gloves.

   Barrier skin creams may offer some protection if applied before contact.

include fever, shaking chills, headache, muscle ache, tiredness, jaundice, nausea, vomiting, and diarrhea. Malaria can be cured with prescription drugs.

c. Dengue Fever is a potentially life-threatening viral illness transmitted by the bite of the Aedes mosquito, found primarily in urban areas. The disease is found in most of tropical Asia, the Pacific Islands, Central and South America, and Africa. There are four dengue virus serotypes. Symptoms include sudden onset, high fever, severe headache, joint and muscle pain, rash, nausea and vomiting. There is no specific treatment and no vaccine.

d. Yellow Fever is a viral disease transmitted between humans by mosquitoes. It occurs only in Africa and South America. There is a vaccine that confers immunity lasting 10 years or more. Symptoms begin 3-6 days after the mosquito bite and include fever, nausea, vomiting, headache, slow pulse, muscle aches, and restlessness. Treatment is symptomatic.

2. Precautionary Measures

Insect Repellent – Use insect repellants that contain DEET. The effect should last about 4 hours. Always use according to label directions. Use only when outdoors and wash skin after coming indoors. Do not breathe in, swallow, or get into the eyes. Do not put on wounds or broken skin.

Protective Clothing – wear long sleeved shirts and long pants, especially from dusk to dawn. Or avoid going outdoors during these hours.

Mosquito netting – Travelers who will not be staying in well-screened or air conditioned rooms should use a pyrethroid containing flying insect spray in living and sleeping areas during evening and nighttime hours. Sleep under mosquito netting (bed nets) that have been sprayed with permethrin.

Malaria prophylaxis medications may be prescribed, however they do not provide complete protection. The type of medication given depends on the area of travel.

Do not pick up any live snake. If you encounter a snake, walk around the snake, giving it plenty of room. A snake can strike half its length.

Don't pick up freshly killed snakes without first severing the head. The nervous system may still be active and a dead snake can deliver a bite.

3. Medical Follow-up

If you are bitten by a snake, the primary goal is to get to a hospital as soon as possible to receive professional medical evaluation and possible treatment with antivenom if warrented. Initial first aid should include: Wash the bite with soap and water. Immobilize the bitten area and keep it lower than the heart. Try to remain calm. If you are unable to reach a hospital within 30 minutes, a bandage, wrapped two to four inches above the bite, may help slow the venom. The bandage should not cut off blood flow from a vein or artery, make sure the band is loose enough that a finger can slip under it. A suction device from a commercial snakebite kit may be placed over the bite to help draw venon out of the wound.

Research has shown the following to be potentially harmful, DO NOT: apply ice, use a tourniquet, or make incisions into the wound.

E. Valley Fever

1. Background Information

Valley Fever is an illness that results from exposure to a fungal spore (*Coccidioides immitis*). It is endemic to the San Joaquin Valley in California as well as areas of Southwestern U.S., Mexico, Central and South America though it has been found in many other areas. It is particularly associated with arid soils that are not cultivated. Exposure is generally by inhalation of spores, though it may also enter through broken skin. Approximately two weeks after inhalation exposure, severe weakness and flu-like symptoms develop; severe pneumonia may occur. It may also affect the brain, bones, and joints causing disability, spinal meningitis, or death. Dermal forms of the infection can form disfiguring fungal lesions.

2. Precautionary Measures

Because it is associated with arid soils, personnel should avoid locations and activities that create dust. Persons at risk of exposure include geologists, surveyors, excavators, archaeologists, etc. Dust suppression

successful, personnel should be alert to signs and symptoms of possible pathogenic organisms and seek prompt medical evaluation if illness develops or is suspected.

5. Documentation Summary

Complete and distribute a URS Incident Report form 49-1 for all work-related biological exposure incidents.

6. Resources

A. Centers for Disease Control
http://www.cdc.gov

B. U. S. Occupational Safety and Health Administration
http://www.osha.gov

C. U.S. Food and Drug Administration
Treating and Preventing Venomous Snake Bites
http://www.fda.gov/fdac/features/995_snakes.html

2. First Aid Services

   a. First Aid Responders

      At least one person, and preferably two or more, trained in first aid must be available at the worksite if either of these conditions exist:

      (1). If life threatening injuries can reasonably be expected, trained personnel must be available within 3 to 4 minutes. This generally means that community emergency medical services cannot be relied on since their response time is usually greater than 3 minutes.

      (2). If no life threatening injuries can reasonably be expected, the response time for trained personnel is extended to 15 minutes.

      The trained first aid responders should be designated so that the other employees know who they are and how to contact them. The trained responder must have a current first aid certificate and be trained in Bloodborne Pathogens (See SMS 51).

   b. First Aid Kits

      Each site shall maintain a first aid kit in accordance with SMS 24-9.

   c. Emergency Information

      Each location shall post a current list of emergency telephone numbers and maps to access local medical emergency providers (SMS 003). Advance contact with ambulance services to ensure they are familiar with location, access routes, and hospital locations is advised in remote or new locations.

   d. Eyewash Facilities

      If corrosive materials are used, eyewash and body flush facilities must be provided. Where possible, these should provide large quantities of clean water. The water source must be pressure controlled and clearly identified. Portable eyewash stations must contain a minimum of 1 gallon of potable water.

   e. Identification of Medical Facilities

- Fractured bones
- Suspected internal injuries
- Suspected exposure to chemical/biological hazard
- Second or third degree thermal or chemical burns (i.e. blistering)
- Electrocution
- Unexplained change in mental state following an injury (may indicate shock or other internal injuries)

3. Non-Emergency Injury/Illness Treatment

   When a work-related incident results in a non-critical injury/illness, the primary objective is to provide appropriate medical services to diagnose and treat the injury/illness. Options available to the employee and project/office management in these situations include the following:

   - First aid treatment and/or review by a qualified first aid responder
   - First aid treatment and/or review by a qualified first aid responder followed by a referral to the Occupational Health Specialist (866-326-7321).

