ATTACHMENT 15
CONCRETE MANAGEMENT PROGRAM

CONCRETE MANAGEMENT PROGRAM PROCEDURES

1.0 Introduction

This attachment describes the Concrete Management Program (CMP) proposed by the World Resource Company (WRC). The CMP has two principal purposes. The first is to increase the likelihood that WRC's Hazardous Waste Management Unit (HWMU) may be closed in accordance with relevant closure criteria set forth in the Closure Plan's Section 11.4, *i.e.,* compliance with *non-residential* soil remediation standards and the minimum groundwater protection levels (GPLs), or other GPLs approved by the Arizona Department of Environmental Quality. The second purpose is to recognize WRC's voluntary objective of achieving clean closure, *i.e.*, compliance with *residential* soil remediation standards and minimum GPLs, or other GPLs approved by the Arizona Department of Environmental Quality. Compliance with the Section 11.4 criteria will require a Declaration of Environmental Use Restriction (DEUR) but ensures that post-closure structures such as a landfill-like cap will not be required. Achievement of clean closure eliminates the need for a DEUR, as would otherwise be required for properties that are remediated to the non-residential soil remediation standards or that require engineered structures to meet post-closure criteria.

The CMP is designed to minimize the potential for the migration of hazardous constituents into the HWMU's concrete floor and the soil layer between the concrete and the underlying membrane liner. It is also designed—if damage to the lowermost liner is observed during the replacement of damaged concrete and the sampling of the underlying soil layer—to provide data regarding the extent of constituent migration in damaged concrete, the underlying soil layer, and the soil below the lowermost membrane liner.

In accordance with the procedures and schedules described in Section 6 of the RCRA permit application, portions of the HWMU's concrete floor will be inspected on a daily basis, and the entire surface at least annually. The observations made during the inspections and any resulting repairs or replacement of the concrete will be documented using the inspection form in Section 6, or a similar form that is at least as comprehensive as that form. The sampling logs, analytical data, and records regarding replacement of concrete and underlying soil will be maintained at the WRC facility until closure of the HWMU has been approved by ADEQ.

The CMP includes sampling and analytical procedures used to produce data needed for comparison with the action criteria described in Section 2.8 below. However, the CMP will remain in effect only until the Closure Plan goes into effect following notice of final closure as provided in Section 11.1 of the Closure Plan. The determination of compliance with the closure criteria set forth in Section 11.4 of the Closure Plan will be based on data developed in accordance with the sampling and analytical procedures set forth therein.

2.0 Procedures

2.1 Criteria for Concrete Repair and Replacement

The objective of concrete repair is to maintain the integrity and effective life of the HWMU concrete floor before degradation of damaged concrete potentially results in a release pathway through the concrete and to underlying soils. The objective of the concrete replacement is to replace damaged portions of the HWMU concrete surface that cannot be repaired with a reasonable assurance

that the repaired portion will not include release pathways through the concrete. Replacement of the damaged portions of the concrete surface therefore minimizes the potential for the migration of hazardous constituents into the soil layer below the concrete floor.

WRC developed the narrative criteria provided below for the repair and replacement of the HWMU concrete surface as part of the inspection program described in Section 6 of the RCRA permit application. Results of the concrete surface inspection procedures are compared against objective criteria to determine whether repair is appropriate or replacement is necessary.

2.2 Concrete Surface Repair Criteria

Repair activities will be conducted if any of the following is observed:

- Linear types of cracks found to be wider than 0.125 inch at the surface or deeper than 0.5 inch are designated to be repaired;
- Construction or expansion joints exhibiting evidence of deterioration of the joint sealant; and
- Deterioration of the concrete surface includes breaking, splitting, and separation of the sealant from the joint, but not discoloration, minor wear, and other non-substantive conditions.

When crack repair is required, a concrete saw or a hand grinder with a diamond-tipped "crack chaser" is used to prepare a clean, uniform surface. The cut or grinded surface is cleaned by vacuum. The cut or grinded crack is then filled with an appropriate commercial sealant and allowed to cure. On completion, the surface is coated with a chemically resistant sealant.

2.3 Concrete Surface Replacement Criteria

Concrete will be replaced if any of the following is observed.

- Corner break: A corner break is a crack that intersects the joints at a distance less than or equal to one-half the slab length on both sides, measured from the corner of the slab.
- Linear or diagonal cracking affecting the structural integrity of section. These cracks would normally divide the slab into two or three pieces. They are differentiated from linear types of cracks that simply need repair at the point where multiple repairs (three or more) are required for a particular crack.
- Map or pattern cracking within a contiguous area exceeding 150 square feet. Map or pattern cracking is a series of cracks that extend only into the upper surface of the pad.
- Erosion of the concrete surface exceeding 0.5 inch within a contiguous area exceeding 150 square feet.

When replacement of a portion of the concrete floor is required, the designated area for replacement will be cordoned off, the location documented, and recyclable material within the cordoned-off area will be removed. The area cordoned off will initially include an area at least six inches beyond all evidence of irreparable damage to the concrete or to the distance of an intact construction or expansion joint if the joint is less than six inches from the damaged concrete. The area will be swept clean in preparation for repairs.

2.4 Sampling of Removed Concrete and Materials in Soil Layer

Samples of concrete will be collected at locations where maximum constituent concentrations are expected based on the locations of observed seams and cracks, as well as any visible staining that is observed on the concrete. Samples will be collected from the soil and other material located between the sampled concrete and the membrane liner below the soil layer. If that liner appears to be damaged and there is no lower membrane liner, samples of soil below the damaged liner will be collected for analysis before the liner is repaired. If there is a membrane liner below the damaged liner, the soil layer immediately below the two liners will be sampled and the integrity of the lower liner will be observed. If the lower liner appears to be damaged, samples of soil below the damaged portion of the liner will be collected before the lower liner is repaired, the soil layer between the two liners is replaced, and the upper liner repaired. Sampling and removal activities described above will be expanded horizontally where removal of contiguous concrete is indicated by observed conditions in, or analytical results obtained from, impacted concrete or an impacted soil layer.

Sample management procedures described below will apply to all CMP samples. Sampling will be conducted using a decontaminated stainless-steel spoon or disposable sampling trowel for each different media at each sampling location. All samples collected and analyzed as part of the removal of a specific portion of the concrete floor will be identified and reported as such.

Removed materials will be characterized by sampling and analysis in accordance with procedures of Sections 2.5 and 2.6 below. The removed materials may be placed into containers or roll-off bins, covered, and labeled while awaiting analytical results, or temporarily stockpiled on a decontaminated portion of the HWMU and covered with a tarp or plastic sheeting. Replacement soil and concrete will be analyzed for the metals listed in Section 2.5 below.

2.5 Characterization of Removed Concrete, Replacement Cement and Materials in the Soil Layer

Characterization of removed concrete, replacement cement, material in the soil layer, and the soil below the portions of the lowermost membrane liner where damage was observed during replacement activities will include the analysis of all metals and cyanides that form the basis for demonstrating clean closure. The samples will be analyzed by an Arizona Department of Health Services certified laboratory for the constituents and methods described below:

- Total aluminum, antimony, arsenic, barium, beryllium, cadmium, cobalt, copper, chromium, lead, manganese, nickel, selenium, silver, thallium, tin, vanadium, and zinc using United States Environmental Protection Agency (USEPA) Test Methods 3050 (sample preparation) and 6010B (sample analysis);
- Total mercury using USEPA Test Methods 3050 (sample preparation) and 7471 or equivalent (sample analysis);
- Total and amenable cyanide using USEPA Methods 9010C or 9012B; and
- Total hexavalent chromium using USEPA Test Methods 3060 (sample preparation) and 7196 (sample analysis) if total (trivalent chromium) exceeds 30 milligrams per kilogram (mg/kg). (Samples will be extracted and held for possible hexavalent chromium analysis, pending the results of total chromium analysis).

2.6 Toxicity Characteristic, Treatment Standards for Hazardous Wastes and Universal Treatment Standard Criteria

The following table describes analyses that may be required for purposes of characterization of waste for shipment to off-site disposal facilities. It includes the Toxicity Characteristics (TC) and Universal Treatment Standards (UTS) for the Resource Conservation and Recovery Act (RCRA) "Eight" metals and the Underlying Hazardous Constituents for the D004 through D011 Waste Codes. It also includes the Treatment Standards for Hazardous Waste (TSHW) criteria for F006 and F019 waste. The criteria are presented in two forms. The first is based on the Toxicity Characteristic Leaching Procedure (TCLP) and the values are presented in milligrams per liter (mg/l). The second form is based on total metals (TM) analysis and the "20 times" rule and the values are presented in mg/kg. If the TM analyses specified in the following table yield concentrations less than the concentrations presented as mg/kg, analyses based on the TCLP will not be required.

Applicable Toxicity Characteristic (TC) Criteria, Treatment Standards for Hazardous Wastes Criteria and Universal Treatment Standards (UTS) Criteria[1]

Metals	TC Criteria[2]	UTS Criteria[3]	TSHW Criteria[5]
RCRA Eight Metals			
D004, Arsenic	5.0 mg/l, 100 mg/kg	5.0 mg/l, 100 mg/kg	
D005, Barium	100.0 mg/l, 2,000 mg/kg	21 mg/l, 420 mg/kg	
D006, Cadmium	1.0 mg/l, 20 mg/kg	0.11 mg/l, 2.2 mg/kg	
D007, Chromium (total)	5.0 mg/l, 100 mg/kg	0.6 mg/l, 12 mg/kg	
D008, Lead	5.0 mg/l, 100 mg/kg	0.75 mg/l, 15 mg/kg	
D009, Mercury	0.2 mg/l,4.0 mg/kg	0.025 mg/l, 0.5 mg/kg	
D010, Selenium	1.0 mg/l, 20 mg/kg	5.7 mg/l, 114 mg/kg[6]	
D011, Silver	5.0 mg/l, 100 mg/kg	0.14 mg/l, 2.8 mg/kg	
F006 and F019 Waste			
F006, Cadmium			0.11 mg/l, 2.2 mg/kg
F006, Chromium (total)			0.6 mg/l, 12 mg/kg
F006, Nickel			11 mg/l, 220 mg/kg
F019, Chromium (total)			0.6 mg/l, 12 mg/kg
F006 and F019, Total Cyanide			590 mg/kg[4]
F006 and F019, Free Cyanide			30 mg/kg[4]
Applicable Underlying Hazardous Constituent Criteria for D004 through D011 Waste Codes			
Antimony		1.5 mg/l, 30 mg/kg	
Beryllium		1.22 mg/l, 24.4 mg/kg	
Thallium		0.2 mg/l, 4 mg/kg	

[1] USEPA Test Methods 1311 (TCLP) followed by Method 6010B (sample analysis for all metals except mercury), and 7471 (for mercury analysis) or, for total metals (Method 3050 (sample preparation) followed by Method 6010B (sample analysis for all metals except mercury), and Method 7471 (for mercury analysis).

