PNNL-11646
UC-721

Status Report: Pretreatment Chemistry Evaluation FY 1997—Wash and Leach Factors for the Single-shell Tank Waste Inventory

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August 1997

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

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Summary

The work described in this report was conducted by the Pretreatment Chemistry Evaluation Task of the Tank Waste Remediation System (TWRS). Updated wash and leach factors, developed as part of this task, will be incorporated into process flowsheets in the TWRS Operation and Utilization Plan. These updated factors incorporate dissolution data from tests performed with tank wastes, which, in actuality, are mixtures of insoluble and soluble materials. As a result, these overall factors apply to a composite single-shell tank (SST) inventory. The wash factors will be used to partition the SST inventory into soluble and insoluble portions. The leach factors will be used to estimate the further removal of bulk analytes, such as chromium, aluminum, and phosphate, as well as minor components.

Wash and leach factors are given here for 18 analytes, including chromium, phosphate, and aluminum, elements expected to drive the volume of material disposed of as high-level waste (HLW). These factors are determined by a weighting methodology developed earlier by this task. Tank-specific analyte inventory values, depicted in Tank Waste Data Summary Worksheets, are calculated from concentrations obtained from characterization reports; the waste density; and the tank waste volume. The experimentally determined percentage of analytes removed by washing and leaching in a particular tank waste are translated into a mass (metric tons) in Experimental Washing and Leaching Data Summary Worksheets.

Individual analyte masses from the Experimental Washing and Leaching Data Summary Worksheets are entered into a spreadsheet that weights the analyte masses according to the volume contribution of its characteristic waste type. The relationship among individual tank wastes and their characteristic waste types is based on the Sort on Radioactive Waste Type (SORWT) Model. Results from the detailed spreadsheet evaluations are given in Analyte Wash and Leach Evaluation Worksheets, which include analyte-specific wash factors (% of analyte removed from initial solids); leach factors (% of analyte removed from washed solids); and, for some analytes, oxidative leach factors (% of analyte removed from washed and leached solids using oxidative dissolution methods). The updated wash and leach factors are summarized in Table S-1.

Importantly, the mass weighted wash and leach factors are highly dependent on available information. For example, the unfavorable overall chromium leach factor of 14% in 1996 was due entirely to the absence of data for the heavily weighted (approximately 0.4) Redox and Evaporator Bottoms waste groups (SORWT Groups I, V, and IX). No leach behavior could be assumed with any confidence because of the surprisingly poor leach behavior exhibited by two other predominantly salt-type wastes (BY-104 and BY-110). In 1997, data from washing and leaching studies were obtained for two Redox/Evaporator Bottom wastes, S-101 and S-111, and the enhanced sludge washing performance increased based solely on these data. The new chromium leach factor is 78%.

Table S-1. FY 1997 Summary of Wash and Leach Factors for a Composite Single-shell Tank Waste Inventory

Analyte	Wash Factor[a]	Leach Factor[b]	Oxidative Leach Factor[c]	% SST Inventory Accounted For
Al	24	88[d] 78[e]	7.8[d] 34[e]	101
Ba	2	0.1	insufficient data	inventory unknown
Bi	0.2	0.3	insufficient data	92
Ca	4	3	0.2	132
Cd	16	1	insufficient data	76
Cr	35	78[d] 77[e]	11[d] 13[e]	80
^{137}Cs	61	78	insufficient data	115
Fe	0.3	0.7	0.1	111
Mg	2	0.3	insufficient data	inventory unknown
Mn	0.3	0.1	insufficient data	244
Na	96	46[f]	insufficient data	98
Ni	7	2	insufficient data	70
PO_4	79	75	5	95
Si	14	36	1	324
SO_4	Incomplete waste inventories— no wash and leach factors calculated.			
Sr	0.2	1	insufficient data	226
^{90}Sr	0.1	1	insufficient data	70
U	2.5	2.1	insufficient data	84
Zr	0.2	0.2	insufficient data	151

(a) Percent analyte removed from initial solids.
(b) Percent analyte removed from washed solids.
(c) Percent analyte removed from washed and leached solids using oxidative leaching methods.
(d) As a result of technical review comments, extended alkaline leach time study data, previously combined with oxidative leaching data, were combined with alkaline leach data. This redistribution increased the leach factor and decreased the oxidative leach factor.
(e) Factors presented in June 30, 1997, draft report.
(f) Leach factor based on very limited data.

The percent sodium, aluminum, phosphate, chromium, and bismuth accounted for in the analyte evaluations was 98, 101, 95, 80, and 92, respectively. The favorable mass balances for these bulk inventory analytes lend support to the weighting methodology, to the sample matrix, and to the current standard inventories. Notably, most of the sodium, aluminum, and chromium inventories reside in the Redox and Evaporator Bottom waste groups. Because these analytes potentially affect HLW production, washing and leaching data for additional wastes in these groups would improve confidence in the wash and leach factors.

Partitioning factors for sulfate cannot be computed from currently available data. If wash and leach factors are needed for this analyte, the total sulfate/sulfur concentration in a particular waste sample needs to be determined prior to washing and leaching to calculate percentages removed with each step. Alternatively, the residual solids could be analyzed for sulfur so that the total mass could be obtained by summing the wash, leach, and residual solids fractions. Based on the inventory distribution observed in the not-yet-complete sulfate evaluation, wastes from BY-104, BY-108, BY-110, S-101, and S-111 may be good candidates for study.

Description of Waste-Type Groups

The following waste type groups are referred to in the figure and in the detailed analyte evaluations in this report. These waste type groups are based on the Sort on Radioactive Waste Type (SORWT) Model (Hill et al. 1995). The acronyms used to designate the primary and secondary waste types may vary slightly from the acronyms used in Hill et al. (1995).

1C

First decontamination cycle (1C) waste from the Bismuth Phosphate Process at B and T Plants. This waste type consists of byproducts coprecipitated from a plutonium-containing solution. Coating waste (CW) from the removal of aluminum fuel element cladding was added and composed about 24% of this waste. Tank T-104 is the only tank that contains predominantly 1C waste (1670 kL).

1C/?

Waste-type group (185 kL waste, 15 kL of which are supernatant) assigned to U-112. This tank received first decontamination cycle (1C) waste from the Bismuth Phosphate Process and additional waste of unknown origin.

1C/EB (SORWT Group VIII)

This six-tank group of B and BX Farm tanks contains 3640 kL of waste. These tanks all received first decontamination cycle (1C) waste from the Bismuth Phosphate Process in the late 1940s and early 1950s. In the mid-1950s, the supernatant portion of the 1C waste was transferred from the tanks, and they began receiving evaporator bottoms (EB) waste. For this evaluation, 3050 kL of sludge are assigned to this group; 590 kL salts have been assigned to the EB/1C group.

1C(f)/EB

Waste-type group assigned to TY-101 (447 kL). This tank received first decontamination cycle (1C) ferrocyanide-scavenged (f) waste and evaporator bottoms (EB) waste.

1C/CW (SORWT Group X)

This five-tank waste group contains 2880 kL of waste, ~50 kL of which are supernatant. T-105, T-106, and U-110 initially received second decontamination cycle (2C) waste from the Bismuth Phosphate Process in 1947. The cascade was then filled with first decontamination cycle (1C) waste from 1948 until 1955 when it began receiving cladding waste (CW) in large quantities. C-107 and T-107 both initially

received 1C waste but eventually began receiving CW in the 1960s. A large amount of solids accumulated from these waste types. In the 1970s, a number of different liquid wastes were transferred through these tanks but most likely did not affect the solids content to the degree of the previous wastes.

1C/TBP (SORWT Group XII)

This four-tank waste group contains 2620 kL of waste. Even though this group transcends four different tank farms in both the 200 East and West Areas, these tanks have similar processing histories. They were filled with first decontamination cycle (1C) waste from the Bismuth Phosphate Process in the 1940s. A portion of this volume was drained in the early 1950s, and the tanks began receiving tributyl phosphate (TBP) waste. The solids volume that was measured at this time did not accumulate further during the rest of the history of these tanks.

2C/5-6 (SORWT Group XVI)

This three-tank waste group, located in the B Tank Farm of the 200 East Area, contains 1950 kL of waste, ~20 kL of which are supernatant. These three tanks also were connected in a three-tank cascade. The cascade was originally filled with second decontamination cycle (2C) waste from the Bismuth Phosphate Process in the 1940s, cribbed in 1950, and refilled with 2C waste. The continuous overflow in B-112 was cribbed. The cascade began receiving waste from Tank 5-6 at B Plant (5-6) in 1952 as part of the shutdown and decontamination of B Plant. The tanks began receiving fission products in 1963. B Plant low-level waste (BL) and ion exchange waste (IX) were routed to the cascade in the late 1960s and early 1970s; however, these were mostly liquid in nature.

2C/EB

Waste-type group (1400 kL waste) assigned to B-104. This tank received second decontamination cycle (2C) waste from the Bismuth Phosphate Process and evaporator bottoms (EB).

224 (SORWT Group VII)

This eight-tank waste group represents 1060 kL of waste, ~20 kL of which are supernatant. All eight tanks are 208-kL (55-kgal), 200 Series tanks located in B and T Farms. These tanks received only lanthanum fluoride decontamination (224) waste from the Bismuth Phosphate Process.

2C/224 (SORWT Group XV)

This three-tank waste group contains 3420 kL of waste, ~40 kL of which are supernatant. These tanks were connected in a three-tank cascade. They all received second decontamination cycle (2C) waste from the Bismuth Phosphate Process in the

1940s and early 1950s until the cascade was full. In 1952, they began receiving lanthanum fluoride decontamination waste (224) from the Bismuth Phosphate Process, and the excess supernatant was cascaded to a crib. The cascade also received waste from Tank 5-6 at B Plant (5-6) after 1951 and Tanks T-111 and T-112 received dilute decontamination waste (DW) and a mixture of liquid wastes (MIX) in the late 1960s. These transfers are not expected to have significantly altered the characteristics of the waste relative to the first two waste types.

EB/1C (SORWT Group II)

This 10-tank waste-type group contains approximately 17,500 kL of waste; 590 kL salts from the 1C/EB waste group have been assigned to this group for a total of 18,100 kL. All but two of these tanks are located in the TX Tank Farm; one is located in B Tank Farm and the other in TY Tank Farm. These tanks are characterized as having received large quantities of evaporator bottoms (EB), mainly from the 242-T Evaporator. They also received modest quantities of first decontamination cycle (1C) waste from the Bismuth Phosphate Process.

TBP

Waste-type assigned to TY-105 (874 kL waste). This tank received predominantly tributyl phosphate (TBP) waste from the Uranium-Extraction Process at U Plant. The waste is composed of concentrated, neutralized aqueous effluents from the primary extraction column and from the solvent wash.

TBP/Sr

Waste-type group (568 kL) assigned to C-105. This tank received tributyl phosphate (TBP) waste from the Uranium-Extraction Process and sludge wash waste from the strontium extraction process (Sr).

TBP/DiaE

Waste-type group (64 kL) assigned to TY-106. This tank received tributyl phosphate (TBP) waste from the Uranium-Extraction Process. Diatomaceous earth (DiaE) was added to the tank, most likely in an attempt to prevent the escape of liquid waste.

TBP/EB (SORWT Group XXI)

The two tanks in this waste group are located in the 200 West Area and hold a total of 814 kL of waste. The tributyl phosphate (TBP) waste originated from the Uranium-Extraction Process. These tanks also received an appreciable amount of evaporator bottoms (EB).

TBP(f)/EB (SORWT Group III)

This waste-type group contains 10 tanks and is the third most significant in terms of number of tanks and total waste volume. The tanks in the group hold 15,100 kL of waste. All of these tanks, which originally held wastes from the Bismuth Phosphate Process [mostly first decontamination cycle (1C) with some metal waste (MW)], can be found in the BY Farm located in the 200 East Area. They were completely emptied in the early 1950s, and no significant amounts of Bismuth Phosphate Process solids remain in the tanks. After sluicing, these tanks received tributyl phosphate (TBP) ferrocyanide-scavenged (f) waste from U Plant. During the late 1960s and early 1970s, these tanks were connected to the in-tank solidification (ITS-2) loops. This process, in which one tank in the loop was used as an in-tank evaporator and the rest of the tanks as liquid holders, concentrated the waste and reduced the liquid volume.

TBP/EBits (SORWT Group XIX)

The pair of BY Farm tanks in this waste group contain a combined total of 2890 kL of waste. Both tanks received metal waste (MW) from the Bismuth Phosphate Process before 1955, but the tanks were sluiced to recover any residual solids that may have been suspended and eventually settled. Beginning in 1955, both tanks received tributyl phosphate (TBP) waste from the Uranium-Extraction Process. Both tanks received quantities of cladding waste (CW) in the early 1960s and were connected to an in-tank solidification (ITS) loop in the late 1960s; Tank BY-102 to ITS-1 and BY-109 to ITS-2.

TBP/CW (SORWT Group V)

This nine-tank waste group, located almost entirely in BX Tank Farm, contains 2680 kL of waste. These tanks were originally filled with metal waste (MW) or first decontamination cycle (1C) waste from the Bismuth Phosphate Process in the 1940s. In the early 1950s, MW tanks were sluiced and other tanks were pumped down to provide room for tributyl phosphate (TBP) waste from the Uranium-Extraction Process. Additions of this waste type began in the mid-1950s. The addition of cladding waste (CW) began in the mid-1960s.

TBP(f)/1C (SORWT Group XIII)

This four-tank waste group contains 1110 kL of waste, ~20 kL of which are supernatant. The tanks were originally filled with first decontamination cycle (1C) waste from the Bismuth Phosphate Process. The tanks were used as the primary settling tanks during the In-Farm Scavenging campaign in the 1950s. The supernatant was transferred out of the tanks to make room for the tributyl phosphate (TBP) ferrocyanide scavenged (f) waste that was allowed to settle.

TBP/1C(f) (SORWT Group XXII)

The pair of ferrocyanide tanks in this waste group are located in TY Farm and contain 787 kL of waste, ~11 kL of which are supernatant. These tanks received tributyl phosphate (TBP) waste in the early 1950s; then, during the mid-1950s, the supernatant was transferred out, and first decontamination cycle (1C) ferrocyanide scavenged (f) waste was placed on the TBP heel. During the 1960s and 1970s, a variety of waste was transferred into and out of these tanks; however the solids accumulation did not substantially change during these transfers.

R-RCW/EB (SORWT Group I)

This waste-type group is the most significant group predicted by SORWT in terms of number of tanks and total waste volume. The 21[a] tanks within this group contain an estimated 36,700 kL of total waste. Note that supernatant has been included in the total waste volume for this group for sodium mass balance purposes. All of these tanks can be found in three different 200 West Area Tank Farms, S, SX, and TX. These tanks typically received a large amount of high-level REDOX waste (R) along with lesser amounts of REDOX Cladding Waste (RCW) and a very small amount of PUREX Cladding Waste (PCW) during the 1950s. This waste is most likely responsible for any sludge accumulation in these tanks. These tanks also received large amounts of evaporator bottoms (EB), a supersaturated, high-nitrate waste, usually from the 242-S Evaporator, in the early 1970s. Despite the slightly different processing history of these tanks between addition of the R in the 1950s and the EB in the 1970s, it is believed that these two waste types predominantly dictate the physical and chemical characteristics of the waste. For this evaluation, the 380 kL of PUREX cladding waste (PCW) have been assigned to the PCW/ZrCW waste group, which leaves a total of 36,320 kL total waste in this group.

EB/R (SORWT Group IX)

This waste group consists of five 200 West Area tanks, mostly from U Farm. These tanks contain 7710 kL of waste, ~180 kL of which are supernatant. Initially, these tanks held substantial amounts of supernatant before receiving solid wastes. Some tanks were filled with metal waste (MW) from the Bismuth Phosphate Process in the 1940s, but these MW receivers were completely sluiced out in the early 1950s. Large quantities of high-level REDOX (R) waste were then introduced into these tanks and allowed to remain there for many years. In the early 1970s, large volumes

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(a) The SORWT Model originally assigned S-107 to this group, for a total of 22 tanks. For the detailed analyte evaluations in Section 3.0, S-107 was removed from this group because it contains Zircaloy cladding waste.

of R supernatant were transferred from the tanks and replaced with evaporator bottoms (EB) from the 242-S Evaporator.

EB/CW (SORWT Group VI)

The eight tanks in this waste group contain 8730 kL of waste, ~440 kL of which are supernatant. All of these tanks except TX-118 were filled with metal waste (MW) from the Bismuth Phosphate Process in the early 1940s or early 1950s; in the mid- to late 1950s, the MW was sluiced from the tanks to recover the uranium. The order that the tanks then received evaporator bottoms (EB) and cladding waste (CW) varies; however, EB and CW are believed to be the primary and secondary waste types, respectively.

EB/DW

Waste-type group (507 kL) assigned to TX-108. This tank received evaporator bottoms (EB) and decontamination waste (DW), i.e., wash solution from equipment decontamination efforts at the T Plant.

R-Sludge(Zr)

REDOX sludge containing Zircaloy cladding waste. This waste type has been assigned to S-107 (1420 kL waste) for this evalution.

R-Sludge (SORWT Group IV)

This 10-tank waste-type group contains high-level REDOX (R) waste. S-104 received R waste which still contained cladding waste (CW); all other tanks were filled with R waste only after the CW was removed. Tanks SX-111 and SX-114 received a small amount of EB waste from the REDOX waste evaporator. These tanks hold 4660 kL of predominantly sludge-type waste (~10 kL are supernatant). Eight of these tanks can be found in the SX Tank Farm, and all are located in the 200 West Area.

R/Mix

Waste-type group (329 kL of waste, 11 kL of which are supernatant) assigned to TX-101. This tank received high-level REDOX (R) waste and a mixture of several miscellaneous liquid wastes.

R/2C

Waste-type group (11 kL of waste, ~3 kL of which are supernatant) assigned to U-204. This tank received high-level REDOX (R) waste and second decontamination cycle (2C) waste from the Bismuth Phosphate Process.

R/DiaE (SORWT Group XXIV)

This pair of assumed leaker tanks contains 560 kL of waste. Tank U-104 initially received metal waste (MW) from the Bismuth Phosphate Process in the 1940s, but this waste was sluiced from the tank in the early 1950s. Tank SX-113 was not released to operation until the mid-1950s. Both tanks exclusively received high-level REDOX (R) waste after 1958. Diatomaceous earth (DiaE) was added to both tanks after they were declared leakers, in an attempt to prevent the escape of liquid waste.

RCW/Mix and PCW/Mix (SORWT Group XVII)

This three-tank cascade waste group currently holds 609 kL of waste, ~68 kL of which are supernatant. The cascade was initially filled with metal waste (MW) from the Bismuth Phosphate Process in the 1940s and emptied in 1951. The cascade was again filled with MW in 1955 but sluiced empty the following year. The empty cascade was then filled with REDOX cladding waste (RCW) and, in the case of T-102 and T-103, PUREX cladding waste (PCW) beginning in 1957. This single waste type remained until the early 1970s, when a mixture of several miscellaneous liquid wastes was routed to these tanks. For this evaluation, RCW/Mix is assigned 382 kL waste and PCW/Mix is assigned 159 kL waste.

RCW (SORWT Group XVIII)

These three 200-Series tanks from U Farm contain only 49 kL of waste, of which ~11 kL are supernatant. The history of these tanks indicates that the predominant waste type is REDOX cladding waste (RCW).

DSSF (SORWT Group XI)

This four-tank waste group contains a total of 8000 kL of waste, ~40 kL of which are supernatant. These tanks initially received either plutonium-uranium extraction (PUREX) high-activity, neutralized acid waste (P) or B Plant high-level waste from waste fractionization process (B). However, all of these tanks were sluiced of their contents in 1976. The waste types added to these tanks after sluicing were double shell slurry feed (DSSF) and noncomplexed (NCPLX) waste, which are generic terms describing the potential for further processing of the waste instead of the original source of the waste.

CC/DSSF (SORWT Group XXIII)

This waste group is composed of two AX Farm tanks that contain 572 kL of waste, ~12 kL of which are supernatant. Both of these tanks were sluiced of their contents in 1977, leaving a 23-kL heel of PUREX high-activity, neutralized acid waste (P). The tanks then received wastes identified by unspecific waste names like complexed

concentrate (CC), double-shell slurry feed (DSSF), and post-1976 evaporator feed (EVAP).

AR Sludge

Waste type assigned to AX-104 (26 kL waste). This tank contains neutralized PUREX acidified sludge after strontium recovery in the AR Vault (AR). This tank also received noncomplexed (NCPLX) waste, which is a generic term describing the potential for further processing of the waste instead of the original source of the waste.

CC/AR

Waste-type group (473 kL) assigned to A-106 . This tank received waste referred to as complexed concentrate (CC) waste. This tank also received neutralized PUREX acidified sludge after strontium recovery in the AR Vault (AR).

AR/PCW (SORWT Group XX)

Both of the tanks in this waste group, C-103 and C-106, are located in C Farm. Tank C-103 contains 738 kL of waste, ~503 kL of which are supernatant. Tank C-106 contains 867 kL of total waste. This group received metal waste (MW) from the Bismuth Phosphate Process in the 1940s, which was removed in the early 1950s. The tanks were then filled with tributyl phosphate (TBP) waste from the Uranium-Extraction Process that was scavenged in the CR vault in the mid-1950s. Also during the mid-1950s, these tanks received various quantities of PUREX high-activity, neutralized acid waste (P) and cladding waste (CW). In the early 1970s, these tanks received large quantities of a variety of liquid waste, which was later transferred out. In 1976 and 1977, these tanks received a large transfer of strontium-leached sludge (SRS), which added to the solids volume in the tank. These tanks also received a large quantity of high-level solids as suspended particulates from sludge washing in the AR Vault (Sr). These suspended solids settled in the tanks are considered a significant contributor to the high radioactivity.

Tank C-106 has not been included in the wash and leach factor evaluation because this tank is expected to be processed as part of privatization efforts. Results from bench-scale testing of this tank are provided in Brooks et al. (1997).

P Sludge

Waste type (180 kL) assigned to A-104 and A-105. This tank contains sludge from PUREX high-activity, neutralized acid waste (P).

HS (SORWT Group XIV)

This four-tank group of 208-kL (55-kgal), 200-Series tanks is located in the C Farm. These tanks received metal waste (MW) from the Bismuth Phosphate Process in the 1940s but were sluiced in the early 1950s. After sluicing, these tanks received waste only from the Strontium Extraction Process at the Hot Semiworks (HS). The majority of this waste was removed from these tanks in the late 1960s and early 1970s; approximately 42 kL total waste remain.

PCW/ZrCW

Waste type group (2720 kL) assigned to C-102 and C-104. These tanks contain PUREX aluminum and Zircaloy cladding wastes (PCW/ZrCW). An additional 380 kL PCW has been assigned to this group from waste group R-RCW/EB, for a total of 3100 kL waste.

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Acknowledgments

The author wishes to thank the following persons who provided valuable assistance and input to this task: M. J. Kupfer and A. L. Boldt (Lockheed Martin Hanford Company); R. M. Orme and R. A. Kirkbride (Numatec Hanford Company); and B. M. Rapko and S. R. Gano (Pacific Northwest National Laboratory).

1.0 Introduction

After the primary mission at the Hanford Site changed from plutonium production to environmental restoration (1990), the Tank Waste Remediation System (TWRS) was established by the U.S. Department of Energy (DOE) to safely manage and dispose of high-level wastes (HLW) stored in the underground tanks. A key element of the disposal activities under TWRS involves establishing a reference strategy for pretreating wastes prior to disposal. Pretreatment strategies include utilizing processes and equipment to separate and/or destroy waste components to minimize treated waste volumes and to produce waste fractions that are compatible with final waste forms and their disposal criteria.

The currently envisioned pretreatment strategy proposes 1) to remove radionuclides from the aqueous waste fractions to produce streams suitable for disposal as low-level waste (LLW) and 2) to use washing and selective leaching strategies to remove elements from sludges expected to drive HLW production, i.e., aluminum, phosphorus, and chromium. The effect of this pretreatment strategy on final waste volumes is evaluated in systems engineering studies, such as the TWRS Process Flowsheet (Orme et al. 1996), by employing assumptions about the chemical and physical behavior of the wastes. Included in these assumptions are wash and leach factors, i.e., the fraction of each waste component expected to dissolve or to leach from waste streams during various processing steps.

Before 1996, the single-shell tank (SST) and double-shell tank (DST) waste inventories were partitioned into soluble (salt) and insoluble (sludge) portions based on the judgment of experienced personnel. Estimated sludge wash factors were employed to further separate residual soluble material from the insoluble sludge portion. These estimated sludge wash factors (Boomer et al. 1993) were derived from a very limited set of available data. Portions of this set were updated in 1994 by the TWRS Pretreatment Chemistry Evaluation Task by analyzing results from waste characterization studies of 27 SST sludges (Colton 1995).

Since 1994, as part of the TWRS Program to provide experimental data and a technical basis for wash and leach factors, washing and caustic leaching tests of Hanford tank wastes have been performed by Pacific Northwest National Laboratory (PNNL)[a] and Los Alamos National Laboratory (LANL). In 1996, the Pretreatment Chemistry Evaluation Task

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(a) Operated for the U.S. Department of Energy by Battelle under Contract DE-AC06-76RLO 1830.

incorporated data from these tests [22[a] individual SST wastes] into the partitioning factors for the SST waste solids inventory, i.e., sludges, salt cake, and associated interstitial liquid. A weighting methodology was developed that derived overall wash and leach factors for a composite SST inventory, rather than only an assumed insoluble portion (Colton 1996). The purpose of considering the entire inventory was to provide a more representative picture of the partitioning behavior of the analytes during envisioned waste retrieval and processing activities.

This report updates partitioning factors for the composite SST waste solids inventory, based on recent experimental data. These data originated from wash and leach tests performed on an additional nine SST wastes; from extended leaching studies; from oxidative dissolution studies; and from a scaled-up wash and leach test. The data sources and methodology used in the evaluation are summarized in Section 2.0. Updated wash and leach factors are presented in Section 3.0 in the form of detailed evaluations by analyte. Conclusions and recommendations are given in Section 4.0. Section 5.0 lists the references cited throughout the document. Supporting worksheets—individual tank data summary worksheets and tank-specific, experimental washing and leaching data summary worksheets—are contained in Appendices A and B, respectively.

(a) Washing and leach tests were completed for 23 SST wastes; however, data for SX-108 were not available for consideration in the 1996 evaluation.

2.0 Data Sources and Methodology

In FY 1997, the Pretreatment Chemistry Evaluation Task was requested to evaluate SST wash and leach factors and include data from the most recent experimental studies performed with Hanford tank wastes. The data sources, the methodology, and the work completed in FY 1997 are discussed in the following sections.

2.1 Data Sources

Information needed to construct overall wash and leach factors included data generated over the years as part of characterization, washing and leaching, oxidative dissolution, scale-up, and radionuclide removal studies. The data sources are listed in Table 1.

2.2 Methodology

The weighting methodology (Colton 1996) was used to generate the results discussed in Section 3.0. The methodology is highlighted below, along with activities completed in FY 1997.

Prepare Individual Tank Waste Data Summary Worksheets

Individual *Tank Waste Data Summary Worksheets* are prepared to provide tank-specific analyte inventory values. These inventory values are calculated from analyte concentrations obtained from characterization reports and databases; the waste density; and the tank waste volume (Hanlon 1996).

Tank Waste Data Summary Worksheets were completed for 10 SST wastes (Appendix A) in FY 1997, three of which (C-104, C-105, and C-107) are revisions to worksheets prepared in previous years.

Prepare Experimental Washing and Leaching Data Summary Worksheets

Experimental Washing and Leaching Data Summary Worksheets are prepared for each waste to translate the experimentally determined percentage of a specific analyte inventory removed by washing or leaching into mass [in terms of metric tons (MT)]. Analyte inventories are obtained from the individual Tank Waste Data Summary Worksheets.

Table 1. Data Sources for 49 Single-shell Tanks Used in This Evaluation

Tank	Characterization Data 1986 or later	Sludge Washing/ Leaching Data 1994 or later	Radionuclide Removal Test Data 1980 or earlier
A-103	Colton (1995) [data from Weiss and Schull (1988a)]	--	--
A-106	Colton (1995) [data from Weiss and Schull (1988b)]	--	--
B-104	Colton (1996) [data from Field et al. (1996a)]	Temer and Villarreal (1996)	--
B-105	--	--	Schulz (1980)
B-106	Worksheet provided in Appendix A [data obtained from McCain et al. (1996)]	Temer and Villarreal (1997)	--
B-110	Colton (1995) [data from PNNL letter report to WHC]	Lumetta and Rapko (1994)	--
B-111	Colton (1995) [from Giamberardini (1993)]	Rapko et al. (1995) Rapko et al. (1996)	--
B-201	Colton (1995) from [data from WHC (1993a)]	Lumetta and Rapko (1994)	--
B-202	Colton (1996) [data from TWINS database]	Temer and Villarreal (1995)	--
BX-103	Worksheet provided in Appendix A	Temer and Villarreal (1997)	--
BX-104	Colton (1995) [data from Weiss and Schull (1988c)]	--	--
BX-105[a]	Colton (1995) [data from Weiss and Schull (1988d)]	Temer and Villarreal (1995)	--
BX-107	Colton (1995) [data from Kristofski (1993)]	Rapko et al. (1995)	--
BX-109	Colton (1996) [data from Field et al. (1996b)]	Temer and Villarreal (1996)	--
BY-104	Colton (1996) [data from TWINS database]	Lumetta et al. (1996)	--

Table 1. cont'd.

Tank	Characterization Data 1986 or later	Sludge Washing/ Leaching Data 1994 or later	Radionuclide Removal Test Data 1980 or earlier
BY-108	Worksheet provided in Appendix A [data from Baldwin et al. (1996b)]	Lumetta et al. (1997)	--
BY-110	Colton (1996) [data from TWINS database]	Rapko et al. (1997) Lumetta et al. (1996)	--
C-103	Colton (1995) [data from Weiss and Schull (1988e)]	Rapko et al. (1995)	--
C-104	Updated worksheet provided in Appendix A [data from Baldwin et al. (1997), Fritts (1996)]; original worksheet in Colton (1995) [data from Weiss and Schull (1988f)]	Temer and Villarreal (1997)	--
C-105	Updated worksheet provided in Appendix A; original worksheet in Colton (1995) [data from Weiss and Schull (1988g)]	Temer and Villarreal (1997)	--
C-107	Updated worksheet provided in Appendix A; original worksheet in Colton (1995) [data from Bell et al. (1995)]	Results from scale-up tests by Brooks et al. (PNNL) provided in Appendix B; small-scale tests Temer and Villarreal (1995) Lumetta and Rapko (1996)	--
C-108	Colton (1996) [data obtained from TWINS database]	Temer and Villarreal (1995)	--
C-109	Colton (1995) [data from Simpson et al. (1993a)]	Lumetta and Rapko (1994)	--
C-110	Colton (1995) [data from WHC (1993b)]	--	--
C-112	Colton (1995) [data from Simpson et al. (1993b)]	Lumetta and Rapko (1994)	--
S-101	Worksheet provided in Appendix A [data from Kruger et al. (1996)]	Lumetta et al. (1997)	--

Table 1. cont'd.

Tank	Characterization Data 1986 or later	Sludge Washing/ Leaching Data 1994 or later	Radionuclide Removal Test Data 1980 or earlier
S-104	Colton (1995) [data from Kocher (1993)]	Lumetta et al. (1997) Temer and Villarreal (1995) Rapko et al. (1995)	--
S-105	--	--	Schulz (1980)
S-107	Colton (1996) [data obtained from TWINS database]	Rapko et al. (1997) Lumetta et al. (1996)	--
S-109	--	--	Schulz (1980)
S-110	--	--	Schulz (1980)
S-111	Worksheet provided in Appendix A [data from Conner et al. (1997), Steen (1996)]	Lumetta et al. (1997)	--
SX-102	--	--	Schulz (1980)
SX-103	--	--	Schulz (1980)
SX-108	Worksheet provided in Appendix A [data from Eggers (1996), Eggers et al. (1996)]	Rapko et al. (1997) Lumetta et al. (1996)	--
SX-113	Worksheet provided in Appendix A [data from Temer and Villarreal (1997)]	Temer and Villarreal (1997)	--
T-102	Colton (1995) [data from WHC (1993c)]	--	--
T-104	Colton (1995) [data from WHC (1993d)]	Temer and Villarreal (1995) Rapko et al. (1995)	--
T-105	Colton (1996) [data obtained from TWINS database]	--	--

Table 1. cont'd.

