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Saltstone 3QCY10 TCLP Results

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EXECUTIVE SUMMARY

A Saltstone waste form was prepared in the Savannah River National Laboratory (SRNL) from a Tank 50H sample and Z-Area premix material for the third quarter of calendar year 2010 (3QCY10). After the prescribed 28 day cure, samples of the saltstone were collected, and the waste form was shown to meet the South Carolina Hazardous Waste Management Regulations (SCHWMR) R.61-79.261.24 and R.61-79.268.48(a) requirements for a nonhazardous waste form with respect to RCRA metals and underlying hazardous constituents. These analyses met all quality assurance specifications of USEPA SW-846.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

B&W TSG-RACL	B & W Technical Services Group-Radioisotope and Analytical Chemistry Laboratory
CVAA	Cold Vapor Atomic Absorption
DL	Detection Limit
DSS-HT	Decontaminated Salt Solution Hold Tank
ESS-WP	Environmental Services Section – Waste Programs
ETP	Effluent Treatment Project
ICP-MS	Inductively Coupled Plasma – Mass Spectrometer
ISWLF	Industrial Solid Waste Landfill
LCS	Laboratory Control Sample
MCL	Maximum Contaminant Level
MCU	Modular Caustic Side Solvent Extraction Unit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
QL	Quantitation Limit
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
RPD	Relative Percent Differences
SCDHEC	South Carolina Department of Health and Environmental Control
SCHWMR	South Carolina Hazardous Waste Management Regulations
SDF	Saltstone Disposal Facility
SDG	Sample Delivery Group
SPF	Saltstone Production Facility
SRNL	Savannah River National Laboratory
TCLP	Toxic Characteristic Leaching Procedure
UHC	Underlying Hazardous Constituent
UTS	Universal Treatment Standards

1.0 Introduction

The Saltstone Production Facility (SPF) receives waste from Tank 50H for treatment. In the third quarter of the 2010 calendar year (3QCY10), Tank 50H accepted transfers of approximately 76 kgal from the Effluent Treatment Project (ETP), approximately 7 kgal from Tank 710—the H-Canyon General Purpose Evaporator, approximately 57 kgal from the H-Canyon Super Kukla campaign, approximately 58 kgal from the Modular Caustic Side Solvent Extraction Unit (MCU) Decontaminated Salt Solution Hold Tank (DSS-HT), and approximately 6 kgal from other sources.

The Saltstone Grout Sampling plan provides the South Carolina Department of Health and Environmental Control (SCDHEC) with the chemical and physical characterization strategy for the salt solution which is to be disposed of in the Z-Area Solid Waste Landfill (ISWLF)[1]. During operation, samples were collected from Tank 50H and grout samples prepared to determine the non-hazardous nature of the grout to meet the requirements of the South Carolina Hazardous Waste Management Regulations (SCHWMR) R.61-79.261.24(b) and R.61-79.268.48(a).

Savannah River National Laboratory (SRNL) was asked to prepare saltstone from samples of Tank 50H obtained July 1, 2010 during 3QCY10 to determine the non-hazardous nature of the grout. The samples were cured and shipped to Babcock & Wilcox Technical Services Group-Radioisotope and Analytical Chemistry Laboratory (B&W TSG-RACL) to perform the Toxic Characteristic Leaching Procedure (TCLP)[2] and subsequent extract analysis on saltstone samples for the analytes required for the quarterly analysis saltstone sample. In addition to the eight toxic metals—arsenic, barium, cadmium, chromium, mercury, lead, selenium and silver—analytes included the underlying hazardous constituents (UHC) antimony, beryllium, nickel, and thallium which could not be eliminated from analysis by process knowledge.[3] B&W TSG-RACL provided subsamples to GEL Laboratories, LLC for analysis for the UHCs benzene, phenols and total and amenable cyanide.

2.0 Experimental Procedure

This section is a summary of the approach taken to prepare and characterize the saltstone samples. The saltstone sample preparation was performed at SRNL. Saltstone sample characterization was performed at both B&W TSG-RACL facility in Lynchburg, Virginia and the GEL laboratory facility in Charleston, South Carolina. Figure 2-1 is a flowchart of the steps taken to prepare and characterize the saltstone samples.