[2] Value from Arizona Administrative Code (A.A.C. R18-8-261.A (40 CFR 261.24), Table 1: first value based on TCLP analysis; second value based on TM analysis and 20 times rule.

[3] Value from A.A.C. R18-8-268 (40 CFR 268.48), Universal Treatment Standards Table, Nonwastewater Standard: first value based on TCLP analysis; second value based on TM analysis and 20 times rule.

[4] Both Total Cyanides and Amenable Cyanides are to be analyzed using USEPA Test Method 9010C and Method 9012B, respectively, with a sample size of 10 grams and a distillation time of one hour and 15 minutes.

[5] Treatment Standards for Hazardous Wastes Table, Nonwastewater Standard: first value based on TCLP analysis; second value based on TM analysis and 20 times rule.

[6] This constituent is not an underlying hazardous constituent as defined at § 268.2(i) of this part because its UTS level is greater than its TC
level, thus a treated selenium waste would always be characteristically hazardous, unless treated to below its characteristic level (A.A.C. R18-8-268 (40 CFR 268.48), Footnote 7).

mg/l = milligrams per liter

mg/kg = milligrams per kilogram

2.7 Sample Documentation

Information will be recorded on chain-of-custody forms, sampling log sheets, and a field notebook.The field notebook is used to keep a diary of field activities and to record pertinent data that are not necessarily included on the chain-of-custody form or the sampling data log sheet. The information recorded on the sampling data sheets includes the following:

- Sample identification number recorded on the container label;
- Type of sample, e.g., concrete, soil within soil layer, soil beneath the lowermost liner;
- Sample location number;
- HWMU Site Map/Site Inspection Log, Section 6 of RCRA Permit Application, showing sample location (by sample location number) relative to area (pad) being sampled;
- Random or biased sampling location coordinates;
- Sampling equipment used;
- Sampling depth (in inches if sample collected above lowermost membrane liner or in feet if sample is collected below lowermost liner);
- Moisture observations;
- Visual observations
- Sampling time and date; and
- Identification of blind duplicate samples and fictitious sampling times.

2.8 Evaluation of Concrete Management Program Data

As explained in Section 1.0, the CMP is designed to increase the likelihood that constituent concentrations in the HWMU's concrete floor, the soil layer between the concrete and the underlying membrane liner(s), and the soil below the lowermost liner will meet closure criteria set forth in Section 11.4 of the Closure Plan or criteria for clean closure. As also explained in Section 1.0, the CMP will not be in effect once the Closure Plan takes effect following notice of final closure in accordance with Section 11.1 of the Closure Plan. The data generated in accordance with the sampling and analysis procedures of the Closure Plan will be used to determine whether the required closure criteria have been met. The criteria for clean closure include compliance with minimum or ADEQ-approved GPLs and residential (pre-determined or risk-based) soil remediation standards. The applicable criteria for closure as described in Section 11.4 of the Closure Plan include compliance with minimum or ADEQ-approved GPLs and non-residential (pre-determined or risk-based) soil remediation standards.

Existing data (Table 5 of this Attachment 15) indicate that average concentrations of metals, except arsenic, have been below the clean closure criteria, i.e., the concentrations are well below minimum GPLs and well below residential pre-determined soil remediation standards. Arsenic is unique because its pre-determined residential and non-residential standards are both 10 mg/kg and that is the lowest concentration of all metals for which pre-determined soil remediation standards have been established. Still, as explained below, it is unlikely that the average arsenic concentration will exceed 10 mg/kg within the foreseeable future. Whenever it exceeds the pre-determined 10 mg/kg standard, a risk-based standard will be developed in accordance with A.A.C. R18- 7-206 and submitted to ADEQ for approval.

Based on the average concentrations shown in Table 5, arsenic is the only metal likely to exceed a pre-determined residential soil remediation standard and require a risk-based standard. If other metals exceed the pre-determined residential standards, WRC may develop risk-based standards in

accordance with A.A.C. R18-7-206 and submit the standards to ADEQ for approval. WRC may develop the risk-based standards for either residential or non-residential use. However, a DEUR will be required if the data generated during closure indicate that the metal concentrations meet non-residential soil remediation standards (either pre-determined or risk-based).

Table 5 of the Demonstration includes average constituent concentrations and relevant criteria. As new data are generated, they will be added to the data base represented in Table 5 by the constituent concentrations in (1) the damaged concrete that is being replaced, (2) the replacement cement, and (3) the soil between concrete floor and the underlying membrane liner. Concentrations from a minimum of 10 separate samples concentrations is considered the minimum number required for a statistically representative concentration to be compared with the action criteria of Table 2-1 below. The table will be expanded to include constituent concentrations in the soil below the lowermost liner if samples are collected for soil below the lowermost liner. Constituent concentrations in the replacement cement will be monitored to provide an improved understanding of potential constituent migration. The replacement cement has no action criteria.

Because the concrete is not replaced unless it is determined to be damaged beyond the point of reasonable repair, the CMP data provides a conservative, if not a worse case, basis for projecting future constituent concentrations in the concrete and in the soil layer between the concrete and the underlying membrane liner, Those projections also serve as a basis for projecting worse-case conditions in soil below the membrane liner because there is no reason to assume that constituent concentrations below the membrane liner will be greater than the concentrations above the liner.

The data from the concrete replacement activities may tend to overestimate future constituent concentrations in the soil below the lowermost membrane liner. Even the replaced concrete may increase the degree of overestimation because it will act somewhat as a landfill cap and will tend to minimize further migration of constituents that might have migrated through the removed concrete. The CMP procedures importantly require soil sampling below any lowermost liner observed to be damaged during concrete replacement activities.

WRC will report the results of the CMP sampling and analysis activities to ADEQ annually. However, it will notify ADEQ within 30 days following the receipt of a final laboratory report that includes a constituent concentration, when added to the existing data base for that constituent, yields an average concentration that exceeds one of the action criteria listed in Table 2-1. The notification will include a description of what actions (*e.g.*, soil removal, development of an alternate GPL, or the development of a non-residential (risk-based) soil remediation standard) WRC proposes for determining whether a move to another stage will be necessary.

Although the CMP data likely overestimate constituent concentrations in soil below the lowermost liner, Table 2-1 requires WRC to either indicate its plans to remove impacted soil or to begin the preparation of a contingent closure plan and a contingent post-closure plan whenever laboratory data indicate that the Stage 3 action criteria are exceeded. If WRC elects to prepare contingent plans rather than attempting soil removal at that time, it may submit for ADEQ's approval a closure plan for a land-fill like cap to cover all, or a certain portion of the HWMU floor, depending on the horizontal extent to which constituent concentrations exceed the action criteria in the concrete floor and the soil layer between the concrete and the underlying membrane liner. The closure plans will be prepared in sufficient detail to provide a realistic cost estimate. The cost estimate will form the basis for the required financial assurance.

As used in this section, "action criteria" means the action criteria listed in Table 2-1 for Stages 1, 2, and 3. Constituent concentrations used to determine compliance with the criteria will be based on the 95% UCL of at least 12 discrete samples collected from portions of four separate concrete pads. The 95% UCLs will be calculated using ProUCL, a software package available from the

USEPA. ProUCL automatically converts and presents input data as a variety of mathematical distributions and identifies which of the distributions (and which of the 95% UCLs) are more appropriate than others. ProUCL 4.1.00.02 or the most recent version of ProUCL may be used.

ADEQ's approval will be required of risk-based soil remediation standards developed by WRC in accordance with A.A.C. R18-8-206. ADEQ's approval will also be required of either alternate GPLs or GPLs based on a groundwater model that are developed by WRC in accordance with ADEQ's guidance document, "A Screening Method to Determine Soil Concentrations Protective of Groundwater."

Analytical data generated from the analysis of samples collected to date as part of the CMP indicate that the average concentrations of metals, except the concentrations of arsenic, in removed portions of the concrete floor and in the underlying soil layer are well below the minimum GPLs and the residential, pre-determined, soil remediation standards of A.A.C. R18-8-205. Because the concentrations are so low, there is no pressing need to calculate their 95% UCLs. Arsenic is the exception because the predetermined residential and non-residential soil remediation standards of A.A.C. R18-8-205 are both 10 mg/kg, a value much smaller than residential pre-determined soil remediation standards for other metals. Because the average arsenic concentrations reported in Table 5 of the Demonstration are relatively close to arsenic's pre-determined standard of 10 mg/kg, 95% UCLs were calculated using ProUCL in the manner described above. The average concentrations from Table 5 and the 95% UCL concentrations at the date of this RCRA permit application are respectively:

- Cement – 6.08 mg/kg and 6.298 mg/kg, 95% KM(t);
- Concrete – 6.19 mg/kg and 6.871mg/kg, 95%KM (BCA) UCL; and
- Soil – 7.47 mg/kg and 7.917, 95% KM (BCA) UCL.

Note: As described in the ProUCL user's manual, "KM" refers to the Kaplan-Meier method for nonparametric statistics, and "BCA" refers to the Bias Corrected Accelerated Bootstrap method for nonparametric statistics.