Tank	Characterization Data 1986 or later	Sludge Washing/ Leaching Data 1994 or later	Radionuclide Removal Test Data 1980 or earlier
T-107	Colton (1995) [data from WHC (1993e)]	Temer and Villarreal (1995)	--
T-108	Baldwin et al. (1996a)	--	--
T-111	Colton (1995) [data from WHC (1993f)]	Rapko et al. (1995)	--
TX-116	--	--	Schulz (1980)
TY-102	Colton (1996) [data from Weiss and Mauss (1987a)]	--	--
TY-104	Colton (1995) [data from Weiss and Mauss (1987b)]	Temer and Villarreal (1995)	--
TY-105	Colton (1995) [data from Weiss and Mauss (1987c)]	--	--
TY-106	Colton (1995) [data from Weiss and Mauss (1987d)]	--	--
U-110	Colton (1995) [data from Brown and Jenson (1993)]	Lumetta and Rapko (1994)	--

(a) Data from this tank have not been included in this evaluation because of discrepancies in projected inventories derived from core samples obtained in 1986 and auger surface samples obtained in 1994. (The auger method generally was used to sample the first 8 inches of solids on the tank waste surface.) These samples may be representative of cladding waste, the last type of waste added to this tank. Washing and leaching tests were performed only on the auger surface sample.

Experimental Washing and Leaching Data Summary Worksheets were completed for 14 SST wastes (Appendix B) in FY 1997, five of which (B-111, BY-110, C-107, S-104, and S-107) are revisions to worksheets prepared in previous years. These revisions reflect new data from oxidative and enhanced leaching studies, and for C-107, the results from scale-up tests performed with larger quantities of waste.

Perform Analyte Wash and Leach Factor Spreadsheet Evaluations

Individual analyte data from the *Experimental Washing and Leaching Data Summary Worksheets* are entered into a spreadsheet in terms of 1) analyte inventory; 2) analyte removed with washing; 3) analyte removed with alkaline leaching; and where applicable, 4) analyte removed with oxidative dissolution methods. In this spreadsheet, the analyte masses are then weighted according to the volume contribution of their characteristic waste type. The relationship among individual tank wastes and their characteristic waste types, according to the Sort on Radioactive Waste Type (SORWT) Model (Hill et al. 1995), is depicted schematically in Figure 1 at the end of this section.

The following assumptions are incorporated into the spreadsheet:

- Characteristic waste-type groups with no available individual tank waste data are assigned representative tanks that are believed to have similar waste compositions, e.g., first-cycle bismuth phosphate waste (1C) and first-cycle bismuth phosphate waste with additional salts added to the waste from evaporator campaigns (1C/EB).

- Mass of analyte in a particular characteristic waste type $M_{A(c)}$ is given by:

$$M_{A(c)} = \sum m_{A(i)} \left(\frac{V_c}{\sum V_i} \right)$$

where

$M_{A(c)}$	=	mass of analyte in a particular waste type
$m_{A(i)}$	=	mass of analyte in an individual waste
V_c	=	volume of characteristic waste
V_i	=	volume of individual waste

Tank volumes for wastes that contribute only wash data are not included in the summation of volumes used to weight leach data.

- For waste types originating from the Purex Process, where wash information derived from characterization analyses is available, metric tons of analyte leached are calculated using leach factors from a waste type expected to exhibit similar leaching behavior. Specific assumptions are noted at the end of each analyte worksheet.

- Waste in C-106 is not included in calculations because this tank is expected to be processed as part of privatization efforts.

- For wastes that were tested by both PNNL and LANL, e.g., T-104, metric tons of washed and leached analyte are calculated by averaging the results from each analysis. In some cases, results for a minor analyte were only reported by one laboratory.

- Redox wastes that were tested by Schulz (1980) are included for highly soluble anions, i.e., Na and ^{137}Cs, and for Al spreadsheet evaluations. In the case of Al, wastes from S-109, SX-102, and SX-103 were included to represent Redox tanks with lower Al inventories.

Partitioning behavior and wash and leach factors resulting from the spreadsheet evaluations are summarized, by analyte, in *Analyte Wash and Leach Factor Evaluation Worksheets*. Results from the spreadsheet evaluations performed in FY 1997 are detailed in Section 3.0.

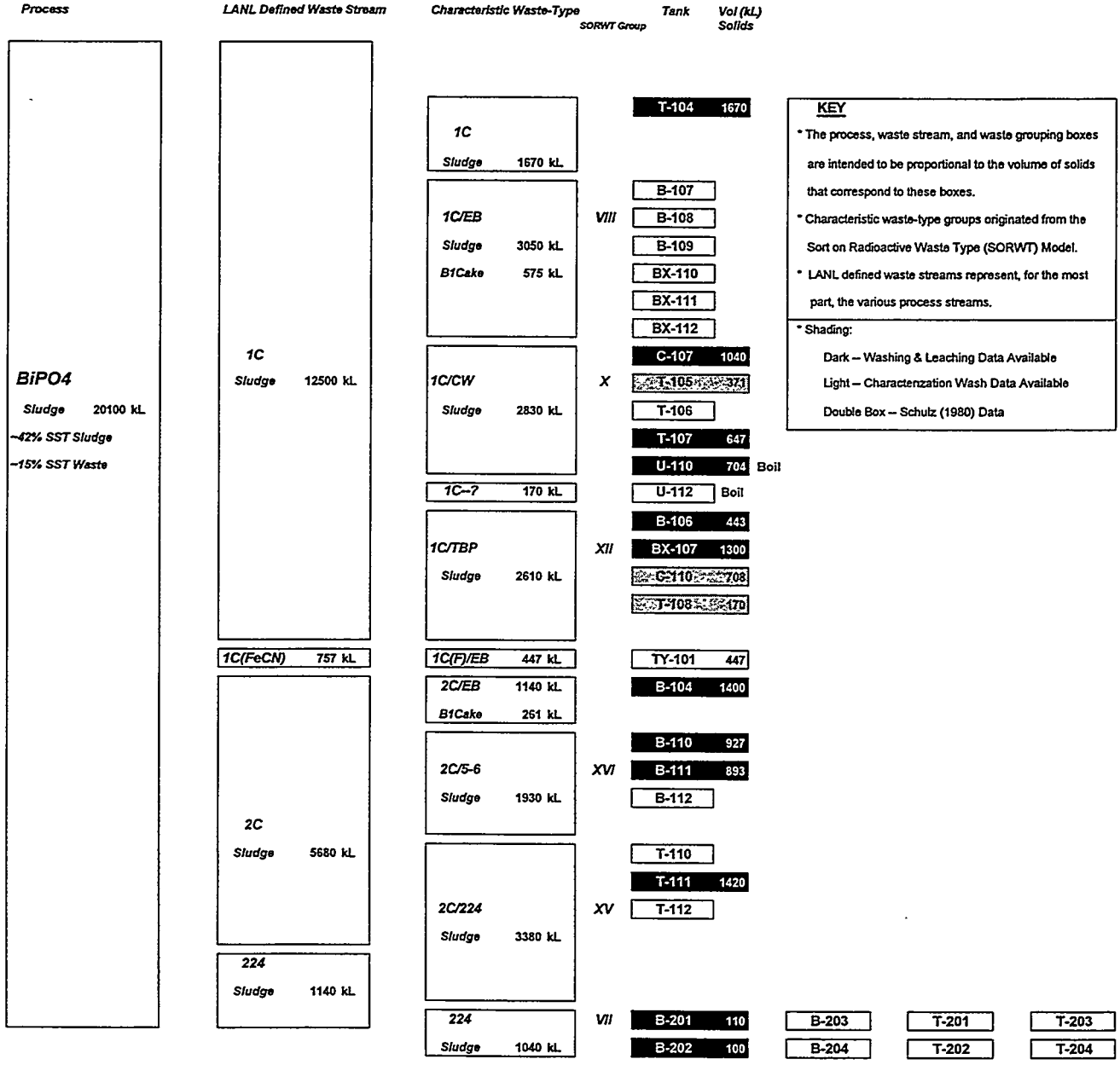

Figure 1. Pictorial Summary of Relationships Among Chemical Processes/Campaigns, Waste Streams, Characteristic Waste-type Groups, and Single-shell Tanks

Process	LANL Defined Waste Stream	Characteristic Waste-Type	SORWT Group	Tank	Vol (kL) Solids		
		TBP/Sr 570 kL		C-105	568		
		TBP/DiaE 64 kL		TY-106	64		
		TBP/EB Sludge 814 kL	XXI	T-109			
				TX-103			
		TBP Sludge 874 kL		TY-105	874		
TBP Sludge 7570 kL ~16% SST Sludge ~5% SST Waste	TBP Sludge 3790 kL	TBP/CW Sludge 2560 kL SaltCake 10 kL	V	BX-101		BX-106	
				BX-102		BX-108	
				BX-103	235	BX-109	731
				BX-104	380	C-101	
				BX-105*	160		
		TBP/1C(F) Sludge 776 kL	XXII	TY-103	613		
				TY-104	160		
	TFeCN Sludge 1130 kgal	TBP(F)/1C Sludge 1090 kL	XIII	C-108	250	C-111	
				C-109	230	C-112	394
	PFeCN Sludge 2650 kgal	TBP(F)/EB Sludge 2410 kL BYits Cake 12700 kL	III	BY-101			
				BY-103			
				BY-104	1540		
				BY-105			
				BY-106			
				BY-107			
				BY-108	672		
				BY-110	1510		
				BY-111			
				BY-112			
Evaporator Bottoms SaltCake 87400 kL ~65% SST Waste	BYits SaltCake 15200 kL ~17% SST SaltCake	TBP/EBits Sludge 310 kL SaltCake 2580 kL	XIX	BY-102			
				BY-109			

*Washing and leaching tests performed; however, not included in this evaluation due to discrepancies in projected inventories.

Process	LANL Defined Waste Stream	Characteristic Waste-Type	SORWT Group	Tank	Vol (kL) Solids			
REDOX Sludge 12900 kL ~27% SST Sludge ~10% SST Waste	Flowsheet #4 Flowsheet #5 Flowsheet #6 Flowsheet #7 Flowsheet #8 Flowsheet #9 Sludge 12900 kL	REDOX Sludge 4650 kL	IV	S-104*	1110	Boil	SX-114	Boil
				SX-107		Boil	SX-115	
				SX-108	329	Boil	U-101	
				SX-109		Boil	* Contains 10% RCW.	
				SX-110				
				SX-111		Boil		
				SX-112		Boil		
		R/2C 8 kL		U-204				
		R/Dia 560 kL	XXIV	SX-113	98		U-104	
		R/Mix 318 kL		TX-101				
		RCW/Mix 382 kL	XVII	T-101				
		RCW 38 kL	XVIII	U-201			U-202	U-203
Evaporator Bottoms (cont'd)	S1 SaltCake 26700 kL ~31% SST SaltCake	R-RCW/EB Sludge 5440 kL S1 Cake 26700 kL T2 Cake 5590 kL	I	S-101	1370	Boil		
				S-102				
				S-103				
				S-105	1730			
				S-106				
				S-107(Zr)	1420			
				S-108				
				S-109	901			
				S-110	1480			
				S-111	2256			
				S-112				
				SX-101		Boil		
				SX-102	2050	Boil		
				SX-103	2460	Boil		
				SX-104				
				SX-105				
				SX-106				
				TX-102				
				TX-104				
				TX-105				
				TX-106				
				TX-107				

Process	LANL Defined Waste Stream	Characteristic Waste-Typ	SORWT Group	Tank	Vol (kL) Solids
Evaporator Bottoms (cont'd)	S1 (cont)	R-RCW/EB (cont)	I		
	T2 SaltCake 22300 kL ~26% SST SaltCake	EB/1C Sludge 151 kL B1 Cake 1160 kL T2 Cake 13800 kL T1 Cake 2420 kL	II	B-105 1160 TX-109 TX-110 TX-111 TX-112 TX-113 TX-114 TX-102 242 TX-116 2390 TX-117	

Process	LANL Defined Waste Stream	Characteristic Waste-Type		SORWT Group	Tank	Vol (kL) Solids	
Evaporator Bottoms (cont'd)	T2 (cont)	EB/1C (cont)		II			
	R1 SaltCake 10400 kL ~12% SST SaltCake	EB/DW	507 kL		TX-108		
		EB/R		IX	TX-115 U-102		
		Sludge	481 kL		U-103		
		T2 Cake	2420 kL		U-106		
		R1 Cake	4630 kL		U-111	Boil	
	T1 SaltCake 3750 kL ~4% SST SaltCake	EB/CW		VI	B-101 B-102 B-103 TX-118 U-105		
		Sludge	1190 kL		U-107		
		B1 Cake	38 kL		U-108		
		T1 Cake	1310 kL		U-109		
		R1 Cake	5750 kL				
	B1 SaltCake 2040 kL ~2% SST SaltCake						
	A1 SaltCake 7040 kL ~8% SST SaltCake	CC/DSSF	560 kL	XXIII	AX-102		AX-103
		DSSF		XI	A-101 A-102	140	
		Sludge	1460 kL		A-103	1390	
		A1 Cake	6500 kL		AX-101		

Process	Waste Streams	Characteristic Waste-Type	SORWT Group	Tank	Vol (kL) Solids			
PUREX Sludge 6430 kL ~15% SST Sludge ~5% SST Waste	PUREX Supernatant and Sludge Supernatant (PSN) to Cs Recovery Sludge (PSL) to Sr Recovery	DSSF (cont)	XI					
	- Sludge Supernatant (PSS)	P Sludge 178 kL		A-104		A-105		
	- Acidified Sludge (PAS)	CC/AR 473 kL		~~A-106~~	~~473~~			
	- Neutralized PAS --> AR sludge	AR Sludge 26 kL		AX-104				
	Sludge 6430 kL	AR/PCW Sludge 980 kL	XX	C-103 C-106**	235 519			
		PCW/Mix 159 kL	XVII	~~T-102~~	~~72~~	T-103		
		PCW/ZrCW Sludge 2720 kL		C-102 C-104	 1120			
		HS? 42 kL	XIV	C-201		C-202	C-203	C-204

**This tank has been removed from the overall wash and leach factor evaluation because this tank is expected to be processed as part of privatization efforts.

3.0 Results

Wash and leach factor evaluations have been completed to date for 16 nonradioactive analytes (Al, Ba, Bi, Ca, Cd, Cr, Fe, Mg, Mn, Na, Ni, PO_4, Si, Sr, U, and Zr) and two radioactive analytes (^{137}Cs and ^{90}Sr). Partitioning factors for sulfate cannot be computed from currently available data. Sulfate concentrations, which are needed to derive a total SST sulfate inventory and are obtained from characterization studies, in most cases are based on ion chromatography analyses of water-leached samples. Therefore, actual sulfate inventories for individual tank wastes only can be assumed to be greater than or equal to the inventories derived from water leach concentrations.

Evaluation results are detailed in analyte worksheets at the end of this section. These worksheets show the calculated distribution of a particular analyte (in metric tons) among the wash and leach steps and in the residual solids. An analyte-specific wash factor (% analyte removed from initial solids); leach factor (% analyte removed from washed solids); and, in some instances, oxidative leach factor (% analyte removed from washed and leached solids by oxidative leaching methods) also have been calculated. Examples of additional information that can be readily extracted from these analyte worksheets are listed below:

- tanks that have an unusually high inventory of a particular analyte; e.g., C-112 has a very high inventory of uranium.

- characteristic wastes groups that contain a large fraction of a particular analyte inventory; e.g., the sodium, aluminum, and chromium inventories appear concentrated in tanks that contain Redox/Evaporator Bottom wastes.

Table 2 compares the partitioning behavior for individual SST analytes using 1996 and updated 1997 partitioning factors. The 1997 factors are applied to both the TWRS and best-basis[a] SST inventories. While the aluminum and chromium wash factors decreased compared to last year (31% to 24% for Al and 59% to 35% for Cr), the leach factors increased dramatically (60% to 88% for Al and 14% to 78% for chromium). In addition, data resulting from longer alkaline leach times (S-104 and S-107) and from oxidative leaching studies (SX-108) further reduced the mass of expected residual solids for both aluminum and chromium.

(a) Best-basis SST analyte inventories are calculated by subtracting the TWRS DST analyte inventories (Shelton 1996) from standard analyte inventories (Kupfer et al. 1997).

Table 2. Comparison of Single-shell Tank Analyte Partitioning Behaviors Based on 1996 and 1997 Wash and Leach Factors

	TWRS Inventory E												Standard Inventories						
		1996 Partitioning Behavior				1997 Partitioning Behavior							Best-basis	1997 Partitioning Behavior					
	TWRS SST Inv (MT)	Wash Factor (%)	Washed Solids (MT)	Leach Factor (%)	*Residual Solids (MT)*	Wash Factor (%)	Washed Solids (MT)	Leach Factor (%)	Leached Solids (MT)	Ox Leach Factor (%)	*Residual Solids (MT)*	SST Inv (MT)[a]	Wash Factor (%)	Washed Solids (MT)	Leach Factor (%)	Leached Solids (MT)	Ox Leach Factor (%)	*Residual Solids (MT)*
Al+3	2960	31	2345	60	***938***	24	2582	88	310	6.8	***289***	6241	24	4743	88	569	6.8	***530***
Al+3 (w/Si)	438	(combined Al inventory 3398 MT)				24	2582	78[b]	568	34[b]	***375***		24	4743	78[b]	1051	34[b]	***694***
Ba+2	0.589	0.9	0.584	0.000	***0.584***	2.0	0.577	0.1	0.577		***0.577***	14[c]	2	14	0.1	14		***14***
Bi+3	262	0.3	261	0	***260***	0.2	261	0.3	261		***261***	577	0.2	576	0.3	574		***574***
Ca+2	128	4	123	2	***120***	4	123	3	119		***119***	176	4	169	3	164	0.2	***164***
Cd+2	3.84	15	3	0	***3***	16	3	1	3		***3***	7.8	16	7	1	6		***6***
Cr+3/+6	268	59	110	14	***94***	35	174	78	38	11	***34***	699	35	454	78	100	11	***89***
						35	174	77[b]	40	13[b]	***35***		35	454	77[b]	105	13[b]	***91***
Fe+3	631	0.4	628	0.2	***627***	0.3	629	0.7	625	0.1	***624***	1013	0.3	1010	0.7	1003	0.1	***1002***
Mg+2	0	1	0	0.6	***0***	2	0	0.3	0		***0***	56[c]	2	55	0.3	55		***55***
Mn+4	120	0.5	119	0	***119***	0.3	120	0.1	120		***120***	75	0.3	75	0.1	75		***75***
Na+	57342	94	3462	46	***1870***	96	2308	46	1246		***1246***	42875	96	1715	46[d]	929		***929***
Na+ (w/Al/Si)	460	(factors applied to combined Na inventory 57707 MT)																
Ni+2	203	2.5	198	0	***198***	7	189	2	185		***185***	100	7	93	2	91		***91***
PO4(-3)	4730	75	1183	70	***355***	79	993	75	248	5	***236***	5754	79	1208	75	302	5	***287***
Si+4	14.5	12	403	13	***351***	14	394	36	252	1	***250***	260	14	224	36	143	1	***142***
Si+4 (w/Al)	444	(factors applied to combined Si inventory 459 MT)																
Sr+2	36.1	1.0	36	0	***36***	0.2	36	0.5	36		***36***	31	0.2	31	1	30		***30***
U+6	1407	2.0	1379	2.0	***1351***	2.5	1372	2.1	1343	0.8	***1332***	960	2.5	936	2.1	916	0.8	***909***
Zr+4	382	0.3	381	0	***381***	0.2	381	0.2	380		***380***	123	0.2	123	0.2	123		***123***

(a) Best-basis SST analyte inventories are calculated by subtracting the TWRS DST analyte inventories (Shelton 1996) from the standard analyte inventories (Kupfer 1997). Analyte masses for C-106 have not been included in the SST inventory because this tank is expected to be processed as part of privatization efforts.

(b) Factors presented in June 30, 1997, draft report.

(c) Inventory based on this evaluation.

(d) Leach factor for sodium based on very limited data.

These factors will be incorporated into process flowsheets in the TWRS Operation and Utilization Plan (Kirkbride et al. 1997), where the wash factors will be used to partition the SST inventory into soluble and insoluble portions, and the leach factors will be used to further remove bulk analytes, such as aluminum, chromium, and phosphate, along with minor components.

Analyte Wash and Leach Factor

Evaluation Worksheets

Analyte Wash and Leach Factor

Evaluation Worksheets

Element: Al

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.303	0.97	19.3	61.68			11.60	37.06	31.2	99.71
		T-105 (w)	371	0.0738								18.9	
		C-107	897	0.639		39.0						63.9	
		T-107	655	0.57		11.9						16	
		U-110	704	1.77		145						177	
1C/CW	2830		2627	3.0528	3.29	195.9	245.74			76.85	48.08	275.8	297.11
		T-108 (w)	167	0.127								0.572	
		C-110 (w)	708	1.03								12.4	
		B-106	443	0.454		0.941						1.62	
		BX-107	1302	0.223		15						22.3	
1C/TBP	2620		2620	1.834	1.83	15	22.52			20.06	12.54	36.892	36.89
2C/EB	1400	B-104	1400	0.202	0.20	1.9	1.90			1.26	1.26	3.36	3.36
		B-110	927	0		0.277						1.54	
		B-111	893	0		0.03		0.030				1.52	
2C/5-6	1930		1820	0	0.00	0.307	0.33	0.030	0.06	2.72	2.85	3.06	3.24
2C/224	3380	T-111	1715	0	0.00	0.14	0.28			0.94	1.85	1.08	2.13
		B-201	106			0.18						0.643	
		B-202	102			0.016						0.1	
224	1040		208	0	0.00	0.196	0.98			0.55	2.74	0.743	3.72
		B-105	1158	0.432		0						1.84	
		TY-102	242	0.0012		0						0.32	
		TX-116	2388	0.221		0						4.31	
EB/1C	18100		3788	0.6542	3.13	0	0.00			5.82	27.79	6.47	30.92
Total (MT)					9.42		333.43		0.06		134.17		477.08
% Inventory					0.15		5.29		0.00		2.13		7.56
TBP													
TBP/Sr	568	C-105	568	0	0.00	147	147.00			1.72	1.72	148.72	148.72
TBP/DiaE	64	TY-106 (w)	64	0.0003	0.00	0.326	0.33			0.28	0.28	0.604	0.60
TBP/EB	814	BY-104	1540	77.7		38.9						118	
TBP(f)/EB	15100	BY-110	1510	28		0.597		0.62				29.8	
TBP/EBits	2890	BY-108	863	25.4		3.635						40.39	
	18804		3913	131.1	630.00	43.132	207.27	0.62	7.72	13.34	59.35	188.19	904.35
TBP	874	TY-105 (w)	874	0.003	0.003	1.28	1.28			1.28	1.28	2.56	2.56
		BX-104 (w)	363	0.783								31.1	
		BX-103	235	0.268		26.49						26.84	
		BX-109	731	1.28		0.76						2.09	
TBP/CW	2570		1329	2.331	4.51	27.25	95.80			30.45	15.77	60.03	116.09
TBP/1C(f)	776	TY-104	163	0.228	1.09	1.35	6.43			0.92	4.39	2.5	11.90
		C-108	250	0.513		15.3						16.9	
		C-109	235	1.72		26.1						34.4	
		C-112	394	2.67		6.41						10.7	
TBP(f)/1C	1090		879	4.903	6.08	47.81	59.29			9.29	11.52	62	76.88
Total (MT)					641.68		517.39		7.72		94.31		1261.10
% Inventory					10.17		8.20		0.12		1.50		20.00

Element: Al (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	5.889		188						196.29	
RCW	38	SX-108	329	3.208		19.127						53.46	
	5396		1438	9.097	34.14	207.127	777.23		0.00	33.53	125.80	249.75	937.17
R/DlaE	560	SX-113	98	0.016	0.091	1.406	8.03			0.18	1.02	1.6	9.14
R-Sludge(Zr)	1420	S-107	1420	0	0.00	156	156.00	30.20	30.20	53.80	53.80	240	240.00
		S-101	1616	28.45								237.1	
R-RCW/EB	36320	S-111	2256	22.39		(based on 98% leach in						223.9	
EB/R	7530	S-109	2150	30.4		S-101 and S-111)						34	
EB/CW	8290	SX-102	2029	20.70								23.4	
EB/DW	507	SX-103	1612	9.85								9.9	
	52647		9663	111.79	609.07	408.2	2223.78		0.00	8.33	45.38	528.3	2878.23
Total (MT)					643.29		3165.05		30.20		226.00		4064.55
% Inventory					10.20		50.18		0.48		3.58		64.45
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	27.7	170.40	1.76	10.83			1.44	8.86	30.9	190.09
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0	0.00	2.19	4.50			2.37	4.87	4.56	9.37
PCW/Mix	159	T-102 (w)	72	0.102	0.23	18.6	41.08			20.10	44.38	38.8	85.68
PCW/ZrCW	3100	C-104	1117	6.56	18.21	64.14	178.01			2.19	6.08	72.89	202.29
CC/AR	473	A-106 (w)	473	7.56	7.56	8.016	8.02			1.12	1.12	16.7	16.70
Total (MT)					196.39		242.43		0.00		65.31		504.13
% Inventory					3.11		3.84		0.00		1.04		7.99
TOTAL (MT)					1490.78		4258.29		37.99		519.80		6306.86
Distribution					24		68		0.6		8		
	Wash Factor		24	% initial solids									
	Leach Factor		88	% washed solids									
	Enhanced Leach Factor		6.8	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					101

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	7845
less C-106 Estimated Inventory	-44
less TWRS DST Inventory	-1560
Expected SST Inventory	6241
This Evaluation	6307
Expected Inventory Accounted for	101 %

Element: Ba

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.0002	0.00	0	0.00			0.02	0.06	0.02	0.06
		C-107	897	0		0.01						0.51	
		T-107	655	0		0						0.05	
		U-110	704	0.0058		0						0.05	
1C/CW	2830		2256	0.0058	0.01	0.01	0.01			0.59	0.75	0.61	0.77
		C-110 (w)	708	0.0007								0.0064	
		B-106	443	0.0007		0						0.010	
		BX-107	1302	0		0						0.024	
1C/TBP	2620		2453	0.0014	0.00	0	0.00			0.04	0.04	0.0404	0.043
2C/EB	1400	B-104	1400	0	0.00	0	0.00			0.01	0.01	0.013	0.013
		B-110	927	0		0						0.03	
		B-111	893	0		0						0.05	
2C/5-6	1930		1820	0	0.00	0	0.00		0.00	0.08	0.08	0.08	0.08
2C/224	3380	T-111	1715	0.0008	0.00		0.00			0.13	0.25	0.13	0.26
		B-201	106	0.001		0						0.05	
		B-202	102	0.002		0						0.20	
224	1040		208	0.003	0.02	0	0.00			0.25	1.24	0.25	1.25
EB/1C	18100	TY-102	242	0.0025	0.19		0.00			0.00	0.19	0.0051	0.38
Total (MT)					0.21		0.01		0.00		2.63		2.86
% Inventory					1.10		0.06		0.00		13.60		14.77
TBP													
TBP/Sr	568	C-105	568	0	0.00	0.00009	0.00009			0.01	0.01	0.0094	0.009
TBP/DiaE	64	TY-106 (w)	64	0.0007	0.0007		0.00			0.12	0.12	0.116	0.12
TBP/EB	814	BY-104	1540	0		0						0.076	
TBP(f)/EB	15100	BY-110	1510	0		0						0.13	
TBP/EBits	2890	BY-108	863	—		0						0.13	
	18804		3913	0	0.00	0	0.00		0.00	0.34	1.61	0.336	1.61
TBP	874	TY-104	163	0.0003	0.002		0.00			0.02	0.11	0.02	0.11
		BX-104 (w)	363	0.0006								1.08	
		BX-103	235	0.0006		0.0002						0.0038	
		BX-109	731	0		0						0.04	
TBP/CW	2570		1329	0.0012	0.00	0.0002	0.00			1.12	2.17	1.1238	2.17
TBP/1C(f)	776	TY-104	163	0.0003	0.001		0.00			0.02	0.09	0.02	0.10
		C-109	235	0		0						0.03	
		C-112	394	0		0						0.05	
TBP(f)/1C	1090		629	0	0.00	0	0.00			0.08	0.14	0.08	0.14
Total (MT)					0.01		0.00		0.00		4.25		4.25
% Inventory					0.03		0.00		0.00		21.95		21.98

Element: Ba (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0.0005								0.06	
RCW	38	SX-108	329	0		0						0.08	
	5026		1438	0.0005	0.00	0	0.00		0.00	0.14	0.49	0.14	0.49
R/DlaE	560	SX-113	98	0.00005	0.0003	0.0006	0.003			0.00	0.02	0.005	0.03
R-Sludge (Zr)	1420	S-107	1420		0.00		0.00		0.00	0.04	0.04	0.04	0.04
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bot}$	1616									Less than value	
EB/DW	507	S-111	2256									Not analyzed	
	52647		3872	0.00	0.00	0	0.00		0.00	0.00	0.00	0.0	0.00
Total (MT)					0.00		0.00		0.00		0.55		0.56
% Inventory					0.01		0.02		0.00		2.85		2.88
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.008	0.05		0.00			1.06	6.53	1.07	6.58
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.016	0.03	0	0.00			1.54	3.17	1.56	3.21
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.00	0.00	0.0015	0.00
PCW/ZrCW	3100	C-104	1117	0	0.00	0.0004	0.001			0.12	0.33	0.12	0.33
CC/AR	473	A-106 (w)	473	0.016	0.02		0.00			1.54	1.54	1.56	1.56
Total (MT)					0.10		0.00		0.00		11.59		11.68
% Inventory					0.51		0.01		0.00		59.86		60.37
TOTAL (MT)					0.32		0.02		0.00		19.02		19.35
Distribution					1.6		0.1		0.0		98.3		
	Wash Factor		2	% initial solids									
	Leach Factor		0.1	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					Not available

	(MT)
Best-basis Total Inventory	Not available
less C-106 Estimated Inventory	-5.21
less TWRS DST Inventory	
Expected SST Inventory	Not available
This Evaluation	19
Expected Inventory Accounted for	Not available %

Element: Bi

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0	0.00	0	0.00			36.40	116.33	36.4	116.33
		T-105 (w)	371	0.0031								0.506	
		C-107	897	0		0.42						15.2	
		T-107	655	0.004		0.041						11.8	
		U-110	704	0		0						14.7	
1C/CW	2830		2627	0.0071	0.01	0.459	0.58			41.74	44.88	42.206	45.47
		T-108 (w)	167	0								0.151	
		C-110 (w)	708	0.1								14	
		B-106	443	0		0.0015						1.52	
		BX-107	1302	0		0						37.7	
1C/TBP	2620		2620	0.1	0.10	0.0015	0.0023			53.27	53.27	53.371	53.37
2C/EB	1400	B-104	1400	0	0.00	0.708	0.71			20.09	20.09	20.8	20.80
		B-110	927	0		0						25.2	
		B-111	893	0		0						22.6	
2C/5-6	1930		1820	0	0.00	0	0.00		0.00	47.80	50.69	47.8	50.69
2C/224	3380	T-111	1715	0	0.00	0	0.00			48.90	96.37	48.9	96.37
		B-201	106	0		0						13.7	
		B-202	102	0		0.002						4.37	
224	1040		208	0	0.00	0.002	0.01			18.07	90.34	18.07	90.35
		B-105	1158	0		0						0	
		TY-102	242	0.004		0						0.051	
		TX-116	2388	0		0						0	
EB/1C	18100		3788	0.004	0.02	0	0.00			0.05	0.22	0.051	0.24
Total (MT)					0.13		1.30		0.00		472.20		473.62
% Inventory					0.02		0.24		0.00		88.50		88.77
TBP													
TBP/Sr	568	C-105 (w)	568	0.062	0.062	0	0.00			0.49	0.49	0.55	0.55
TBP/DiaE	64	TY-106 (w)	64	0.0009	0.00		0.00			0.52	0.52	0.52	0.52
TBP/EBits	2890												
TBP/EB	814	BY-104	1540	0		0						0.19	
TBP(f)/EB	15100	BY-110	1510	0		0						2.1	
	18804		3050	0	0.00	0	0.00		0.00	2.29	14.12	2.29	14.12
TBP	874	TY-105 (w)	874	0.0096	0.0096	0	0.00				0.51	0.52	0.52
		BX-104 (w)	363	0.0075		0						0.92	
		BX-103	235	0		0.00002						0.01	
		BX-109	731	0		0.001						0.43	
TBP/CW	2570		1329	0.0075	0.01	0.00102	0.00			1.35	2.61	1.359	2.63
TBP/1C(f)	776	TY-104	163	0.002	0.01	0.038	0.18			4.83	22.99	4.87	23.18
		C-108	250	0		0						4.13	
		C-109	235	0		0						3.46	
		C-112	394	0		0						3.78	
TBP(f)/1C	1090		879	0	0.00	0	0.00			11.37	14.10	11.37	14.10
Total (MT)					0.10		0.18		0.00		55.34		55.62
% Inventory					0.02		0.03		0.00		10.37		10.42