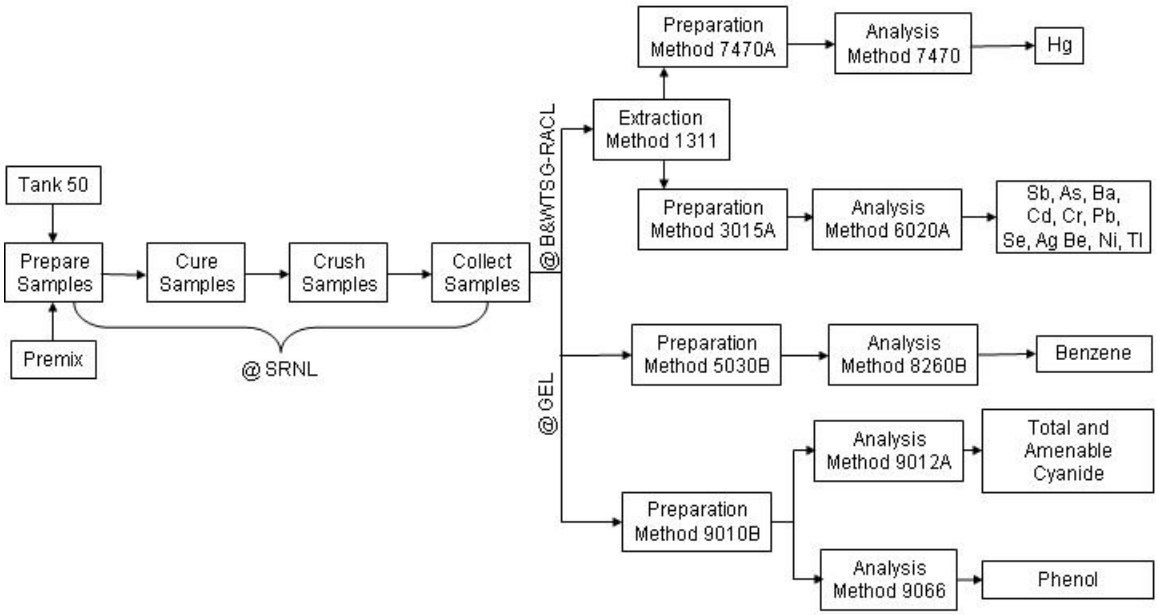

Figure 2-1. Flowchart of Saltstone preparation and analysis.

2.1 Saltstone Preparation

Saltstone preparation was performed at SRNL. The weight percent solids data used for the TCLP sample was taken from the quarterly Waste Acceptance Criteria (WAC) analyses performed on Tank 50H.[4] Table 2-1 lists the concentration of TCLP metals of interest in the salt solution from the WAC analysis[4] for the sample. As shown in Table 2-1, the contents of Tank 50H exceed the regulatory limits for antimony, chromium, mercury, phenol, and thallium and therefore must be treated and disposed of in a non-hazardous waste form. Table 2-2 contains the parameters used to prepare the TCLP sample.[5]

Saltstone samples for TCLP were prepared with the Tank 50H blended salt solution and a premix of cement, slag, and fly ash. Figure 2-2 shows the formulation used to prepare these samples. The salt solution, admixtures and premix materials were combined in a blender and mixed at low speed for one minute, inspected for incorporation of the premix, and then mixed at high speed for an additional two minutes. After the saltstone slurry was mixed, it was cast into a polyethylene zip top bag. The bag was laid flat and the air was expelled prior to sealing. The sample was cured flat in a polypropylene bag to facilitate the size reduction step needed to conform to the particle size requirements of the TCLP method.

After curing for not less than 28 days[1]— 33 days for the 3Q10 sample, the saltstone was removed from the container and a portion of the saltstone was crushed to particles less than 0.9 centimeters (3/8 inch) as prescribed by Section 7.13 of the TCLP method.[2] The crushed saltstone was packaged into containers provided by Environmental Services Section – Waste Programs (ESS-WP). After the saltstone has been crushed, sieved and packaged, the sample is deemed "collected."[6] ESS-WP retrieved the samples from SRNL and transported them to B&W TSG-RACL for extraction and analysis. B&W TSG-RACL repackaged a portion of the sample and shipped the sample to GEL Laboratories to perform totals analysis for the UHCs benzene, phenol and total and amenable cyanide.