The following criteria and follow-up actions will be used during the implementation of the WRC's Concrete Management Program. The action criteria reflect conditions that may require a move to the next stage. For example, the current CMP data place the CMP in Stage 1. Conditions that may cause a move to the next stage are shown as action criteria. The CMP will remain in Stage 1 provided that the necessary and appropriate follow-up actions are successfully completed. In this example, the CMP would move to Stage 2 if the follow up actions are not successfully completed or if WRC decides to voluntarily move to Stage 2 because the identified options are not economically viable.

Table 2-1. Concrete Management Program – Criteria and Follow-Up Actions		
Stage 1 Criteria	**Stage 1 Action Criteria**	**Stage 1 Follow-Up Actions**
Compliance with residential (pre-determined) SRLs Compliance with a minimum GPLs	Objective – Comply with Clean Closure Criteria Exceedance of a residential (pre-determined) SRL Exceedance of a minimum GPL	As necessary and appropriate: • Remove impacted soil • Remediate to a residential (risk-based) SRL • Remediate to an alternate GPL Move to Stage 2 if follow-up actions are not successful or are not economically viable.
Stage 2 Criteria	**Stage 2 Action Criteria**	**Stage 2 Follow-Up Actions**
Compliance with non-residential (pre-determined) SRLs Compliance with a minimum or alternate GPLs	Objective – Comply with Closure Plan's Section 11.4 Criteria Exceedance of a non-residential (pre-determined) SRL Exceedance of a minimum or alternate GPL	As necessary and appropriate: • Remove impacted soil • Remediate to a non-residential (risk-based) SRL • Remediate to an alternate or modeled GPL Move to Stage 3 if follow-up actions are not successful or are not economically viable.
Stage 3 Criteria	**Stage 3 Action Criteria**	**Stage 3 Follow-Up Actions**
Compliance with non-residential (pre-determined or risk-based) SRLs Compliance with alternate or modeled GPLs	Objective – Determine if Contingent Closure and Contingent Post-Closure Plans Are Required Exceedance of a non-residential (pre-determined or risk-based) SRL Exceedance of alternate or modeled GPL	As necessary and appropriate: • Remove impacted soil; or • Remediate to a non-residential (risk-based) SRL • Remediate to a modeled GPL If follow-up actions are not successful or are not economically viable or cannot be accomplished without use of post-closure structures and care, notify ADEQ of intent to begin preparation of Contingent Closure and Contingent Post-Closure Plans.

SRL = soil remediation level (soil remediation standard)
GPL = groundwater protection level

Tables

Table 1. WRC Hazardous Waste Management Unit Original Data

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Analytical Results for Concrete, Cement and Soil from HWMU	Date	Soil/Concrete	Depth of Soil	Old/New	Location	Test	Run By	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Co (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Sn (ppm)	V (ppm)	Zn (ppm)
1	11/12/1996	Soil	Unknown	Old	Pad 26	TM	AZF	14.6	<21.05	ND	0.54	6.72	<1.45	4.28	ND		ND								
2	11/12/1996	Soil	8 inches	Old	Pad 26	TM	AZF	<1.35	<21.05	42.08	0.33	6	<1.45	2.86	11.46		11.47								
3	11/15/1996	Cement	Unknown	New	Pad 27	TM	AZF	1.8	<42	82	2.1	42	< 2.96	31	<15	120	94								
4	02/07/1997	Concrete	Unknown	Old	Pad 20	TM	AZF	4	4.3	170	7.6	76	<1.9	34	0.3	319	132								
5	02/07/1997	Concrete	Unknown	Old	Pad 19	TM	AZF	1.4	2.9	ND	5.7	98	<2.0	42	ND	353	ND								
6	02/07/1997	Concrete	Unknown	Old	Pad 19	TM	AZF	2.2	4	156	14	99	<1.5	37	1	531	483								
7	02/07/1997	Soil	Unknown	Old	Pad 20	TM	AZF	0.5	7	136	1	27	1	19	<0.5	42	32								
4	02/07/1997	Concrete	Unknown	Old	Pad 20	TM	AZF	4	4.3	170	7.6	76	<1.9	34	0.3	319	132								
8	02/07/1997	Soil	Unknown	Old	Pad 19	TM	AZF	0.9	6.5	115	1.4	27	<2.4	19	<0.5	63	69								
9	02/07/1997	Soil	Unknown	Old	Pad 19	TM	AZF	0.7	5.02	106	1.1	26	<2.4	12	<0.5	24	32								
10	02/07/1997	Cement	Unknown	New	Pads 19 & 20	TM	AZF	1.4	3.3	95	0.4	26	<2.4	12	<0.5	24	48								
11	03/06/1997	Concrete	Unknown	Old	Pad 25	TM	AZF	3.6	<22	145	9.3	65	< 0.3	32	<0.05	377	122								
12	03/06/1997	Soil	Unknown	Old	Pad 25	TM	AZF	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE								
NE	03/06/1997	Concrete	Unknown	Old	Pad 24	TM	AZF	NE	<22	NE	NE	28	1.4	NE	NE	NE	NE								
14	03/06/1997	Soil	Unknown	Old	Pad 24	TM	AZF	2.6	<22	110	2.6	59	2.5	29	<0.05	190	300								
15	03/06/1997	Concrete	Unknown	Old	Pad 3	TM	AZF	1.7	<22	197	0.6	13	<0.3	16	<0.05	25	16								
16	03/06/1997	Soil	Unknown	Old	Pad 3	TM	AZF	1.5	<22	94	1.5	28	0.7	21	<0.05	116	40								
17	07/23/1997	Soil	Unknown	Old	Pad 6	TM	AZF	1.4	13.75	119	1.6	29	0.095	28	3.74	47	36								
18	07/23/1997	Concrete & Soil	Unknown	Old	Pad 6	TM	AZF	8.4	9.97	98	2.7	48	0.095	25	<0.5	115	44								
19	06/30/1998	Soil	Unknown	Old	Pad 24	TCLP	AZF	0.002	0	0.81	0.035	0.4	0	0.25	0	2.73	1								
20	06/30/1998	Concrete	Unknown	Old	Pad 24	TCLP	AZF	0	0	0.693	0.017	0.268	0	0.153	0	1.03	0.405								
21	07/06/1998	Concrete & Soil	Unknown	Old	Pad 3	TM	AZF	10.36	18.23	92.2	4.41	69.4	<3.26	32.9	<17.07	557.9	153.6								
22	07/06/1998	Soil	Unknown	Old	Pad 3	TM	AZF	3.08	12.77	118.6	4.43	88.4	<3.26	47.6	<17.07	709	174.9								
23	07/06/2000	Cement	Unknown	New	Pad 18	TM	AZF	6.1	0.91	156.9	3.1	3.5		4.9	19.3										
24	08/07/2000	Concrete	Unknown	Old	Pad 16	TM	AZF	8	2.25	145.7	4.9	36.9		43.1	18										
25	08/25/2000	Concrete	Unknown	Old	Pad 18	TM	AZF	6.5	0.41	149.9	2.1	27.2		21.8	17.1										