Element: Bi (Continued)

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
REDOX													
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0		0						0.03	
RCW	38	SX-108	329	NR		NR						0.04	
	5026		1438	0	0.00	0	0.00		0.00	0.07	0.24	0.07	0.24
R/DiaE	560	SX-113	98	0.00001	0.0001	0.0002	0.0009			0.00	0.00	0.0006	0.00
R-Sludge (Zr)	1420	S-107	1420	0	0.00	0.01	0.01		0.00	0.07	0.07	0.08	0.08
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	$S\text{-}101_{Bol}$	1616									Not reported	
EB/DW	507	S-111	2256									Not reported	
	52647		3872	0.00	0.00	0	0.00		0.00	0.00	0.00	0.0	0.00
Total (MT)					0.00		0.01		0.00		0.32		0.33
% Inventory					0.00		0.00		0.00		0.06		0.06
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.161	0.99		0.00			0.41	2.55	0.575	3.54
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0	0.00	0.08	0.16			0.00	0.00	0.08	0.16
PCW/Mix	159	T-102 (w)	72	0	0.00	0	0.00			0.00	0.00	0	0.00
PCW/ZrCW	3100	C-104	1117	0	0.00	0	0.00			0.04	0.11	0.039	0.11
CC/AR	473	A-106 (w)	473	0.036	0.036		0.00			0.13	0.13	0.17	0.17
Total (MT)					1.03		0.16		0.00		2.79		3.98
% Inventory					0.19		0.03		0.00		0.52		0.75
TOTAL (MT)					1.25		1.65		0.00		530.65		533.55
Distribution					0.2		0.3		0.0		99.5		
	Wash Factor		0.2	% initial solids									
	Leach Factor		0.3	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					83 - 102

	(MT)
Best-basis Total Inventory	580 +/-60
less C-106 Estimated Inventory	-0.53
less TWRS DST Inventory	-2.2
Expected SST Inventory	577
This Evaluation	534
Expected Inventory Accounted for	92 %

Element: *Ca*

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.16666695	0.53	0.0605	0.19			1.05	3.36	1.28	4.09
		T-105 (w)	371	0.0564									
		C-107	897	0		0.006						0.59	
		T-107	655	0.263		0						0.75	
		U-110	704	0.115		0						3.01	
1C/CW	2830		2627	0.4344	0.47	0.006	0.01			3.91	4.21	4.35	4.69
		T-108 (w)	167	0								0.0442	
		C-110 (w)	708	0.159								0.54	
		B-106	443	0		0.0015						1.5	
		BX-107	1302	0.227		0.227						1.62	
1C/TBP	2620		2620	0.386	0.39	0.2285	0.34			3.09	2.98	3.7042	3.70
2C/EB	1400	B-104	1400	0	0.00	0	0.00			0.60	0.60	0.6	0.60
		B-110	927	0.121		0.109						1.21	
		B-111	893	0.069		0.015		0.018				0.76	
2C/5-6	1930		1820	0.19	0.20	0.124	0.13	0.018	0.04	1.64	1.72	1.97	2.09
2C/224	3380	T-111	1715	0	0.00	0.046	0.09			4.51	8.90	4.56	8.99
		B-201	106	0		0.018						1.83	
		B-202	102	0.003		0						1.19	
224	1040		208	0.003	0.02	0.018	0.09			3.00	15.00	3.02	15.10
		B-105	1158	0.02		0						0.02	
		TY-102	242	NR		0						NR	
		TX-116	2388	NR		0						NR	
EB/1C	18100		3788	0.02	0.31	0	0.00			0.00	0.00	0.02	0.31
Total (MT)					1.92		0.86		0.04		36.76		39.57
% Inventory					0.83		0.37		0.02		15.87		17.09
TBP													
TBP/Sr	568	C-105	568	0	0.00	0.014	0.01			0.46	0.46	0.47	0.47
TBP/DiaE	64	TY-104	163	0.002	0.00		0.00			0.21	0.08	0.21 (assumed)	0.08
TBP/EB	814	BY-104	1540	0		0						2.73	
TBP(f)/EB	15100	BY-110	1510	0		0		0.03				2.51	
TBP/EBits	2890	BY-108	863	0		0						3.42	
	18804		3913	0	0.00	0	0.00	0.03	0.31	8.64	41.30	8.66	41.62
TBP	874	TY-104	163	0.002	0.01		0.00			0.21	1.12	0.21 (assumed)	1.13
		BX-104 (w)	363	0.0394								4.85	
		BX-103	235	0.001		0.0007						0.13	
		BX-109	731	0		0						4.42	
TBP/CW	2570		1329	0.0404	0.08	0.0007	0.00			9.36	18.10	9.4	18.18
TBP/1C(f)	776	TY-104	163	0.002	0.01		0.00			0.21	0.99	0.21	1.00
		C-108	250	0.009		0						4.13	
		C-109	235	0.056		0.056						5.58	
		C-112	394	0.146		0						14.6	
TBP(f)/1C	1090		879	0.211	0.26	0.056	0.07			24.04	29.81	24.31	30.15
Total (MT)					0.36		0.09		0.31		91.86		92.62
% Inventory					0.16		0.04		0.13		39.67		40.00

Element: Ca (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	0.372		0.508						3.18	
RCW	38	SX-108	329	0.01		0.01						1.04	
	5396		1438	0.382	1.43	0.518	1.94	0.00	0.00	3.32	12.46	4.22	15.84
R/DiaE	560	SX-113	98	0.011	0.063	0.0042	0.02			0.26	1.51	0.28	1.60
R-Sludge(Zr)	1420	S-107	1420	0.14	0.14	0.251	0.25	0.17	0.17	0.44	0.44	1	1.00
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bot}$	1616	0.08		0.302						1.2	
EB/DW	507	S-111	2256										
	52647		3872	0.08	2.64	0.302	4.11		0.00	0.78	31.05	1.2	37.79
Total (MT)					4.28		6.33		0.17		45.46		56.23
% Inventory					1.85		2.73		0.07		19.63		24.28

PUREX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach MT Tank	Oxidative Leach MT Waste Type	Residual Solids MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.262	1.61	0	0.00			2.94	18.07	3.2	19.69
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.035	0.07	0	0.00			3.46	7.10	3.49	7.17
PCW/Mix	159	T-102 (w)	72	0.0134	0.03	0	0.00			2.59	5.71	2.6	5.74
PCW/ZrCW	3100	C-104	1117	0	0.00	0.007	0.02			2.40	6.67	2.41	6.69
CC/AR	473	A-106 (w)	473	0.0472	0.05		0.00			3.81	3.81	3.86	3.86
Total (MT)					1.76		0.02		0.00		41.37		43.15
% Inventory					0.76		0.01		0.00		17.87		18.63
TOTAL (MT)					8.31		7.29		0.52		215.45		231.56
Distribution					3.6		3.1		0.2		93.0		

Wash Factor	4	% initial solids
Leach Factor	3	% washed solids
Enhanced Leach Factor	0.2	% washed and leached solids

% of (Expected) SST Inventory Accounted For: 132

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	214
less C-106 Estimated Inventory	-12.7
less TWRS DST Inventory	-25.7
Expected SST Inventory	176
This Evaluation	232
Expected Inventory Accounted for	132 %

Element: Cd

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0	0.00		0.00			0.01	0.03	0.01	0.03
		T-105 (w)	371	0.0014								0.0093	
		C-107	897	0		0						0.06	
		U-110	704	0		0						0.02	
1C/CW	2830		1972	0.0014	0.00	0	0.00			0.09	0.13	0.0893	0.13
		C-110 (w)	708	0.0007								0.0044	
		BX-107	1302	0.0011		0						0.01	
1C/TBP	2620		2010	0.0018	0.00	0	0.00			0.01	0.02	0.0144	0.02
2C/EB	1400	B-104	1400	0.00035	0.00	0	0.00			0.00	0.00	0.0010	0.0010
		B-110	927	0.0078		0						0.04	
		B-111	893	0		0						0.02	
2C/5-6	1930		1820	0.0078	0.01	0	0.00		0.00	0.05	0.06	0.06	0.06
2C/224	3380	T-111	1715	0.0008	0.002		0.00			0.02	0.04	0.02	0.04
		B-201	106	0.0001		0						0.01	
		B-202	102	0.0001		0						0.0017	
224	1040		208	0.0002	0.00	0	0.00			0.01	0.06	0.0117	0.06
EB/1C	18100	TY-102	242	0.0009	0.07	0	0.00			0.00	0.07	0.0019	0.14
Total (MT)					0.08		0.00		0.00		0.40		0.48
% Inventory					1.41		0.00		0.00		6.80		8.20
TBP													
TBP/Sr	568	C-105	568	0.0496	0.0496		0.00			0.09	0.09	0.139	0.14
TBP/DiaE	64	TY-106 (w)	64	0.0002	0.0002		0.00			0.00	0.00	0.0025	0.00
TBP/EB	814	BY-104	1540	0		0						0.17	
TBP(f)/EB	15100	BY-110	1510	0		0						0.05	
TBP/EBits	2890	BY-108	863									Less than value	
	18804		3913	0	0.00	0	0.00		0.00	0.22	1.06	0.22	1.06
TBP	874	TY-105 (w)	874	0.0022	0.00		0.00			0.01	0.01	0.0073	0.01
		BX-104 (w)	363	0.0017								0.0162	
		BX-103	235	0.0003		0.0001						0.008	
TBP/CW	2570		598	0.0020	0.01	0.0001	0.001			0.02	0.09	0.024	0.10
TBP/1C(f)	776	TY-104	163	0.0009	0.00		0.00			0.00	0.01	0.0035	0.02
		C-109	235	0		0						0.0028	
		C-112	394	0		0						0.0032	
TBP(f)/1C	1090		629	0	0.00	0	0.00			0.01	0.01	0.006	0.01
Total (MT)					0.06		0.00		0.00		1.27		1.34
% Inventory					1.10		0.02		0.00		21.56		22.68

Element: Cd (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0		0						0.001	
RCW	38	SX-108	329	Not reported		Not reported						0.01	
	5026		1438	0	0.00	0	0.00		0.00	0.01	0.04	0.011	0.04
R/DlaE	560	SX-113	98	Not reported	0.000	Not reported	0.00			0.00	0.00	0.00002	0.0001
R-Sludge (Zr)	1420	S-107	1420	0	0.00	0	0.00		0.00	0.01	0.01	0.01	0.01
EB/DW	507												
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290												
	52647	S-101$_{Bot}$	1616	Not reported	0.00	Not reported	0.00		0.00	0.01	0.33	0.01	0.3
Total (MT)					0.00		0.00		0.00		0.37		0.37
% Inventory					0.00		0.00		0.00		6.35		6.35
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.129	0.79		0.00			0.04	0.25	0.169	1.04
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.002	0.00		0.00			0.16	0.32	0.16	0.33
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.00	0.00	0.0016	0.0035
PCW/ZrCW	3100	C-104	1117	0	0.00	0.025	0.07			0.81	2.23	0.8	2.3
CC/AR	473	A-106 (w)	473	0.0083	0.01		0.00			0.02	0.02	0.028	0.028
Total (MT)					0.81		0.07		0.00		2.83		3.70
% Inventory					13.66		1.18		0.00		47.95		62.79
TOTAL (MT)					0.95		0.07		0.00		4.87		5.90
Distribution					16		1.2		0.0		82.6		
	Wash Factor		16	% initial solids									
	Leach Factor		1	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					76

	(MT)
Best-basis Total Inventory	8.2
less C-106 Estimated Inventory	-0.40
less TWRS DST Inventory	Value Unknown
Expected SST Inventory	7.8
This Evaluation	6
Expected Inventory Accounted for	76 %

Element: Cr

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.3	0.96	0.3805	1.22			1.08	3.45	1.76	5.62
		T-105 (w)	371	0.0964								0.295	
		C-107	897	0.159		0.116						0.43	
		T-107	655	0.148		0.066						0.35	
		U-110	704	0.439		0.032						0 65	
1C/CW	2830		2627	0.8424	0.91	0.214	0.27			0.67	0.68	1.725	1.86
		T-108 (w)	167	0								0	
		C-110 (w)	708	0.22								0.396	
		B-106	443	0.019		0.106						0.16	
		BX-107	1302	0.318		0.121						1.51	
1C/TBP	2620		2620	0.557	0.56	0.227	0.46			1.28	1.05	2.066	2.07
2C/EB	1400	B-104	1400	0.028	0.03	0.644	0.64			0.27	0.27	0.94	0.94
		B-110	927	0.122		0.584						1.22	
		B-111	893	0.347		0 18		0.137				1.28	
2C/5-6	1930		1820	0.469	0.50	0.764	0.81	0.137	0.30	1.13	1.05	2.5	2.65
2C/224	3380	T-111	1715	0	0.00	0.003	0.01			0.06	0.11	0.06	0.12
		B-201	106	0.151		0.102						0.44	
		B-202.	102	0.079		0.03						0 37	
224	1040		208	0.23	1.15	0.132	0.66			0.45	2.24	0.81	4.05
		B-105	1158	0.0278		0						0.029	
		TY-102	242	0.0033		0						0.043	
		TX-116	2388	0.889		0						1.49	
EB/1C	18100		3788	0.9201	4.40	0	0.00			0.64	3.07	1.562	7.46
Total (MT)					8.50		4.06		0.30		11.92		24.77
% Inventory					1.53		0.73		0.05		2.14		4.45
TBP													
TBP/Sr	568	C-105	568	0.332	0.33	0.021	0.02			0.48	0.48	0.83	0.83
TBP/DiaE	64	TY-106 (w)	64	0.0001	0.00	0.00175	0.00			0.01	0.01	0.0125	0.01
TBP/EB	814	T-109	220	0.014	0.05	0	0.00			0.00	0.00	0.014	0.05
				(assume removed w/wash)									
		BY-104	1540	10		0.129						14.3	
		BY-110	1510	2.95		0.063		3.07				6.28	
TBP(f)/EB (high [Cr])	3050		3050	12.95	12.95	0.192	0.19	3.07	6.20	4.37	1.24	20.58	20.58
TBP(f)/EB	12050												
TBP/EBits	2890	BY-108	863	0.127		0						0.26	
(low [Cr])	14940		863	0.127	2.20	0	0.00			0.13	2.30	0.26	4.50
TBP	874	TY-105 (w)	874	0.0313	0.03	0.00146	0.00			0.11	0.11	0.146	0.15
		BX-104 (w)	363	0.388								2.48	
		BX-103	235	0.104		0.113						0.38	
		BX-109	731	0.054		0.067						0.15	
TBP/CW	2570		1329	0.546	1.06	0.18	0.48			2.28	4.29	3.01	5.82
TBP/1C(f)	776	TY-104	163	0.46	2.19	0.087	0.41			0.09	0.44	0.64	3.05
		C-108	250	0.047		0.003						0.06	
		C-109	235	0.048		0.01						0.07	
		C-112	394	0 07		0.059						0 15	
TBP(f)/1C	1090		879	0.165	0.20	0.072	0.09			0.04	0.05	0.28	0.35
Total (MT)					19.01		1.20		6.20		8.92		35.34
% Inventory					3.42		0.22		1.11		1.60		6.35

Element: Cr (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	6.42		0.642						7.14	
RCW	38	SX-108	329	3.82		0.906						5.38	
	5396		1438	10.24	38.42	1.548	5.81	0.00	0.00	0.73	2.75	12.52	46.98
R/DiaE	560	SX-113	98	0.00017	0.001	0.0032	0.02			0.01	0.03	0.0085	0.05
R-Sludge(Zr)	1420	S-107	1420	1.31	1.31	1.63	1.63	2.00	2.00	0.51	0.51	5.45	5.45
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bol}$	1616	6.14		6.27						14.0	
EB/DW	507	S-111	2256	3.02		13.43						16.8	
	52647		3872	9.16	124.51	19.7	267.86		0.00	1.87	25.47	30.7	417.83
Total (MT)					164.24		275.31		2.00		28.75		470.31
% Inventory					29.52		49.48		0.36		5.17		84.52
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.0855	0.53	0.285	1.75			2.48	15.25	2.85	17.53
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42	C-103	235	0.004		0.019						0.19	
	483		235	0.004	0.01	0.019	0.04			0.17	0.34	0.19	0.39
PCW/Mix	159	T-102 (w)	72	0.0993	0.22	0.00017	0.00			0.00	0.00	0.101	0.22
PCW/ZrCW	3100	C-104	1117	0.154	0.43	0.461	1.28			0.90	2.48	1.51	4.19
CC/AR	473	A-106 (w)	473	0.303	0.30	0.371	0.37			3.04	3.04	3.71	3.71
Total (MT)					1.48		3.44		0.00		21.12		26.05
% Inventory					0.27		0.62		0.00		3.80		4.68
TOTAL (MT)					193.24		284.02		8.50		70.71		556.46
Distribution					34.7		51.0		1.5		12.7		
	Wash Factor		35	% initial solids									
	Leach Factor		78	% washed solids									
	Enhanced Leach Factor		11	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					64-105*

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	785 +/- 170*
less C-106 Estimated Inventory	-1
less TWRS DST Inventory	-85
Expected SST Inventory	699 +/- 170*
This Evaluation	556
Expected Inventory Accounted for	80 %

*** Uncertainty in timing of changes to flowsheet results in a 170 MT uncertainty in the calculated Cr inventory.**

Element: ^{137}Cs

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	27.8	89	41.4	132			157	501	226	722
		T-105 (w)	371	19630								51210	
		C-107	897	16977		15601						45884	
		T-107	655	4553		12124						18396	
		U-110	704	1087		2019						15531	
1C/CW	2830		2627	42247	45512	29744	37312			59030	58322	131021	141146
		B-106	443	6870		6560						13470	
		BX-107	1302	4026		18230						23682	
1C/TBP	2620		1745	10896	16360	24790	37221			1466	2201	37152	55781
2C/EB	1400	B-104	1400	0	0	9299	9299			66.0	66	9365	9365
		B-110	927	13670		1256						15706	
		B-111	893	76236		64502						146588	
2C/5-6	1930		1820	89906	95340	65758	69732		0.00	6630	7031	162294	172103
2C/224	3380	T-111	1715	68.2	134	84.57	167			120	237	273	538
		B-201	106	17.6		8.28						104	
		B-202	102	5.11		2.36						9.76	
224	1040		208	22.71	114	10.64	53			80	402	113.76	569
		B-105	1158	660		0						96705	
		TY-102	242	837		0						1063	
		TX-116	2388	28227		0						140836	
EB/1C	18100		3788	29724	142029	0	0			208880	998080	238604	1140109
Total (MT)					3.00E+5		1.54E+5		0.00E+0		1.07E+6		1.52E+6
% Inventory					2.04		1.05		0.00		7.26		10.34
TBP													
TBP/Sr	568	C-105	568	86963	86963	61196	61196			12883	12883	161042	161042
TBP/DiaE	64	TY-106 (w)	64	338	338	386	386			899	899	1623	1623
TBP/EB	814												
TBP(f)/EB	15100	BY-110	1510	128217		2617						130833	
TBP/EBits	2890	BY-108	863	7854		251326						261798	
	18804		2373	136071	1078247	253943	2012282		0.00	2617	20737	392631	3111266
TBP	874	TY-105 (w)	874	6706	3164		0			3165	6707	9871	9871
		BX-103	235	9816		160						10016	
		BX-109	731	0		11818						11818	
TBP/CW	2570		966	9816	26115	11978	31867			40	106	21834	58088
TBP/1C(f)	776	TY-104	163	3943	18772	1241	5908			4508	21461	9692	46141
		C-108	250	1534		36790						38350	
		C-109	235	8771		163138						175332	
		C-112	394	16357		384329						408847	
TBP(f)/1C	1090		879	26662	33062	584257	724505			11610	14397	622529	771964
Total (MT)					1.25E+6		2.84E+6		0.00E+0		7.72E+4		4.16E+6
% Inventory					8.48		19.29		0.00		0.53		28.30

Element: ^{137}Cs (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	94620		8411						105134	
RCW	38	SX-108	329	36633		13955						58147	
	5396		1438	131253	492518	22366	83927		0.00	9662	36256	163281	612701
R/DlaE	560	SX-113	98	103	589	2699	15423			615	3514	3417	19526
R-Sludge(Zr)	1420	S-107	1420	115505	115505		0		0.00	34501	34501	150006	150006
		S-105	1718	71983		52000	(Assumed)					105899	
		S-109	2150	196555		0						196656	
		S-110	980	33039		0						33039	
R-RCW/EB	36320	SX-102	2029	196871		0						196871	
EB/R	7530	SX-103	1612	89850		0						89850	
EB/CW	8290	S-101$_{Bol}$	1616	346620		10720						357341	
EB/DW	507	S-111	2256	215870		215870						449728	
	52647		12361	1150788.00	4901346	278590	1186549		0.00	6.00	25.6	1429384	6087920
Total (MT)					5.51E+6		1.29E+6		0.00E+0		7.43E+4		6.9E+6
% Inventory					37.48		8.75		0.00		0.51		46.74
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	288439	1774368		0.00			2716	16708	291155	1791076.25
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	2902	5965	4483	9214			7111	14615	14496	29794
PCW/Mix	159	T-102 (w)	72	2960	6537	182	402			423	934	3565	7873
PCW/ZrCW	3100	C-104	1117	47646	132232	37181	103188			256	710	85083	236130
CC/AR	473	A-106 (w)	473	59612	59612	7282	7282			16992	16992	83886	83886
Total (MT)					1.98E+6		12.0E+4		0.00E+0		50.0E+3		2.15E+6
% Inventory					13.46		0.82		0.00		0.34		14.62
TOTAL (MT)					9.03E+6		4.40E+6		0.00E+0		1.27E+6		14.7E+6
Distribution					61		30		0.0		8.6		
	Wash Factor		61	% initial solids									
	Leach Factor		78	% washed solids									
	Enhanced Leach Factor			% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					115

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	38.4E+6
less C-106 Estimated Inventory	-.27E+6
less TWRS DST Inventory	-25.4E+6
Expected SST Inventory	12.7E+6
This Evaluation	14.7E+6
Expected Inventory Accounted for	115 %

Element: Fe

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.153	0.49	0	0.00			17.15	54.80	17.3	55.29
		T-105 (w)	371	0.0013								19.6	
		C-107	897	0		0.006						56.2	
		T-107	655	0.025		0.006						30.9	
		U-110	704	0.0338		0						10.7	
1C/CW	2830		2627	0.0601	0.06	0.012	0.02			117.33	126.39	117.4	126.47
		T-108 (w)	167	0.0179								1.53	
		C-110 (w)	708	0.264								9.3	
		B-106	443	0		0.0192						9.61	
		BX-107	1302	0.185		0						17.3	
1C/TBP	2620		2620	0.4669	0.47	0.0192	0.03			37.25	37.24	37.74	37.74
2C/EB	1400	B-104	1400	0	0.00	0	0.00			19.70	19.70	19.7	19.70
		B-110	927	0.149		0						24.2	
		B-111	893	0.002		0.03						18.3	
2C/5-6	1930		1820	0.151	0.16	0.03	0.03	0.000	0.00	42.32	44.88	42.5	45.07
2C/224	3380	T-111	1715	0.241	0.47		0.00			34.26	67.52	34.5	67.99
		B-201	106	0.0008		0.02						2	
		B-202	102	0.002		0						0.72	
224	1040		208	0.0028	0.01	0.02	0.10			2.70	13.49	2.72	13.60
		B-105	1158	0.0371		0						11.8	
		TY-102	242	0.0005		0						0.499	
		TX-116	2388	0		0						35.5	
EB/1C	18100		3788	0.0376	0.18	0	0.00			47.76	228.22	47.799	228.40
Total (MT)					1.85		0.18		0.00		592.23		594.26
% Inventory					0.16		0.02		0.00		52.82		53.00
TBP													
TBP/Sr	568	C-105	568	0	0.00	0.143	0.14			2.73	2.73	2.87	2.87
TBP/DiaE	64	TY-106 (w)	64	0.0004	0.00		0.00			4.04	4.04	4.04	4.04
TBP/EB	814	BY-104	1540									11.8	
TBP(f)/EB	15100	BY-110	1510	0.065		0		0.02				2.17	
TBP/EBits	2890	BY-108	863	0		0		0.07				7.3	
	18804		3913	0.065	0.31	0	0.00	0.09	1.17	21.11	100.73	21.27	102.21
TBP	874	TY-105 (w)	874	0.0008	0.00		0.00			28.00	28.00	28	28.00
		BX-104 (w)	363	0.0008								4.7	
		BX-103	235	0		0.029						0.79	
		BX-109	731	0		0						23.6	
TBP/CW	2570		1329	0.0008	0.00	0.029	0.08			29.06	56.18	29.09	56.25
TBP/1C(f)	776	TY-104	163	0.058	0.28	0.008	0.04			8.90	42.39	8.97	42.70
		C-108	250	0.202		0.278						2.33	
		C-109	235	0.213		0.053						5.32	
		C-112	394	0.288		0.576						14.4	
TBP(f)/1C	1090		879	0.703	0.87	0.907	1.12			20.44	25.35	22.05	27.34
Total (MT)					1.46		1.38		1.17		259.41		263.42
% Inventory					0.13		0.12		0.10		23.14		23.49

Element: Fe (Continued)

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
REDOX													
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	0		0.083						4.14	
RCW	38	SX-108	329	0		0						10.61	
	5396		1438	0	0.00	0.083	0.31	0.00	0.00	14.67	55.04	14.75	55.35
R/DlaE	560	SX-113	98	0.018	0.103	0.165	0.94			1.65	9.41	1.83	10.46
R-Sludge(Zr)	1420	S-107	1420	0	0.00	0.131	0.13	0.00	0.00	4.24	4.24	4.37	4.37
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bot}$	1616	0.00		0.288						3.2	
EB/DW	507	S-111	2256	0.013		0.087						0.2	
	52647		3872	0.01	0.18	0.375	5.10		0.00	2.99	40.68	3.4	45.96
Total (MT)					0.28		6.48		0.00		109.37		116.13
% Inventory					0.02		0.58		0.00		9.75		10.36
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.0118	0.07		0.00			0.65	3.99	0.661	4.07
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.0022	0.00	0	0.00			27.30	56.11	27.3	56.11
PCW/Mix	159	T-102 (w)	72	0.0134	0.03		0.00			2.59	5.71	2.6	5.74
PCW/ZrCW	3100	C-104	1117	0.0094	0.00		0.09			22.39	62.08	22.4	62.17
CC/AR	473	A-106 (w)	473	0.003	0.00		0.00			19.30	19.30	19.3	19.30
Total (MT)					0.11		0.09		0.00		147.18		147.38
% Inventory					0.01		0.01		0.00		13.13		13.15
TOTAL (MT)					3.70		8.13		1.17		1108.19		1121.20
Distribution					0.3		0.7		0.1		98.8		
	Wash Factor		0.3	% initial solids									
	Leach Factor		0.7	% washed solids									
	Enhanced Leach Factor		0.1	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					111

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	1230
less C-106 Estimated Inventory	-55.5
less TWRS DST Inventory	-162
Expected SST Inventory	1013
This Evaluation	1121
Expected Inventory Accounted for	111 %

Element: Mg

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.04	0.13		0.00			0.27	0.86	0.31	0.99
		T-105 (w)	371	0.0031								0.60	
		C-107	897	0		0.074						0.30	
		T-107	655	0.031		0						0.22	
		U-110	704	0.335		0						1.4	
1C/CW	2830		2627	0.3691	0.40	0.074	0.09			2.08	2.22	2.52	2.71
		C-110 (w)	708	0.0018								0.045	
		B-106	443	0		0						0.37	
		BX-107	1302	0.0257		0						0.25	
1C/TBP	2620		2453	0.0275	0.03	0	0.00			0.64	0.68	0.665	0.71
2C/EB	1400	B-104	1400	0.005	0.01	0.015	0.02			0.23	0.23	0.25	0.25
		B-110	927	0.022		0						0.24	
		B-111	893	0		0						0.82	
2C/5-6	1930		1820	0.022	0.02	0	0.00		0.00	1.04	1.10	1.06	1.12
2C/224	3380	T-111	1715	0.047	0.09		0.00			0.66	1.31	0.71	1.40
		B-201	106	0.0017		0						0.45	
		B-202	102	0.0006		0						0.061	
224	1040		208	0.0023	0.01	0	0.00			0.51	2.54	0.511	2.56
		B-105	1158	0		0						0.005 (assumed)	
		TY-102	242	0		0						0.001 (assumed)	
		TX-116	2388	0		0						0.01 (assumed)	
EB/1C	18100		3788	0	0.00	0	0.00			0.02	0.08	0.016	0.08
Total (MT)					0.69		0.11		0.00		9.03		9.82
% Inventory					1.22		0.19		0.00		16.09		17.51
TBP													
TBP/Sr	568	C-105	568	0	0.00	0	0.00			0.10	0.10	0.1	0.10
TBP/DiaE	64	TY-104	163	0	0.00	0	0.00			0.08	0.03	0.08	0.03
TBP/EB	814												
TBP(f)/EB	15100	BY-110	1510	0		0						0.10	
TBP/EBits	2890	BY-108	863			0						0.45	
	18804		2373	0	0.00	0	0.00		0.00	0.55	4.36	0.55	4.36
TBP	874	TY-104	163	0	0.00	0	0.00			0.08	0.43	0.08	0.43
		BX-104 (w)	363	0.0007								1.62	
		BX-103	235	0		0						0.029	
		BX-109	731	0		0						0.82	
TBP/CW	2570		1329	0.0007	0.00	0	0.00			2.47	4.77	2.469	4.77
TBP/1C(f)	776	TY-104	163	0	0.00	0	0.00			0.08	0.38	0.08	0.38
		C-108	250	0.001		0						0.06	
		C-109	235	0.002		0						0.14	
		C-112	394	0.022		0						0.33	
TBP(f)/1C	1090		879	0.025	0.03	0	0.00			0.50	0.62	0.528	0.65
Total (MT)					0.03		0.00		0.00		10.70		10.73
% Inventory					0.06		0.00		0.00		19.07		19.13

Element: Mg (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0.0075								0.09	
RCW	38	SX-108	329	0.01		0						0.16	
	5026		1438	0.0175	0.06	0	0.00		0.00	0.23	0.81	0.25	0.87
R/DlaE	560	SX-113	98	0.0085	0.049	0	0.00			0.27	1.55	0.28	1.60
R-Sludge (Zr)	1420	S-107	1420	0.028	0.03	0.061	0.06		0.00	0.17	0.17	0.26	0.26
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	$S\text{-}101_{Bod}$	1616	Less than value		Less than value						1.2	
EB/DW	507	S-111	2256	Less than value		Less than value						Less than value	
	52647		3872	0.00	0.00	0	0.00		0.00	1.23	16.72	1.2	16.72
Total (MT)					0.14		0.06		0.00		19.26		19.46
% Inventory					0.25		0.11		0.00		34.34		34.69
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.0054	0.03		0.00			1.47	9.07	1.5	9.10
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.058	0.12	0	0.00			1.89	3.89	2.0	4.01
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.01	0.03	0.0138	0.03
PCW/ZrCW	3100	C-104	1117	0.0092	0.03	0	0.00			0.30	0.83	0.31	0.86
CC/AR	473	A-106 (w)	473	0.0004	0.00		0.00			2.08	2.08	2.08	2.08
Total (MT)					0.18		0.00		0.00		15.90		16.08
% Inventory					0.32		0.00		0.00		28.36		28.67
TOTAL (MT)					1.04		0.17		0.00		54.89		56.09
Distribution					1.8		0.3		0.0		97.9		
	Wash Factor		2	% initial solids									
	Leach Factor		0.3	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					Not available

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	Not available
less C-106 Estimated Inventory	
less TWRS DST Inventory	
Expected SST Inventory	Not available
This Evaluation	56
Expected Inventory Accounted for	Not available %