[1] Samples are considered ready for analysis after 28 days. Samples are not crushed until shipment has been scheduled.

Table 2-1. Sample Results of TCLP Metals from Tank 50H WAC Analysis.

-	Sample Results (mg/L)[4]	Regulatory Limits (mg/L)
-	3Q10	Toxicity[a]
As	< 0.114	5
Ba	< 0.978	100
Cd	< 0.696	1
Cr	47.5	5
Pb	< 0.433	5
Hg	9.42	0.2
Se	< 0.228	1
Ag	< 1.77	5
--	--	UHC[b]
Sb	< 5.70	1.15
Be	< 0.058	1.22
Ni	7.66	11
Tl	< 0.666	0.20
-	-	(mg/kg)
benzene	< 0.150	10
phenol	< 10.0	6.2
cyanide (total)	NM	590
cyanide (amenable)	NM	30

NM – Not Measured
[a] SCHWMR R.61-79.261.24(b) "Characteristic of Toxicity."
[b] SCHWMR R.61-79.268.48 "Universal Treatment Standards."

Table 2-2. Customer Recommended Values for Preparation of TCLP Sample.

Parameter	3Q10
Water-to-Premix ratio	0.60
(Daratard 17) gal/Ton premix	0.00
(Dow Corning Q2-1383A) gal/Ton premix	0.15

Saltstone Mix Data Sheet

MIX # 0119			Date: 8/16/2010
Material	**%**	**WT%**	**Grams**
Waste Solution: Tank 50 7/1/10 3Q10 **Wt% Solids #** 24.10 **Grams Water** 165.32		44.19	217.81
Admixture: Q2 Antifoam*		0.03	0.08
Admixture:			
Admixture:			
Premix		55.79	275.00
Cement (% of Premix)	10	5.58	27.50
Slag (% of Premix)	45	25.11	123.75
Fly Ash (% of Premix)	45	25.11	123.75
Total	100	100.01	492.89
Water to Premix Ratio	0.60		

Calculations:

Use CBO fly ash

From customer: 0.60 w/p, 0.10 gpm, 33T/hr dry feed

Q2 is diluted Q2 amount . In plant, diluted 1:4 in water.

* Actual amount of Q2 added to sample is 0.078 g. Q2 was diluted to a 1:4 in water and 100 uL pipette was used to add the diluted Q2 to the sample.

Figure 2-2. Data sheet for the Saltstone mix used to prepare the 3Q10 TCLP sample.[5]

2.2 Saltstone Testing

Saltstone testing was performed by B&W TSG-RACL and GEL Laboratories, LLC. Activities associated with the 3QCY10 saltstone samples were:

At B&W TSG-RACL,

- performing the TCLP extraction,
- digesting the TCLP leachate, and
- analyzing the digested leachate.

At GEL

- performing extractions on solid subsamples shipped from B&W TSG-RACL and
- analyzing extracts.

2.2.1 *B&W TSG-RACL*

The samples arrived at B&W TSG-RACL, Lynchburg, Virginia on September 23, 2010 for analysis. Shipping container temperatures were documented to be within specifications. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage.

The Metals method 6020A analysis was performed on an X-7 Series Inductively Coupled Plasma – Mass Spectrometer (ICP-MS). The instrument measures ions produced by a radio-frequency inductively coupled plasma. Analyte species originating in a liquid are nebulized and the resulting aerosol transported by argon gas into the plasma torch. The ions produced by high temperatures are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier. Mass interferences must be assessed and valid corrections applied or the data flagged to indicate problems.

The Metals method 7470A analysis was performed on a Leman PC 200 II instrument which consists of a cold vapor atomic absorption spectrometer (CVAA) set to detect mercury at a wavelength of 253.7 nm. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic absorption spectrophotometer. Absorbance (peak height) is measured as a function of mercury concentration.