   Additional support for the employee and managers in these situations can also be obtained from a URS H&S professional.

   Attachment 065-1 provides a flow chart to assist employees and managers in determining the most appropriate option for obtaining medical services for non-emergency injuries/illnesses.

   Note – Some states allow injured workers to choose their own initial medical provider. Employees are to be cautioned that not all medical providers accept workers' compensation insurance and coverage should be verified prior to treatment if an employee lives in a state that permits him/her to elect to see their personal doctor rather than the company recommended physician.

C. Workers' Compensation Case Management

1. Health and Safety

   a. URS Occupational Health Specialist will:

(3). Forward any external communication (clinic bills, Monopolistic state forms, etc.) to the OHS upon receipt.

b. Regional HR Managers will coordinate any Short Term Disability benefits owed to employees disabled from working over one week because of a work-related injury/illness.

3. Supervisor

The Supervisor (or HR or H&S Representative) will:

a. Sign the Medical Treatment Referral form (065-2) prior to the employee leaving the site for medical treatment (this will not be necessary in an emergency). The employee will also be given the Medical Authorization Form (065-3) to be signed with copy provided to the employee, health care provider and OHS.

b. Provide transitional job assignments, with consultation and approval of the office manager, whenever possible to enable an injured worker to return to work (Return to Work Policy 065-4). Transitional employment is defined as temporary modified or light duty work that covers the time from the injury until the release to full duty from the doctor. The return to work hierarchy includes:

(1). Return to own job

(2). Return to own job with accommodations/modifications

(3). Return to another job at URS with or without accommodations/modifications

(4). Placement in alternate jobs through telecommuting or other job assignments determined on a case by case basis.

c. Provide, when requested by the treating physician or insurance carrier, the Description of Employee's Job Duties form (065-5).

d. Maintain regular contact with employees who are temporarily disabled (contact at least weekly by phone or email).

4. Employee

The employees will:

- OSHA 1910.151 Medical Services and First Aid
- OSHA Instruction CPL 2-2.53 Guidelines for First Aid Programs
- OSHA Safety & Health Topics: Medical and First Aid
- Red Cross Health & Safety Services www.redcross.org/services/hss/
- SMS 003 Emergency Action Plans
- SMS 024 Medical Surveillance
- SMS 049 Incident Reporting
- SMS 051 Bloodborne Pathogens
- Medical Services Provider – WorkCare™ 1-800-455-6155
- Workers' compensation insurance provider AIG – www.aigcs.net
- Occupational Health Specialist – Jeanette Schrimsher, RN COHN-S
- Phone 866-326-7321
- Confidential Fax 512-419-6413

Attachments

065-1 Injury Management Procedures (Flow Chart)

065-2 Medical Treatment Referral form

065-3 Medical Authorization Letter

065-4 Return to Work Policy

065-5 Description of Employee's Job Duties

ATTACHMENT F

SUBCONTRACTOR HEALTH AND SAFETY PLAN

To be included with final HASP.

APPENDIX G

HEALTH AND SAFETY EQUIPMENT LIST

HEALTH AND SAFETY EQUIPMENT LIST

5736 W Jefferson St, Phoenix, AZ 85043

Required	Recommended	
3		URS Safety Management Standards (Attachment E)
	3	OSHA "Safety on the Job" Posters
3		Hardhats
3		Safety glasses
3		Ear plugs or muffs
	3	Cotton coveralls
3		Traffic safety vest
	3	Tyvek® coveralls
	3	Polycoated Tyvek® Q-23 Coveralls
3		Steel-toed boots
3		Chemical-resistant steel-toed boots or chemical-resistant boot covers
	3	Work gloves
3		Nitrile outer gloves
3		Surgical nitrile inner gloves
3		Plastic sheeting (visqueen)
3		55 gallon 17-H drums (for contaminated solids)
3		Barricade tape and barricades
3		Wash tubs and scrub brushes
3		Decon solution (i.e., Alconox®, TSP)
	3	Folding chairs
3		5 or 10 gallon portable eyewash
3		Respirator sanitizing equipment
3		First Aid kit
3		Infection control kit
3		Drinking water
3		Gatorade or similar drink
3		Type ABC fire extinguishers
3		Half-face respirators (NIOSH approved)
	3	Full-face respirators (NIOSH approved)
3		Respirator cartridges **[n, p, r- 100 Cartridge]**
	1	Photoionization Detector (PID) w/ 10.6 lamp and calibration kit
	3	Combustible Gas Indicator and calibration kit
	3	Garden sprayer
	3	Compressed gas horn
3		Duct tape
3		Paper towels and hand soap
	3	Spill sorbent
3		Plastic garbage bags
	3	Broom and/or shovel