Element: Mn

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.0008	0.00		0.00			0.11	0.35	0.11	0.35
		T-105 (w)	371	0.0004								8.63	
		C-107	897	0		0						1.76	
		T-107	655	0.0025		0						0.22	
		U-110	704	0		0						2.49	
1C/CW	2830		2627	0.0029	0.00	0	0.00			13.10	14.11	13.1	14.11
		T-108 (w)	167	0								0.182	
		C-110 (w)	708	0.0018								0.0451	
		B-106	443	0		0						0.11	
		BX-107	1302	0.01		0.001						0.1	
1C/TBP	2620		2620	0.0118	0.01	0.001	0.00			0.42	0.42	0.4371	0.44
2C/EB	1400	B-104	1400	0	0.00		0.00			0.07	0.07	0.07	0.07
		B-110	927	0		0						0.11	
		B-111	893	0		0						0.12	
2C/5-6	1930		1820	0	0.00	0	0.00		0.00	0.23	0.24	0.23	0.24
2C/224	3380	T-111	1715	0.0467	0.09		0.00			11.89	23.44	11.94	23.53
		B-201	106	0.0005		0						3.06	
		B-202	102	0.0003		0						1.49	
224	1040		208	0.0008	0.00	0	0.00			4.55	22.75	4.55	22.75
		B-105	1158	0								0	
		TY-102	242	0.0007								0.0123	
		TX-116	2388	0								0	
EB/1C	18100		3788	0.0007	0.00	0	0.00			0.01	0.06	0.0123	0.06
Total (MT)					0.12		0.00		0.00		61.44		61.56
% Inventory					0.06		0.00		0.00		33.68		33.74
TBP													
TBP/Sr	568	C-105	568	0	0.00	0	0.00			0.42	0.42	0.42	0.42
TBP/DiaE	64	TY-106 (w)	64	0.0016	0.00		0.00			0.05	0.05	0.049	0.05
TBP/EB	814	BY-104	1540	0		0						0.22	
TBP(f)/EB	15100	BY-110	1510	0		0						0.11	
TBP/EBits	2890	BY-108	863			0						0.21	
	18804		3913	0	0.00	0	0.00		0.00	0.54	2.59	0.54	2.59
TBP	874	TY-105 (w)	874	0.0175	0.02		0.00			0.20	0.20	0.218	0.22
		BX-104 (w)	363	0.0137								0.643	
		BX-103	235	0		0						1.02	
		BX-109	731	0		0						0.11	
TBP/CW	2570		1329	0.0137	0.03	0	0.00			1.76	3.40	1.773	3.43
TBP/1C(f)	776	TY-104	163	0.0041	0.02	0.001	0.00			0.56	2.69	0.57	2.71
		C-108	250	0.0001		0.0001						0.01	
		C-109	235	0		0						0.03	
		C-112	394	0.0011		0						0.14	
TBP(f)/1C	1090		879	0.0012	0.00	0.0001	0.00			0.18	0.22	0.18	0.22
Total (MT)					0.07		0.00		0.00		9.58		9.65
% Inventory					0.04		0.00		0.00		5.25		5.29

Element: Mn (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0		0.054						1.81	
RCW	38	SX-108	329	0		0						3.55	
	5026		1438	0	0.00	0.054	0.19		0.00	5.31	18.55	5.36	18.73
R/DiaE	560	SX-113	98	0.001	0.006	0.002	0.01			0.05	0.26	0.049	0.28
R-Sludge (Zr)	1420	S-107	1420	0	0.00		0.00		0.00	1.13	1.13	1.13	1.13
		S-105	1718	0								0.375	
R-RCW/EB	36320	S-109	2150	0								0.77	
EB/R	7530	SX-102	2029	0								5.7	
EB/CW	8290	SX-103	1612	0.00								0.9	
EB/DW	507	S-101$_{Bcd}$	1616	0		0						4.5	
	52647		9125	0.00	0.00	0	0.00		0.00	12.29	70.92	12.3	70.92
Total (MT)					0.01		0.20		0.00		90.86		91.07
% Inventory					0.00		0.11		0.00		49.81		49.92
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.053	0.33		0.00			0.18	1.10	0.232	1.43
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.0037	0.01	0	0.00			0.78	1.60	0.78	1.60
PCW/Mix	159	T-102 (w)	72	0.001	0.00		0.00			0.12	0.27	0.125	0.28
PCW/ZrCW	3100	C-104	1117	0	0.00	0	0.00			5.67	15.74	5.67	15.74
CC/AR	473	A-106 (w)	473	0.07	0.07		0.00			1.03	1.03	1.10	1.10
Total (MT)					0.41		0.00		0.00		19.74		20.15
% Inventory					0.22		0.00		0.00		10.82		11.04
TOTAL (MT)					0.60		0.21		0.00		181.62		182.42
Distribution					0.3		0.1		0.0		99.6		
	Wash Factor		0.3	% initial solids									
	Leach Factor		0.1	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					244

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	105
less C-106 Estimated Inventory	-1.96
less TWRS DST Inventory	-28.3
Expected SST Inventory	74.74
This Evaluation	182
Expected Inventory Accounted for	244 %

Element: Na

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	31.3	100.03	88.4	282.51			4.30	13.74	124	396.28
		T-105 (w)	371	29.2								29.9	
		C-107	897	19.7		62.6						85.7	
		T-107	655	65.1		48.6						128	
		U-110	704	79.4		0						115	
1C/CW	2830		2627	193.4	208.34	111.2	139.49			54.00	38.47	358.6	386.31
		T-108 (w)	167	27.7								55.7	
		C-110 (w)	708	56.2								71.1	
		B-106	443	64.8		3.21						68.2	
		BX-107	1302	106								158	
1C/TBP	2620		2620	254.7	254.70	3.21	18.98			95.09	79.32	353	353.00
2C/EB	1400	B-104	1400	199	199.00		0.00			15.00	15.00	214	214.00
		B-110	927	116		NR						125	
		B-111	893	89.8		NR						97.6	
2C/5-6	1930		1820	205.8	218.24	0	0.00		0.00	16.80	17.82	222.6	236.05
2C/224	3380	T-111	1715	62	122.19		0.00			7.80	15.37	69.8	137.57
		B-201	106	4.07		NR						5.5	
		B-202	102	1.89		1.98						4.2	
224	1040		208	5.96	29.80	1.98	9.90			1.76	8.80	9.7	48.50
		B-105	1158	325		0						330	
		TY-102	242	81.5		0						84.7	
		TX-116	2388	784		0						804	
EB/1C	18100		3788	1190.5	5688.50	0	0.00			28.20	134.75	1218.7	5823.25
Total (MT)					6820.81		450.89		0.00		323.26		7594.96
% Inventory					16.32		1.08		0.00		0.77		18.17
TBP													
TBP/Sr	568	C-105	568	22.8	22.80	5.97	5.97			0.13	0.13	28.9	28.90
TBP/DiaE	64	TY-106 (w)	64	109	109.00		0.00			45.00	45.00	154	154.00
TBP/EB	814	BY-104	1540	553								553	
TBP(f)/EB	15100	BY-110	1510	562								574	
TBP/EBits	2890	BY-108	863	159		0						165.4	
	18804		3913	1274	6122.23	0	0.00			18.40	88.42	1292.4	6210.65
TBP	874	TY-105 (w)	874	109	109.00		0.00			45.00	45.00	154	154.00
		BX-104 (w)	363	32.3								45	
		BX-103	235	7.5		1.84						9.76	
		BX-109	731	120								125	
TBP/CW	2570		1329	159.8	309.02	1.84	20.12			18.12	18.48	179.76	347.62
TBP/1C(f)	776	TY-104	163	12.7	60.46	17	80.93			1.40	6.67	31.1	148.06
		C-108	250	19		11						30.6	
		C-109	235	18								23.7	
		C-112	394	50.1								69.7	
TBP(f)/1C	1090		879	87.1	108.01	11	13.64			25.90	32.12	124	153.77
Total (MT)					6840.52		120.67		0.00		235.81		7197.00
% Inventory					16.36		0.29		0.00		0.56		17.22

Element: Na (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	150		45.5						198	
RCW	38	SX-108	329	130		1.35						135	
	5396		1438	280	1050.68	46.85	175.80		0.00	6.15	23.08	333	1249.56
R/DlaE	560	SX-113	98	0.094	0.537	0.035	0.20			0.00	0.01	0.13	0.74
R-Sludge(Zr)	1420	S-107	1420	165	165.00		0.00		0.00	13.00	13.00	178	178.00
		S-105	1718	831								835	
		S-109	2150	971								990	
		S-110	980	418								418	
R-RCW/EB	36320	SX-102	2029	915								919	
EB/R	7530	SX-103	1612	677								679	
EB/CW	8290	S-101$_{Bcd}$	1616	494								509	
EB/DW	507	S-111		----------Percentage of sodium in each solution not tracked in S-111----------									
	52647		10105	4306.00	22434.24	0	0.00		0.00	44.00	229.24	4350.0	22663.48
Total (MT)					23650.46		176.00		0.00		265.32		24091.78
% Inventory					56.57		0.42		0.00		0.63		57.63

PUREX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach MT Tank	Oxidative Leach MT Waste Type	Residual Solids MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	380	2337.62		0.00			9.00	55.36	389	2392.98
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	2.38	4.89		0.00			13.52	27.79	15.9	32.68
PCW/Mix	159	T-102 (w)	72	3.71	8.19		0.00			0.00	0.00	3.71	8.19
PCW/ZrCW	3100	C-104	1117	127	352.46	17	47.18			0.00	0.00	144	399.64
CC/AR	473	A-106 (w)	473	74.9	74.90		0.00			14.40	14.40	89.3	89.30
Total (MT)					2778.06		47.18		0.00		97.55		2922.80
% Inventory					6.65		0.11		0.00		0.23		6.99
TOTAL (MT)					40089.85		794.73		0.00		921.95		41806.53
Distribution					95.9		1.9		0.0		2.2		
	Wash Factor		96	% initial solids									
	Leach Factor		46	% washed solids									
	Enhanced Leach Factor		incomplete	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					98

	(MT)
Best-basis Total Inventory	54200
less C-106 Estimated Inventory	-125
less TWRS DST Inventory	-11200
Expected SST Inventory	42875
This Evaluation	41807
Expected Inventory Accounted for	98 %

Element: Ni

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0	0.00	0.001	0.00			0.02	0.06	0.02	0.06
		C-107	897	0		0						3.16	
		T-107	655	0.002		0						0.28	
		U-110	704	0		0						0.099	
1C/CW	2830		2256	0.002	0.00	0	0.00			3.54	4.44	3.5387	4.44
		T-108 (w)	167	0								0	
		C-110 (w)	708	0.024								0.0206	
		B-106	443	0.0003		0						0.035	
		BX-107	1302	0.0024		0						0.02	
1C/TBP	2620		2620	0.0267	0.03	0	0.00			0.05	0.05	0.0756	0.08
2C/EB	1400	B-104	1400	0.001	0.00	0	0.00			0.03	0.03	0.03	0.03
		B-110	927	0		0						0.11	
		B-111	893	0		0						0.021	
2C/5-6	1930		1820	0	0.00	0	0.00		0.00	0.13	0.14	0.1308	0.14
2C/224	3380	T-111	1715	0.0032	0.01		0.00			0.25	0.49	0.25	0.49
		B-201	106	0.0004		0						0.0992	
		B-202	102	0.0002		0						0.0229	
224	1040		208	0.0006	0.00	0	0.00			0.12	0.61	0.1221	0.61
						0							
EB/1C	18100	TY-102	242	0.0006	0.04	0	0.00			0.01	0.59	0.0085	0.64
Total (MT)					0.08		0.00		0.00		6.40		6.49
% Inventory					0.12		0.00		0.00		9.20		9.33
TBP													
TBP/Sr	568	C-105	568	0	0.00	0	0.00			2.00	2.00	2	2.00
TBP/DiaE	64	TY-106 (w)	64	0.0001	0.00		0.00			0.00	0.00	0.0042	0.00
TBP/EB	814	BY-104	1540	0		0						2.26	
TBP(f)/EB	15100	BY-110	1510	0		0						0.68	
TBP/EBits	2890	BY-108	863	0.458		0						2.55	
	18804		3913	0.458	2.20	0	0.00		0.00	5.03	24.18	5.49	26.38
TBP	874	TY-105 (w)	874	0.0014	0.00		0.00			0.11	0.11	0.113	0.11
		BX-104 (w)	363	0.011								0.102	
		BX-103	235	0		0.028						0.34	
		BX-109	731	0.001		0						0.06	
TBP/CW	2570		1329	0.012	0.02	0.028	0.07			0.46	0.87	0.502	0.97
TBP/1C(f)	776	TY-104	163	0.001	0.00		0.00			0.43	2.04	0.43	2.05
		C-108	250	0.015		0						3.16	
		C-109	235	0.0251		0						3.75	
		C-112	394	0.529		0						8.38	
TBP(f)/1C	1090		879	0.5691	0.71	0	0.00			14.72	18.25	15.29	18.96
Total (MT)					2.94		0.07		0.00		47.47		50.48
% Inventory					4.22		0.11		0.00		68.28		72.61

Element: Ni (Continued)

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
REDOX													
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0		0.032						0.0912	
RCW	38	SX-108	329	0.007		0						0.71	
	5026		1438	0.007	0.02	0.032	0.11		0.00	0.76	2.66	0.8012	2.80
R/DiaE	560	SX-113	98	0	0.000	0	0.00			0.00	0.00	0.0008	0.005
R-Sludge (Zr)	1420	S-107	1420	0	0.00	0	0.00	0.12	0.12	1.41	1.41	1.53	1.53
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	$S\text{-}101_{Bot}$	1616	0.004		0						0.2	
EB/DW	507	S-111	2256	0.098								0.1	
	52647		3872	0.10	1.39	0	0.00		0.00	0.21	2.80	0.3	4.19
Total (MT)					1.41		0.11		0.12		6.88		8.52
% Inventory					2.03		0.16		0.18		9.89		12.26
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.0689	0.42		0.00			0.11	0.65	0.174	1.07
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0	0.00		0.00			0.29	0.60	0.29	0.60
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.01	0.02	0.0094	0.02
PCW/ZrCW	3100	C-104	1117	0	0.00	0.321	0.89			0.36	1.00	0.68	1.89
CC/AR	473	A-106 (w)	473	0.009	0.01		0.00			0.45	0.45	0.458	0.46
Total (MT)					0.43		0.89		0.00		2.71		4.03
% Inventory					0.62		1.28		0.00		3.90		5.80
TOTAL (MT)					4.86		1.08		0.12		63.45		69.52
Distribution					7.0		1.6		0.2		91.3		
	Wash Factor		7	% initial solids									
	Leach Factor		2	% washed solids									
	Enhanced Leach Factor		incomplete	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					70

	(MT)
Best-basis Total Inventory	111
less C-106 Estimated Inventory	-0.55
less TWRS DST Inventory	-10.9
Expected SST Inventory	100
This Evaluation	70
Expected Inventory Accounted for	70 %

Element: PO_4

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	37.3	119.20	103	329.17			1.70	5.43	142	453.80
		T-105 (w)	371	1.64								2.83	
		C-107	897	35.3		25.8						67.8	
		T-107	655	80.3		12.4						94.5	
		U-110	704	41.7		3.7						46.4	
1C/CW	2830		2627	158.94	171.22	41.9	52.56			10.69	4.09	211.53	227.88
		T-108 (w)	167	3.12								28	
		C-110 (w)	708	20.4								52.5	
		B-106	443	26.2		14.7						43.7	
		BX-107	1302	22		80.3						110	
1C/TBP	2620		2620	71.72	71.72	95	142.64			67.48	19.84	234.2	234.20
2C/EB	1400	B-104	1400	43.9	43.90	52.5	52.50			1.10	1.10	97.5	97.50
		B-110	927	55		9.17						65.5	
		B-111	893	21.9		24.4		0.000				50.9	
2C/5-6	1930		1820	76.9	81.55	33.57	35.60	0.000	0.00	5.93	6.29	116.4	123.44
2C/224	3380	T-111	1715	29.5	58.14	13.6	26.80			15.90	31.34	59	116.28
		B-201	106	0.241		0.386						2.41	
		B-202	102	0.269		0.146						0.95	
224	1040		208	0.51	2.55	0.532	2.66			2.32	11.59	3.36	16.80
		B-105	1158	177		0						177	
		TY-102	242	10.4		0						11.6	
		TX-116	2388	274		0						274	
EB/1C	18100		3788	461.4	2204.68	0	0.00			1.20	5.73	462.6	2210.42
Total (MT)					2752.97		641.93		0.00		85.42		3480.31
% Inventory					50.19		11.70		0.00		1.56		63.45
TBP													
TBP/Sr	568	C-105	568	3.29	3.29		0.00			0.00	0.00	3.29	3.29
TBP/DiaE	64	TY-106 (w)	64	1.1	1.10	2.04	2.04			1.96	1.96	5.1	5.10
TBP/EB	814	BY-104	1540	36.3		0.386						38.6	
TBP(f)/EB	15100	BY-110	1510	4.23		0.889		1.49				22.2	
TBP/EBits	2890	BY-108	863	22.4		0						30.7	
	18804		3913	62.93	302.41	1.275	6.13	1.49	18.55	25.81	112.61	91.5	439.71
TBP	874	TY-105 (w)	874	10.5	10.50	99.64	99.64			5.86	5.86	116	116.00
		BX-104 (w)	363	6.29								7.52	
		BX-103	235	0.108		0.103						0.22	
		BX-109	731	55		14.5						72.3	
TBP/CW	2570		1329	61.398	118.73	14.603	38.85			4.04	0.00	80.04	154.78
TBP/1C(f)	776	TY-104	163	18	85.69	0.688	3.28			2.91	13.86	21.6	102.83
		C-108	250	18.9		0.013						25.3	
		C-109	235	4.95		1.98						16.5	
		C-112	394	23.4		20.3						52	
TBP(f)/1C	1090		879	47.25	58.59	22.293	27.64			24.26	30.08	93.8	116.32
Total (MT)					580.32		177.58		18.55		164.37		938.02
% Inventory					10.58		3.24		0.34		3.00		17.10

Element: PO_4 (Continued)

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
REDOX													
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	0		0						0.48	
RCW	38	SX-108	329	0.021		0						0.24	
	5396		1438	0.021	0.08	0	0.00	0.00	0.00	0.70	2.62	0.72	2.70
R/DlaE	560	SX-113	98	0	0.000		0.00			0.00		<0.05	
R-Sludge(Zr)	1420	S-107	1420	11	11.00	0.849	0.85		0.00	0.27	0.27	12.12	12.12
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bot}$	1616	10.23		1.18						11.8	
EB/DW	507	S-111	2256	53								53.0	
	52647		3872	63.23	859.73	1.18	16.04		0.00	0.39	5.30	64.8	881.08
Total (MT)					870.81		16.89		0.00		8.20		895.90
% Inventory					15.88		0.31		0.00		0.15		16.33
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	11.9	73.20	0.08	0.49			0.12	0.74	12.1	74.43
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	1.06	2.18	1.57	3.23			1.30	2.67	3.93	8.08
PCW/Mix	159	T-102 (w)	72	0.16	0.35	0.237	0.52			0.20	0.43	0.592	1.31
PCW/ZrCW	3100	C-104	1117	4.74	13.15	10.9	30.25			1.86	5.16	17.5	48.57
CC/AR	473	A-106 (w)	473	36.5	36.50	0.8	0.80			1.20	1.20	38.5	38.50
Total (MT)					125.39		35.29		0.00		10.20		170.89
% Inventory					2.29		0.64		0.00		0.19		3.12
TOTAL (MT)					4329.48		871.69		18.55		268.19		5485.12
Distribution					78.9		15.9		0.3		4.9		
	Wash Factor		79	% initial solids									
	Leach Factor		75	% washed solids									
	Enhanced Leach Factor		5	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					95

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	6000
less C-106 Estimated Inventory	-9.3
less TWRS DST Inventory	-237
Expected SST Inventory	5754
This Evaluation	5485
Expected Inventory Accounted for	95 %

Element: Si

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	OxidativeLeach (after Wash & Leach) MT Tank	OxidativeLeach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	2.59	8.28	1.45	4.63			8.36	26.72	12.4	39.63
		T-105 (w)	371	0.236									
		C-107	897	0.44		1.1						11.0	
		T-107	655	1.65		0.276						5.95	
		U-110	704	0.576		0.46						11.5	
1C/CW	2830		2627	2.902	3.13	1.836	2.30			23.71	25.22	28.45	30.65
		T-108 (w)	167	0.0442								0.375	
		C-110 (w)	708	0.204								5.99	
		B-106	443	0.093		1.05						1.86	
		BX-107	1302	0		0.318						10.6	
1C/TBP	2620		2620	0.3412	0.34	1.368	2.05			17.12	16.43	18.825	18.83
2C/EB	1400	B-104	1400	0.104	0.10	5.14	5.14			5.16	5.16	10.4	10.40
		B-110	927	3.45		4.87						12.3	
		B-111	893	0.323		4.84		0.011				10.8	
2C/5-6	1930		1820	3.773	4.00	9.71	10.30	0.011	0.02	9.61	10.17	23.1	24.50
2C/224	3380	T-111	1715	2.14	4.22	4.28	8.44			4.28	8.44	10.7	21.09
		B-201	106	0.258		1.38						3.22	
		B-202	102	0.087		0.104						0.34	
224	1040		208	0.345	1.73	1.484	7.42			1.73	8.66	3.56	17.80
		B-105	1158	0.0973		0						3.76	
		TY-102	242	0.0324		0						0.154	
		TX-116	2388	0		0						2.69	
EB/1C	18100		3788	0.1297	0.62	0	0.00			6.47	30.94	6.604	31.56
Total (MT)					22.41		40.28		0.02		131.72		194.44
% Inventory					2.66		4.78		0.00		15.62		23.06
TBP													
TBP/Sr	568	C-105	568	0.082	0.08	6.253	6.25			1.90	1.90	8.23	8.23
TBP/DiaE	64	TY-106 (w)	64	0.0049	0.005	0.47	0.47			7.37	7.37	7.84	7.84
TBP/EB	814	BY-104	1540	1.69		0.735						3.67	
TBP(f)/EB	15100	BY-110	1510	0.248		0.727		0.19				1.55	
TBP/EBits	2890	BY-108	863	0.124		0.528						1.55	
	18804		3913	2.062	9.91	1.99	9.56	0.19	2.35	2.53	10.71	6.77	32.53
TBP	874	TY-105 (w)	874	0.092	0.09	0.052	0.05			0.35	0.35	0.492	0.49
		BX-104 (w)	363	0.0859								21.2	
		BX-103	235	0.01		0.132						0.34	
		BX-109	731	0.226		0.697						1.88	
TBP/CW	2570		1329	0.3219	0.62	0.829	2.21			22.27	42.46	23.42	45.29
TBP/1C(f)	776	TY-104	163	1.22	5.81	0.132	0.63			0.88	4.18	2.23	10.62
		C-108	250	0.016		0.072						0.62	
		C-109	235	0.076		0.331						2.55	
		C-112	394	0.06		0.196						1.51	
TBP(f)/1C	1090		879	0.152	0.19	0.599	0.74			3.93	4.87	4.68	5.80
Total (MT)					16.71		19.91		2.35		71.83		110.80
% Inventory					1.98		2.36		0.28		8.52		13.14

Element: Si (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	0		1.09						2.43	
RCW	38	SX-108	329	0		0.227						2.53	
	5396		1438	0	0.00	1.317	4.94	0.00	0.00	3.64	13.67	4.96	18.61
R/DiaE	560	SX-113	98	0.474	2.709	22.5	128.57			0.73	4.15	23.7	135.43
R-Sludge(Zr)	1420	S-107	1420	3.93	3.93	3.92	3.92	0.43	0.43	0.53	0.53	8.81	8.81
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bcd}$	1616	2.51		1.94						6.3	
EB/DW	507	S-111	2256	2.36		2.16						5.1	
	52647		3872	4.87	66.22	4.1	55.75		0.00	2.44	33.18	11.4	155.14
Total (MT)					72.86		193.18		0.43		51.52		317.99
% Inventory					8.64		22.91		0.05		6.11		37.72
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.714	4.39	0.206	1.27			19.68	121.06	20.6	126.72
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0	0.00	0.222	0.46			21.98	45.17	22.2	45.63
PCW/Mix	159	T-102 (w)	72	0.0059	0.01	0.0042	0.01			0.41	0.42	0.417	0.92
PCW/ZrCW	3100	C-104	1117	0.133	0.37	2.863	7.95			3.66	10.17	6.66	18.48
CC/AR	473	A-106 (w)	473	0.0058	0.01	0.281	0.28			27.81	27.81	28.1	28.10
Total (MT)					4.78		9.96		0.00		204.63		219.86
% Inventory					0.57		1.18		0.00		24.27		26.08
TOTAL (MT)					116.75		263.34		2.81		459.71		843.09
Distribution					14		31		0.3		55		
	Wash Factor		14	% initial solids									
	Leach Factor		36	% washed solids									
	Enhanced Leach Factor		0.6	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					220-690

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	570 +/-135
less C-106 Estimated Inventory	-75.7
less TWRS DST Inventory	-234
Expected SST Inventory	260
This Evaluation	843
Expected Inventory Accounted for	324 %

Element: SO_4

Tank inventories unknown - wash and leach data meaningless without this information.

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Incomplete[a] Total MT Tank	Incomplete[a] Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670									7.48	23.90
		T-105 (w)	371									5.26	
		C-107	897									8.05	
		T-107	655									10.41	
		U-110	704									1.36	
1C/CW	2830		2627									25.08	27.02
		T-108 (w)	167									0.278	
		C-110 (w)	708									16.2	
		B-106	443									9.44	
		BX-107	1302									21.4	
1C/TBP	2620		2620									47.318	47.32
2C/EB	1400	B-104	1400									39.1	39.10
		B-110	927									14.1	
		B-111	893									12.9	
2C/5-6	1930		1820									27	28.63
2C/224	3380	T-111	1715									6.92	13.64
		B-201	106									0.05	
		B-202	102									0.95	
224	1040		208									1	5.00
		B-105	1158									26.4	
		TY-102	242									5.76	
		TX-116	2388									56.8	
EB/1C	18100		3788									88.96	425.07
Total (MT)													609.68
% Inventory													22.53
TBP													
TBP/Sr	568	C-105	568									7.87	7.87
TBP/DiaE	64	TY-106 (w)	64									1.23	1.23
TBP/EB	814	BY-104	1540									87.3	
TBP(f)/EB	15100	BY-110	1510									55.4	
TBP/EBits	2890	BY-108	863									23.7	
	18804		3913									166.4	799.64
TBP	874	TY-105 (w)	874									4	4.00
		BX-103	235									0.22	
		BX-109	731									20.6	
TBP/CW	2570		966									20.82	55.39
TBP/1C(f)	776	TY-104	163									1.44	6.86
		C-108	250									2.17	
		C-109	235									1.96	
		C-112	394									8.68	
TBP(f)/1C	1090		879									12.81	15.88
Total (MT)					0.00		0.00		0.00		0.00		890.87
% Inventory					0.00		0.00		0.00		0.00		32.92

Element: SO_4 (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Incomplete[a] Total MT Tank	Incomplete[a] Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109									3.94	
RCW	38	SX-108	329									4.08	
	5026		1438									8.02	28.03
R/DiaE	560	SX-113	98									0.046	0.26
R-Sludge (Zr)	1420	S-107	1420									5.35	5.35
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bol}$	1616									20.2	
EB/DW	507	S-111	2256									65.1	
	52647		3872									85.3	1159.81
Total (MT)													1193.46
% Inventory													44.10
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385									NR	NA
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235									0.9	1.85
PCW/Mix	159	T-102 (w)	72									0.215	0.47
PCW/ZrCW	3100	C-104	1117									3.63	10.07
CC/AR	473	A-106 (w)	473									NR	NA
Total (MT)					0.00		0.00		0.00				12.40
% Inventory					0.00		0.00		0.00				0.46
TOTAL (MT)					0.00		0.00		0.00				2706
Distribution					0.0		0.0		0.0				
	Wash Factor			% initial solids									
	Leach Factor			% washed solids									
	Enhanced Leach Factor			% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					59

(a) Sulfate concentrations reported from ion chromatography analyses of water-leached samples. Therefore, analyte inventories must be assumed ≥ reported values.

	(MT)
Best-basis Total Inventory	5000
less C-106 Estimated Inventory	-6
less TWRS DST Inventory	-395
Expected SST Inventory	4599
This Evaluation	2706
Expected Inventory Accounted for	59 %

Element: Sr

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.002	0.01	0	0.00			0.19	0.60	0.19	0.61
		T-105 (w)	371	0.0005								0.0622	
		C-107	897	0		0.009						0.14	
		T-107	655	0.0054		0						0.94	
		U-110	704	0.0037		0						0.42	
1C/CW	2830		2627	0.0096	0.01	0.009	0.01			1.54	1.66	1.56	1.68
		T-108 (w)	167	0								0	
		C-110 (w)	708	0.0047								0.107	
		B-106	443	0		0						0.25	
		BX-107	1302	0.0038		0						0.263	
1C/TBP	2620		2620	0.0085	0.01	0	0.00			0.61	0.61	0.62	0.62
2C/EB	1400	B-104	1400	0	0.00	0	0.00			0.27	0.27	0.27	0.27
		B-110	927	0		0						0.27	
		B-111	893	0.001		0						0.25	
2C/5-6	1930		1820	0.001	0.00	0	0.00		0.00	0.52	0.55	0.52	0.55
2C/224	3380	T-111	1715	0.0037	0.01		0.00			0.56	1.10	0.56	1.10
		B-201	106	0.0001		0						0.12	
		B-202	102	0.0003		0						0.07	
224	1040		208	0.0004	0.00	0	0.00			0.19	0.95	0.19	0.95
EB/1C	18100	B-105	1158	0.005	0.08	(based on 1/5 calcium)				0:00	0.00	0.005	0.08
Total (MT)					0.11		0.01		0.00		5.74		5.86
% Inventory					0.16		0.02		0.00		8.32		8.50
TBP													
TBP/Sr	568	C-105	568	0	0.00	0.0002	0.00			0.10	0.10	0.1	0.10
TBP/DiaE	64	TY-104	163		0.00		0.00			0.17	0.07	0.17	0.07
TBP/EB	814	BY-104	1540	0		0						2.85	
TBP(f)/EB	15100	BY-110	1510	0		0						0.13	
TBP/EBits	2890	BY-108	863	0		0						3.24	
	18804		3913	0	0.00	0	0.00		0.00	6.22	29.89	6.22	29.89
TBP	874	TY-104	163		0.00		0.00			0.17	0.91	0.17	0.91
		BX-104 (w)	363	0								0.0406	
		BX-103	235	0		0.0001						0.019	
		BX-109	731	0		0.001						0.65	
TBP/CW	2570		1329	0	0.00	0.0011	0.00			0.71	1.37	0.710	1.37
TBP/1C(f)	776	TY-104	163		0.00		0.00			0.17	0.81	0.17	0.81
		C-108	250	0		0						0.06	
		C-109	235	0.0003		0						0.05	
		C-112	394	0.002		0						0.19	
TBP(f)/1C	1090		879	0.0023	0.00	0	0.00			0.30	0.37	0.3	0.37
Total (MT)					0.00		0.00		0.00		33.52		33.52
% Inventory					0.00		0.00		0.00		48.57		48.58

Element: Sr (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0		0.021						0.7	
RCW	38	SX-108	329	0		0						0.33	
	5026		1438	0	0.00	0.021	0.07		0.00	1.01	3.53	1.03	3.60
R/DiaE	560	SX-113	98	0.00009	0.001	0.00013	0.001			0.00	0.02	0.004	0.02
R-Sludge (Zr)	1420	S-107	1420	0	0.00	0	0.00		0.00	0.45	0.45	0.45	0.45
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290												
EB/DW	507	S-101$_{Bod}$	1616	0		0.0077						0.77	
	52647		1616	0.00	0.00	0.0077	0.25		0.00	0.76	24.83	0.77	25.09
Total (MT)					0.00		0.32		0.00		28.83		29.16
% Inventory					0.00		0.47		0.00		41.78		42.26
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0	0.00		0.00			0.02	0.14	0.0223	0.14
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0	0.00	0	0.00			0.04	0.08	0.04	0.08
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.00	0.01	0.0023	0.01
PCW/ZrCW	3100	C-104	1117	0	0.00	0.0001	0.0003			0.07	0.20	0.071	0.20
CC/AR	473	A-106 (w)	473	0.0003	0.0003		0.00			0.04	0.04	0.0385	0.04
Total (MT)					0.00		0.00		0.00		0.46		0.46
% Inventory					0.00		0.00		0.00		0.67		0.67
TOTAL (MT)					0.12		0.34		0.00		68.55		69.00
Distribution					0.2		0.5		0.0		99.3		
	Wash Factor		0.2	% initial solids									
	Leach Factor		0.5	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					226

	(MT)
Best-basis Total Inventory	31.3
less C-106 Estimated Inventory	-0.11
less TWRS DST Inventory	-0.62
Expected SST Inventory	30.6
This Evaluation	69
Expected Inventory Accounted for	226 %