A portion of the leachate from the third quarter sample was used as the quality control sample (matrix spike) for the ICP-MS and CVAA.

2.2.2 *GEL Laboratories, LLC*

The subsamples arrived at GEL Laboratories, LLC, Charleston, South Carolina on September 30, 2010 for analysis. Shipping container temperatures were documented to be within specifications. All sample containers arrived without any visible signs of tampering or breakage. The sample arrived with the proper chain of custody documentation and signatures.

The method 8260B analysis was performed with an HP6890/HP5973 gas chromatograph/mass spectrometer using a J&W DB-624 column. Methods 9012A and 9066 were performed using a Lachat QuickChem FIA+ 8000 Series.

3.0 Results and Discussion

Results summarized in the following tables are from the data package for these analyses.[7] Data is presented in these results as reported by the vendors.

3.1 B&W TSG-RACL

Analytes detected but at concentrations too low to determine quantitatively have been flagged with the "B" qualifier. Analytes that were not detected have been flagged with the "U" qualifier. In addition to the results, Detection Limits (DLs) have been given. The DL is the minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the concentration is above zero. The DL values given in the table are the results from this study adjusted for sample dilution. The Quantitation Limit (QL) is the lowest level at which an analyte may be accurately and reproducibly achieved.

Results in Table 3-1, when compared with the DLs and QLs, can be organized into three groups:

- Beryllium, silver and thallium were not detected in the leachate.
- Antimony, cadmium, chromium, lead, and nickel were detected below the QLs.
- Arsenic, barium, mercury, and selenium were detected in the leachates at concentrations above the QLs.

Table 3-1. TCLP Leachates RCRA Metal Concentrations, DLs, and QLs.

-	Methods	Sample Limits (µg/L)	Sample Limits (µg/L)	Sample Results (µg/L)
SRS ID	-	-	-	**3Q10**
B&W ID	-	**DL**	**QL**	**1009015-01A**
Sb	3015, 6020A	0.133	11.111	[B]3.9
As	3015, 6020A	0.100	5.556	[N]24.3
Ba	3015, 6020A	0.439	55.556	[N,E]186
Cd	3015, 6020A	0.111	5.556	[B]0.61
Cr	3015, 6020A	0.306	11.111	[B]4.3
Pb	3015, 6020A	0.483	5.556	[B,N]3.5
Hg	7470A	0.07	0.200	0.40
Se	3015, 6020A	0.244	27.778	54.3
Ag	3015, 6020A	0.061	5.556	[U]0.06
Be	3015, 6020A	0.156	5.556	[U]0.16
Ni	3015, 6020A	1.578	5.556	[B]2.7
Tl	3015, 6020A	0.206	5.556	[U,N]0.21

- Indicates a location in the table for which an entry would not be appropriate.
[U] Final concentration of the analyte was found to be below the DL.
[B] Analyte is present at a concentration above the DL but less than the QL
[N] Associated Matrix Spike is outside percent recovery quality control criteria.
[E] Associated Serial Dilution is outside percent difference quality control criteria.

3.1.1 *Comparison of Results to Regulatory Limits*

Results from the TCLP leachate analyses from Table 3-1 are replicated in Table 3-2 — with units changed from μg/L to mg/L—along with the regulatory limits that may be applied to the Saltstone waste form. Table 3-2 includes the SCHWMR R.61-79.261.24(b) limits above which a waste is to be considered characteristically hazardous for toxicity and the SCHWMR R.61-79.268.48 Universal Treatment Standards (UTS) for hazardous constituents. In addition, Maximum Contaminant Levels (MCL's) from the State Primary Drinking Water Regulations[2] also have been included in Table 3-2. By comparing the sample results and the regulatory limits in, the following conclusions can be made:

- The saltstone waste form was not characteristically hazardous for toxicity.
- The leachate metals concentrations were below the Nonwastewater Standard for all of the metals.
- Antimony, barium, beryllium, cadmium, chromium, lead, mercury, silver and thallium were below the MCL's.
- Arsenic and selenium exceeded the MCL.
- Nickel does not have a MCL.