26	08/28/2000	Concrete	Unknown	Old	Pad 22	TM	AZF	6.7	0.7	134.3	2.39	30.1		24.8	14.8										
27	02/13/2002	Soil	Unknown	Old	Pad 19	TCLP	PAF	0.031	0.349	0.602	1.07	0.121	<.005	0.14	<0.05										
28	02/13/2002	Soil	Unknown	Old	Pad 23	TCLP	PAF	0.035	0.282	0.643	0.174	0.076	<.005	0.096	<0.05										
29	02/13/2002	Soil	Unknown	Old	Pad 24	TCLP	PAF	0.03	0.173	0.965	0.007	0.023	<.005	0.022	<0.05										
30	02/13/2002	Soil	Unknown	Old	Pad 27	TCLP	PAF	0.032	0.315	0.575	0.093	0.131	<.005	0.076	<0.05										
31	10/29/2004	Concrete	6-inch Core sample	Old	Dryer Area	TCLP	Del Mar Analytical	< 0.25	< 0.5	< 10	< 0.25	0.12	< 0.0005	< 0.5	< 0.25										
32	06/21/2005	Concrete	6-inch Core sample	Old	Dryer Area	TM	AZF	0.652	7.2	143.1	1.22	36.43	0.58	14.87	4.35										
33	09/20/2005	Concrete	6-inch Core sample	Old	Pads 21 & 23	TM	AZF	0	3.15	171	0.097	42	0	10	0										
34	07/31/2006	Concrete	6-inch Core sample	Old	B Loading Dock	TM	AZF	0	6.55	144.4	1.15	44	0.4	11.65	6.33	142	77.5	8.75	7992.9	302.7	0.4	0	10.1	17.1	79.4
35	11/03/2006	Concrete	6-inch Core sample	Old	Pads 21, 16 & SW	TM	AZF	0	0.96	148.4	0.51	27.4	0	7.88	7.03	57.2	45.4	8.06	8099	329.5	0.256	0	9.12	14.13	38.45
36	11/27/2006	Concrete	6-inch Core sample	Old	Dryer Area	TM	AZF	0	6.58	139.6	0.47	29.53	0	7.4	3.88	49.5	51.8	6.95	6940.7	230.2	0.82	0	18.9	9.82	35.2
37	11/27/2006	Soil	6-inches	Old	Pad 18	TM	AZF	0	5.54	52.4	1.02	26.5	0	7.82	1.25	213.7	68.2	5.66	3290.2	191.1	0.74	0	24.1	7.9	44.45
38	02/26/2007	Soil	4 inches	Old	Pad 16	TCLP	Test America	< 0.25	< 0.5	0.652	< 0.25	< 0.5	< 0.0005	0.095	< 0.25										
39	02/26/2007	Soil	12 inches	Old	Pad 29	TCLP	Test America	< 0.25	< 0.5	0.462	0.022	< 0.5	< 0.0005	< 0.5	< 0.25										
40	04/09/2007	Concrete	6-inch Core sample	Old	Pad 29	TM	AZF	1.01	<4.15	165.84	0.86	25.86	<1.1	9.7	6.32										
41	11/08/2007	Concrete	Chip Samples	Old	Pads 26,18 & 19	TM	Test America	2.7	4	170	5.8	120	0.025	23	< 0.25	670	500			260	ND	ND	ND		120
42	11/08/2007	Soil	4 inch Core sample	Old	Pad 18	TM	Test America	1.2	4.3	61	0.76	22	< 0.0005	7.9	< 0.25	76	41			190	ND	ND	ND		30
43	11/08/2007	Soil	4 inch Core sample	Old	Pad 19	TM	Test America	3.4	6.4	100	< 0.25	69	< 0.0005	17	< 0.25	380	130			340	ND	ND	ND		76
44	11/8/2007	Soil	4 inch Core sample	Old	Pad 26	TM	Test America	1.1	7.4	110	< 0.25	44	< 0.0005	11	< 0.25	64	41			410	0.52	ND	ND		49
45	11/9/2007	Cement	Grab	New	Pads 26, 18 & 19	TM	Test America	< 0.25	3.9	100	< 0.25	56	< 0.0005	8.7	< 0.25	19	44			370	ND	ND	ND		48
46	03/26/2008	Concrete	Grab/Chip	Old	Pads 25, 26, 17 & 18	TCLP/TM	Test America	3.1	5.3	130	14	180/< 0.5	< 0.1/< 0.0005	24	< 5/< 0.25	1300	58			480	< 0.5	< 5	53		190
47	03/26/2008	Soil	4" Core	Old	Pad 17	TM	Test America	< 2.5	7.4	90	0.6	29	< 0.1	9.1	< 5	180	94			320	< 0.5	< 5	< 5		53
48	03/26/2008	Soil	4" Core	Old	Pads 25 & 26	TM	Test America	< 2.5	3.4	80	1.1	38	< 0.1	8.4	< 5	260	92			320	< 0.5	< 5	7.2		58
49	03/26/2008	Soil	4" Core	Old	Pad 18	TM	Test America	< 2.5	3.5	66	< 0.5	16	< 0.1	5.8	< 5	56	25			200	< 0.5	< 5	< 5		27
50	03/28/2008	Cement	Fill Cement	New	Pads 25, 26, 17 & 18	TM	Test America	< 2.5	8.9	150	3.3	76	< 0.1	8.9	< 5	430	190			300	< 0.5	< 5	12		98
51	04/10/2008	Concrete	Grab/Chip	Old	Pads 27, 28 & WWTU	TM	Test America	< 2.5	< 0.5	170	0.54	28	< 0.1	8.4	< 5	71	43			230	< 0.5	< 5	< 5		38
52	04/10/2008	Soil	4" Core	Old	Pad 28	TM	Test America	< 2.5	6.2	92	0.68	32	< 0.1	7.9	< 5	69	68			310	< 0.5	< 5	< 5		37
53	04/10/2008	Soil	4" Core	Old	WWTU	TM	Test America	< 2.5	8.2	100	1.4	33	0.029	8.5	< 5	86	77			370	0.53	< 5	< 5		49
54	04/10/2008	Soil	4" Core	Old	Pad 27	TM	Test America	< 2.5	4.7	73	1.6	35	0.035	9.7	< 5	150	95			230	< 0.5	< 5	< 5		42
55	04/11/2008	Cement	Fill Cement	New	Pads 27, 28 & WWTU	TM	Test America	< 2.5	6.9	120	< 0.5	37	0.034	7	< 5	27	21			300	< 0.5	< 5	< 5		46
56	09/02/2008	Soil	4" Core	Old	Pad 25A	TM	Test America	< 2.5	3.6	71	0.75	14	< 0.1	6.8	< 5	93	49			300	< 0.5	< 5	< 5		30
57	09/02/2008	Soil	4" Core	Old	Pad 25B	TM	Test America	< 2.5	5.7	59	< 0.5	18	< 0.1	5.6	< 5	48	45			190	< 0.5	< 5	< 5		26
58	09/02/2008	Concrete	Grab/Chip	Old	Pads 25A & 25B	TCLP/TM	Test America	< 2.5/< 0.25	2.5	170	32/< 0.25	38	< 0.1/< 0.0005	13	< 5/< 0.25	160	91			260	< 0.5	< 5	< 5		48
59	09/03/2008	Cement	Fill Cement	New	Pads 25A & 25B	TM	Test America	< 2.5	3.7	120	< 0.5	17	< 0.1	7.8	< 5	9.6	7.3			230	< 0.5	< 5	< 5		29
60	01/20/2009	Soil	4" Core	Old	Pad 25	TM	Test America	< 2.5	3.6	71	2.6	24	< 0.1	7.2	< 5	140	140			200	< 0.5	< 5	< 5		45
61	01/20/2009	Concrete	Grab/Chip	Old	Pad 25	TCLP/TM	Test America	8.4	8.4	220	37/< 0.25	230/< 0.5	< 0.1/< 0.0005	87	< 5/< 0.25	1400	1000			3400	0.79	< 5	74		390
62	01/20/2009	Cement	Fill Cement	New	Pad 25	TM	Test America	< 2.5	4.8	250	< 0.5	21	< 0.1	5.8	< 5	18	12			260	0.69	< 5	21		33
63	06/18/2009	Soil	4" Core	Old	Pad 27	TM	Test America	< 2.5	4.5	66	5.2	85	< 0.1	25	< 5	600	440			220	< 0.5	< 5	37		110
64	06/18/2009	Soil	4" Core	Old	Pad 26	TM	Test America	< 2.5	6.6	92	2.1	46	< 0.1	16	< 5	270	140			390	< 0.5	< 5	16		71
65	06/18/2009	Soil	4" Core	Old	Pad 24	TM	Test America	< 2.5	5.6	98	< 0.5	23	< 0.1	9	< 5	72	35			340	< 0.5	< 5	< 5		47
66	06/18/2009	Concrete	Grab/Chip	Old	Pads 27, 26 & 24	TM	Test America	< 2.5	5.8	150	2	35	< 0.1	9.9	< 5	120	180			190	< 0.5	< 5	< 5		66
67	06/19/2009	Cement	Fill Cement	New	Pads 27, 26 & 24	TM	Test America	< 2.5	2.4	94	< 0.5	13	< 0.1	6.3	< 5	10	8.6			340	< 0.5	< 5	14		24
68	11/03/2009	Soil	4" Core	Old	Pad 25	TM	Test America	< 2.5	5.8	120	3.1	89	< 0.1	21	< 5	380	620			400	< 0.5	< 5	26		100
69	11/03/2009	Soil	4" Core	Old	Pads 25 & 26	TM	Test America	< 2.5	5.7	110	< 0.5	32	< 0.1	8.4	< 5	59	40			380	< 0.5	< 5	< 5		49