Element: ^{90}Sr

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0	0	43	137			4284	13691	4327	13828
		C-107	897	16752		18093						3350463	
		T-107	655	46		0						92320	
		U-110	704	200		2263						226268	
1C/CW	2830		2256	16998	21323	20356	25535			3631697	4555719	3669051	4602577
		B-106	443	0		0						50025	
		BX-107	1302	0		0						13292	
1C/TBP	2620		1745	0	0	0	0			63317	95066	63317	95066
2C/EB	1400	B-104	1400		0		0			18800	18800	18800	18800
		B-110	927	0		174						173724	
		B-111	893	0		0						553821	
2C/5-6	1930		1820	0	0	174	185		0	727371	771333	727545	771518
2C/224	3380	T-111	1715		0		0			8810	17363	8810	17363
		B-201	106	0		0						259	
		B-202	102	0		0						400	
224	1040		208	0	0	0	0			659	3295	659	3295
		B-105	1158	1107		0						262122	
		TY-102	242	18		0						1433	
		TX-116	2388	43		0						6388	
EB/1C	18100		3788	1168	5581	0	0			268775	1284273	269943	1289854
Total (MT)					2.69E+4		2.59E+4		0.00E+0		6.76E+6		6.81E+6
% Inventory					0.08		0.07		0.00		19.55		19.70
TBP													
TBP/Sr	568	C-105	568	0	0	0	0			91521	91521	91521	91521
TBP/DiaE	64	TY-106 (w)	64	4	4		0			9117	9117	9121	9121
TBP/EB	814												
TBP(f)/EB	15100	BY-110	1510	0		2644						132200	
TBP/EBits	2890	BY-108	863	0		0						145105	
	18804		2373	0	0	2644	20951		0	274661	2176454	277305	2197405
TBP	874	TY-105 (w)	874	20	20		0			233457	233457	233477	233477
		BX-104 (w)	363	139								132359	
		BX-103	235	0		0						60327	
		BX-109	731	0		0						195000	
TBP/CW	2570		1329	139	269	0	0			387547	749432	387686	749701
TBP/1C(f)	776	TY-104	163	0	0	0	0			27661	131687	27661	131687
		C-108	250	0		0						8030	
		C-109	235	0		2561						256100	
		C-112	394	0		10180						1018022	
TBP(f)/1C	1090		879	0	0	12741	15799			1269411	1574127	1282152	1589927
Total (MT)					2.93E+02		3.68E+04		0.00E+00		4.97E+06		5.00E+06
% Inventory					0.00		0.11		0.00		14.36		14.47

Element: ^{90}Sr (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	0		217						434448	
RCW	38	SX-108	329	0		0						1813757	
	5396		1438	0	0	217	814		0	2247988	8435426	2248205	8436241
R/DlaE	560	SX-113	98	141	806	0	0			4571	26120	4712	26926
R-Sludge(Zr)	1420	S-107	1420	0	0	0	0		0	333773	333773	333773	333773
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bot}$	1616	0		0						672014	
EB/DW	507	S-111	2256	0		29024						55814	
	52647		3872	0.00	0	29024	394635		0	698804	9501533	727828.0	9896168
Total (MT)					8.06E+2		3.95E+5		0.00E+0		18.3E+6		18.7E+6
% Inventory					0.00		1.14		0.00		52.92		54.07

PUREX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach MT Tank	Oxidative Leach MT Waste Type	Residual Solids MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	2541	15631		0			133171	819218	135712	834849
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	248	510		0			649128	1334165	649376	1334675
PCW/Mix	159	T-102 (w)	72		0		0			26412	58327	26412	58327
PCW/ZrCW	3100	C-104	1117	0	0	0	0			432784	1201102	432784	1201102
CC/AR	473	A-106 (w)	473	1978	1978		0			634521	634521	636499	636499
Total (MT)					1.81E+4		0.00E+0		0.00E+0		4.05E+6		4.07E+6
% Inventory					0.05		0.00		0.00		11.71		11.76
TOTAL (MT)					4.61E+4		4.58E+5		0.00E+0		34.1E+6		34.6E+6
Distribution					0.1		1.3		0.0		98.5		

Wash Factor	0.1	% initial solids
Leach Factor	1	% washed solids
Enhanced Leach Factor	0	% washed and leached solids

% of (Expected) SST Inventory Accounted For: 70

	(MT)
Best-basis Total Inventory	62.3E+6
less C-106 Estimated Inventory	-1.6E+6
less TWRS DST Inventory	-11.4E+6
Expected SST Inventory	49.3E+6
This Evaluation	34.6E+6
Expected Inventory Accounted for	70 %

Element: U

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.0135	0.04	0.183	0.58			1.47	4.71	1.67	5.34
		C-107	897	3.42		0.856						14.3	
		T-107	655	0.943		0.077						24.9	
		U-110	704	0		0						9	
1C/CW	2830		2256	4.363	5.47	0.933	1.17			42.90	53.82	48.2	60.46
		B-106	443	0.073		0.066						7.3	
		BX-107	1302	0.567		0.142						3.55	
1C/TBP	2620		1745	0.64	0.96	0.208	0.31			10.00	15.02	10.85	16.29
2C/EB	1400	B-104	1400	0.02	0.02	0.707	0.71			1.28	1.28	2.01	2.01
		B-110	927	0.071		0.147						0.51	
		B-111	893	0.143		0.01		0.000				0.25	
2C/5-6	1930		1820	0.214	0.23	0.157	0.17	0.000	0.00	0.39	0.41	0.76	0.81
2C/224	3380	T-111	1715	0	0.00	0.106	0.21			5.17	10.20	5.28	10.41
		B-201	106	0		0						0.08	
		B-202	102	0		0						0.04	
224	1040		208	0	0.00	0	0.00			0.12	0.60	0.12	0.60
		B-105	1158	0		0						0.0734	
		TY-102	242	0.0036		0						0.079	
		TX-116	2388	NR		0						NR	
EB/1C	18100		3788	0.0036	0.05	0	0.00			0.15	0.68	0.1524	0.73
Total (MT)					6.77		3.15		0.00		86.72		96.64
% Inventory					0.84		0.39		0.00		10.71		11.94
TBP													
TBP/Sr	568	C-105	568	2.59	2.59	0	0.00			11.01	11.01	13.6	13.60
TBP/DiaE	64	TY-106 (w)	64	0.0002	0.00	0	0.00			0.74	0.74	0.736	0.74
TBP/EB	814	BY-104	1540	0		0.132						6.59	
TBP(f)/EB	15100	BY-110	1510	0.187		0		0.55				9.35	
TBP/EBits	2890	BY-108	863	0		0						9.61	
	18804		3913	0.187	0.90	0.132	0.63	0.55	6.85	24.68	114.40	25.55	122.78
TBP	874	TY-105 (w)	874	0.0189	0.02	0	0.00			7.20	7.20	7.22	7.22
		BX-104 (w)	363	0.0022								16	
		BX-103	235	0.854		0						10.7	
		BX-109	731	0.355		0						17.7	
TBP/CW	2570		1329	1.2112	2.34	0	0.00			43.19	83.52	44.4	85.86
TBP/1C(f)	776	TY-104	163	0.034	0.16	0.008	0.04			5.32	25.32	5.36	25.52
		C-108	250	0.014								0.14	
		C-109	235	0								2.39	
		C-112	394	1.57								35.3	
TBP(f)/1C	1090		879	1.584	1.96	0	0.00			36.25	44.95	37.83	46.91
Total (MT)					7.98		0.67		6.85		287.13		302.63
% Inventory					0.99		0.08		0.85		35.46		37.38

Element: U (Continued)

REDOX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
R/Mix	318												
R/2C	8												
R-Sludge	4650												
RCW/Mix	382	S-104	1109	0		0.003						11	
RCW	38	SX-108	329	0		0		0.00				4 47	
	5396		1438	0	0.00	0.003	0.01	0.00	0.00	15.47	58.04	15.47	58.05
R/DiaE	560	SX-113	98	0.0006	0.003	0.0017	0.01			0.02	0.10	0.019	0.11
R-Sludge(Zr)	1420	S-107	1420	0	0.00	0.566	0.57	0.00	0.00	13.63	13.63	14.2	14.20
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290	S-101$_{Bod}$	1616	0.00		0.138						13.8	
EB/DW	507	S-111	2256	0.208		0.401						0 8	
	52647		3872	0.21	2.83	0.539	7.33		0.00	13.82	187.95	14.6	198.11
Total (MT)					2.83		7.92		0.00		259.72		270.46
% Inventory					0.35		0.98		0.00		32.08		33.41

PUREX

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach MT Tank	Oxidative Leach MT Waste Type	Residual Solids MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.018	0.11	0.05	0.31			2.60	16.01	2.67	16.42
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.79	1.62	0.022	0.05			0.27	0.55	1.08	2.22
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.09	0.21	0.0945	0.21
PCW/ZrCW	3100	C-104	1117	0.434	1.20	1.74	4.83			41.23	114.41	43.4	120.45
CC/AR	473	A-106 (w)	473	0.0065	0.01	0.01	0.01			0.57	0.57	0.588	0.59
Total (MT)					2.95		5.19		0.00		131.75		139.89
% Inventory					0.36		0.64		0.00		16.27		17.28
TOTAL (MT)					20.52		16.93		6.85		765.32		809.62
Distribution					2.5		2.1		0.8		94.5		

Wash Factor	2.5	% initial solids
Leach Factor	2.1	% washed solids
Enhanced Leach Factor	0.9	% washed and leached solids

% of (Expected) SST Inventory Accounted For: 84

Leach factor from tests performed with AR/PCW (Purex) waste (C-103) used for DSSF, CC/DSSF, PCW/Mix, and CC/AR (Purex) wastes.

	(MT)
Best-basis Total Inventory	965
less C-106 Estimated Inventory	-0.436
less TWRS DST Inventory	-4.49
Expected SST Inventory	960
This Evaluation	810
Expected Inventory Accounted for	84 %

Element: Zr

BiPO4

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash & Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
1C	1670												
1C/?	170												
1C/EB	3050												
1C(f)/EB	447												
	5337	T-104	1670	0.001	0.00		0.00			0.13	0.41	0.13	0.42
		T-105 (w)	371	0.0003								0.0704	
		C-107	897	0		0.048						1.61	
		T-107	655	0.001		0						0.09	
		U-110	704	0		0						0.23	
1C/CW	2830		2627	0.0013	0.00	0.048	0.06			1.95	2.09	2.00	2.15
		T-108 (w)	167	0								0.0027	
		C-110 (w)	708	0.0106								0.142	
		B-106	443	0.0003		0						0.017	
		BX-107	1302	0		0.002						0.21	
1C/TBP	2620		2620	0.0109	0.01	0.002	0.00			0.36	0.36	0.3717	0.37
2C/EB	1400	B-104	1400	0.0005	0.00		0.00			0.05	0.05	0.05	0.05
		B-110	927	0		0						0.0044	
		B-111	893	0		0						0.023	
2C/5-6	1930		1820	0	0.00	0	0.00		0.00	0.03	0.03	0.0273	0.03
2C/224	3380	T-111	1715	0.0015	0.00		0.00			0.01	0.01	0.0075	0.01
		B-201	106	0.0001		0						0.0083	
		B-202	102	0		0						0.0009	
224	1040		208	0.0001	0.00	0	0.00			0.01	0.05	0.0092	0.05
EB/1C	18100	TY-102	242	0.0017	0.13	0	0.00			0.002	0.16	0.0039	0.29
Total (MT)					0.15		0.06		0.00		3.16		3.37
% Inventory					0.08		0.03		0.00		1.71		1.82
TBP													
TBP/Sr	568	C-105	568	0	0.00	0.0056	0.01			0.07	0.07	0.08	0.08
TBP/DiaE	64	TY-106 (w)	64	0.0004	0.00		0.00			0.06	0.06	0.057	0.06
TBP/EB	814	BY-104	1540	0								0.13	
TBP(f)/EB	15100	BY-110	1510	0								0.13	
TBP/EBits	2890												
	18804		3050	0	0.00	0	0.00		0.00	0.26	1.60	0.26	1.60
TBP	874	TY-105 (w)	874	0.0003	0.00		0.00			0.07	0.07	0.070	0.07
		BX-104 (w)	363	0.0032								0.82	
		BX-103	235	0		0.038						1.65	
		BX-109	731	0		0.001						0.66	
TBP/CW	2570		1329	0.0032	0.01	0.039	0.10			3.09	5.94	3.13	6.05
TBP/1C(f)	776	TY-104	163	0.0013	0.01		0.00			0.05	0.23	0.050	0.24
TBP(f)/1C	1090	C-112	394	0	0.00	0	0.00			0.02	0.04	0.0151	0.04
Total (MT)					0.01		0.11		0.00		8.02		8.14
% Inventory					0.01		0.06		0.00		4.32		4.39

Element: Zr (Continued)

Waste Type	Waste Type Vol (kL)	Representative Tanks	Tank Vol (kL)	Wash MT Tank	Wash MT Waste Type	Leach MT Tank	Leach MT Waste Type	Oxidative Leach (after Wash and Leach) MT Tank	Oxidative Leach MT Waste Type	Residual Solids (after washing & leaching) MT Tank	Residual Solids MT Waste Type	Total MT Tank	Total MT Waste Type
REDOX													
R/Mix	318												
R/2C	8												
R-Sludge	4280												
RCW/Mix	382	S-104	1109	0		0						1.07	
RCW	38	SX-108	329	0		0						0.26	
	5026		1438	0	0.00	0	0.00		0.00	1.33	4.65	1.33	4.65
R/DiaE	560	SX-113	98	0.00002	0.000	0.00029	0.00			0.00	0.01	0.0018	0.01
R-Sludge (Zr)	1420	S-107	1420	0	0.00	0	0.00		0.00	10.20	10.20	10.2	10.20
R-RCW/EB	36320												
EB/R	7530												
EB/CW	8290												
EB/DW	507												
	52647	S-101$_{Bot}$	1616		0.00		0.00		0.00	0.07	2.22	0.068	2.22
Total (MT)					0.00		0.00		0.00		17.07		17.07
% Inventory					0.00		0.00		0.00		9.20		9.20
PUREX													
DSSF	7960												
CC/DSSF	560												
	8520	A-103 (w)	1385	0.0257	0.16		0.00			0.36	2.23	0.389	2.39
AR/PCW	235												
P Sludge	180												
AR Sludge	26												
HS	42												
	483	C-103	235	0.038	0.08	0	0.00			3.80	7.81	3.84	7.89
PCW/Mix	159	T-102 (w)	72	0	0.00		0.00			0.01	0.01	0.0054	0.01
PCW/ZrCW	3100	C-104	1117	0	0.00	0.053	0.15			52.45	145.56	52.5	145.70
CC/AR	473	A-106 (w)	473	0.02	0.02		0.00			0.88	0.88	0.90	0.90
Total (MT)					0.26		0.15		0.00		156.49		156.90
% Inventory					0.14		0.08		0.00		84.37		84.59
TOTAL (MT)					0.42		0.32		0.00		184.75		185.49
Distribution					0.2		0.2		0.0		99.6		
	Wash Factor		0.2	% initial solids									
	Leach Factor		0.2	% washed solids									
	Enhanced Leach Factor		0	% washed and leached solids				*% of (Expected) SST Inventory Accounted For:*					151

	(MT)
Best-basis Total Inventory	430
less C-106 Estimated Inventory	-2.31
less TWRS DST Inventory	-305
Expected SST Inventory	123
This Evaluation	185
Expected Inventory Accounted for	151 %

4.0 Conclusions and Recommendations

The updated wash and leach factors incorporate dissolution data from tests performed with tank wastes, which, in actuality, are mixtures of insoluble and soluble materials. As a result, these overall factors apply to a composite SST inventory.

Importantly, the mass weighted partitioning factors are highly dependent on available information. The unfavorable overall chromium leach factor of 14% in 1996 was due entirely to the absence of data for the heavily weighted (approximately 0.4) Redox and Evaporator Bottoms waste groups (SORWT Groups I, V, and IX). No leach behavior could be assumed with any confidence because of the surprisingly poor leach behavior exhibited by two other predominantly salt-type wastes (BY-104 and BY-110). In 1997, data from washing and leaching studies were obtained for two Redox/Evaporator Bottom wastes, S-101 and S-111, and the enhanced sludge washing performance increased based solely on these data. The new chromium leach factor is 78%.

The percent sodium, aluminum, phosphate, chromium, and bismuth accounted for in the analyte evaluations in Section 3.0 was 98, 101, 95, 80, and 92, respectively. The favorable mass balances for these bulk inventory analytes lend support to the weighting methodology, to the sample matrix, and to the current standard inventories. Notably, most of the sodium, aluminum, and chromium inventories reside in the Redox and Evaporator Bottom waste groups. Because these analytes potentially affect HLW production, washing and leaching data for additional wastes in these groups would improve confidence in the wash and leach factors.

Partitioning factors for sulfate cannot be computed from currently available data. If wash and leach factors are needed for this analyte, the total sulfate/sulfur concentration in a particular waste sample needs to be determined prior to washing and leaching to calculate percentages removed with each step. Alternatively, the residual solids could be analyzed for sulfur so that the total mass could be obtained by summing the wash, leach, and residual solids fractions. Based on the inventory distribution observed in the not-yet-complete sulfate evaluation in Section 3.0, wastes from BY-104, BY-108, BY-110, S-101, and S-111 may be good candidates for study.

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Appendix A

Tank Waste Data Summary Worksheets

Completed in FY 1997

B-106 (BiPO4 1C, TBP)

Density (g/mL)	1.34
Volume (L)	442845
Mass (kg)	593412
Solids (ug/g)	464000
~pH	NR

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum	1.889	173.000	102.7	6.34	2557.000	1517.4	4830.173	93.66	0.000	0.0	0.000	0.00	2730.000	1620.0
Barium	1.117	<20	0.0	0.00	40.300	23.9	45.015	100.00	0.000	0.0	0.000	0.00	40.300	23.9
Bismuth	1.115	<40	0.0	0.00	2560.000	1519.1	2854.400	100.00	0.000	0.0	0.000	0.00	2560.000	1519.1
Boron	3.220	170.000	100.9	19.27	712.000	422.5	2292.640	80.73	0.000	0.0	0.000	0.00	882.000	523.4
Cadmium	1.142	<2	0.0	#DIV/0!	<4	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Calcium	1.399	<40	0.0	0.00	2520.000	1495.4	3525.480	100.00	0.000	0.0	0.000	0.00	2520.000	1495.4
Chromium	1.923	31.900	18.9	11.68	241.100	143.1	463.635	88.32	0.000	0.0	0.000	0.00	273.000	162.0
Cobalt	1.271	<8	0.0	#DIV/0!	<15	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Copper	1.252	<4	0.0	0.00	21.500	12.8	26.918	100.00	0.000	0.0	0.000	0.00	21.500	12.8
Iron	1.382	145.000	86.0	0.90	16055.000	9527.2	22188.010	99.10	0.000	0.0	0.000	0.00	16200.000	9613.3
Lead	1.077	<40	0.0	0.00	341.000	202.4	367.257	100.00	0.000	0.0	0.000	0.00	341.000	202.4
Magnesium	1.658	<40	0.0	0.00	617.000	366.1	1022.986	100.00	0.000	0.0	0.000	0.00	617.000	366.1
Manganese	1.582	<4	0.0	0.00	192.000	113.9	303.744	100.00	0.000	0.0	0.000	0.00	192.000	113.9
Nickel	1.272	<8	0.0	0.00	58.300	34.6	74.158	100.00	0.000	0.0	0.000	0.00	58.300	34.6
Phosphate	1.000	30400.000	18039.7	41.32	43179.545	25623.3	43179.545	58.68	0.000	0.0	0.000	0.00	73579.545	43663.0
Potassium	1.000	247.000	146.6	62.22	150.000	89.0	150.000	37.78	0.000	0.0	0.000	0.00	397.000	235.6
Silicon	2.139	3130.000	1857.4	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	3130.000	1857.4
Silver	1.000	<6	0.0	#DIV/0!	<7	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Sodium	1.000	97600.000	57917.0	84.87	17400.000	10325.4	17400.000	15.13	0.000	0.0	0.000	0.00	115000.000	68242.4
Strontium	1.183	4.030	2.4	0.96	415.970	246.8	492.093	99.04	0.000	0.0	0.000	0.00	420.000	249.2
Zinc	1.245	8.040	4.8	7.09	105.400	62.5	131.223	92.91	0.000	0.0	0.000	0.00	113.440	67.3
Zirconium	1.351	4.600	2.7	16.43	23.400	13.9	31.613	83.57	0.000	0.0	0.000	0.00	28.000	16.6
Uranium	1.134	<200	0.0	0.00	12300.000	7299.0	13948.200	100.00	0.000	0.0	0.000	0.00	12300.000	7299.0
Nitrate	1.000	181000.000	107407.6	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	181000.000	107407.6
Chloride	1.000	1270.000	753.6	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	1270.000	753.6
Fluoride	1.000	4920.000	2919.6	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	4920.000	2919.6
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	1530.000	907.9	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	1530.000	907.9
TOC	1.336	505.000	224.3	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	377.894	224.3
Nitrite	1.000	7610.000	4515.9	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	7610.000	4515.9
Sulfate	1.000	13900.000	8248.4	87.21	2039.130	1210.0	2039.130	12.79	0.000	0.0	0.000	0.00	15939.130	9458.5
Total		342648.570					115366.221				0.000			
		73.85	%total solids in wash				24.86	%total solids in acid			0.00	%total solids in fusion	98.71	% mass balance
Radionuclides		uCi/g	Ci/tank	dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank
Total alpha		0.000	0.0	0.00		0.0		0.00	0.041	24.3		100.00	0.041	24.3
Total beta		0.000	0.0	0.00		0.0		0.00	173.000	102660.3		100.00	173.000	102660.3
Sr-90		0.000	0.0	0.00		0.0		0.00	84.300	50024.7		100.00	84.300	50024.7
Tc-99		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Am-241		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Co-60		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.05	0.0		#DIV/0!	0.000	0.0
Cs-137		0.000	0.0	0.00		0.0		0.00	22.700	13470.5		100.00	22.700	13470.5
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0

NOTES:

WHC-SD-WM-601, Rev. 0

Core Sample 1995

NR - Not Reported

NA - No Analysis Performed

<DL - Less than Detection Limit

BX-103 (TBP/CW)

Density (g/mL)	1.23
Volume (L)	234670
Mass (kg)	288644
Solids (ug/g)	443000
~pH	NR

Component	Oxide Factor	ug/g sludge (element)	kg/tank (element)	% element dissolved	ug/g sludge (element)	kg/tank (element)	ug/g sludge (oxide)	% element dissolved	LANL Direct Analysis ug/g sludge (element)	kg/tank (element)	ug/g sludge (oxide)	% element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum	2.790	0.000	0.0	0.00	0.000	0.0	0.000	0.00	93030.000	26852.6	259553.700	100.00	93030.000	26852.6
Barium	1.117	0.000	0.0	0.00	0.000	0.0	0.000	0.00	13.201	3.8	14.746	100.00	13.201	3.8
Bismuth	1.115	0.000	0.0	0.00	0.000	0.0	0.000	0.00	36.060	10.4	40.207	100.00	36.060	10.4
Boron	3.220	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Cadmium	1.142	0.000	0.0	0.00	0.000	0.0	0.000	0.00	26.624	7.7	30.405	100.00	26.624	7.7
Calcium	1.399	0.000	0.0	0.00	0.000	0.0	0.000	0.00	465.150	134.3	650.745	100.00	465.150	134.3
Chromium	1.923	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1324.570	382.3	2547.148	100.00	1324.570	382.3
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1.971	0.6	2.506	100.00	1.971	0.6
Copper	1.252	0.000	0.0	0.00	0.000	0.0	0.000	0.00	91.701	26.5	114.810	100.00	91.701	26.5
Iron	1.382	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2751.030	794.1	3801.923	100.00	2751.030	794.1
Lead	1.077	0.000	0.0	0.00	0.000	0.0	0.000	0.00	784.110	226.3	844.486	100.00	784.110	226.3
Magnesium	1.658	0.000	0.0	0.00	0.000	0.0	0.000	0.00	101.890	29.4	168.934	100.00	101.890	29.4
Manganese	1.582	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3552.860	1025.5	5620.625	100.00	3552.860	1025.5
Nickel	1.272	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1190.000	343.5	1513.680	100.00	1190.000	343.5
Phosphate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	764.000	220.5	764.000	100.00	764.000	220.5
Potassium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3202.890	924.5	3202.890	100.00	3202.890	924.5
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1191.670	344.0	2548.982	100.00	1191.670	344.0
Silver	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	77.082	22.2	77.082	100.00	77.082	22.2
Sodium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	33756.600	9743.6	33756.600	100.00	33756.600	9743.6
Strontium	1.183	0.000	0.0	0.00	0.000	0.0	0.000	0.00	64.678	18.7	76.514	100.00	64.678	18.7
Zinc	1.245	0.000	0.0	0.00	0.000	0.0	0.000	0.00	598.050	172.6	744.572	100.00	598.050	172.6
Zirconium	1.351	0.000	0.0	0.00	0.000	0.0	0.000	0.00	5714.700	1649.5	7720.560	100.00	5714.700	1649.5
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	37034.800	0.0	41997.463	100.00	37034.800	10689.9
Nitrate (1)	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	15500.000	4474.0	15500.000	100.00	15500.000	4474.0
Chloride (1)	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	288.000	83.1	288.000	100.00	288.000	83.1
Fluoride (1)	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	391.000	112.9	391.000	100.00	391.000	112.9
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate (1)	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	24600.000	7100.6	24600.000	100.00	24600.000	7100.6
TOC	1.336	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Nitrite (1)	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	14700.000	4243.1	14700.000	100.00	14700.000	4243.1
Sulfate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1870.000	539.8	1870.000	100.00	1870.000	539.8
Total		0.000					0.000				423141.578			
		0.00	%total solids in wash				0.00	%total solids in acid			95.52	%total solids in fusion	95.52	% mass balance
Radionuclides		**uCi/g**	**Ci/tank**	**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**
Pu-239,240		0.000	0.0	0.00		0.0		0.00	0.540	156.0		100.00	0.540	156.0
Total alpha		0.000	0.0	0.00		0.0		0.00	1.289	372.1		100.00	1.289	372.1
Sr-90		0.000	0.0	0.00		0.0		0.00	208.653	60226.5		100.00	208.653	60226.5
Tc-99		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.1	0.0		#DIV/0!	0.000	0.0
Am-241		0.000	0.0	0.00		0.0		0.00	0.691	199.5		100.00	0.691	199.5
Co-60		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.3	0.0		#DIV/0!	0.000	0.0
Cs-137		0.000	0.0	0.00		0.0		0.00	34.687	10012.2		100.00	34.687	10012.2
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0

NOTES: Data sheets FAX'd to R. Kirkbride from LANL, 5/1/97

1. Based on analyzed concentrations in 1975 samples normalized to sodium,
   e.g., 1.98M Na (analyzed supernatant) = 37,000 ug/g (density 1.23) x 0.91 = 33,700 ug/g Na (analyzed LANL value)

NR - Not Reported
NA - No Analysis Performed
<DL - Less than Detection Limit

BY-108 [EB/TBP(f)]

Density (g/mL)	1.51
Volume (L)	862980
Mass (kg)	1303100
Solids (ug/g)	672000
~pH	NR

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum	2.790	0.000	0.0	0.00	0.000	0.0	0.000	0.00	39800.000	51863.4	111042.000	100.00	39800.000	51863.4
Barium	1.117	0.000	0.0	0.00	0.000	0.0	0.000	0.00	124.000	161.6	138.508	100.00	124.000	161.6
Bismuth	1.115	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<495	0.0	0.000	#DIV/0!	0.000	0.0
Boron	3.220	0.000	0.0	0.00	0.000	0.0	0.000	0.00	250.000	325.8	805.000	100.00	250.000	325.8
Cadmium	1.142	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<16.3	0.0	0.000	#DIV/0!	0.000	0.0
Calcium	1.399	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3370.000	4391.4	4714.630	100.00	3370.000	4391.4
Chromium	1.923	0.000	0.0	0.00	0.000	0.0	0.000	0.00	255.000	332.3	490.365	100.00	255.000	332.3
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	34.200	44.6	43.468	100.00	34.200	44.6
Copper	1.252	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<45.9	0.0	0.000	#DIV/0!	0.000	0.0
Iron	1.382	0.000	0.0	0.00	0.000	0.0	0.000	0.00	7190.000	9369.3	9936.580	100.00	7190.000	9369.3
Lead	1.077	0.000	0.0	0.00	0.000	0.0	0.000	0.00	439.000	572.1	472.803	100.00	439.000	572.1
Magnesium	1.658	0.000	0.0	0.00	0.000	0.0	0.000	0.00	447.000	582.5	741.126	100.00	447.000	582.5
Manganese	1.582	0.000	0.0	0.00	0.000	0.0	0.000	0.00	209.000	272.3	330.638	100.00	209.000	272.3
Nickel	1.272	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2510.000	3270.8	3192.720	100.00	2510.000	3270.8
Phosphate	1.000	26000.000	33880.6	85.81	0.000	0.0	0.000	0.00	4300.000	5603.3	4300.000	14.19	30300.000	39483.9
Potassium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2650.000	3453.2	2650.000	100.00	2650.000	3453.2
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1530.000	1993.7	3272.670	100.00	1530.000	1993.7
Silver	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<49.9	0.0	0.000	#DIV/0!	0.000	0.0
Sodium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	163000.000	212405.3	163000.000	100.00	163000.000	212405.3
Strontium	1.183	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3190.000	4156.9	3773.770	100.00	3190.000	4156.9
Zinc	1.245	0.000	0.0	0.00	0.000	0.0	0.000	0.00	83.500	108.8	103.958	100.00	83.500	108.8
Zirconium	1.351	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<34.7	0.0	0.000	#DIV/0!	0.000	0.0
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	9470.000	0.0	10738.980	100.00	9470.000	12340.4
Nitrate	1.000	201000.000	261923.1	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	201000.000	261923.1
Chloride	1.000	1540.000	2008.8	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	1540.000	2008.8
Fluoride	1.000	6610.000	8613.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	6610.000	8613.5
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	26700.000	34792.8	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	26700.000	34792.8
TOC (1)	2.450	10976.000	14302.8	40.82	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	10976.000	14302.8
Nitrite	1.000	27300.000	35574.6	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	27300.000	35574.6
Sulfate	1.000	23400.000	30492.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	23400.000	30492.5
Total		323526.000					0.000				319747.216			
		48.14	%total solids in wash				0.00	%total solids in acid			47.58	%total solids in fusion	95.73	% mass balance
Radionuclides		**uCi/g**	**Ci/tank**	**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**
Pu-239,240		0.000	0.0	0.00		0.0		0.00	0.046	59.8		100.00	0.046	59.8
Total alpha		0.000	0.0	0.00		0.0		0.00	0.062	80.7		100.00	0.062	80.7
Sr-90		0.000	0.0	0.00		0.0		0.00	143.000	186343.3		100.00	143.000	186343.3
Total beta		0.000	0.0	0.00		0.0		0.00	549.000	715401.8		100.00	549.000	715401.8
Am-241		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.187	0.0		#DIV/0!	0.000	0.0
Co-60		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.00911	0.0		#DIV/0!	0.000	0.0
Cs-137		0.000	0.0	0.00		0.0		0.00	258.000	336199.7		100.00	258.000	336199.7
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	NA	0.0		#DIV/0!	0.000	0.0

NOTES:

WHC-SD-WM-ER-533, Rev. 0, rotary mode core, 1995

1. as acetate

NR - Not Reported

NA - No Analysis Performed

<DL - Less than Detection Limit

C-104 (PCW/ZrCW)

Density (g/mL)	1.20
Volume (L)	1116575
Mass (kg)	1339890
Solids (ug/g)	521000
~pH	NR