The MCL is the limit for a constituent in drinking water. The MCL is used to determine the class of landfill required. At 10x MCL, a Class 3 landfill is required. The SDF vaults are permitted as a Class 3 landfill. None of the analyses were greater than 10x the MCL.

[2] Regulations 61-58 through 61-58.15 are promulgated pursuant to S.C. Code Sections 44-55-10 et seq. and are collectively known as the State Primary Drinking Water Regulations.

Table 3-2. Saltstone TCLP Results and Corresponding Regulatory Limits.

-	Sample Results (mg/L)	Regulatory Limits		
SRS ID	**3Q10**	**Toxicity[a]**	**UTS[b]**	**MCL[c]**
B&W ID	**1009015-01A**	**(mg/L)**	**Nonwastewater Standard (mg/L TCLP)**	**(mg/L)**
Sb	[B]3.90E-03	-	1.15	0.006
As	[N]2.43E-02	5	5	0.010
Ba	[N,E]1.86E-01	100	21	2
Cd	[B]6.10E-04	1	0.11	0.005
Cr	[B]4.30E-03	5	0.6	0.1
Pb	[B,N]3.50E-03	5	0.75	0.015[d]
Hg	4.00E-04	0.2	0.025	2E-03
Se	5.43E-02	1	5.7	0.05
Ag	[U]6.00E-05	5	0.14	0.1[e]
Be	[U]1.60E-04	-	1.22	4E-03
Ni	[B]2.70E-03	-	11	-
Tl	[U,N]2.10E-04	-	0.20	2E-03

- Indicates a location in the table for which an entry would not be appropriate.
[U] Final concentration of the analyte was found to be below the DL.
[B] Analyte is present at a concentration above the DL but less than the QL.
[N] Associated Matrix Spike is outside percent recovery quality control criteria.
[E] Associated Serial Dilution is outside percent difference quality control criteria.
[a] R.61-79.261.24(b) "Characteristic of Toxicity."
[b] R.61-79.268.48 "Universal Treatment Standards."
[c] SCDHEC State Primary Drinking Water Regulation Maximum Contaminant Levels.
[d] Lead action level from SCDHEC 61-58.11.B.
[e] Secondary drinking water parameter.

3.1.2 *Quality Assurance*

The following subsections include summaries of results from blanks, laboratory control samples, matrix spikes, and matrix spike duplicates. The data package also includes data for calibration verifications, interference checks, and serial dilutions.[7]

3.1.3 *Blanks*

Blank concentrations are given in Table 3-3. In the TCLP Blank, selenium was present at a detectable concentration. Arsenic, barium, cadmium, chromium, lead, and nickel were present at levels above their respective DLs, but below their respective QLs. Antimony, beryllium, silver and thallium were found to be below the DLs.

Table 3-3. TCLP Blank.

Analyte	TCLP Blank (µg/L)
Sb	[U]0.13
As	[B,N]1.7
Ba	[B,N,E]6.8
Cd	[B]0.72
Cr	[B]2.3
Pb	[B,N]4.4
Hg	[U]0.07
Se	34.7
Ag	[U]0.06
Be	[U] 0.16
Ni	[B]5.2
Tl	[U,N]0.21

[B] Analyte is present at a concentration above the DL but less than the QL.
[U] Final concentration of the analyte was found to be below the DL.
[N] Associated Matrix Spike is outside percent recovery quality control criteria.
[E] Associated Serial Dilution is outside percent difference quality control criteria.

3.1.4 *Laboratory Control Samples*

Results from the Laboratory Control Sample (LCS) are given in Table 3-4. The LCS post spike recoveries met USEPA SW-846 acceptance limits for all elements. Laboratory Control Samples are clean aqueous solutions analyzed to assure integrity of the analytical technique exclusive of matrix effects.