Table 1. WRC Hazardous Waste Management Unit Original Data

ATTACHMENT 15

Analytical Results for Concrete, Cement and Soil from HWMU	Date	Soil/Concrete	Depth of Soil	Old/New	Location	Test	Run By	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Co (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Sn (ppm)	V (ppm)	Zn (ppm)
70	11/03/2009	Concrete	Grab/Chip	Old	Pads 25 & 26	TM	Test America	< 2.5	7.9	160	< 0.5	24	< 0.1	9.2	< 5	37	23			290	< 0.5	< 5	< 5		110
71	11/04/2009	Cement	Fill Cement	New	Pads 25 & 26	TM	Test America	< 2.5	4.8	160	< 0.5	20	< 0.1	9.3	< 5	15	10			340	< 0.5	< 5	< 5		30
72	9/7/2010	Cement	Fill Cement	New	Pad 19	TM	Test America	< 2.5	10	130	1.3	34	< 0.1	10	< 5	130	110			180	< 0.5	< 5	7.1		37
73	12/01/2010	Soil	4" Core	Old	Pad 19	TM	Test America	< 2.5	4.1	67	< 0.5	16	< 0.1	6.7	< 5	58	74			260	< 0.5	< 5	< 5		29
74	12/10/2010	Cement	Fill Cement	New	Pads 19 & 28	TM	Test America	< 2.5	8.4	120	0.56	24	< 0.1	11	< 5	54	44			350	< 0.5	< 5	< 5		29
75	05/09/2011	Concrete	Grab/Chip	Old	Pad 1	TM	WRC	ND	5.99	81.4	ND	18.85	ND	5.95	0.86	23.23	23.38			337	ND	1.3	ND		28.4
76	05/12/2011	Concrete	Grab/Chip	Old	Pad 29			Sample was either not taken or not digested - no analytical data exists																	
77	05/13/2011	Soil	4" Core	Old	Pad 29	TM	Test America	< 2.5	5.2	79	< 0.5	18	< 0.090	8.4	< 5	44	28			220	< 0.5	< 5	< 5		28
78	05/16/2011	Cement	Fill Cement	New	Pad 29	TM	WRC	ND	6.1	151	0.85	22.9	0.39	96.82	< 5.0	46.8	12.4			318	0.41	< 0.5	6.67		34.3
79	05/16/2011	Concrete	Grab/Chip	Old	Pads 28 & 29	TM	Test America	< 2.5	4.9	170	1.1	22	< 0.1	9.6	< 5	69	52			260	<0.5	< 5	< 5		33
80	05/16/2011	Concrete	Grab/Chip	Old	Pad 28	TM	Test America	< 2.5	4.9	160	3.4	31	< 0.1	14	< 5	160	200			240	<0.5	<0.5	5.1		52
81	05/17/2011	Soil	4" Core	Old	Pad 29	TM	WRC	ND	8.17	106.7	3.6	38.6	ND	11.4	< 5	115	223			426	0.31	ND	10.5		72.5
82	05/17/2011	Concrete	Grab/Chip	Old	Pads 24 & 25	TM	Test America	< 2.5	5.3	140	2.3	31	< 0.1	14	< 5	150	90			250	<0.5	<0.5	6.9		42
83	05/18/2011	Cement	Fill Cement	New	Pad 29	TM	WRC	ND	5.71	155	0.92	21.2	ND	40.1	1.56	17.63	10.86			307	0.4	ND	6.25		34.8
84	05/18/2011	Soil	4" Core	Old	Pad 28	TM	WRC	ND	9.16	113	0.71	37.61	ND	13.65	0.28	147	65.8			419	< 0.5	ND	14.77		53
85	05/19/2011	Concrete	Grab/Chip	Old	Pad 29A	TM	WRC	ND	5.76	162	1.07	25.35	< 0.1	11.38	< 5	67.3	65.2			278	0.35	ND	9.11		40.9
86	05/23/2011	Soil	4' Core	Old	Pads 24, 25 & 26	TM	WRC	2.1	10.4	130.9	1.1	45.5	< 0.1	11.39	1.19	74.7	50.86			419	0.44	< 0.5	8.9		58
87	05/23/2011	Soil	4' Core	Old	Pads 27 & 28	TM	WRC	ND	8.7	119	2.6	41.7	< 0.1	13.78	0.94	134	143			528	0.41	< 0.5	12.4		69
88	05/23/2011	Soil	4' Core	Old	Pad 29A	TM	WRC	ND	8	105	1.1	31.3	< 0.1	9.7	0.1	67.9	69.5			513	0.38	< 0.5	7.9		48.9
89	05/23/2011	Cement	Fill Cement	New	Pads 27 & 28	TM	WRC	ND	8.37	146	1	19.56	< 0.1	45.7	1.57	21.17	11.99			394	0.41	< 0.5	6.67		31.37
90	05/24/2011	Cement	Fill Cement	New	Pad 29	TM	WRC	ND	6.06	155	0.87	23.58	< 0.1	28.58	1.87	24.3	11.69			318	0.42	< 0.5	7.62		33.85
91	06/02/2011	Concrete	Grab/Chip	Old	Pads 15 & 9	TM	Test America	< 2.5	6.1	140	6.3	39	< 0.1	23	< 5	230	220			240	<0.5	< 5	6		65
92	06/02/2011	Concrete	Grab/Chip	Old	Pits 1-5	TM	Test America	< 2.5	6.8	120	3.8	16	< 0.1	7.6	< 5	92	470			290	<0.5	< 5	< 5		82
93	06/06/2011	Cement	Fill Cement	New	Pads 15 & 9	TM	WRC	ND	7.34	125.3	0.34	32.3	<0.1	8.1	< 5	61.6	24.5			377	0.22	< 5	9.2		38.8
94	06/08/2011	Cement	Fill Cement	New	Pads 15 & 9	TM	WRC	< 0.05	4.2	79	< 0.01	14	< 0.06	9.66	0.43	8.76	7.9			239	0.08	2.07	0.2		29
95	06/08/2011	Soil	4" Core	Old	Pads 15 & 9	TM	WRC	ND	7.57	72.5	2.02	33.62	ND	12.94	< 5	209	251			368	0.3	< 5	22.7		48.7
96	06/15/2011	Cement	Fill Cement	New	Pad 1	TM	WRC	< 0.05	5.6	84	0.02	16.5	0.27	10.4	1.14	15.9	11			298	0.13	1.17	< 0.2		34
97	06/15/2011	Soil	4" Core	Old	Rail Site	TM	Test America	< 2.5	4.7	76	3.1	120	< 0.1	22	< 5	570	280			320	< 0.5	< 5	39		62
98	06/16/2011	Cement	Fill Cement	New	Rail Site	TM	WRC	< 0.05	6	113	0.09	22	0.26	11	1.34	11.7	10.1			340	0.16	2	< 0.2		34
99	06/17/2011	Cement	Fill Cement	New	Pad 1	TM	WRC	< 0.05	5.7	90.7	0.12	20	0.62	14.2	1.7	23	12.2			273	0.11	1.3	< 0.2		42
100	06/20/2011	Concrete	Grab/Chip	Old	Dryer Area	TM	Test America	< 2.5	9.5	140	2.9	47	< 0.1	27	< 5.0	300	150								
101	06/21/2011	Cement	Fill Cement	New	Rec B Entrance	TM	WRC	< 0.05	6.9	140	0.24	33	0.005	14.8	2.2	14.6	18			311	< 0.01	1.7	0.5		47
102	06/22/2011	Cement	Fill Cement	New	Pad 9	TM	WRC	< 0.05	4.7	52	0.04	7.7	0.21	6.27	0.72	5.3	4.7			244	0.05	1.3	< 0.2		18
103	06/22/2011	Soil	4' Core	Old	Dryer Area	TM	WRC	1.25	6.26	70.45	4.32	83.3	0.16	20.38	ND	525	198			252	ND	< 0.5	55		75.6
104	06/23/2011	Cement	Fill Cement	New	Rec B Entrance	TM	WRC	ND	4	107	0.11	21.5	0.23	14.6	0.85	12.06	10.39			316	0.18	2.58	3.2		38.7
105	06/23/2011	Concrete	Grab/Chip	Old	Rail Site	TM	Test America	< 2.5	14	160	4.4	61	< 0.089	27	< 5	360	200								
106	06/27/2011	Cement	Fill Cement	New	Dryer Area	TM	WRC	< 0.05	4.6	102	0.15	19.5	0.3	11.8	2.3	10	8.65			287	0.23	0.86	0.42		41
107	01/12/2012	Soil	Grab/Chip	New	Soil Pit 6	TM	Test America	< 2.5	8.4	68	7.3	25	< 0.1	8.7	< 5	97	420			470	0.71	< 5	< 5		94
108	01/12/2012	Concrete	Grab/Chip	New	Concrete Pit 6	TM	Test America	< 2.5	6	180	0.6	24	< 0.1	9.3	< 5	63	36								
109	01/20/2012	Soil	Grab/Chip	New	AB Pit 6	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
110	01/20/2012	Cement	Grab/Chip	New	Incoming Cement Pile	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
111	02/22/2012	Cement	Grab/Chip	New	TW Basin 2-inch Cement (4599)	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
112	02/22/2012	Soil	Grab/Chip	New	Rec A TW Basin Soil	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
113	02/22/2012	Concrete	Grab/Chip	New	Outgoing Concrete (WB2)	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
114	02/23/2012	Soil	Grab/Chip	New	TW Basin 2 5506	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
115	11/08/2012	Cement	Grab/Chip	New	Pad 22	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
116	11/08/2012	Cement	Grab/Chip	New	Pad 24	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
117	11/19/2012	Concrete	Grab/Chip	Old	Concrete Outgoing	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
118	11/19/2012	Soil	Grab/Chip	New	Pad 24 2nd Half	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
119	11/19/2012	Soil	Grab/Chip	New	Pad 23	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
120	11/21/2012	Cement	Grab/Chip	New	Truck 1 32108	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
121	11/21/2012	Cement	Grab/Chip	New	Truck 2 32107	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
122	11/21/2012	Cement	Grab/Chip	New	Truck 3 32068	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
123	11/21/2012	Cement	Grab/Chip	New	Truck 4 31918	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										
124	11/21/2012	Cement	Grab/Chip	New	Truck 5 32099	TCLP	Test America	< 0.25	< 0.5	< 10	< 0.25	< 0.5	< 0.0005	< 0.5	< 0.25										

Ag = Silver
As = Arsenic
Ba = Barium
Cd = Cadmium
Cr = Chromium
Hg = Mercury
Pb = Lead
Se = Selenium
Cu = Copper
Ni = Nickel
Co = Cobalt
Al = Aluminum
Mn = Manganese
Be = Beryllium
Sb = Antimony
Sn = Tin
V = Vanadium
Zn = Zinc

HWMU = Hazardous Waste Management Unit
ppm = parts per million
WWTU = Wastewater Treatment Unit
TM = Total Metals
TCLP = Toxicity Characteristic Leaching Procedure
ND = Not Detected
SW = South Berm Wall
AZF = Arizona Facility
PAF = Pennsylvania Facility
Old/New = Old is in reference to any material taken offsite; New is in reference to material brought onsite
Cement = Any of various calcinated mixtures of clay and limestone, usually mixed with water and sand, gravel, etc., to form Concrete (*1)
Concrete = An artificial, stone-like material used for various structural purposes, made by mixing Cement and various aggregates, as sand, pebbles, gravel, or shale, with water and allowing the mixture to harden. (*2)
Note: All Soil sampled was taken from below the Concrete, but above the liner

Table 1. WRC Hazardous Waste Management Unit Original Data

ATTACHMENT 15

Analytical Results for Concrete, Cement and Soil from HWMU	Date	Soil/Concrete	Depth of Soil	Old/New	Location	Test	Run By	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Co (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Sn (ppm)	V (ppm)	Zn (ppm)

Cited Sources:

*1 Cement. (n.d.). Dictionary.com Unabridged (v 1.1). Retrieved October 16, 2007, from Dictionary.com website: http://dictionary.reference.com/browse/Cement

*2 Concrete. (n.d.). Dictionary.com Unabridged (v 1.1). Retrieved October 16, 2007, from Dictionary.com website: http://dictionary.reference.com/browse/Concrete