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum (1)	2.790	676.750	906.8	1.24	49198.250	65920.2	137263.118	90.40	4550.000	6096.5	10101.000	8.36	54425.000	72923.5
Barium	1.117	0.000	0.0	0.00	88.850	119.0	99.245	100.00	0.000	0.0	0.000	0.00	88.850	119.0
Bismuth	1.115	0.000	0.0	0.00	29.400	39.4	32.781	100.00	0.000	0.0	0.000	0.00	29.400	39.4
Boron	3.220	0.000	0.0	0.00	113.950	152.7	366.919	100.00	0.000	0.0	0.000	0.00	113.950	152.7
Cadmium	1.142	0.000	0.0	0.00	0.000	0.0	0.000	0.00	619.500	830.1	707.469	100.00	619.500	830.1
Calcium	1.399	0.000	0.0	0.00	1802.500	2415.2	2521.698	100.00	0.000	0.0	0.000	0.00	1802.500	2415.2
Chromium	1.923	74.875	100.3	8.49	0.000	0.0	0.000	0.00	806.875	1081.1	1551.621	91.51	881.750	1181.4
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	437.000	585.5	555.427	100.00	437.000	585.5
Copper	1.252	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Iron	1.382	0.000	0.0	0.00	0.000	0.0	0.000	0.00	16650.000	22309.2	23010.300	100.00	16650.000	22309.2
Lead	1.077	0.000	0.0	0.00	505.250	677.0	544.154	100.00	0.000	0.0	0.000	0.00	505.250	677.0
Magnesium	1.658	0.000	0.0	0.00	0.000	0.0	0.000	0.00	229.000	306.8	379.682	100.00	229.000	306.8
Manganese	1.582	0.000	0.0	0.00	0.000	0.0	0.000	0.00	4235.000	5674.4	6699.770	100.00	4235.000	5674.4
Nickel	1.272	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Phosphate	1.000	2459.750	3295.8	18.76	0.000	0.0	0.000	0.00	10650.250	14270.2	10650.250	81.24	13110.000	17566.0
Potassium	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	4965.000	6652.6	10620.135	100.00	4965.000	6652.6
Silver	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Sodium	1.000	71775.000	96170.6	66.77	0.000	0.0	0.000	0.00	35725.000	47867.6	35725.000	33.23	107500.000	144038.2
Strontium	1.183	0.000	0.0	0.00	0.000	0.0	0.000	0.00	52.800	70.7	62.462	100.00	52.800	70.7
Zinc	1.245	0.000	0.0	0.00	0.000	0.0	0.000	0.00	603.000	808.0	750.735	100.00	603.000	808.0
Zirconium	1.351	0.000	0.0	0.00	0.000	0.0	0.000	0.00	39175.000	52490.2	52925.425	100.00	39175.000	52490.2
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	32425.000	0.0	36769.950	100.00	32425.000	43445.9
Nitrate	1.000	11814.750	15830.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	11814.750	15830.5
Chloride	1.000	483.250	647.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	483.250	647.5
Fluoride	1.000	21137.500	28321.9	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	21137.500	28321.9
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	29287.500	39242.0	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	29287.500	39242.0
TOC	1.336	8552.500	8577.4	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	8401.572	8577.4
Nitrite	1.000	22045.000	29537.9	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	22045.000	29537.9
Sulfate	1.000	2709.500	3630.4	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	2709.500	3630.4
Total		171016.375					140827.915				190509.226			
		32.82	%total solids in wash				27.03	%total solids in acid			36.57	%total solids in fusion	96.42	% mass balance
Radionuclides		**uCi/g**	**Ci/tank**	**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**		**% dissolved**	**uCi/g**	**Ci/tank**
Pu-239,240		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Gross beta		0.000	0.0	0.00		0.0		0.00	641.500	859539.4		100.00	641.500	859539.4
Sr-90		0.000	0.0	0.00		0.0		0.00	322.750	432449.5		100.00	322.750	432449.5
Tc-99		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Am-241		0.000	0.0	0.00		0.0		0.00	3.792	5081.2		100.00	3.792	5081.2
Co-60		0.000	0.0	0.00		0.0		0.00	0.284	380.0		100.00	0.284	380.0
Cs-137		0.000	0.0	0.00		0.0		0.00	63.485	85062.9		100.00	63.485	85062.9
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0

NOTES: WHC-SD-WM-DP-211, Rev. 1

1. Acid dissolution oxide factor 2.79 (assuming 85% Al(OH)3, 15% AlOOH); fusion dissolution oxide factor 2.22 (assuming AlOOH)

NR - Not Reported
NA - No Analysis Performed
<DL - Less than Detection Limit

C-105 (TBP, Sr) (1)

Density (g/mL)	1.55
Volume (L)	567750
Mass (kg)	880013
Solids (ug/g)	623000
~pH	NR

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum	2.790	0.000	0.0	0.00	0.000	0.0	0.000	0.00	169456.000	149123.4	472782.240	100.00	169456.000	149123.4
Barium	1.117	0.000	0.0	0.00	0.000	0.0	0.000	0.00	10.716	9.4	11.969	100.00	10.716	9.4
Bismuth	1.115	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<0.2	0.0	0.000	#DIV/0!	0.000	0.0
Boron	3.220	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<2	0.0	0.000	#DIV/0!	0.000	0.0
Cadmium	1.142	0.000	0.0	0.00	0.000	0.0	0.000	0.00	0.673	0.6	0.768	100.00	0.673	0.6
Calcium	1.399	0.000	0.0	0.00	0.000	0.0	0.000	0.00	537.026	472.6	751.299	100.00	537.026	472.6
Chromium	1.923	0.000	0.0	0.00	0.000	0.0	0.000	0.00	466.004	410.1	896.126	100.00	466.004	410.1
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3.993	3.5	5.076	100.00	3.993	3.5
Copper	1.252	0.000	0.0	0.00	0.000	0.0	0.000	0.00	127.092	111.8	159.119	100.00	127.092	111.8
Iron	1.382	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3264.520	2872.8	4511.567	100.00	3264.520	2872.8
Lead	1.077	0.000	0.0	0.00	0.000	0.0	0.000	0.00	163.226	143.6	175.794	100.00	163.226	143.6
Magnesium	1.658	0.000	0.0	0.00	0.000	0.0	0.000	0.00	116.501	102.5	193.159	100.00	116.501	102.5
Manganese	1.582	0.000	0.0	0.00	0.000	0.0	0.000	0.00	474.103	417.2	750.031	100.00	474.103	417.2
Nickel	1.272	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2267.720	1995.6	2884.540	100.00	2267.720	1995.6
Phosphate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	3738.000	3289.5	3738.000	100.00	3738.000	3289.5
Potassium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	747.600	657.9	747.600	100.00	747.600	657.9
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	9345.000	8223.7	19988.955	100.00	9345.000	8223.7
Silver	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	18.877	16.6	18.877	100.00	18.877	16.6
Sodium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	32832.100	28892.7	32832.100	100.00	32832.100	28892.7
Strontium	1.183	0.000	0.0	0.00	0.000	0.0	0.000	0.00	117.124	103.1	138.558	100.00	117.124	103.1
Zinc	1.245	0.000	0.0	0.00	0.000	0.0	0.000	0.00	172.571	151.9	214.851	100.00	172.571	151.9
Zirconium	1.351	0.000	0.0	0.00	0.000	0.0	0.000	0.00	90.958	80.0	122.884	100.00	90.958	80.0
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	15512.700	0.0	17591.402	100.00	15512.700	13651.4
Nitrate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	5382.720	4736.9	5382.720	100.00	5382.720	4736.9
Chloride	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	697.760	614.0	697.760	100.00	697.760	614.0
Fluoride	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<400	0.0	0.000	#DIV/0!	0.000	0.0
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
TOC	1.336	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Nitrite	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	48594.000	42763.3	48594.000	100.00	48594.000	42763.3
Sulfate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	10154.900	8936.4	10154.900	100.00	10154.900	8936.4
Total		0.000					0.000				623344.295			
		0.00	%total solids in wash				0.00	%total solids in acid			100.06	%total solids in fusion	100.06	% mass balance
Radionuclides		uCi/g	Ci/tank	dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank
Pu-239,240		0.000	0.0	0.00		0.0		0.00	1.210	1064.8		100.00	1.210	1064.8
Total alpha		0.000	0.0	0.00		0.0		0.00	1.240	1091.0		100.00	1.240	1091.0
Sr-90		0.000	0.0	0.00		0.0		0.00	104.000	91521.3		100.00	104.000	91521.3
Tc-99		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.1	0.0		#DIV/0!	0.000	0.0
Am-241		0.000	0.0	0.00		0.0		0.00	0.257	226.4		100.00	0.257	226.4
Co-60		0.000	0.0	0.00		0.0		0.00	0.174	153.5		100.00	0.174	153.5
Cs-137		0.000	0.0	0.00		0.0		0.00	183.000	161042.3		100.00	183.000	161042.3
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	NA	0.0		#DIV/0!	0.000	0.0

NOTES: Preliminary data from LANL; Memo from Garfield to Powell, Numatec 8C451-97-005, Attachment 2.

1. Revised: original worksheet (Colton 1995) had mass balance of only 57% due to incomplete analyses.

NR - Not Reported
NA - No Analysis Performed
<DL - Less than Detection Limit

C-107 (BIPO4 1C, CW) (1)

Density (g/mL)	1.50
Volume (L)	897045
Mass (kg)	1345568
Solids (ug/g)	452000
~pH	NR

Component	Oxide Factor	ug/g sludge (element)	kg/tank (element)	% element dissolved	ug/g sludge (element)	kg/tank (element)	ug/g sludge (oxide)	% element dissolved	LANL Direct Analyses ug/g sludge (element)	LANL Direct Analyses kg/tank (element)	LANL Direct Analyses ug/g sludge (oxide)	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum (2)	2.720	0.000	0.0	0.00	0.000	0.0	0.000	0.00	47460.000	63860.6	129091.200	47460.000	63860.6
Barium	1.117	0.000	0.0	0.00	0.000	0.0	0.000	0.00	377.420	507.8	421.578	377.420	507.8
Bismuth	1.115	0.000	0.0	0.00	0.000	0.0	0.000	0.00	11254.800	15144.1	12549.102	11254.800	15144.1
Boron	3.220	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2.644	3.6	8.514	2.644	3.6
Cadmium	1.142	0.000	0.0	0.00	0.000	0.0	0.000	0.00	45.652	61.4	52.135	45.652	61.4
Calcium	1.399	0.000	0.0	0.00	0.000	0.0	0.000	0.00	439.796	591.8	615.275	439.796	591.8
Chromium	1.923	0.000	0.0	0.00	0.000	0.0	0.000	0.00	319.112	429.4	613.652	319.112	429.4
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	9.718	13.1	12.352	9.718	13.1
Copper	1.252	0.000	0.0	0.00	0.000	0.0	0.000	0.00	100.344	135.0	125.631	100.344	135.0
Iron	1.382	0.000	0.0	0.00	0.000	0.0	0.000	0.00	41764.800	56197.4	57718.954	41764.800	56197.4
Lead	1.077	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2278.080	3065.3	2453.492	2278.080	3065.3
Magnesium	1.658	0.000	0.0	0.00	0.000	0.0	0.000	0.00	219.672	295.6	364.216	219.672	295.6
Manganese	1.582	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1310.800	1763.8	2073.686	1310.800	1763.8
Nickel	1.272	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2350.400	3162.6	2989.709	2350.400	3162.6
Phosphate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	49494.000	66597.5	49494.000	49494.000	66597.5
Potassium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	329.960	444.0	329.960	329.960	444.0
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	8181.200	11008.4	17499.587	8181.200	11008.4
Silver	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	262.612	353.4	262.612	262.612	353.4
Sodium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	63732.000	85755.7	63732.000	63732.000	85755.7
Strontium	1.183	0.000	0.0	0.00	0.000	0.0	0.000	0.00	104.864	141.1	124.054	104.864	141.1
Zinc	1.245	0.000	0.0	0.00	0.000	0.0	0.000	0.00	169.500	228.1	211.028	169.500	228.1
Zirconium	1.351	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1175.200	1581.3	1587.695	1175.200	1581.3
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	10622.000	0.0	12045.348	10622.000	14292.6
Nitrate (3)	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	52825.240	71079.9	52825.240	52825.240	71079.9
Chloride	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	0.000	0.0
Fluoride	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	4429.600	5960.3	4429.600	4429.600	5960.3
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	0.000	0.0
Carbonate	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	0.000	0.0
TOC	1.336	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	0.000	0.0
Nitrite	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	0.000	0.0
Sulfate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	5876.000	7906.6	5876.000	5876.000	7906.6
Total		0.000					0.000				417506.618		
		0.00	%total solids in wash				0.00	%total solids in acid			92.37 %total solids in fusion	92.37	% mass balance
Radionuclides		**uCi/g**	**Ci/tank**	**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**		**uCi/g**	**Ci/tank**
Pu-239,240		0.000	0.0	0.00		0.0		0.00	1.311	1763.8		1.311	1763.8
C-14		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		0.000	0.0
Sr-90		0.000	0.0	0.00		0.0		0.00	2486.000	3345080.8		2486.000	3345080.8
Tc-99		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.2	0.0		0.000	0.0
Am-241		0.000	0.0	0.00		0.0		0.00	0.515	693.3		0.515	693.3
Co-60		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		0.000	0.0
Cs-137		0.000	0.0	0.00		0.0		0.00	34.081	45858.0		34.081	45858.0
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		0.000	0.0

NOTES:
1. Revised: original worksheet (Colton 1996) did not factor percent water into tank inventory calculations.
2. Al oxide factor based on assuming 75% gibbsite [Al(OH)3], 25% boehmite (AlOOH).
3. No analyses performed for NO3, CO3, NO2; NO3 concentration added to ion balance.

NR - Not Reported
NA - No Analysis Performed

S-101 [REDOX (boiling), EB]

Density (g/mL)	1.65
Volume (L)	1616195
Mass (kg)	2666722
Solids (ug/g)	598000
~pH	NR

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL(1) ug/g sludge (element)	TOTAL(1) kg/tank (element)
Aluminum	(2)	11800.000	31467.3	13.27	12100.000	32267.3	33759.000	13.61	65000.000	173336.9	144300.000	73.12	88900.000	237071.6
Barium	1.117	<27	0.0	#DIV/0!	<33.5	0.0	0.000	#DIV/0!	<1050	0.0	0.000	#DIV/0!	0.000	0.0
Bismuth	1.115	<54	0.0	#DIV/0!	<67	0.0	0.000	#DIV/0!	<2100	0.0	0.000	#DIV/0!	0.000	0.0
Boron	3.220	0.000	0.0	0.00	54.000	144.0	173.880	100.00	0.000	0.0	0.000	0.00	54.000	144.0
Cadmium	1.142	<2.7	0.0	0.00	3.930	10.5	4.488	100.00	0.000	0.0	0.000	0.00	3.930	10.5
Calcium	1.399	<54	0.0	0.00	435.000	1160.0	608.565	100.00	0.000	0.0	0.000	0.00	435.000	1160.0
Chromium	1.923	1570.000	4186.8	30.02	1730.000	4613.4	3326.790	33.08	1930.000	5146.8	3711.390	36.90	5230.000	13947.0
Cobalt	1.271	<10.8	0.0	#DIV/0!	<13.4	0.0	0.000	#DIV/0!	<420	0.0	0.000	#DIV/0!	0.000	0.0
Copper	1.252	<5.4	0.0	0.00	15.200	40.5	19.030	100.00	0.000	0.0	0.000	0.00	15.200	40.5
Iron	1.382	<27	0.0	0.00	736.000	1962.7	1017.152	61.33	464.000	1237.4	641.248	38.67	1200.000	3200.1
Lead	1.077	<54	0.0	#DIV/0!	<69	0.0	0.000	#DIV/0!	<2100	0.0	0.000	#DIV/0!	0.000	0.0
Magnesium	1.658	<54	0.0	#DIV/0!	<67	0.0	0.000	#DIV/0!	<2100	0.0	0.000	#DIV/0!	0.000	0.0
Manganese	1.582	<5.4	0.0	0.00	1580.000	4213.4	2499.560	92.94	120.000	320.0	189.840	7.06	1700.000	4533.4
Nickel	1.272	<11	0.0	0.00	79.000	210.7	100.488	100.00	0.000	0.0	0.000	0.00	79.000	210.7
Phosphate	1.000	4020.000	10720.2	91.16	390.000	1040.0	390.000	8.84	0.000	0.0	0.000	0.00	4410.000	11760.2
Potassium	1.000	916.000	2442.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	916.000	2442.7
Silicon	2.139	407.000	1085.4	17.32	0.000	0.0	0.000	0.00	1943.000	5181.4	4156.077	82.68	2350.000	6266.8
Silver	1.000	<5.4	0.0	#DIV/0!	<6.8	0.0	0.000	#DIV/0!	<210	0.0	0.000	#DIV/0!	0.000	0.0
Sodium	1.000	135000.000	360007.4	70.68	0.000	0.0	0.000	0.00	56000.000	149336.4	56000.000	29.32	191000.000	509343.9
Strontium	1.183	<5.4	0.0	0.00	200.000	533.3	236.600	69.20	89.000	237.3	105.287	30.80	289.000	770.7
Zinc	1.245	6.960	18.6	37.42	0.000	0.0	0.000	0.00	11.640	31.0	14.492	62.58	18.600	49.6
Zirconium	1.351	<5.4	0.0	0.00	25.600	68.3	34.586	100.00	0.000	0.0	0.000	0.00	25.600	68.3
Uranium	1.134	<10000	0.0	0.00	5190.000	13840.3	5885.460	100.00	0.000	0.0	0.000	0.00	5190.000	13840.3
Nitrate	1.000	135000.000	360007.4	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	135000.000	360007.4
Chloride	1.000	3260.000	8693.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	3260.000	8693.5
Fluoride	1.000	334.000	890.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	334.000	890.7
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	18800.000	50134.4	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	18800.000	50134.4
TOC	1.336	1990.000	3972.1	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	1489.521	3972.1
Nitrite	1.000	45000.000	120002.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	45000.000	120002.5
Sulfate	1.000	6270.000	16720.3	82.61	0.000	0.0	0.000	0.00	1320.000	3520.1	1320.000	17.39	7590.000	20240.4
Total		364373.960					48055.599				210438.334			
		60.93	%total solids in wash				8.04	%total solids in acid			35.19	%total solids in fusion	104.16	% mass balance
Radionuclides		**uCi/g**	**Ci/tank**	**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**		**dissolved**	**uCi/g**	**Ci/tank**
Pu-239,240		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Total alpha		0.000	0.0	0.00		0.0		0.00	0.358	954.7		100.00	0.358	954.7
Sr-90		0.000	0.0	0.00		0.0		0.00	252.000	672013.9		100.00	252.000	672013.9
Total beta		0.000	0.0	0.00		0.0		0.00	603.000	1608033.2		100.00	603.000	1608033.2
Am-241		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<4.4	0.0		#DIV/0!	0.000	0.0
Co-60		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.032	0.0		#DIV/0!	0.000	0.0
Cs-137		0.000	0.0	0.00		0.0		0.00	134.000	357340.7		100.00	134.000	357340.7
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	NA	0.0		#DIV/0!	0.000	0.0

NOTES: WHC-SD-WM-ER-613, Rev. 0, push-mode, rotary core, 1996

NR - Not Reported

1. Unlike the TCR, this total does not include the results from a drainable liquid sample. The Na and anion inventories for this tank potentially could be 2% larger than reported.
2. Acid dissolution oxide factor 2.79 (assuming 85% Al(OH)3, 15% AlOOH); fusion dissolution oxide factor 2.22 (assuming AlOOH)

NA - No analysis performed

S-111 (REDOX, EB)

Density (g/mL)	1.78
Volume (L)	2255860
Mass (kg)	4015431
Solids (ug/g)	713000
~pH	13.0

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum	1.889	14800.000	59428.4	26.55	0.000	0.0	0.000	0.00	40950.000	164431.9	77354.550	73.45	55750.000	223860.3
Barium	1.117	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<1100	0.0	0.000	#DIV/0!	0.000	0.0
Bismuth	1.115	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<2200	0.0	0.000	#DIV/0!	0.000	0.0
Boron	3.220	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<1100	0.0	0.000	#DIV/0!	0.000	0.0
Cadmium	1.142	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<110	0.0	0.000	#DIV/0!	0.000	0.0
Calcium	1.399	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<2200	0.0	0.000	#DIV/0!	0.000	0.0
Chromium	1.923	1030.500	4137.9	24.65	0.000	0.0	0.000	0.00	3149.500	12646.6	6056.489	75.35	4180.000	16784.5
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	441.500	1772.8	561.147	100.00	441.500	1772.8
Copper	1.252	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<220	0.0	0.000	#DIV/0!	0.000	0.0
Iron	1.382	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<1100	0.0	0.000	#DIV/0!	0.000	0.0
Lead	1.077	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<2200	0.0	0.000	#DIV/0!	0.000	0.0
Magnesium	1.658	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<2200	0.0	0.000	#DIV/0!	0.000	0.0
Manganese	1.582	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<220	0.0	0.000	#DIV/0!	0.000	0.0
Nickel	1.272	0.000	0.0	0.00	0.000	0.0	0.000	0.00	24.500	98.4	31.164	100.00	24.500	98.4
Phosphate	1.000	7529.000	30232.2	56.84	0.000	0.0	0.000	0.00	5716.000	22952.2	5716.000	43.16	13245.000	53184.4
Potassium	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1280.000	5139.8	2737.920	100.00	1280.000	5139.8
Silver	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<220	0.0	0.000	#DIV/0!	0.000	0.0
Sodium	1.000	191000.000	766947.3	87.21	0.000	0.0	0.000	0.00	28000.000	112432.1	28000.000	12.79	219000.000	879379.3
Strontium	1.183	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<220	0.0	0.000	#DIV/0!	0.000	0.0
Zinc	1.245	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<220	0.0	0.000	#DIV/0!	0.000	0.0
Zirconium	1.351	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<220	0.0	0.000	#DIV/0!	0.000	0.0
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	191.500	0.0	217.161	100.00	191.500	769.0
Nitrate	1.000	266900.000	1071718.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	266900.000	1071718.5
Chloride	1.000	2752.500	11052.5	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	2752.500	11052.5
Fluoride	1.000	485.800	1950.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	485.800	1950.7
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	48875.000	196254.2	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	48875.000	196254.2
TOC	1.336	1024.000	3077.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	766.467	3077.7
Nitrite	1.000	29010.000	116487.6	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	29010.000	116487.6
Sulfate	1.000	16185.000	64989.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	16185.000	64989.7
Total		579591.800					0.000				120674.430			
		81.29	%total solids in wash				0.00	%total solids in acid			16.92	%total solids in fusion	98.21	% mass balance
Radionuclides		uCi/g	Ci/tank	dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank
Gross alpha		0.000	0.0	0.00		0.0		0.00	0.013	51.6		100.00	0.013	51.6
Gross beta		0.000	0.0	0.00		0.0		0.00	138.000	554129.5		100.00	138.000	554129.5
Eu-154		0.000	0.0	0.00		0.0		0.00	0.059	236.9		100.00	0.059	236.9
Eu-155		0.000	0.0	0.00		0.0		0.00	0.262	1050.8		100.00	0.262	1050.8
Am-241		0.000	0.0	0.00		0.0		0.00	0.693	2782.7		100.00	0.693	2782.7
Co-60		0.000	0.0	0.00		0.0		0.00	0.016	64.9		100.00	0.016	64.9
Cs-137		0.000	0.0	0.00		0.0		0.00	112.000	449728.2		100.00	112.000	449728.2
Sr-90		0.000	0.0	0.00		0.0		0.00	0.000	0.0		0.00	13.900	55814.5

NOTES:
WHC-SD-WM-DP-195, Rev. 1
5/20/96 Push Mode

NR - Not Reported
NA - No Analysis Performed
<DL - Less than Detection Limit

SX-108 [REDOX sludge (boiling)]

Density (g/mL)	1.80	(assumed)
Volume (L)	329295	
Mass (kg)	592731	
Solids (ug/g)	975000	
~pH	NR	

Component	Oxide Factor	WATER ug/g sludge (element)	WATER kg/tank (element)	WATER % element dissolved	ACID ug/g sludge (element)	ACID kg/tank (element)	ACID ug/g sludge (oxide)	ACID % element dissolved	FUSION ug/g sludge (element)	FUSION kg/tank (element)	FUSION ug/g sludge (oxide)	FUSION % element dissolved	TOTAL ug/g sludge (element)	TOTAL kg/tank (element)
Aluminum (1)	2.790	6220.000	3686.8	6.90	31847.875	18877.2	88855.571	35.31	52132.125	30900.3	115733.318	57.80	90200.000	53464.3
Barium	1.117	<27	0.0	0.00	139.000	82.4	155.263	100.00	0.000	0.0	0.000	0.00	139.000	82.4
Bismuth	1.115	<54	0.0	0.00	66.400	39.4	74.036	100.00	0.000	0.0	0.000	0.00	66.400	39.4
Boron	3.220		0.0	0.00	30.300	18.0	97.566	100.00	0.000	0.0	0.000	0.00	30.300	18.0
Cadmium	1.142	<2.9	0.0	0.00	17.300	10.3	19.757	100.00	0.000	0.0	0.000	0.00	17.300	10.3
Calcium	1.399		0.0	0.00	1750.000	1037.3	2448.250	100.00	0.000	0.0	0.000	0.00	1750.000	1037.3
Chromium	1.923	6540.000	3876.5	72.11	2530.000	1499.6	4865.190	27.89	0.000	0.0	0.000	0.00	9070.000	5376.1
Cobalt	1.271	<DL	0.0	0.00	19.907	11.8	25.301	100.00	0.000	0.0	0.000	0.00	19.907	11.8
Copper	1.252	<5.4	0.0	0.00	46.800	27.7	58.594	100.00	0.000	0.0	0.000	0.00	46.800	27.7
Iron	1.382	<27	0.0	0.00	17900.000	10609.9	24737.800	100.00	0.000	0.0	0.000	0.00	17900.000	10609.9
Lead	1.077	<54	0.0	0.00	234.000	138.7	252.018	100.00	0.000	0.0	0.000	0.00	234.000	138.7
Magnesium	1.658	<54	0.0	0.00	269.000	159.4	446.002	100.00	0.000	0.0	0.000	0.00	269.000	159.4
Manganese	1.582	<5.4	0.0	0.00	5990.000	3550.5	9476.180	100.00	0.000	0.0	0.000	0.00	5990.000	3550.5
Nickel	1.272	<11	0.0	0.00	1190.000	705.3	1513.680	100.00	0.000	0.0	0.000	0.00	1190.000	705.3
Phosphate	1.000	<DL	0.0	0.00	402.000	238.3	402.000	100.00	0.000	0.0	0.000	0.00	402.000	238.3
Potassium	1.000	658.000	390.0	7.90	0.000	0.0	0.000	0.00	7672.000	4547.4	7672.000	92.10	8330.000	4937.4
Silicon (1)	2.139	1020.000	604.6	23.94	70.000	41.5	149.730	1.64	3170.000	1879.0	6780.630	74.41	4260.000	2525.0
Silver	1.000	14.900	8.8	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	14.900	8.8
Sodium	1.000	185000.000	109655.2	81.14	10000.000	5927.3	10000.000	4.39	33000.000	19560.1	33000.000	14.47	228000.000	135142.7
Strontium	1.183	<DL	0.0	0.00	563.000	333.7	666.029	100.00	0.000	0.0	0.000	0.00	563.000	333.7
Zinc	1.245	11.900	7.1	15.80	63.400	37.6	78.933	84.20	0.000	0.0	0.000	0.00	75.300	44.6
Zirconium	1.351	<DL	0.0	0.00	433.000	256.7	584.983	100.00	0.000	0.0	0.000	0.00	433.000	256.7
Uranium	1.134	<DL	0.0	0.00	0.000	0.0	0.000	0.00	7542.500	0.0	8553.195	100.00	7542.500	4470.7
Nitrate	1.000	372050.000	220525.6	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	372050.000	220525.6
Chloride	1.000	2160.000	1280.3	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	2160.000	1280.3
Fluoride	1.000	433.000	256.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	433.000	256.7
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate (2)	1.000	29200.000	17307.7	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	29200.000	17307.7
TOC	1.336	637.900	283.0	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	477.470	283.0
Nitrite	1.000	15700.000	9305.9	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	15700.000	9305.9
Sulfate	1.000	6890.000	4083.9	100.00	0.000	0.0	0.000	0.00	0.000	0.0	0.000	0.00	6890.000	4083.9
Total		626535.700					144906.883				171739.143			
		64.26	%total solids in wash				14.86	%total solids in acid			17.61	%total solids in fusion	96.74	% mass balance
Radionuclides		uCi/g	Ci/tank	dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank
Pu-239,240		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Gross alpha		0.000	0.0	0.00		0.0		0.00	3.293	1951.6		100.00	3.293	1951.6
Sr-90		0.000	0.0	0.00		0.0		0.00	3063.750	1815979.6		100.00	3063.750	1815979.6
Gross beta		0.000	0.0	0.00		0.0		0.00	6921.250	4102439.4		100.00	6921.250	4102439.4
Am-241		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0
Co-60		0.000	0.0	0.00		0.0		0.00	0.842	499.0		100.00	0.842	499.0
Cs-137		0.000	0.0	0.00		0.0		0.00	98.074	58131.7		100.00	98.074	58131.7
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	0.000	0.0		#DIV/0!	0.000	0.0

NOTES: WHC-SD-WM-DP-151, Rev. 0, Auger, Surface

1. Aluminum species such as boehmite, found in boiling REDOX waste in S-104 and silicate/aluminum silicate species are not readily dissolved in acid. Because characterization analyses were performed on water and acid dissolved samples, the aluminum and silicon total concentrations here are based on pretreatment analyses.
2. Carbonate concentration assumed based on ion balance of water dissolved species; consistent with analyzed concentration for S-104.

NR - Not Reported
NA - No Analysis Performed
<DL - Less than Detection Limit

SX-113 (REDOX w/Diatomaceous Earth)

Density (g/mL)	1.40	(assumed)
Volume (L)	98410	
Mass (kg)	137774	
Solids (ug/g)	546000	
~pH	NR	

Component	Oxide Factor	ug/g sludge (element)	kg/tank (element)	% element dissolved	ug/g sludge (element)	kg/tank (element)	ug/g sludge (oxide)	% element dissolved	LANL Direct Analysis ug/g sludge (element)	kg/tank (element)	ug/g sludge (oxide)	% element dissolved	TOTAL ug/g sludge (element)	kg/tank (element)
Aluminum	2.790	0.000	0.0	0.00	0.000	0.0	0.000	0.00	11575.200	1594.8	32294.808	100.00	11575.200	1594.8
Barium	1.117	0.000	0.0	0.00	0.000	0.0	0.000	0.00	36.527	5.0	40.801	100.00	36.527	5.0
Bismuth	1.115	0.000	0.0	0.00	0.000	0.0	0.000	0.00	4.483	0.6	4.998	100.00	4.483	0.6
Boron	3.220	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<0.2	0.0	0.000	#DIV/0!	0.000	0.0
Cadmium	1.142	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<0.2	0.0	0.000	#DIV/0!	0.000	0.0
Calcium	1.399	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2052.960	282.8	2872.091	100.00	2052.960	282.8
Chromium	1.923	0.000	0.0	0.00	0.000	0.0	0.000	0.00	61.698	8.5	118.645	100.00	61.698	8.5
Cobalt	1.271	0.000	0.0	0.00	0.000	0.0	0.000	0.00	1.870	0.3	2.377	100.00	1.870	0.3
Copper	1.252	0.000	0.0	0.00	0.000	0.0	0.000	0.00	14.032	1.9	17.568	100.00	14.032	1.9
Iron	1.382	0.000	0.0	0.00	0.000	0.0	0.000	0.00	13267.800	1828.0	18336.100	100.00	13267.800	1828.0
Lead	1.077	0.000	0.0	0.00	0.000	0.0	0.000	0.00	6.661	0.9	7.174	100.00	6.661	0.9
Magnesium	1.658	0.000	0.0	0.00	0.000	0.0	0.000	0.00	2052.960	282.8	3403.808	100.00	2052.960	282.8
Manganese	1.582	0.000	0.0	0.00	0.000	0.0	0.000	0.00	355.992	49.0	563.179	100.00	355.992	49.0
Nickel	1.272	0.000	0.0	0.00	0.000	0.0	0.000	0.00	5.842	0.8	7.431	100.00	5.842	0.8
Phosphate	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<120	0.0	0.000	#DIV/0!	0.000	0.0
Potassium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	748.020	103.1	748.020	100.00	748.020	103.1
Silicon	2.139	0.000	0.0	0.00	0.000	0.0	0.000	0.00	171990.000	23695.8	367886.610	100.00	171990.000	23695.8
Silver	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	<0.2	0.0	0.000	#DIV/0!	0.000	0.0
Sodium	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	933.660	128.6	933.660	100.00	933.660	128.6
Strontium	1.183	0.000	0.0	0.00	0.000	0.0	0.000	0.00	31.886	4.4	37.722	100.00	31.886	4.4
Zinc	1.245	0.000	0.0	0.00	0.000	0.0	0.000	0.00	62.244	8.6	77.494	100.00	62.244	8.6
Zirconium	1.351	0.000	0.0	0.00	0.000	0.0	0.000	0.00	13.268	1.8	17.925	100.00	13.268	1.8
Uranium	1.134	0.000	0.0	0.00	0.000	0.0	0.000	0.00	138.138	0.0	156.648	100.00	138.138	19.0
Nitrate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	228.228	31.4	228.228	100.00	228.228	31.4
Chloride	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	707.070	97.4	707.070	100.00	707.070	97.4
Fluoride	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Free OH	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Carbonate	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
TOC	1.336	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Nitrite	1.000	0.000	0.0	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0	0.000	#DIV/0!	0.000	0.0
Sulfate	1.000	0.000	0.0	0.00	0.000	0.0	0.000	0.00	333.060	45.9	333.060	100.00	333.060	45.9
Total		0.000					0.000				428795.417			
		0.00	%total solids in wash				0.00	%total solids in acid			78.53	%total solids in fusion	78.53	% mass balance
Radionuclides		uCi/g	Ci/tank	dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank		dissolved	uCi/g	Ci/tank
Pu-239,240		0.000	0.0	0.00		0.0		0.00	0.059	8.1		100.00	0.059	8.1
Total alpha		0.000	0.0	0.00		0.0		0.00	0.059	8.1		100.00	0.059	8.1
Sr-90		0.000	0.0	0.00		0.0		0.00	34.234	4716.6		100.00	34.234	4716.6
Tc-99		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.1	0.0		#DIV/0!	0.000	0.0
Am-241		0.000	0.0	#DIV/0!		0.0		#DIV/0!	<0.01	0.0		#DIV/0!	0.000	0.0
Co-60		0.000	0.0	#DIV/0!		0.0		#DIV/0!	NA	0.0		#DIV/0!	0.000	0.0
Cs-137		0.000	0.0	0.00		0.0		0.00	24.843	3422.7		100.00	24.843	3422.7
I-129		0.000	0.0	#DIV/0!		0.0		#DIV/0!	NA	0.0		#DIV/0!	0.000	0.0

NOTES: Preliminary data from LANL; Memo from Garfield to Powell, Numatec 8C451-97-005, Attachment 2.
Mass balance indicates that some analyzed concentration may be low, that some analyte is missing, or that the percent water analyses may be off somewhat due to the vast quantity of silica in the sample.