Table 3-4. RCRA Metal Laboratory Control Sample

Analyte	Laboratory Control (µg /L)		Recovery (%)
-	**True**	**Measured**	(80 – 120)
Sb	328.0	330	101
As	719.0	714	99
Ba	463.0	486	105
Cd	476.0	466	98
Cr	162.0	169	104
Pb	280.0	295	105
Hg	10.8	9.98	92.4
Se	1000.0	963	96
Ag	194.0	198	102
Be	136.0	124	91
Ni	533.0	491	92
Tl	142.0	138	97

3.1.5 *Matrix Spikes*

Results from analysis of the matrix spike (MS) and matrix spike duplicates (MSD) are given in Table 3-5. The initial concentrations in the second column are reproduced from Table 3-1. These results show that:

- The percent recoveries (%R) obtained from the MS analyses met the recommended quality control acceptance criteria for percent recoveries (75 – 125%) for all applicable analytes.
- The percent recoveries (%R) obtained from the MSD analyses met the recommended quality control acceptance criteria for percent recoveries (75 – 125%) for all applicable analytes with the exception of As, Ba, Pb, and Tl.
- The RPD(s) between the MS and MSD met the acceptance limits (0 – 20%).

Table 3-5. TCLP Leachates RCRA Metal Matrix Spike and Duplicate Results.

Analyte	Initial Concentrations (µg /L)		Spiked Sample (µg /L)		Recovery (%)		RPD (%)
-	B&W ID 1009015-01A	Spike Added	Spike	Spike Duplicate	Spike	Spike Duplicate	-
Sb	[B]3.9	1000	1055	1171	105	117	10
As	[N]24.3	500	575	687	110	132	18
Ba	[N,E]186	2500	3006	3367	113	127	11
Cd	[B]0.61	250	244	271	98	108	10
Cr	[B]4.3	1000	1034	1150	103	115	11
Pb	[B,N]3.5	500	591	660	117	131	11
Hg	0.40	5.00	5.39	5.77	99.8	107.4	6.8
Se	54.3	250	308	359	102	122	15
Ag	[U]0.06	250	240	266	96	107	10
Be	[U]0.16	250	237	258	95	103	8
Ni	[B]2.7	1000	876	974	87	97	11
Tl	[U,N]0.21	250	291	327	117	131	12

[U] Final concentration of the analyte was found to be below the DL.
[B] Analyte is present at a concentration above the DL but less than the QL.
[N] Associated Matrix Spike is outside percent recovery quality control criteria.
[E] Associated Serial Dilution is outside percent difference quality control criteria.

3.1.6 *Calibration Information*

- All initial calibration requirements have been met for this sample delivery group (SDG).
- All Contract Required Reporting Limit standard(s) met the referenced advisory control limits with the exception of NI.
- All interference check samples associated with this SDG met the established acceptance criteria.
- All continuing calibration blanks bracketing this batch met the established acceptance criteria.
- All continuing calibration verifications bracketing this SDG met the acceptance criteria.

3.2 GEL Laboratories, LLC

GEL reports general chemistry analyses on the organics in the sample. If the concentrations of benzene, phenol and cyanide are not detected or below the detection limit (<MDL) the result is reported as "ND". Analytes detected but at concentrations too low to determine quantitatively have been flagged with the "J" qualifier. Analytes that were not detected have been flagged with the "U" qualifier. In addition to the results, Detection Limits (DLs) and Reporting Limits (RLs) have been given. The DL is the minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the concentration is above zero. The DL values given in Table 3-6 are the results from this study adjusted for sample dilution. The RL is the lowest level at which an analyte may be accurately and reproducibly quantitated.

Table 3-6. Total Concentrations, DLs, and RLs.

-	Methods	Sample Limits (µg/kg)	Sample Limits (µg/kg)	Sample Results (µg/kg)
SRS ID	-	-	-	**3Q10**
GEL ID	-	**DL**	**RL**	**261811001**
benzene	5030, 8260B	42.6	142	^{U}ND
phenol	9010B, 9066	94.7	296	603
cyanide (total)	9010B, 9012A	111	347	12100
cyanide (amenable)	9012A	111	347	11900

- Indicates a location in the table for which an entry would not be appropriate.
^{U} Final concentration of the analyte was found to be below the DL.

3.2.1 *Comparison of Results to Regulatory Limits*

Results from the analyses from Table 3-6 are replicated in Table 3-7 — with units changed from µg/kg to mg/kg — along with the regulatory limits that may be applied to the Saltstone waste form. Table 3-7 includes the SCHWMR R.61-79.268.48 Universal Treatment Standards (UTS) for hazardous constituents. By comparing the sample results and the regulatory limits in Table 3-7, it can be concluded that for all of the analytes, the concentrations were below the Nonwastewater Standard.