Table 2. WRC Hazardous Waste Management Unit Average Soil Concentrations

ATTACHMENT 15

Analytical Row	Date	Method	Location	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Zn (ppm)	Co (ppm)	Sn (ppm)	V (ppm)
1	11/12/1996	TM	Pad 26	14.6	*10.525*	39.4		6.72	*ND*	ND	12.14		11.69								
2	11/12/1996	TM	Pad 26	*0.675*	*10.525*	42.08	0.33	6	*0.725*	2.86	11.46		11.47								
8	02/07/1997	TM	Pad 19	0.9	6.5	115	1.4	27	*1.2*	19	*0.25*	63	69								
9	02/07/1997	TM	Pad 19	0.7	5.02	106	1.1	26	*1.2*	12	*0.25*	24	32								
7	02/07/1997	TM	Pad 20	0.5	7	136		27	ND	ND	*0.25*	42	32								
12	03/06/1997	TM	Pad 25	1.7	*11*	124	1.7	30	0.7	24	*0.025*	52	38								
14	03/06/1997	TM	Pad 24	2.6	*11*	110	2.6	59	2.5	29	*0.025*	190	300								
9	02/07/1997	TM	Pad 19	0.7	5.02	106	1.1	26	*1.2*	12											
16	03/06/1997	TM	Pad 3	1.5	*11*	94	1.5	28	0.7	21	*0.025*	116	40								
17	07/23/1997	TM	Pad 6	1.4	13.75	119	1.6	29	0.095	28	3.74	47	36								
18	07/23/1997	TM	Pad 6	8.4	9.97	98	2.7	48	0.095	25	*0.25*	115	44								
22	07/06/1998	TM	Pad 3	3.08	12.77	118.6	4.43	88.4	*1.63*	47.6	*8.535*	709	174.9								
21	07/06/1998	TM	Pad 3	10.36	18.23	NE	NE	NE	NE	NE	*8.535*	557.9	153.6								
37	11/27/2006	TM	Pad 18	0	5.54	NE	NE	26.5	NE	NE	1.25	213.7	68.2	3290.2	191.1	0.74		44.45	5.66	24.1	7.9
42	11/08/2007	TM	Pad 18	1.2	4.3	61	0.76	22	*0.00025*	7.9	*0.125*	76	41		190			30			
43	11/08/2007	TM	Pad 19	3.4	6.4	100	*0.125*	69	*0.00025*	17	*0.125*	380	130		340			76			
44	11/8/2007	TM	Pad 26	1.1	7.4	110	*0.125*	44	*0.00025*	11	*0.125*	64	41		410	0.52		49			
47	03/26/2008	TM	Pad 17	*1.25*	7.4	90	0.6	29	*0.05*	9.1	*2.5*	180	94		320	0.25	*2.5*	53		*2.5*	
49	03/26/2008	TM	Pad 18	*1.25*	3.5	66	0.25	16	*0.05*	5.8	*2.5*	56	25		200	0.25	*2.5*	27		*2.5*	
48	03/26/2008	TM	Pads 25 & 26	*1.25*	3.4	80	1.1	38	*0.05*	8.4	*2.5*	260	92		320	0.25	*2.5*	58		7.2	
54	04/10/2008	TM	Pad 27	*1.25*	4.7	73	1.6	35	0.035	9.7	*2.5*	150	95		230	0.25	*2.5*	42		*2.5*	
ND = No Data																					
NE = Not Established																					
52	04/10/2008	TM	Pad 28	*1.25*	6.2	92	0.68	32	*0.05*	7.9	*2.5*	69	68		310	0.25	*2.5*	37		*2.5*	
53	04/10/2008	TM	WWTU	*1.25*	8.2	100	1.4	33	0.029	8.5	*2.5*	86	77		370	0.53	*2.5*	49		*2.5*	
56	09/02/2008	TM	Pad 25A	*1.25*	3.6	71	0.75	14	*0.05*	6.8	*2.5*	93	49		300	0.25	*2.5*	30		*2.5*	
57	09/02/2008	TM	Pad 25B	*1.25*	5.7	59	*0.25*	18	*0.05*	5.6	*2.5*	48	45		190	0.25	*2.5*	26		*2.5*	
60	01/20/2009	TM	Pad 25	*1.25*	3.6	71	2.6	24	*0.05*	7.2	*2.5*	140	140		200	0.25	*2.5*	45		*2.5*	
63	06/18/2009	TM	Pad 27	*1.25*	4.5	66	5.2	85	*0.05*	25	*2.5*	600	440		220	0.25	*2.5*	110		37	
64	06/18/2009	TM	Pad 26	*1.25*	6.6	92	2.1	46	*0.05*	16	*2.5*	270	140		390	0.25	*2.5*	71		16	
65	06/18/2009	TM	Pad 24	*1.25*	5.6	98	*0.25*	23	*0.05*	9	*2.5*	72	35		340	0.25	*2.5*	47		*2.5*	
68	11/03/2009	TM	Pad 25	*1.25*	5.8	120	3.1	89	*0.05*	21	*2.5*	380	620		400	0.25	*2.5*	100		26	
69	11/03/2009	TM	Pads 25 & 26	*1.25*	5.7	110	*0.25*	32	*0.05*	8.4	*2.5*	59	40		380	0.25	*2.5*	49		*2.5*	
73	12/01/2010	TM	Pad 19	*1.25*	4.1	67	*0.25*	16	*0.05*	6.7	*2.5*	58	74		260	0.25	*2.5*	29		*2.5*	
77	05/13/2011	TM	Pad 29	*1.25*	5.2	79	*0.25*	18	*0.045*	8.4	*2.5*	44	28		220	0.25	*2.5*	28		*2.5*	
81	05/17/2011	TM	Pad 29		8.17	106.7	3.6	38.6		11.4	*2.5*	115	223		426	0.31		72.5		10.5	
84	05/18/2011	TM	Pad 28		9.16	113	0.71	37.61		13.65	0.28	147	65.8		419	0.25		53		14.77	
86	05/23/2011	TM	Pads 24, 25 & 26	2.1	10.4	130.9	1.1	45.5	*0.05*	11.39	1.19	74.7	50.86		419	0.44	*0.25*	58		8.9	
87	05/23/2011	TM	Pads 27 & 28		8.7	119	2.6	41.7	*0.05*	13.78	0.94	134	143		528	0.41	*0.25*	69		12.4	
88	05/23/2011	TM	Pad 29A		8	105	1.1	31.3	*0.05*	9.7	0.1	67.9	69.5		513	0.38	*0.25*	48.9		7.9	
97	06/15/2011	TM	Rail Site	*1.25*	4.7	76	3.1	120	*0.05*	22	*2.5*	570	280		320	*0.25*	*2.5*	62		39	
95	06/08/2011	TM	Pads 15 & 9		7.57	72.5	2.02	33.62		12.94	*2.5*	209	251		368	0.3	*2.5*	48.7		22.7	
103	06/22/2011	TM	Dryer Area	*1.25*	6.26	70.45	4.32	83.3	0.16	20.38		525	198		252		*0.25*	75.6		55	
107	01/12/2012	TM	Soil Pit 6	*1.25*	8.4	68	7.3	25	*0.05*	8.7	*2.5*	97	420		470	0.71	*2.5*	94		*2.5*	
19	06/30/1998	TCLP	Pad 24	0.002		0.81	0.035	0.4		0.25		2.73	1								
27	02/13/2002	TCLP	Pad 19	0.031	0.349	0.602	1.07	0.121	*0.0025*	0.14	*0.025*										
28	02/13/2002	TCLP	Pad 23	0.035	0.282	0.643	0.174	0.076	*0.0025*	0.096	*0.025*										
29	02/13/2002	TCLP	Pad 24	0.03	0.173	0.965	0.007	0.023	*0.0025*	0.022	*0.025*										
30	02/13/2002	TCLP	Pad 27	0.032	0.315	0.575	0.093	0.131	*0.0025*	0.076	*0.025*										
38	02/26/2007	TCLP	Pad 16	*0.125*	*0.25*	0.652	*0.125*	*0.25*	*0.00025*	0.095	*0.125*										
39	02/26/2007	TCLP	Pad 29	*0.125*	*0.25*	0.462	0.022	*0.25*	*0.00025*	0.25	0.125										
109	01/20/2012	TCLP	AB PIT 6	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
119	11/19/2012	TCLP	Pad 23	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
112	02/22/2012	TCLP	Rec A TW Basin Soil	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										

Table 2. WRC Hazardous Waste Management Unit Average Soil Concentrations

Analytical Row	Date	Method	Location	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Zn (ppm)	Co (ppm)	Sn (ppm)	V (ppm)
114	02/23/2012	TCLP	TW Basin 2-inch 2 5506	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
118	11/19/2012	TCLP	Pad 24 2nd Half	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										

Soil TM Averages	2.17	7.47	90.57	1.75	39.28	0.35	14.53	2.49	183.44	121.61	3290.20	327.45	0.33	2.11	54.56	5.66	12.08	7.90
SRLs[1]																		
Residential (mg/kg)	390	10	15,000	39	120,000	23	400	390	3,100	1,600	76,000	3,300	150	31	23,000	1,400	47,000	78
Non-residential (mg/kg)	5,100	10	170,000	510	1,000,000	310	800	5,100	41,000	20,000	920,000	32,000	1,900	410	310,000	13,000	610,000	1,000
TCLP Threshold Concentrations[4] (mg/L)	100	100	2,000	20	100	4	100	20										
Minimum GPLs[3] (mg/kg)		290	12,000	29	590	12	290	290		590			23	35				
Soil TCLP Averages	0.09	0.26	2.63	0.19	0.19	0.0011	0.18	0.09										
TCLP Criteria[2] (mg/L)	5.0	5.0	100	1.0	5.0	0.2	5.0	1.0										

Ag = Silver
As = Arsenic
Ba = Barium
Cd = Cadmium
Cr = Chromium
Hg = Mercury
Pb = Lead
Se = Selenium
Cu = Copper
Ni = Nickel
Al = Aluminum
Mn = Manganese
Be = Beryllium
Sb= Antimony
Zn = Zinc
Co = Cobalt
Sn = Tin
V = Vanadium

ppm = parts per million

WWTU = Wastewater Treatment Unit

TM = Total Metals

TCLP = Toxicity Characteristic Leaching Procedure

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

Italicized entries are set at one-half of the applicable detection limits shown in Table 1 for "less than" concentrations.

[1]Soil Remediation Levels (SRLs) - the Arizona Administrative Code (AAC) R18-7, Article 2, Appendix A.

[2]Maximum concentrations of contaminants for the TCLP criteria - AAC R18-8-261.24, Table 1.

[3]Groundwater Protection Levels (GPLs) - A screening method to determine soil concentrations protective of groundwater quality, ADEQ, Sept. 1996, Table 4.

[4]TCLP Threshold Concentrations were derived by multiplying the TCLP criteria by 20.