NR - Not Reported
NA - No Analysis Performed
<DL - Less than Detection Limit

Appendix B

Experimental Washing and Leaching Data

Summary Worksheets Used in FY 1997 Evaluation

B-104 (BiPO4 2C, EB) Experimental Results

1.3 Density (g/mL)
1404 Volume (kL)

Component	summation ug/g sample (Temer 1996)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	1310	98	1840	3.36	6	0.202	60	1.90	57
Ba	7.37	108		0.013	0	0.000	0	0.000	0
Bi	12000	98	11400	20.8	0	0.000	3	0.708	3
Ca	217	105	328	0.60	0	0.000	0	0.000	0
Cd	0.574	direct analysis		0.0010	33	0.00035	0	0.000	0
Cr	526.29		513	0.94	3	0.028	71	0.644	69
Fe	12000	104	10800	19.72	0	0.000	1	0.099	1
Mg	136	99		0.25	2	0.005	6	0.015	6
Mn	35.9	107		0.07	0	0.000	0	0.000	0
Na	(130000 direct)		117000	214	93	199		0.000	
Ni	16.9	70		0.03	2	0.001	0	0.000	0
Si	3020	67.7	5700	10.4	1	0.104	50	5.14	49
Sr	150	99		0.27	0	0.000	0	0.000	0
U	1380	94	1100	2.01	1	0.020	36	0.707	35
Zr	24.8	90		0.05	1	0.0005	1	0.001	1

Component	summation ug/g sample (Temer 1996)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	57600	105	53400	97.5	45	43.9	98	52.5	54
SO4-2			21400	39.1		0.000		0.000	
	summation uCi/g sample (Temer 1996)	% recovery	uCi/g sample (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	5.13	103		9365		0.000	99	9299	
Sr-90	10.3			18803		0.000	0	0.000	

Notes:
NR: Not Reported

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory*, PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Temer, D. J. and R. Vallarreal. 1996. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1996 Results*, LAUR96-2839, Los Alamos National Laboratory, Los Alamos, New Mexico.

B-106 (BiPO4, TPB) Experimental Results

1.34	Density (g/mL)
443	Volume (kL)

Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	3460	102	2730	1.62	28	0.454	81	0.941	58
Ba	36.6	89	40.3	0.024	0	0.000	0	0.000	0
Bi	2800	109	2560	1.52	0	0.000	1	0.018	1
Ca	2540	103	2520	1.50	0	0.000	0	0.0015	0.1
Cd	0.682	80		0.00		0.000		0.000	
Cr	283	87	273	0.16	12	0.019	75	0.106	66
Fe	17400	110	16200	9.61	0	0.000	0	0.0192	0.2
Mg	589	128	617	0.37	0	0.000	0	0.000	0
Mn	135	76	192	0.11	0	0.000	0	0.000	0
Na			115000	68.2	95	64.8	94	3.21	5
Ni	41.2	70	58.3	0.035	1	0.0003	0	0.000	0
Si	1240	90	3130	1.86	5	0.093	59	1.05	57
Sr	445	99	420	0.25	0	0.000	0	0.000	0
U	14800	104	12300	7.30	1	0.073	1	0.066	0.9
Zr	31.5	94	28	0.017	2	0.0003	0	0.000	0

Component	summation ug/g sample$_{wet}$	% recovery	ug/g sample$_{wet}$	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	72000	99	73600	43.7	60	26.2	84	14.7	34
SO4-2			15900	9.44		0.000		0.000	
	summation uCi/g sample$_{wet}$	% recovery	uCi/g sample$_{wet}$	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	28.4	103	22.7	13470	51	6870	99	6560	49
Sr-90	<100		84.3	50025	0	0.000	0	0.000	0

Notes:

Temer, D. J. and R. Villarreal. 1997. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1997 Results,* LAUR-97-2889, Los Alamos National Laboratory, Los Alamos, New Mexico.

Characterization worksheet provided in Appendix.

B-110 (BiPO4 2C, 5-6) Experimental Results

1.35 Density (g/mL)
927 Volume (kL)

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	700 - 2200		1230	1.54	0	0.000	18	0.277	18
Ba			24.6	0.03		0.000		0.000	
Bi	21000 - 25000		20100	25.2	0	0.000	0	0.000	0
Ca	870 - 1800		967	1.21	10	0.121	10	0.109	9
Cd			30	0.04		0.000		0.000	
Cr	890 - 970		972	1.22	10	0.122	53	0.584	48
Fe	20000 - 23000		19300	24.2	0	0.000		0.000	
Mg	150 - 180		191	0.24	9	0.022	0	0.000	0
Mn	72 - 130		90.3	0.11	0	0.000	0	0.000	0
Na	99000 - 140000		100000	125	93	116		0.000	
Ni			88.5	0.11		0.000		0.000	
Si	7000 - 14000		9850	12.3	28	3.45	53	4.686	38
Sr	220 - 270		217	0.27	0	0.000	0	0.000	0
U	610 - 1900		404	0.51	14	0.071	34	0.147	29
Zr			3.5	0.00		0.000		0.000	

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	54000 - 60000		52300	65.47	84	55.0	88	9.17	14
SO4-2			11300	14.15		0.000		0.000	
	range uCi/g sample (Lumetta 1994)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	14.6 - 16.0		15.1	18904	87	16446	62	1512	8
Sr-90	169 - 250		169	211569	0	0.000	0.1	212	0.1

Notes:
Less than wash, leach values entered above as zero.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Lumetta, G. J. and B. M. Rapko. 1994. *Washing and Alkaline Leaching of Hanford Sludges: A Status Report*, PNL-10078, Pacific Northwest National Laboratory, Richland, Washington.

B-111 (BiPO4 2C, 5-6) Experimental Results (1)

1.25 Density (g/mL)
893 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Rapko 1995)	% recovery	ug/g sample$_{wet}$ (Colton 1995)	MT (tank)	Wash (2) % removed initial solids	Wash (2) MT removed	Leach (2) % removed washed solids	Leach (2) MT removed	Leach (2) % leach initial solids	Oxidative Leach (3) % removed leached solids	Oxidative Leach (3) MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
Al	1480	137	1360	1.52	0	0.000	2	0.030	2	2.0	0.030
Ba	23.4	185	42.3	0.05	0	0.000	0	0.000	0		
Bi	14600	85	20200	22.55	0	0.000	0	0.000	0		
Ca	592	149	683	0.76	9	0.069	2	0.015	2	2.7	0.018
Cd	2.42		20.0	0.02	0	0.000	0	0.000	0		
Cr	950		1150	1.28	27	0.347	19	0.180	14	18.1	0.137
Fe	14500	88	16400	18.31	0	0.000	0	0.000	0	0.01	0.0018
Mg			738	0.82	0	0.000	0	0.000	0		
Mn	194	55	111	0.12	0	0.000	0	0.000	0		
Na (4)			87400	97.59	92	89.8		0.000			
Ni			18.6	0.02				0.000			
Si	9900	106	9640	10.76	3	0.323	46	4.844	45	0.2	0.011
Sr	170	81	221	0.25	0	0.000	0	0.000	0		
U	211	98	225	0.25	57	0.143	9	0.010	4		
Zr	8.06		20.5	0.02	0	0.000	0	0.000	0		

Component	summation ug/g sample$_{wet}$ (Rapko 1995)	% recovery	ug/g sample$_{wet}$ (Colton 1995)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % removed initial solids	Oxidative Leach % removed leached solids	Oxidative Leach MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
PO4-3	45600	103	45600	50.92	43	21.9	84	24.4	48		
SO4-2	11100	77	11600	12.95	92	11.9		0.000			
	summation uCi/g sample$_{wet}$ (Rapko 1995)	% recovery	uCi/g sample$_{wet}$ (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids	% removed leached solids	Ci removed
					Wash Factor		Leach Factor			Ox-L Factor	
Cs-137	140	103	158	176419	52	91738	92	77624	44		
Sr-90	240	105	496	553821	0	0.000	0	0.000	0		

Notes:

1. This worksheet includes the results from oxidative leaching tests, i.e. stoichiometric $KMnO_4$ Reaction.
2. Wash and leach tests reported in Rapko 1995.
3. Oxidative leaching test results reported in Rapko 1996.
4. Na wash factor impractical due to method of sample prep (Rapko 1995); therefore, Na wash factor based on Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL 10512, Pacific Northwest National Laboratory, Richland, Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1995. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY1995 Studies*, PNL-10712, Pacific Northwest National Laboratory, Richland Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1996. *Oxidative Dissolution of Chromium from Hanford Tank Sludges Under Alkaline Conditions*, PNNL-11233, Pacific Northwest National Laboratory, Richland, Washington.

B-201 (BiPO4 224) Experimental Results

1.25	Density (g/mL)
106	Volume (kL)

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	2600 - 3920		4850	0.64	0	0.000	28	0.180	28
Ba	104 - 200		396	0.05	0	0.000	0	0.000	0
Bi	72000 - 96000		103400	13.7	0	0.000	0	0.000	0
Ca	9600 - 12000		13800	1.83	0	0.000	1	0.018	1
Cd			39.5	0.01		0.000		0.000	
Cr	2520 - 3160		3350	0.44	34	0.151	35	0.102	23
Fe	12000 - 13600		15100	2.00	0	0.000	1	0.020	1
Mg	1320 - 1560		3410	0.45	0	0.000	0	0.000	0
Mn	18000 - 22400		23100	3.06	0	0.000	0	0.000	0
Na (1)	32000 - 40000		41500	5.50	73	4.01		0.000	
Ni				0.00		0.000		0.000	
Si	12000 - 20000		24300	3.22	8	0.258	47	1.38	43
Sr	600 - 840		930	0.12	0	0.000	0	0.000	0
U			638	0.08		0.000		0.000	
Zr	120 - 204		62.3	0.01		0.000		0.000	

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	32000 - 40000		18200	2.41	10	0.241	18	0.386	16
SO4-2			347	0.05		0.000		0.000	
	range uCi/g sample (Lumetta 1994)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	0.16 - 1.23		0.897	118.83	17	20.201	10	9.506	8
Sr-90	3.2 - 6.8		2.27	300.72	0	0.000	0	0.000	0

Notes:
Less than wash, leach values entered above as zero.

(1) Na value not reported in Lumetta 1995; therefore, Na wash factor based on Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Lumetta, G. J. and B. M. Rapko. 1994. *Washing and Alkaline Leaching of Hanford Sludges: A Status Report*, PNL-10078, Pacific Northwest National Laboratory, Richland Washington.

B-202 (BiPO4) Experimental Results

1.1 Density (g/mL)
102 Volume (kL)

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	576	92	876	0.10	0	0.000	16	0.016	16
Ba	1060	101	1780	0.20	0	0.000	0	0.000	0
Bi	63100	109	38900	4.37	0	0.000	0	0.002	0
Ca	1650		10600	1.19	0	0.003	0	0.000	0
Cd			15	0.00	0	0.000	0	0.000	0
Cr	2450	91	3320	0.37	21	0.079	10	0.030	8
Fe	4940	96	6380	0.72	0	0.000	0	0.000	0
Mg	276	107	539	0.06	0	0.000	0	0.000	0
Mn	12200	104	13300	1.50	0	0.000	0	0.000	0
Na	49400	200	37400	4.20	45	1.89	85	1.98	47
Ni			205	0.02	0	0.000	2	0.0005	2
Si	5690	97	2990	0.34	26	0.087	42	0.104	31
Sr	478	103	595	0.07	0	0.000	0	0.000	0
U	242	102	323	0.04	0	0.000	1	0.000	1
Zr			7.66	0.0009	0	0.000	0	0.000	0

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	7030	98	8430	0.95	28	0.269	22	0.146	15
SO4-2	3170	90	2050	0.23	29	0.067	26	0.042	18
	summation uCi/g sample (Temer 1995)	% recovery	uCi/g sample (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	0.0288	109	0.1	11.24	52	5.868	50	2.706	24
Sr-90	3.38	134	4.13	464.27	0	0.000	0	0.000	0

Notes:

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory*, PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Temer, D. J. and R. Villarreal. 1995. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: A Status Report*, LAUR 95-2070, Los Alamos National Laboratory, Los Alamos, New Mexico.

BX-103 (TPB/CW) Experimental Results

1.23 Density (g/mL)
235 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	103000	111	93000	26.8	1	0.268	100	26.5	99
Ba	14.5	110	13.2	0.0038	17	0.0006	7	0.0002	6
Bi	62.9	174	36.1	0.010	0	0.000	0.2	0.00002	0.2
Ca	518	111	465	0.13	1	0.001	0.6	0.0007	0.6
Cd	27.3	103	26.6	0.008	4	0.0003	0.9	0.0001	0.8
Cr	1180	89	1330	0.38	27	0.104	40	0.113	29
Fe	2850	104	2750	0.79	0	0.000	4	0.029	4
Mg	114	112	102	0.029	0	0.000	0	0.000	0
Mn	3400	96	3550	1.02	0	0.000	0	0.000	0
Na	33800		33800	9.76	77	7.5	82	1.84	19
Ni	346	66	1190	0.34	0	0.000	8	0.028	8
Si	1320	111	1190	0.34	3	0.010	40	0.132	38
Sr	70.4	109	64.7	0.019	0	0.000	0.4	0.0001	0.4
U	41500	112	37000	10.7	8	0.854	0	0.000	0
Zr	5010	88	5710	1.65	0	0.000	2	0.038	2

Component	summation ug/g sample$_{wet}$	% recovery	ug/g sample$_{wet}$	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	267	100	764	0.22	49	0.108	91	0.103	47
SO4-2			1870	0.54		0.000	0	0.000	
	summation uCi/g sample$_{wet}$	% recovery	uCi/g sample$_{wet}$	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	34.9	101	34.7	10016	98	9816	80	160	2
Sr-90	<220		209	60327	0	0.000	0	0.000	0

Notes:

Temer, D. J. and R. Villarreal. 1997. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1997 Results,* LAUR-97-2889, Los Alamos National Laboratory, Los Alamos, New Mexico.

Characterization worksheet provided in Appendix.

BX-105 (TBP, CW) Experimental Results

1.69 Density (g/mL)
174 Volume (kL)

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	147000	112	33900	9.97					
Ba			3200	0.94					
Bi	4.34	82	776	0.23					
Ca	47.7	118	6210	1.83					
Cd	0.834	140	44.3	0.01					
Cr	154	79	8650	2.55					
Fe	365	91	6250	1.84					
Mg	9.93	99	3250	0.96					
Mn	5.03	44	1490	0.44					
Na	88600	430	110000	32.4					
Ni			147	0.04					
Si	259		41500	12.2					
Sr			56.2	0.02					
U	172		4410	1.30					
Zr	1.46		335	0.10					

Data from this tank have not been included in this evaluation because of discrepancies in projected inventories derived from core samples obtained in 1986 and auger surface samples obtained in 1994. Auger samples may be representative of cladding waste, the last type of waste added to this tank. Washing and leaching tests were performed only on the auger surface sample.

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	1860		59700	17.6					
SO4-2				0.00					
	summation uCi/g sample (Temer 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	25.1		54.1	15919					
Sr-90	1.3		137	40312					

Notes:

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Temer, D. J. and R. Villarreal. 1995. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: A Status Report*, LAUR 95-2070, Los Alamos National Laboratory, Los Alamos, New Mexico.

BX-107 (BiPO4 1C, TBP) Experimental Results

1.2 Density (g/mL)
1302 Volume (kL)

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	12300	81	14300	22.3	1	0.223	68	15.0	67
Ba	5.67		9.14	0.01	0	0.000	0	0.000	0
Bi	33100	159	24100	37.7	0	0.000	0	0.000	0
Ca	194	22	1040	1.62	14	0.227	16	0.227	14
Cd	2.84		4.2	0.01	0	0.000	0	0.000	0
Cr	585	59	968	1.51	21	0.318	10	0.121	8
Fe	6840	56	11100	17.3	0	0.000	0	0.000	0
Mg	84.9	49	159	0.25	0	0.000	0	0.000	0
Mn	38	20	64.6	0.10	10	0.010	1	0.001	1
Na (1)			101000	158	67	106		0.000	
Ni			12.3	0.02		0.000		0.000	
Si	4760	55	6780	10.6	0	0.000	3	0.318	3
Sr	88.8	55	169	0.26	0	0.000	0	0.000	0
U	1990	32	2270	3.55	16	0.567	5	0.142	4
Zr	81.8		136	0.21	0	0.000	1	0.002	1

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	66600	92	70400	110	20	22.0	91	80.3	73
SO4-2	9790	114	13700	21.4	90	19.3	50	1.07	5
	summation uCi/g sample (Rapko 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	14.2	86	17.4	27187	17	4622	93	20934	77
Sr-90	7.19	72	9.87	15421	0	0.000	0	0.000	0

Notes:

(1) Na measurement impractical due to method of sample prep (Rapko 1995); therefore, Na wash factor based on Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1995. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY1995 Studies*, PNL-10712, Pacific Northwest National Laboratory, Richland Washington.

BX-109 (TBP/CW) Experimental Results

1.5	Density (g/mL)
731	Volume (kL)

Component	summation ug/g sample (Temer 1996)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	555	81	1910	2.09	61	1.28	93	0.760	36
Ba	36.1	87		0.04	0	0.000	0	0.000	0
Bi	396	78		0.43	0	0.000	0	0.001	0
Ca	2170	99	4030	4.42	0	0.000	0	0.000	0
Cd						0.000		0.000	
Cr	133	78	137	0.15	36	0.054	70	0.067	45
Fe	17500	85	21500	23.6	0	0.000	0	0.047	0
Mg	411	96	748	0.82	0	0.000	0	0.000	0
Mn	96	89		0.11	0	0.000	0	0.000	0
Na	(100000 direct)		114000	125	96	120		0.000	
Ni	51.5	94		0.06	1	0.0006		0.000	
Si	535	123	1720	1.88	12	0.226	42	0.697	37
Sr	540	96	590	0.65	0	0.000	0.1	0.0006	0.1
U	16200	81	16200	17.8	2	0.355		0.000	
Zr	606	90		0.66	0	0.000	1	0.006	1

Component	summation ug/g sample (Temer 1996)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3			66000	72.3	76	55.0	83	14.5	20
SO4-2			18800	20.6		0.000	0	0.000	
	summation uCi/g sample (Temer 1996)	% recovery	uCi/g sample (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	12.8	101	13.9	15231		0.000	100	15185	100
Sr-90	154	92.4	178	195045		0.000	0	0.000	0

Notes:

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory*, PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Temer, D. J. and R. Vallarreal. 1996. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1996 Results*, LAUR96-2839, Los Alamos National Laboratory, Los Alamos, New Mexico.

BY-104 [TBP(f), EB]

1.6	Density (g/mL)
1537	Volume (kL)

Component	summation ug/g sample (Lumetta 1996)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	14500	93	47900	118	66	77.7	97	38.9	33
Ba						0.000		0.000	
Bi	<800		79.3	0.19		0.000	0	0.000	0
Ca	350	10	1110	2.73		0.000	0	0.000	0
Cd	27.4		69.5	0.17		0.000		0.000	
Cr	5670	145	5800	14.3	70	9.98	3	0.143	1
Fe	1700		4790	11.8		0.000		0.000	
Mg						0.000		0.000	
Mn	89.3	34		0.22	0	0.000	0	0.000	
Na	250000	107	225000	553	100	553	#DIV/0!	#DIV/0!	
Ni			920	2.26		0.000	0	0.000	
Si	610	37	1494	3.67	46	1.69	37	0.735	20
Sr	380	113	1160	2.85		0.000		0.000	
U			2680	6.59		0.000	2	0.132	2
Zr	14		53	0.13	0	0.000	0	0.000	0

Component	summation ug/g sample (Lumetta 1996)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	9860	138	15700	38.6	94	36.3	17	0.386	1
SO4-2			35500	87.3		0.000		0.000	
	summation uCi/g sample (Lumetta 1996)	% recovery	uCi/g sample (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137 (1)				0.00		0.000		0.000	
Sr-90 (1)				0.00		0.000		0.000	

Notes:

(1) Radionuclides not reported.

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory*, PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Lumetta, G. J., B. M. Rapko, M. J. Wagner, and J. Liu. 1996. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY 1996 Studies*, PNNL-11278, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

BY-108 [EB/TPB(f)] Experimental Results

1.51	Density (g/mL)
672	Volume (kL)

Component	summation ug/g sample$_{wet}$ (Lumetta 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	9410	111	39800	40.4	63	25.4	24	3.63	9
Ba	155	59	124	0.13		0.000	0	0.000	0
Bi	948	60		0.00		0.000		0.000	
Ca	8060	58	3370	3.42	0	0.000	0	0.000	0
Cd	<6					0.000		0.000	
Cr	210	77	255	0.26	49	0.127	0	0.000	0
Fe	20500	59	7190	7.30		0.000	1	0.073	1
Mg	519	58	447	0.45		0.000	0	0.000	0
Mn	237	66	209	0.21		0.000	0	0.000	0
Na	165000	108	163000	165	96	159	0	0.000	0
Ni	7190	60	2510	2.55	18	0.458	0	0.000	0
Si	1530	31	1530	1.55	8	0.124	37	0.528	34
Sr	5710	63	3190	3.24	0	0.000	0	0.000	0
U	30800	57	9470	9.61	0	0.000	0	0.000	0
Zr	<30					0.000		0.000	

Component	summation ug/g sample$_{wet}$	% recovery	ug/g sample$_{wet}$	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	60900	129	30300	30.7	73	22.4	0	0.000	0
SO4-2			23400	23.7		0.000		0.000	
	summation uCi/g sample$_{wet}$	% recovery	uCi/g sample$_{wet}$	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	621	58	258	261798	3	7854	99	251326	96
Sr-90	<400	55	143	145105	0	0.000	0	0.000	0

Notes:

Lumetta, G. J., I. E. Burgeson, M. J. Wagner, J. Liu, Y. L. Chen. 1997. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY 1997 Studies*, PNNL 11636, Pacific Northwest National Laboratory, Richland, Washington.

Characterization worksheet provided in Appendix; analytical results in Tank Characterization Report indicate analyte concentrations vary from segment to segment.

BY-110 [EB, TBP(f)] Experimental Results (1)

1.5 Density (g/mL)
1506 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Lumetta 1996)	% recovery	ug/g sample$_{wet}$ (Colton 1996)	MT (tank)	Wash (2) % removed initial solids	Wash (2) MT removed	Leach (2) % removed washed solids	Leach (2) MT removed	Leach (2) % leach initial solids	Oxidative Leach (3) % removed leached solids	Oxidative Leach (3) MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
Al	36000	130	13200	29.8	94	28.0	33	0.597	2	52	0.620
Ba	108	132	58.8	0.13	0	0.000	0	0.000	0		0.000
Bi	861		931	2.10	0	0.000	0	0.000	0		0.000
Ca	10100	109	1110	2.51	0	0.000	0	0.000	0	1	0.025
Cd	16.8		22.1	0.050	0	0.000	0	0.000	0		0.000
Cr	4160	137	2780	6.28	47	2.95	2	0.063	1	94	3.071
Fe	13900		961	2.17	3	0.065	0	0.000	0	1	0.021
Mg	664		120	0.27		0.000	0	0.000	0		0.000
Mn	209	46	48.8	0.11		0.000	0	0.000	0		0.000
Na	182000	75	254000	574	98	562		0.000			0.000
Ni			301	0.68	0	0.000		0.000			0.000
Si	1450	40	685	1.55	16	0.248	56	0.727	47	33	0.189
Sr	4050	164	58.5	0.13	0	0.000	0	0.000	0		0.000
U	15300	94	4140	9.35	2	0.187	0	0.000	0	6	0.550
Zr	27.7		58.5	0.13	0	0.000	0	0.000	0		0.000

Component	summation ug/g sample$_{wet}$ (Lumetta 1996)	% recovery	ug/g sample$_{wet}$ (Colton 1996)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % removed initial solids	Oxidative Leach % removed leached solids	Oxidative Leach MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
PO4-3	21700		9840	22.23		0.000	4	0.889	4	7	1.494
SO4-2			23200	52.42		0.000		0.000			0.000
	summation uCi/g sample$_{wet}$ (Lumetta 1996)	% recovery	uCi/g sample$_{wet}$ (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids	% removed leached solids	Ci removed
					Wash Factor		Leach Factor			Ox-L Factor	
Cs-137	199	110	57.9	130833	98	128217	100	2617	2		0.000
Sr-90	298	177	58.5	132189	0	0.000	2	2644	2		0.000

Notes:

1. This updated worksheet includes the results from oxidative leaching tests.
2. Wash and leach tests reported in Lumetta 1996.
3. Oxidative leaching test results reported in Rapko 1997.

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory,* PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Lumetta, G. J., B. M. Rapko, M. J. Wagner, and J. Liu. 1996. *Washing and Causstic Leacving of Hanford Tank Sludges: Results of FY 1996 Studies,* PNNL-11278, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

Rapko, B. M., C. H. Delegard, M. J. Wagner. 1997. *Oxidative Dissolution of Chromium From Hanford Tank Sludges Under Alkaline Conditions,* PNNL-11571, Pacific Northwest National Laboratory, Richland, Washington.

C-103 (PUREX, SRS) Experimental Results

1.34	Density (g/mL)
235	Volume (kL)

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	6150	113	14500	4.56	0	0.000	48	2.19	48
Ba	463	60	4960	1.56	1	0.016	0	0.000	0
Bi	2.14		254	0.08	0	0.000	100	0.080	100
Ca	2790	40	11100	3.49	1	0.035	0	0.000	0
Cd	235	68	509	0.16	1	0.002	0	0.000	0
Cr	447	72	618	0.19	2	0.004	10	0.019	10
Fe	64600	83	86700	27.3	0	0.000	0	0.000	0
Mg	270	69	6190	1.95	3	0.058	0	0.000	0
Mn	1710		2480	0.78	0	0.000	0	0.000	0
Na (1)			50500	15.9	15	2.38		0.000	
Ni			915	0.29		0.000		0.000	
Si	10500		70600	22.2	0	0.000	1	0.222	1
Sr	61.5	79	117	0.04	0	0.000	0	0.000	0
U	2180	184	3440	1.08	73	0.790	7	0.022	2
Zr	6690	75	12200	3.84	1	0.038	0	0.000	0

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	8180	140	12500	3.93	27	1.06	55	1.57	40
SO4-2				0.00		0.000		0.000	
	summation uCi/g sample (Rapko 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor			Leach Factor	
Cs-137	103	112	59.4	18679	20	3736	30	4483	24
Sr-90	3040	79	2710	852181	0	0.000	0	0.000	0

Notes:

(1) Na measurement impractical due to method of sample prep (Rapko 1995); therefore, Na wash factor based on Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1995. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY1995 Studies*, PNL-10712, Pacific Northwest National Laboratory, Richland Washington.

C-104 (PCW/ZrCW) Experimental Results

1.2 Density (g/mL)
1117 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	36210		54400	72.9	9	6.56	97	64.1	88
Ba	118		88.9	0.12	0	0.000	0	0.0004	0.3
Bi	23.6		29.4	0.039	0	0.000	0	0.000	0
Ca	1790		1800	2.41	0	0.000	0	0.007	0.3
Cd	1010		620	0.83	0	0.000	3	0.025	3
Cr	1240		882	1.18	13	0.154	45	0.461	39
Fe	22000		16700	22.4	0	0.000	0.4	0.090	0.4
Mg	330		229	0.31	3	0.0092	0	0.000	0
Mn	3900		4230	5.67	0	0.000	0	0.000	0
Na			107500	144	88	127	98	17.0	12
Ni	509 (direct)			0.68	0	0.000	47	0.321	47
Si	4520		4970	6.66	2	0.133	44	2.86	43
Sr	63.6		52.8	0.071	0	0.000	0.1	0.0001	0.1
U	18100		32400	43.4	1	0.434	4	1.74	4
Zr	55700		39200	52.5	0	0.000	0	0.053	0.1

Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3			13100	17.6	27	4.74	85	10.9	62
SO4-2			2710	3.63		0.000		0.000	
	summation uCi/g sample$_{wet}$ (Temer 1997)	% recovery	uCi/g sample$_{wet}$ (Appendix)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	91.2	100	63.5	85083	56	47646	99	37181	44
Sr-90	<400		323	432784	0	0.000	0	0.000	0

Notes:

Temer, D. J. and R. Villarreal. 1997. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1997 Results,* LAUR-97-A19, Los Alamos National Laboratory, Los Alamos, New Mexico.

Characterization worksheet provided in Appendix.

C-105 (TBP, Sr) Experimental Results

1.55 Density (g/mL)									
568 Volume (kL)									
					Wash		Leach		
Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	% removed initial solids	MT removed	% removed washed solids	MT removed	% leach initial solids
					Wash Factor		Leach Factor		
Al	196900	116	169000	148.72	0	0.000	99	147	99
Ba	13.3	124	10.7	0.0094	0	0.000	1	0.00009	1
Bi	2.13	110		0.00		0.000		0.000	
Ca	346	65	537	0.47	0	0.000	3	0.014	3
Cd	0.698	105	0.673	0.00059	17	0.00010	7	0.00004	6
Cr	456	98	466	0.41	81	0.332	26	0.021	5
Fe	2750	84	3260	2.87	0	0.000	5	0.143	5
Mg	106	91	116	0.10	0	0.000	0	0.000	0
Mn	673	141	474	0.42	0	0.000	0	0.000	0
Na			32800	28.86	79	22.8	99	5.97	21
Ni	2090	92	2270	2.00	0	0.000	0	0.000	0
Si	7290	78	9350	8.23	1	0.082	77	6.25	76
Sr	140	120	117	0.10	0	0.000	0	0.0002	0.2
U	13900	90	15500	13.64	19	2.59	0	0.000	0
Zr	109	120	91.0	0.080	0	0.000	7	0.0056	7

					Wash		Leach		
Component	summation ug/g sample$_{wet}$	% recovery	ug/g sample$_{wet}$	MT (tank)	% removed initial solids	MT removed	% removed washed solids	MT removed	% removed initial solids
					Wash Factor		Leach Factor		
PO4-3	<5000		3740	3.29	100	3.291	#DIV/0!	#DIV/0!	
SO4-2			8940	7.87		0.000		0.000	
	summation uCi/g sample$_{wet}$	% recovery	uCi/g sample$_{wet}$	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	178	97	183	161042	54	86963	83	61196.069	38
Sr-90	<120		104	91521	0	0.000	0	0.000	0

Notes:

Temer, D. J. and R. Villarreal. 1997. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1997 Results,* LAUR-97-2889, Los Alamos National Laboratory, Los Alamos, New Mexico.

Characterization worksheet provided in Appendix.