Table 3-7. Saltstone Total Results and Corresponding Regulatory Limits.

-	Sample Results (mg/kg)	Regulatory Limits (mg/kg)
SRS ID	**3Q10**	**UTS[b]**
GEL ID	**261811001**	
benzene	[U]ND	10
phenol	0.603	6.2
cyanide (total)	12.1	590
cyanide (amenable)	11.9	30

- Indicates a location in the table for which an entry would not be appropriate.
[U] Final concentration of the analyte was found to be below the DL.
[b] R.61-79.268.48 "Universal Treatment Standards".

3.2.2 *Quality Assurance*

The following subsections include summaries of results from blanks, laboratory control samples, matrix spikes, and matrix spike duplicates. The data package for this task also includes data for calibration verifications, interference checks, and serial dilutions.

3.2.3 *Blanks*

Blank concentrations are given in Table 3-8. Target and non target analytes were detected in the Method Blank below the reporting limit. Amenable to chlorination cyanide is determined by subtracting the results determined in the chlorinated cyanide test from those determined in the total cyanide test. The Method Blanks analyzed with this Sample Delivery Group (SDG) met the acceptance criteria.

Table 3-8. Method Blank.

Analyte	Method Blank (µg/kg)
benzene	[U]ND
phenol	[U]ND
cyanide (total)	[U]ND
cyanide (amenable)	--

- Indicates a location in the table for which an entry would not be appropriate.
[U] Final concentration of the analyte was found to be below the DL.
ND – Not Detectable

3.2.4 *Laboratory Control Samples*

Results from the Laboratory Control Sample (LCS) are given in Table 3-9. All LCS recoveries met the vendor laboratory acceptance. Laboratory Control Samples are clean aqueous solutions analyzed to assure integrity of the analytical technique exclusive of matrix effects.

Table 3-9. Laboratory Control Sample.

Analyte	**Laboratory Control (µg /kg)**			**Recovery (%)**	
-	**True**	**Measured**		-	
benzene	50.0	49.6		99.1	
phenol	2090	1980	2260	95.2	109
cyanide (total)	67900	54000	53800	79.5	79.2
cyanide (amenable)	--	--		--	

3.2.5 *Matrix Spikes*

Total cyanide is the only method where a matrix spike would be applicable; however, no samples were analyzed because of the highly radioactive sample matrix.

3.2.6 *Calibration Information*

- All initial calibration requirements have been met for this sample delivery group (SDG).
- All Contract Required Detection Limit standard(s) met the referenced advisory control limits.
- All interference check samples associated with this SDG met the established acceptance criteria.
- All continuing calibration blanks bracketing this batch met the established acceptance criteria.
- All continuing calibration verifications bracketing this SDG met the acceptance criteria.

4.0 Conclusions

Preparation of the 3QCY10 saltstone samples and the subsequent TCLP analyses showed that:

- The saltstone waste form disposed of in the Saltstone Disposal Facility in 3QCY10 was not characteristically hazardous for toxicity.
- The concentrations of the eight RCRA metals and UHCs identified as possible in the saltstone waste form were present at levels below the UTS.
- Analyses met all quality assurance specifications of USEPA SW-846.

The saltstone waste form placed in the Saltstone Disposal Facility in 3QCY10 met the SCHWMR R.61-79.261.24(b) RCRA metals requirements for a nonhazardous waste form. The TCLP leachate concentrations were less than 5x the MCLs in SCDHEC Regulations R.61-107.19, Part I C.

The saltstone waste form placed in the Saltstone Disposal Facility in 3QCY10 met the R.61-79.268.48(a) non wastewater treatment standards.

Analyses met all USEPA SW-846 quality assurance requirements with the exception of the laboratory control sample recoveries from GEL Laboratories. All other limits on holding times, laboratory control sample recoveries, matrix spike recoveries, serial dilution results when applicable, calibration verification, and interference checks were within the quality assurance requirements..

5.0 References

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