Table 3. WRC Hazardous Waste Management Unit Average Concrete Concentrations

ATTACHMENT 15

Analytical Row	Date	Method	Location	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Zn (ppm)	Co (ppm)	Sn (ppm)	V (ppm)
5	02/07/1997	TM	Pad 19	1.4	2.9	133		98	*ND*	ND	1.4	353	128								
6	02/07/1997	TM	Pad 19	2.2	4	156	14	99	*0.75*	37	1	531	483								
4	02/07/1997	TM	Pad 20	4	4.3	170	7.6	76	*0.95*	34	0.3	319	132								
13	03/06/1997	TM	Pad 24	2.4	*11*	178	7.6	28	1.4	16	*0.025*	246	64								
11	03/06/1997	TM	Pad 25	3.6	*11*	145		65	*ND*	ND	*0.025*	377	122								
15	03/06/1997	TM	Pad 3	1.7	*11*	197	0.6	13	*0.15*	16	*0.025*	25	16								
18	07/23/1997	TM	Pad 6	8.4	9.97	98	2.7	48	0.095	25	*0.25*	115	44								
13	03/06/1997	TM	Pad 24	2.4	*11*	178	7.6	28	1.4	16											
21	07/06/1998	TM	Pad 3	10.36	18.23	92.2	4.41	69.4	*1.63*	32.9	*8.535*	557.9	153.6								
24	08/07/2000	TM	Pad 16	8	2.25	145.7	4.9	36.9		43.1	18										
25	08/25/2000	TM	Pad 18	6.5	0.41	149.9	2.1	27.2		21.8	17.1										
26	08/28/2000	TM	Pad 22	6.7	0.7	134.3	2.39	30.1		24.8	14.8										
32	06/21/2005	TM	Dryer Area	0.652	7.2	NE	NE	NE	NE	NE	4.35										
33	09/20/2005	TM	Pads 21 & 23		3.15	NE	NE	42	NE	NE											
34	07/31/2006	TM	B Loading Dock		6.55	144.4	1.15	44	0.4	11.65	6.33	142	77.5	7992.9	302.7	0.4		79.4	8.75	10.1	17.1
35	11/03/2006	TM	Pads 21, 16 & SW		0.96	148.4	0.51	27.4	0	7.88	7.03	57.2	45.4	8099	329.5	0.256		38.45	8.06	9.12	14.13
36	11/27/2006	TM	DRYER AREA		6.58	139.6	0.47	29.53	0	7.4	3.88	49.5	51.8	6940.7	230.2	0.82		35.2	6.95	18.9	9.82
40	04/09/2007	TM	Dryer Area	1.01	*2.075*	165.84	0.86	25.86	*0.55*	9.7	6.32	0	0								
41	11/08/2007	TM	Pads 26, 18 & 19	2.7	4	170	5.8	120	0.025	23	*0.125*	670	500		260			120			
46	03/26/2008	TM	Pads 25, 26, 17 & 18	3.1	5.3	130	14	180	*0.05*	24	*0.25*	1300	58		480	*0.25*	*2.5*	190		53	
51	04/10/2008	TM	Pads 27, 28 & WWTU	*1.25*	*0.25*	170	0.54	28	*0.05*	8.4	*2.5*	71	43		230	*0.25*	*2.5*	38		*2.5*	
ND = No Data																					
NE = Not Established																					
58	09/02/2008	TM	Pads 25A & 25B	*1.25*	2.5	170	32	38	*0.05*	13	*2.5*	160	91		260	*0.25*	*2.5*	48		*2.5*	
61	01/20/2009	TM	Pad 25	8.4	8.4	220	37	230	*0.05*	87	*2.5*	1400	1000		3400	0.79	*2.5*	390		74	
66	06/18/2009	TM	Pads 27, 26 & 24	1.25	5.8	150	2	35	*0.05*	9.9	*2.5*	120	180		190	*0.25*	*2.5*	66		*2.5*	
70	11/03/2009	TM	Pads 25 & 26	1.25	7.9	160	*0.25*	24	*0.05*	9.2	*2.5*	37	23		290	*0.25*	*2.5*	110		*2.5*	
75	05/09/2011	TM	Pad 1		5.99	81.4		18.85		5.95	0.86	23.23	23.38		337		1.3	28.4			
80	05/16/2011	TM	Pad 28	*1.25*	4.9	160	3.4	31	*0.05*	14	*2.5*	160	200		240	*0.25*	*0.25*	52		5.1	
79	05/16/2011	TM	Pads 28 & 29	*1.25*	4.9	170	1.1	22	*0.05*	9.6	*2.5*	69	52		260	*0.25*	*2.5*	33		*2.5*	
82	05/17/2011	TM	Pads 24 & 25	*1.25*	5.3	140	2.3	31	*0.05*	14	*2.5*	150	90		250	*0.25*	*0.25*	42		6.9	
85	05/19/2011	TM	Pad 29A		5.76	162	1.07	25.35	*0.05*	11.38	*2.5*	67.3	65.2		278	0.35		40.9		9.11	
91	06/02/2011	TM	Pads 15 & 9	*1.25*	6.1	140	6.3	39	*0.05*	23	*2.5*	230	220		240	*0.25*	*2.5*	65		6	
92	06/02/2011	TM	Pits 1-5	*1.25*	6.8	120	3.8	16	*0.05*	7.6	*2.5*	92	470		290	*0.25*	*2.5*	82		*2.5*	
100	06/20/2011	TM	Dryer Area	*1.25*	9.5	140	2.9	47	*0.05*	27	*2.5*	300	150								
105	06/23/2011	TM	Rail Site	*1.25*	14	160	4.4	61	*0.0445*	27	*2.5*	360	200								
108	01/12/2012	TM	Concrete Pit 6	*1.25*	6	180	0.6	24	*0.05*	9.3	*2.5*	63	36								
20	06/30/1998	TCLP	Pad 24			0.693	0.017	0.268		0.153		1.03	0.405								
31	10/29/2004	TCLP	Dryer Area	*0.125*	*0.25*	*5*	*0.125*	0.12	*0.00025*	0.25	*0.125*										
46	03/26/2008	TCLP	Pads 25, 26, 17 & 18					*0.25*	*0.00025*		*0.125*										
58	09/02/2008	TCLP	Pads 25A & 25B	*0.125*			*0.125*		*0.00025*		*0.125*										
61	01/20/2009	TCLP	Pad 25				*0.125*	*0.25*	*0.00025*		*0.125*										
113	02/22/2012	TCLP	Outgoing Concrete (WB2)	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
117	11/19/2012	TCLP	Concrete Outgoing	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
			Concrete TM Averages	3.05	6.19	151.48	5.81	51.69	0.30	20.21	3.81	277.42	162.72	7677.53	462.79	0.34	2.03	85.79	7.92	13.82	13.68
			SRLs[1]																		
			Residential (mg/kg)	390	10	15,000	39	120,000	23	400	390	3,100	1,600	76,000	3,300	150	31	23,000	1,400	47,000	78
			Non-residential (mg/kg)	5,100	10	170,000	510	1,000,000	310	800	5,100	41,000	20,000	920,000	32,000	1,900	410	310,000	13,000	610,000	1,000
			TCLP Threshold Concentrations[4] (mg/L)	100	100	2,000	20	100	4	100	20										
			Minimum GPLs[3] (mg/kg)		290	12,000	29	590	12	290	290		590			23	35				
			Concrete TCLP Averages	0.13	0.25	5.00	0.13	0.25	0.0003	0.25	0.13										
			TCLP Criteria[2] (mg/L)	5.0	5.0	100	1.0	5.0	0.2	5.0	1.0										

Table 3. WRC Hazardous Waste Management Unit Average Concrete Concentrations

Ag = Silver	Cd = Cadmium	Pb = Lead	Ni = Nickel	Be = Beryllium	Co = Cobalt
As = Arsenic	Cr = Chromium	Se = Selenium	Al = Aluminum	Sb= Antimony	Sn = Tin
Ba = Barium	Hg = Mercury	Cu = Copper	Mn = Manganese	Zn = Zinc	V = Vanadium

ppm = parts per million

WWTU = Wastewater Treatment Unit

TM = Total Metals

TCLP = Toxicity Characteristic Leaching Procedure

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

Italicized entries are set at one-half of the applicable detection limits shown in Table 1 for "less than" concentrations.

[1]Soil Remediation Levels (SRLs) - the Arizona Administrative Code (AAC) R18-7, Article 2, Appendix A.

[2]Maximum concentrations of contaminants for the TCLP criteria - AAC R18-8-261.24, Table 1.

[3]Groundwater Protection Levels (GPLs) - A screening method to determine soil concentrations protective of groundwater quality, ADEQ, Sept. 1996, Table 4.

[4]TCLP Threshold Concentrations were derived by multiplying the TCLP criteria by 20.