C-107 (BiPO4 1C, CW) PNNL Scale-up Experimental Results

1.5 Density (g/mL)
897 Volume (kL)

Component	summation ug/g sample (Brooks 1996)	% recovery	ug/g sample (Temer 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	29900	85	47500	63.9	1	0.639	62	39.0	61
Ba	334	109	377	0.51	0	0.000	2	0.010	2
Bi	6900	104	11300	15.2	0	0.000	3	0.418	3
Ca	750	92	440	0.59	0	0.000	1	0.006	1
Cd	62.1	92	45.7	0.06	0	0.000	0	0.000	0
Cr	621	102	319	0.43	37	0.159	43	0.116	27
Fe	49220	104	41800	56.2	0	0.000	0	0.006	0.01
Mg	506	130	220	0.30	0	0.000	25	0.074	25
Mn	2390	103	1310	1.76	0	0.000	0	0.000	0
Na (1)			63700	85.7	23	19.7	95	62.6	73
Ni	2020	105	2350	3.16	0	0.000	0	0.000	0
Si	12200	114	8180	11.0	4	0.440	10	1.10	10
Sr	143	116	170	0.23	0	0.000	4	0.009	4
U	7410	112	10600	14.3	24	3.42	8	0.856	6
Zr	1740	151	1180	1.59	0	0.000	3	0.048	3

Component	summation ug/g sample (Brooks 1996)	% recovery	ug/g sample (Temer 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	30636	84	49500	66.61	52	34.635	79	25.3	38
SO4-2			5880	7.91		0.000		0.000	
	summation uCi/g sample (Brooks 1996)	% recovery	uCi/g sample (Temer 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
	(Brooks 1996)				Wash Factor		Leach Factor		
Cs-137	47.4	81	34.1	45884	37	16977	54	15601	34
Sr-90	3550 (total beta)		2490	3350463	0.5	16752	1	18093	0.5

Notes:

(1) Sodium wash and leach factor data from LANL experimental results reported in Colton (1996).

Component inventories derived from Temer 1996 (mass balance 95% vs PNNL mass balance of 85%); updated characterization worksheet provided in Appendix.

Brooks, K. P., J. R. Philips, R. L. Meyers, K. G. Rappe, D. R. Rector, P. A. Smith. 1996. Letter report prepared for Westinghouse Hanford Company: TWRS Low-Level Waste Addback Program, Sludge Pretreatment Studies Using Hanford Tank C-107, Pacific Northwest National Laboratory, Richland, Washington.

Temer, D. J. and R. Vallarreal. 1996. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1996 Results*, LAUR96-2839, Los Alamos National Laboratory, Los Alamos, New Mexico.

C-108 [TBP(f), 1C] Experimental Results

1.3	Density (g/mL)
250	Volume (kL)

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	77400	119	52100	16.9	3	0.513	93	15.3	91
Ba				0.00		0.000		0.000	
Bi				0.00		0.000		0.000	
Ca			12700	4.13	0	0.009	0	0.000	0
Cd				0.00		0.000		0.000	
Cr	189	78	NR	0.06	76	0.047	18	0.003	4
Fe	4900	153	7160	2.33	9	0.202	13	0.278	12
Mg	187	88		0.06	1	0.001	0	0.000	0
Mn	28.6			0.01	1	0.000	1	0.000	1
Na	75700	95	94100	30.6	62	19.0	95	11.010	36
Ni	9720	128		3.16	0	0.015	0	0.001	0
Si	1910	110		0.62	3	0.016	12	0.072	12
Sr	195	134		0.06	0	0.000	0	0.000	0
U	2790	121	421	0.14	10	0.014	1	0.001	1
Zr				0.00		0.000		0.000	

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1996)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	76800	100	77700	25.3	75	18.9	0	0.013	0
SO4-2	5590	94	6690	2.17	94	2.04	7	0.009	0.4
	summation uCi/g sample (Temer 1995)	% recovery	uCi/g sample (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	250.69	95	118	38350	4	1534.000	100	36789.155	96
Sr-90	24.7	143		8028	0	0.000	0	0.000	0

Notes:

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory*, PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Temer, D. J. and R. Villarreal. 1995. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: A Status Report*, LAUR 95-2070, Los Alamos National Laboratory, Los Alamos, New Mexico.

C-109 [TBP(f), BiPO4 1C] Experimental Results

1.2 Density (g/mL)
235 Volume (kL)

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	54000 - 140000		122000	34.36	5	1.72	80	26.1	76
Ba	120 - 250		64.3	0.02	0	0.000	0	0.000	0
Bi	1900 - 4600		12300	3.46		0.000		0.000	0
Ca	8000 - 13000		19800	5.58	1	0.056	1	0.056	1
Cd			10	0.00		0.000		0.000	
Cr	340 - 450		245	0.07	70	0.048	50	0.010	15
Fe	9100 - 16000		18900	5.32	4	0.213	1	0.053	1
Mg	240 - 970		491	0.14	0	0.000	0	0.000	0
Mn	810 - 1400		123	0.03	0	0.000	0	0.000	0
Na	57000		84200	23.71	76	18.02	0	0.000	
Ni			13300	3.75		0.000		0.000	
Si	5400 - 49000		9040	2.55	3	0.076	13	0.331	13
Sr	140 - 290		186	0.05	0	0.000	0	0.000	0
U	7300 - 19000		8490	2.39	0	0.000	0	0.000	0
Zr	120 - 400		Estimate	0.07	0	0.000	0	0.000	0

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	22200 - 28800		58600	16.5	30	4.95	17	1.98	12
SO4-2			6950	1.96		0.000		0.000	
	range uCi/g sample (Lumetta 1994)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	405 - 4170		715	201347	5	10067	98	187253	93
Sr-90	610 - 1640		1055	297092	0	0.000	1	2971	1

Notes:

Less than wash, leach values entered above as zero.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Lumetta, G. J. and B. M. Rapko. 1994. *Washing and Alkaline Leaching of Hanford Sludges: A Status Report*, PNL-10078, Pacific Northwest National Laboratory, Richland Washington.

C-112 [TBP(f), BiPO4 1C] Experimental Results

1.5	Density (g/mL)
394	Volume (kL)

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	4500 - 11000		18100	10.7	25	2.67	80	6.41	60
Ba	36 - 290		86.9	0.05	0	0.000	0	0.000	0
Bi	760 - 12000		6400	3.78	0	0.000	0	0.000	0
Ca	11000 - 26000		24700	14.6	1	0.146	0	0.000	0
Cd			5.5	0.00		0.000		0.000	
Cr	270 - 1400		251	0.15	48	0.071	77	0.059	40
Fe	18000 - 68000		24400	14.4	2	0.288	4	0.576	4
Mg	170 - 5400		563	0.33	0	0.000	0	0.000	0
Mn	160 - 770		236	0.14	0	0.000	0	0.000	0
Na	160000		118000	69.7	72	50.2	46	9.058	13
Ni			14200	8.38		0.000		0.000	
Si	980 - 28000		2550	1.51	4	0.060	14	0.196	13
Sr	370 - 920		319	0.19	0	0.000	0	0.000	0
U	99000 - 240000		59700	35.3	0	0.000	0	0.000	0
Zr	60 - 1800		25.7	0.02	0	0.000	0	0.000	0

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	126000 - 177000		88100	52.0	45	23.4	71	20.3	39
SO4-2			14700	8.68		0.000		0.000	
	range uCi/g sample (Lumetta 1994)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	870 - 27000		795	469416	4	18777	98	441251	94
Sr-90	68 - 250		2000	1180920	0	0.000	1	11809	1

Notes:

Less than wash, leach values entered above as zero.

Bi value based on average of values reported in Lumetta 1994; no value reported in characterization report used for Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Lumetta, G. J. and B. M. Rapko. 1994. *Washing and Alkaline Leaching of Hanford Sludges: A Status Report*, PNL-10078, Pacific Northwest National Laboratory, Richland Washington.

S-101 [REDOX (boiling), EB] Experimental Results

1.65 Density (g/mL)
1616 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Lumetta 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	78900	90	88900	237	12	28.4	95	199.1	84
Ba	<200			0.00		0.000		0.000	
Bi				0.00		0.000		0.000	
Ca	474	61	435	1.16	7	0.081	28	0.302	26
Cd			3.93	0.010		0.000			
Cr	3820	90	5230	13.9	44	6.14	80	6.276	45
Fe	1120	87	1200	3.20	0	0.000	9	0.288	9
Mg	462			1.23		0.000		0.000	
Mn	1410	83	1700	4.53	0	0.000	0	0.000	0
Na	116000	110	191000	509	97	494	0	0.000	0
Ni	149		79	0.21	2	0.004	0	0.000	0
Si	1180	74	2350	6.27	40	2.51	52	1.943	31
Sr	223	76	289	0.77	0	0.000	1	0.0077	1
U	4390	77	5190	13.8	0	0.000	1	0.138	1
Zr	<30		25.6	0.068		0.000		0.000	

Component	summation ug/g sample$_{wet}$	% recovery	ug/g sample$_{wet}$	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	3680	89	4410	11.8	87	10.2	77	1.18	10
SO4-2			7590	20.2		0.000		0.000	
	summation uCi/g sample$_{wet}$	% recovery	uCi/g sample$_{wet}$	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	92	112	134	357341	97	346620	100	10720	3
Sr-90	185	70	252	672014	0	0.000	0	0.000	0

Notes:

Lumetta, G. J., I. E. Burgeson, M. J. Wagner, J. Liu, Y. L. Chen. 1997. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY 1997 Studies*, PNNL 11636, Pacific Northwest National Laboratory, Richland, Washington.

Characterization worksheet provided in Appendix.

S-104 (REDOX) PNNL Experimental Results (1)

1.5	Density (g/mL)
1109	Volume (kL)

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash (2) % removed initial solids	Wash (2) MT removed	Leach (2,3) % removed washed solids	Leach (2,3) MT removed	Leach (2,3) % leach initial solids
					Wash Factor		Leach Factor		
Al	115000	118	118000	196	3	5.89	99	188	96
Ba	38.7	99	33.3	0.06	0	0.000	0	0.000	0
Bi	17.2			0.03	0	0.000	0	0.000	0
Ca	610	42	1910	3.18	21	0.667	20	0.508	16
Cd				0.00		0.000		0.000	
Cr	2670	87	4290	7.14	90	6.42	90	0.642	9
Fe	2610	118	2490	4.14	0	0.000	2	0.083	2
Mg	86	66	53.5	0.09	0	0.000	0	0.000	0
Mn	1550	108	1090	1.81	0	0.000	3	0.054	3
Na (4)			119000	198	76	150	96	45.5	23
Ni			56	0.09		0.000	34	0.032	34
Si	1090	25	1460	2.43	0	0.000	45	1.09	45
Sr	474		418	0.70	0	0.000	3	0.021	3
U	7630	116	6620	11.0	0	0.000	0	0.000	0
Zr	34.4		645	1.07	0	0.000	0	0.000	0

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % removed initial solids
					Wash Factor		Leach Factor		
PO4-3			289	0.48	<45	0.000		0.000	
SO4-2	1240	9	2370	3.94	100	3.94	#DIV/0!	#DIV/0!	
	summation uCi/g sample (Rapko 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	57.1	96	63.2	105134	90	94620	80	8411	8
Sr-90	351	110	303	504043		0.000	0	0.000	0

Notes:

1. Modified enhanced sludge leach, i.e., ~8 h first leach.
2. Wash and leach tests reported in Rapko 1995.
3. Modified leaching test results reported in Lumetta 1997.
4. Na measurement impractical due to method of sample prep (Rapko 1995); therefore, Na wash factor based on Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Lumetta, G. J., I. E. Burgeson, M. J. Wagner, J. Liu, Y. L. Chen. 1997. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY 1997 Studies*, PNNL 11636, Pacific Northwest National Laboratory, Richland, Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1995. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY1995 Studies*, PNL-10712, Pacific Northwest National Laboratory, Richland Washington.

S-107 (R-RCW/EB) Experimental Results (1)

1.4 Density (g/mL)
1370 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Lumetta 1996)	% recovery	ug/g sample$_{wet}$ (Colton 1996)	MT (tank)	Wash (2) % removed initial solids	Wash (2) MT removed	Leach (2) % removed washed solids	Leach (2) MT removed	Leach (2) % leach initial solids	Oxidative Leach (3) % removed leached solids	Oxidative Leach (3) MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
Al	127000	99	125000	240	8	19.182	71	156	65	36	23.3
Ba	24.8	103	21.3	0.04		0.000		0.000			0.000
Bi			42.7	0.08		0.000	12	0.010	12		0.000
Ca	1370	127	523	1.00	14	0.140	29	0.251	25	27	0.165
Cd			3.98	0.01		0.000		0.000			0.000
Cr	3510	96	2840	5.45	24	1.31	39	1.63	30	80	2.00
Fe	2520	96	2280	4.37	0	0.000	3	0.131	3		0.000
Mg	195		133	0.26	11	0.028	27	0.061	24		0.000
Mn	677	88	587	1.13	0	0.000	0	0.000	0		0.000
Na	63400	65	92700	178	93	165		0.000			0.000
Ni			797	1.53		0.000		0.000		8	0.122
Si	6590	151	4540	8.71	44	3.83	80	3.92	45	45	0.431
Sr	300	102	234	0.45		0.000	0	0.000	0		0.000
U	6950	81	7380	14.2	0	0.000	4	0.566	4		0.000
Zr	10200	173	5300	10.2	0	0.000	0	0.000	0		0.000

Component	summation ug/g sample$_{wet}$ (Lumetta 1996)	% recovery	ug/g sample$_{wet}$ (Colton 1996)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % removed initial solids	Oxidative Leach % removed leached solids	Oxidative Leach MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
PO4-3	7880	293	6320	12.1	91	11.0	78	0.849	7		0.000
SO4-2			2790	5.35		0.000		0.000			0.000
	summation uCi/g sample$_{wet}$ (Lumetta 1996)	% recovery	uCi/g sample$_{wet}$ (Colton 1996)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids	% removed leached solids	Ci removed
					Wash Factor		Leach Factor			Ox-L Factor	
Cs-137	83.6	97	78.2	150006	77	115505	100	34501	23		0.000
Sr-90	134	95	174	333773	0	0.000	0	0.000	0		0.000

Notes:

1. This worksheet includes the results from oxidative leaching tests.
2. Wash and leach tests reported in Lumetta 1996.
3. Oxidative leaching test results reported in Rapko 1997.

Colton, N. G. 1996. *Status Report: Pretreatment Chemistry Evaluation--Wash and Leach Factors for the Single-shell Tank Waste Inventory,* PNNL-11290, Pacific Northwest National Laboratory, Richland, Washington.

Lumetta, G. J., B. M. Rapko, M. J. Wagner, and J. Liu. 1996. *Washing and Causstic Leacving of Hanford Tank Sludges: Results of FY 1996 Studies,* PNNL-11278, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

Rapko, B. M., C. H. Delegard, M. J. Wagner. 1997. *Oxidative Dissolution of Chromium From Hanford Tank Sludges Under Alkaline Conditions,* PNNL-11571, Pacific Northwest National Laboratory, Richland, Washington.

S-111 (REDOX, EB) Experimental Results

1.78	Density (g/mL)
2256	Volume (kL)

Component	summation ug/g sample$_{wet}$ (not reported)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % leach initial solids
Al			55750	223.86	10	22.4	100	201	90
Ba				0.00		0.000		0.000	
Bi				0.00		0.000		0.000	
Ca				0.00		0.000		0.000	
Cd				0.00		0.000		0.000	
Cr			4180	16.78	18	3.02	98	13.4	80
Fe			45	0.18	7	0.013	52	0.087	48
Mg				0.00		0.000		0.000	
Mn				0.00		0.000		0.000	
Na			219000	879.38	percentage of Na in each solution not tracked				
Ni			24.5	0.10	100	0.098	0	0.000	
Si			1280	5.14	46	2.36	78	2.16	42
Sr				0.00		0.000		0.000	
U			192	0.77	27	0.208	71	0.401	52
Zr				0.00		0.000		0.000	

Component	summation ug/g sample$_{wet}$ (not reported)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % removed initial solids
PO4-3			13200	53.0	100	53.0	0	0.000	
SO4-2			16200	65.0		0.000		0.000	
	summation uCi/g sample$_{wet}$ (not reported)	% recovery	uCi/g sample$_{wet}$ (Appendix)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
Cs-137			112	449728	48	215870	92	215870	48
Sr-90			13.9	55814	0	0.000	52	29024	52

Notes:

Lumetta, G. J., I. E. Burgeson, M. J. Wagner, J. Liu, Y. L. Chen. 1997. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY 1997 Studies*, PNNL 11636, Pacific Northwest National Laboratory, Richland, Washington.

Characterization worksheet provided in Appendix.

SX-108 [REDOX sludge (boiling)] Experimental Results (1)

1.8 Density (g/mL)
329 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Lumetta 1996)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash (2) % removed initial solids	Wash (2) MT removed	Leach (2) % removed washed solids	Leach (2) MT removed	Leach (2) % leach initial solids	Oxidative Leach (3) % removed leached solids	Oxidative Leach (3) MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
Al	131000	149	90200	53.5	6	3.21	24	12.3	23	18	6.83
Ba	188	138	139	0.08	0	0.000	0	0.000	0		0.000
Bi	141		66.4	0.04	-	0.000		0.000			0.000
Ca	3930	46	1750	1.04	1	0.010	1	0.010	1	8	0.081
Cd	407	101	17.3	0.01		0.000		0.000			0.000
Cr	9060	117	9070	5.38	71	3.82	24	0.376	7	45	0.532
Fe	2480	155	17900	10.6	0	0.000	0	0.000	0		0.000
Mg	440	90	269	0.16	6	0.010	0	0.000	0		0.000
Mn	7310	143	5990	3.55	0	0.000	0	0.000	0		0.000
Na	78600	35	228000	135	96	130	25	1.35	1		0.000
Ni	1638	89	1190	0.71	1	0.007	0	0.000	0		0.000
Si	4030	97	4260	2.53	0	0.000	9	0.227	9	31	0.712
Sr	761	141	563	0.33	0	0.000	0	0.000	0		0.000
U	7360	50	7540	4.47	0	0.000	0	0.000	0		0.000
Zr	380	494	433	0.26	0	0.000	0	0.000	0		0.000

Component	summation ug/g sample$_{wet}$ (Lumetta 1996)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash % removed initial solids	Wash MT removed	Leach % removed washed solids	Leach MT removed	Leach % removed initial solids	Oxidative Leach % removed leached solids	Oxidative Leach MT removed
					Wash Factor		Leach Factor			Ox-L Factor	
PO4-3	1210	37	402	0.24	9	0.021	0	0.000			0.000
SO4-2			6890	4.08		0.000		0.000			0.000
	summation uCi/g sample$_{wet}$ (Lumetta 1996)	% recovery	uCi/g sample$_{wet}$ (Appendix)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids	% removed leached solids	Ci removed
					Wash Factor		Leach Factor			Ox-L Factor	
Cs-137	133	301	98.1	58147	63	36633	65	13955	24		0.000
Sr-90	3920	43	3060	1813757	0	0.000	0	0.000	0		0.000

Notes:

1. This worksheet includes the results from oxidative leaching tests, i.e. $KMnO_4$ in 3*M* NaOH.
2. Wash and leach tests reported in Lumetta 1996..
3. Oxidative leaching test results reported in Rapko 1997.

Lumetta, G. J., B. M. Rapko, M. J. Wagner, J. Liu, Y. L. Chen. 1996. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY 1996 Studies,* PNNL-11278 Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

Rapko, B. M., C. H. Delegard, M. J. Wagner. 1997. *Oxidative Dissolution of Chromium From Hanford Tank Sludges Under Alkaline Conditions,* PNNL-11571, Pacific Northwest National Laboratory, Richland, Washington.

Characterization worksheet provided in Appendix.

SX-113 (REDOX w/Diatomaceous Earth) Experimental Results

1.4 Density (g/mL)
98 Volume (kL)

Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	15000	129	11600	1.60	1	0.016	89	1.41	88
Ba	29.5	81	36.5	0.0050	1	0.00005	1	0.00006	1
Bi	1.11	25	4.48	0.0006	1	0.00001	24	0.00015	24
Ca	1840	90	2050	0.28	4	0.011	2	0.0042	2
Cd	0.123			0.00002		0.000	0	0.000	
Cr	55.1	90	61.7	0.0085	2	0.00017	39	0.0032	38
Fe	11400	86	13300	1.83	1	0.018	9	0.165	9
Mg	1780	87	2050	0.28	3	0.0085	0	0.000	0
Mn	387	109	356	0.049	2	0.0010	4	0.0020	4
Na			934	0.13	73	0.094	100	0.035	27
Ni	6.33	108	5.84	0.00080		0.000	0	0.000	0
Si	196000	114	172000	23.7	2	0.474	97	22.5	95
Sr	19.3	61	31.9	0.004	2	0.00009	3	0.00013	3
U	130	94	138	0.019	3	0.00057	9	0.0017	9
Zr	10.5	79	13.3	0.0018	1	0.00002	16	0.00029	16

Component	summation ug/g sample$_{wet}$ (Temer 1997)	% recovery	ug/g sample$_{wet}$ (Appendix)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	<30		<120	0.00		0.000		0.000	
SO4-2			333	0.046		0.000		0.000	
	summation uCi/g sample$_{wet}$ (Temer 1997)	% recovery	uCi/g sample$_{wet}$ (Appendix)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	24.3	97.7	24.8	3417	3	103	81	2699	79
Sr-90	34.5	101	34.2	4712	3	141	0	0.000	0

Notes:

Temer, D. J. and R. Villarreal. 1997. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1997 Results,* LAUR-97-2889, Los Alamos National Laboratory, Los Alamos, New Mexico.

Characterization worksheet provided in Appendix.

T-104 (BiPO4 1C) LANL Experimental Results

1.15 Density (g/mL)
1673 Volume (kL)

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	15900	102	16200	31.2	1	0.293	63	19.5	63
Ba	8.5	100	8.8	0.02	1	0.000	0	0.000	0
Bi	15200	127	18900	36.4	0	0.000	0	0.087	0
Ca	147	125	664	1.28	4	0.045	6	0.070	6
Cd			5.53	0.01	0	0.000	13	0.001	13
Cr	735	117	916	1.76	17	0.300	40	0.585	33
Fe			9020	17.4	0	0.000	0	0.000	0
Mg			159	0.31	0	0.000	0	0.000	0
Mn			59.6	0.11	0	0.000	0	0.000	0
Na	158000	269	64500	124	25	31.3	95	88.4	71
Ni			12.7	0.02	0	0.000	2	0.001	2
Si	3400	72	6440	12.4	42	5.18	38	2.77	22
Sr	82.3	105	98.8	0.19	0	0.000	0	0.000	0
U	835	93	867	1.67	1	0.010	14	0.233	14
Zr	144	94	69.1	0.13	1	0.001	0	0.000	0

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	65200	110	73900	142	27	37.7	100	105	74
SO4-2			3890	7.48	60	4.46	20	0.598	8
	summation uCi/g sample (Temer 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	0.135	94		260	12	31.9	18	41.6	16
Sr-90	1.24	70	2.61	5021	0	0.000	0	0.000	0

Notes:

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Temer, D. J. and R. Villarreal. 1995. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: A Status Report*, LAUR 95-2070, Los Alamos National Laboratory, Los Alamos, New Mexico.

T-104 (BiPO4 1C) PNNL Experimental Results

1.15	Density (g/mL)
1673	Volume (kL)

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	12600	91	16200	31.2	1	0.312	62	19.012	61
Ba	10.2		6.8	0.02	0	0.000	0	0.000	0
Bi	16100	105	18900	36.4	0	0.000	0	0.000	0
Ca	357	94	664	1.28	23	0.294	5	0.051	4
Cd			5.53	0.01		0.000		0.000	
Cr	914	101	916	1.76	17	0.300	12	0.176	10
Fe	8610	105	9020	17.4	0	0.000	0	0.000	0
Mg	73	83	159	0.31	0	0.000	0	0.000	0
Mn	108	61	59.6	0.11	0	0.000	0	0.000	0
Na (1)			64500	124	72	89.3	0	0.000	
Ni			12.7	0.02		0.000		0.000	
Si	5600	83	6440	12.4	0	0.000	1	0.124	1
Sr	97.6		98.8	0.19	0	0.000	0	0.000	0
U	1190		867	1.67	1	0.017	8	0.133	8
Zr	36.6		69.1	0.13	0	0.000	1	0.001	1

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3 (2)	60400	100	73900	142	26	37.0	97	102	72
SO4-2	3580		3890	7.48	89	6.66		0.000	
	summation uCi/g sample (Rapko 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	0.181	26		348	0	0.000	69	240	69
Sr-90	3.78	103	2.61	5021	0	0.000	1	50.2	1

Notes:

(1) Na measurement impractical due to method of sample prep (Rapko 1995); therefore, Na wash factor based on Colton 1995.

(2) PO4 leach factor based on additional studies performed at PNNL.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1995. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY1995 Studies*, PNL-10712, Pacific Northwest National Laboratory, Richland Washington.

T-107 (TBP(f), BiPO4 1C) Experimental Results

1.5	Density (g/mL)
655	Volume (kL)

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	30900	109	16300	16.0	4	0.570	77	11.9	74
Ba	46			0.05	0	0.000	0	0.000	0
Bi	13500		12000	11.8	0	0.004	0	0.041	0
Ca	635	111	761	0.75	0	0.000	0	0.000	0
Cd				0.00	0	0.000	0	0.000	0
Cr	337	94	360	0.35	42	0.148	32	0.066	19
Fe	26300	116	31500	30.9	0	0.025	0	0.006	0
Mg			226	0.22	0	0.000	0	0.000	0
Mn			221	0.22	0	0.000	0	0.000	0
Na	82000	68	130000	128	51	65.1	78	48.6	38
Ni			290	0.28	1	0.002	0	0.000	0
Si	5000	82	6060	5.95	28	1.65	6	0.276	5
Sr	835	110	962	0.94	0	0.000	0	0.000	0
U	18800	94	25400	24.9	4	0.943	0	0.077	0
Zr			93.2	0.09	1	0.001	0	0.000	0

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	84700	104	96200	94.5	85	80.3	87	12.4	13
SO4-2	9750	71	10600	10.4	79	8.23		0.000	0
	summation uCi/g sample (Temer 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	6.4	82	21.5	21117	25	5227	88	13919	66
Sr-90	103	118	109	107061	0	53.5	0	0.000	0

Notes:

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Temer, D. J. and R. Villarreal. 1995. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: A Status Report*, LAUR 95-2070, Los Alamos National Laboratory, Los Alamos, New Mexico.

T-111 (BiPO42C, BiPO4 224) Experimental Results

1.1	Density (g/mL)
1715	Volume (kL)

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	883	75	570	1.08	0	0.000	13	0.140	13
Ba	44.4	93	69	0.13	0	0.000	0	0.000	0
Bi	14800	98	25900	48.8	0	0.000	0	0.000	0
Ca	2980	78	2420	4.56	0	0.000	1	0.046	1
Cd	8.06	67		0.02	0	0.000	0	0.000	0
Cr	1180	109	1970	3.72	24	0.892	53	1.49	40
Fe	17500	122	18500	34.9	0	0.000	0	0.000	0
Mg	566	118	377	0.71	0	0.000	0	0.000	0
Mn	12900	102	6330	11.9	0	0.000	0	0.000	0
Na (1)			37000	69.8	89	62.1		0.000	
Ni			131	0.25		0.000		0.000	
Si	11300	100	5670	10.7	20	2.14	50	4.28	40
Sr	175	107	298	0.56	0	0.000	0	0.000	0
U	5420	100	2800	5.28	0	0.000	2	0.106	2
Zr	16.1		4	0.01	0	0.000	0	0.000	0

Component	summation ug/g sample (Rapko 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	18900	101	31300	59.0	50	29.5	46	13.6	23
SO4-2	4130	86	3670	6.92	64	4.430		0.000	
	summation uCi/g sample (Rapko 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	0.326	118	0.166	313	25	78.3	41	97.1	31
Sr-90	10.8	109	5.42	10222	0	0.000	0	0.000	0

Notes:

(1) Na measurement impractical due to method of sample prep (Rapko 1995); therefore, Na wash factor based on Colton 1995.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Rapko, B. M., G. J. Lumetta, M. J. Wagner. 1995. *Washing and Caustic Leaching of Hanford Tank Sludges: Results of FY1995 Studies*, PNL-10712, Pacific Northwest National Laboratory, Richland Washington.

TY-104 [TBP, BiPO4 1C(f)] Experimental Results

1.69	Density (g/mL)
163	Volume (kL)

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	17300	94	9090	2.50	9	0.228	60	1.35	54
Ba	75.7	91		0.02	0	0.000	0	0.000	0
Bi	27000	60	17700	4.87	0	0.002	1	0.038	1
Ca	748	92		0.21	1	0.002	0	0.000	0
Cd	9.03	92	12.8	0.00	0	0.000	0	0.000	0
Cr	1360	83	2310	0.64	72	0.460	50	0.087	14
Fe	26000	88	32600	8.97	1	0.058	0	0.008	0
Mg	286	93		0.08	1	0.001	0	0.000	0
Mn	263	128	2090	0.57	0	0.000	0	0.001	0
Na	264000	258	113000	31.1	41	12.7	93	17.1	55
Se				0.00		0.000		0.000	
Si	6790	114	8090	2.23	55	1.22	13	0.132	6
Sr	619	149		0.17	0	0.000	0	0.000	0
U	28000	94	19500	5.36	1	0.034	0	0.008	0
Zr	192	91	181	0.05	0	0.000	0	0.000	0

Component	summation ug/g sample (Temer 1995)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	83300	160	78600	21.6	83	18.0	19	0.688	3
SO4-2	3450	121	5230	1.44	90	1.30		0.000	
	summation uCi/g sample (Temer 1995)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	50.3		45.4	12489	41	5081	22	1599	13
Sr-90	144		132	36312	0	0.000	0	0.000	0

Notes:

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Temer, D. J. and R. Vallarreal. 1996. *Sludge Washing and Alkaline Leaching Tests on Actual Hanford Tank Sludge: FY 1996 Results*, LAUR96-2839, Los Alamos National Laboratory, Los Alamos, New Mexico.

U-110 (BiPO4 1C, RCW) Experimental Results

1.5 Density (g/mL)
704 Volume (kL)

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % leach initial solids
					Wash Factor		Leach Factor		
Al	111000 - 155000		168000	177	1	1.77	83	145	82
Ba	54.7 - 1330		52	0.055	0	0.000	0	0.000	0
Bi	5920 - 7400		13900	14.7	0	0.000	0	0.000	0
Ca	740 - 5250		2850	3.01	0	0.000	0	0.000	0
Cd			16	0.02		0.000		0.000	
Cr	155 - 962		612	0.65	68	0.439	16	0.032	5
Fe	5770 - 14800		10100	10.7	0	0.000	0	0.000	0
Mg	15 - 437		1360	1.44	0	0.000	0	0.000	0
Mn	2000 - 3770		2360	2.49		0.000	0	0.000	0
Na	81400 - 370000		109000	115	69	79.4	0	0.000	
Ni				0.00		0.000		0.000	
Si	5250 - 13300		10900	11.5	5	0.576	4	0.460	4
Sr	252 - 481		402	0.42		0.000		0.000	0
U	311 - 13300		8520	9.00	0	0.000	0	0.000	0
Zr	104 - 660		219	0.23	0	0.000	0	0.000	0

Component	range ug/g sample (Lumetta 1994)	% recovery	ug/g sample (Colton 1995)	MT (tank)	Wash: % removed initial solids	Wash: MT removed	Leach: % removed washed solids	Leach: MT removed	Leach: % removed initial solids
					Wash Factor		Leach Factor		
PO4-3	15500 - 42200		43900	46.4	90	41.7	80	3.71	8
SO4-2			1290	1.36		0.000		0.000	
	range uCi/g sample (Lumetta 1994)	% recovery	uCi/g sample (Colton 1995)	Ci (tank)	% removed initial solids	Ci removed	% removed washed solids	Ci removed	% removed initial solids
					Wash Factor		Leach Factor		
Cs-137	13.9 - 38.6		17.7	18691	7	1308	14	2430	13
Sr-90	222 - 411		261	275620	0	0.000	1	2756	1

Notes:

Cr concentration has been adjusted from reported value of 391 ug/g in Colton 1995.
Less than wash, leach values entered above as zero.

Colton, N. G. 1995. *Sludge Pretreatment Chemistry Evaluation: Enhanced Sludge Washing Separation Factors*, PNL-10512, Pacific Northwest National Laboratory, Richland Washington.

Lumetta, G. J. and B. M. Rapko. 1994. *Washing and Alkaline Leaching of Hanford Sludges: A Status Report*, PNL-10078, Pacific Northwest National Laboratory, Richland Washington.

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