Table 4. WRC Hazardous Waste Management Unit Average Cement Concentrations

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Analytical Row	Date	Method	Location	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Zn (ppm)	Co (ppm)	Sn (ppm)	V (ppm)
3	11/15/1996	TM	Pad 27	1.8	*21*	82		42	*ND*	ND	*7.5*	120	94								
10	02/07/1997	TM	Pads 19 & 20	1.4	3.3	95	0.4	26	*1.2*	12	*0.25*	24	48								
23	07/06/2000	TM	Pad 18	6.1	0.91	156.9	3.1	3.5		4.9	19.3										
45	11/9/2007	TM	Pads 26, 18 & 19	*0.125*	3.9	100	*0.125*	56	*0.00025*	8.7	*0.125*	19	44		370			48			
50	03/28/2008	TM	Pads 25, 26, 17 & 18	*1.25*	8.9	150		76	*ND*	ND	*2.5*	430	190		300	*0.25*	*2.5*	98		12	
55	04/11/2008	TM	Pads 27, 28 & WWTU	*1.25*	6.9	120	*0.25*	37	0.034	7	*2.5*	27	21		300	*0.25*	*2.5*	46		*2.5*	
59	09/03/2008	TM	Pads 25A & 25B	*1.25*	3.7	120	*0.25*	17	*0.05*	7.8	*2.5*	9.6	7.3		230	*0.25*	*2.5*	29		*2.5*	
45	11/9/2007	TM	Pads 26, 18 & 19	*0.125*	3.9	100	*0.125*	56	*0.00025*	8.7											
62	01/20/2009	TM	Pad 25	*1.25*	4.8	250	*0.25*	21	*0.05*	5.8	*2.5*	18	12		260	0.69	*2.5*	33		21	
67	06/19/2009	TM	Pads 27, 26 &24	*1.25*	2.4	94	*0.25*	13	*0.05*	6.3	*2.5*	10	8.6		340	*0.25*	*2.5*	24		14	
71	11/04/2009	TM	Pads 25 & 26	*1.25*	4.8	160	*0.25*	20	*0.05*	9.3	*2.5*	15	10		340	*0.25*	*2.5*	30		*2.5*	
72	9/7/2010	TM	Pad 19	*1.25*	10	130	1.3	34	*0.05*	10	*2.5*	130	110		180	*0.25*	*2.5*	37		7.1	
74	12/10/2010	TM	Pads 19 & 28	*1.25*	8.4	NE	NE	NE	NE	NE	*2.5*	54	44		350	*0.25*	*2.5*	29		*2.5*	
78	05/16/2011	TM	Pad 29		6.1	NE	NE	22.9	NE	NE	*2.5*	46.8	12.4		318	0.41	*0.25*	34.3		6.67	
83	05/18/2011	TM	Pad 29		5.71	155	0.92	21.2		40.1	1.56	17.63	10.86		307	0.4		34.8		6.25	
89	05/23/2011	TM	Pads 27 & 28		8.37	146	1	19.56	*0.05*	45.7	1.57	21.17	11.99		394	0.41	*0.25*	31.37		6.67	
90	05/24/2011	TM	Pad 29		6.06	155	0.87	23.58	*0.05*	28.58	1.87	24.3	11.69		318	0.42	*0.25*	33.85		7.62	
93	06/06/2011	TM	Pads 15 & 9		7.34	125.3	0.34	32.3	*0.05*	8.1	*2.5*	61.6	24.5		377	0.22	*2.5*	38.8		9.2	
94	06/08/2011	TM	Pads 15 & 9	*0.025*	4.2	79	*0.005*	14	*0.03*	9.66	0.43	8.76	7.9		239	0.08	2.07	29		0.2	
96	06/15/2011	TM	Pad 1	*0.025*	5.6	84	0.02	16.5	0.27	10.4	1.14	15.9	11		298	0.13	1.17	34		*0.1*	
98	06/16/2011	TM	Rail Site	*0.025*	6	113	0.09	22	0.26	11	1.34	11.7	10.1		340	0.16	2	34		*0.1*	
ND = No Data																					
NE = Not Established																					
99	06/17/2011	TM	Pad 1	*0.025*	5.7	90.7	0.12	20	0.62	14.2	1.7	23	12.2		273	0.11	1.3	42		*0.1*	
101	06/21/2011	TM	Rec B Entrance	*0.025*	6.9	140	0.24	33	0.005	14.8	2.2	14.6	18		311	*0.005*	1.7	47		0.5	
102	06/22/2011	TM	Pad 9	*0.025*	4.7	52	0.04	7.7	0.21	6.27	0.72	5.3	4.7		244	0.05	1.3	18		*0.1*	
104	06/23/2011	TM	Rec B Entrance		4	107	0.11	21.5	0.23	14.6	0.85	12.06	10.39		316	0.18	2.58	38.7		3.2	
106	06/27/2011	TM	Dryer Area	*0.025*	4.6	102	0.15	19.5	0.3	11.8	2.3	10	8.65		287	0.23	0.86	41		0.42	
110	01/20/2012	TCLP	Incoming Cement Pile	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
111	02/22/2012	TCLP	TW Basin 2-inch Cement (4599)	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
115	11/08/2012	TCLP	Pad 22	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
116	11/08/2012	TCLP	Pad 24	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
120	11/21/2012	TCLP	Truck 1 32108	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
121	11/21/2012	TCLP	Truck 2 32107	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
122	11/21/2012	TCLP	Truck 3 32068	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
123	11/21/2012	TCLP	Truck 4 31918	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										
124	11/21/2012	TCLP	Truck 5 32099	*0.125*	*0.25*	*5*	*0.125*	*0.25*	*0.00025*	*0.25*	*0.125*										

Cement TM Averages	0.99	6.08	121.12	0.46	27.01	0.18	13.44	2.71	47.06	30.97		304.18	0.25	1.81	37.76		5.01	
SRLs[1]																		
Residential (mg/kg)	390	10	15,000	39	120,000	23	400	390	3,100	1,600	76,000	3,300	150	31	23,000	1,400	47,000	78
Non-residential (mg/kg)	5,100	10	170,000	510	1,000,000	310	800	5,100	41,000	20,000	920,000	32,000	1,900	410	310,000	13,000	610,000	1,000
TCLP Threshold Conc.[4] (mg/L)	100	100	2,000	20	100	4	100	20										
Minimum GPL's[3] (mg/kg)		290	12,000	29	590	12	290	290		590			23	35				
Cement TCLP Averages	0.13	0.25	5.00	0.13	0.25	0.0003	0.25	0.13										
TCLP Criteria[2] (mg/L)	5.0	5.0	100	1.0	5.0	0.2	5.0	1.0										

Table 4. WRC Hazardous Waste Management Unit Average Cement Concentrations

Ag = Silver	Cd = Cadmium	Pb = Lead	Ni = Nickel	Be = Beryllium	Co = Cobalt
As = Arsenic	Cr = Chromium	Se = Selenium	Al = Aluminum	Sb= Antimony	Sn = Tin
Ba = Barium	Hg = Mercury	Cu = Copper	Mn = Manganese	Zn = Zinc	V = Vanadium

ppm = parts per million

WWTU = Wastewater Treatment Unit

TM = Total Metals

TCLP = Toxicity Characteristic Leaching Procedure

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

Italicized entries are set at one-half of the applicable detection limits shown in Table 1 for "less than" concentrations.

[1]Soil Remediation Levels (SRLs) - the Arizona Administrative Code (AAC) R18-7, Article 2, Appendix A.

[2]Maximum concentrations of contaminants for the TCLP criteria - AAC R18-8-261.24, Table 1.

[3]Groundwater Protection Levels (GPLs) - A screening method to determine soil concentrations protective of groundwater quality, ADEQ, Sept. 1996, Table 4.

[4]TCLP Threshold Concentrations were derived by multiplying the TCLP criteria by 20.

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Table 5. WRC Hazardous Waste Management Unit Total Metals' Averages

	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cr (ppm)	Hg (ppm)	Pb (ppm)	Se (ppm)	Cu (ppm)	Ni (ppm)	Al (ppm)	Mn (ppm)	Be (ppm)	Sb (ppm)	Zn (ppm)	Co (ppm)	Sn (ppm)	V (ppm)
Cement	0.99	6.08	121	0.46	27.0	0.18	13.44	2.71	47.06	30.97	ND	304.18	0.25	1.81	37.76	ND	5.01	ND
Concrete	3.05	6.19	151	5.81	51.7	0.30	20.21	3.81	277.42	162.72	7678	462.79	0.34	2.03	85.79	7.92	13.82	13.68
Soil	2.17	7.47	90.6	1.75	39.3	0.35	14.53	2.49	183.44	121.61	3290	327.45	0.33	2.11	54.56	5.66	12.08	7.90
	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL	% of Residential SRL
Cement	0.25%	60.84%	0.81%	1.19%	0.02%	0.77%	3.36%	0.70%	1.52%	1.94%	ND	9.22%	0.17%	5.84%	0.16%	ND	0.01%	ND
Concrete	0.78%	61.91%	1.01%	14.90%	0.04%	1.30%	5.05%	0.98%	8.95%	10.17%	10.10%	14.02%	0.23%	6.53%	0.37%	0.57%	0.03%	17.54%
Soil	0.56%	74.70%	0.60%	4.49%	0.03%	1.52%	3.63%	0.64%	5.92%	7.60%	4.33%	9.92%	0.22%	6.81%	0.24%	0.40%	0.03%	10.13%
	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL	% of GPL
Cement	NE	2.10%	1.01%	1.60%	4.58%	1.48%	4.63%	0.94%	NE	5.25%	NE	NE	1.09%	5.18%	NE	NE	NE	NE
Concrete	NE	2.13%	1.26%	20.04%	8.76%	2.50%	6.97%	1.31%	NE	27.58%	NE	NE	1.48%	5.79%	NE	NE	NE	NE
Soil	NE	2.58%	0.75%	6.03%	6.66%	2.92%	5.01%	0.86%	NE	20.61%	NE	NE	1.43%	6.03%	NE	NE	NE	NE
SRLs[1]																		
Residential (mg/kg)	390	10	15,000	39	120,000	23	400	390	3,100	1,600	76,000	3,300	150	31	23,000	1,400	47,000	78
Non-residential (mg/kg)	5,100	10	170,000	510	1,000,000	310	800	5,100	41,000	20,000	920,000	32,000	1,900	410	310,000	13,000	610,000	1,000
TCLP[2] Threshold Conc.[4] (mg/L)	100	100	2,000	20	100	4	100	20	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Minimum GPLs[3] (mg/kg)	NE	290	12,000	29	590	12	290	290	NE	590	NE	NE	23	35	NE	NE	NE	NE

Ag = Silver
As = Arsenic
Ba = Barium
Cd = Cadmium
Cr = Chromium
Hg = Mercury
Pb = Lead
Se = Selenium
Cu = Copper
Ni = Nickel
Al = Aluminum
Mn = Manganese
Be = Beryllium
Sb= Antimony
Zn = Zinc
Co = Cobalt
Sn = Tin
V = Vanadium

ppm = parts per million

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

ND = No Data

NE = Not Established

[1]Soil Remediation Levels (SRLs) - the Arizona Administrative Code (AAC) R18-7, Article 2, Appendix A.

[2]Maximum concentrations of contaminants for the Toxicity Characteristic Leaching Procedure (TCLP) criteria - AAC R18-8-261.24, Table 1.

[3]Groundwater Protection Levels (GPLs) - A screening method to determine soil concentrations protective of groundwater quality, ADEQ, Sept. 1996, Table 4.

[4]TCLP Threshold Concentrations were derived by multiplying the TCLP criteria by 20.