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Test Plan for Tank 241-AZ-101 Solubility Screening Tests

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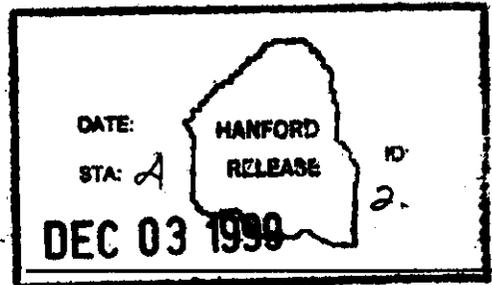
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Abstract: Tank 241-AZ-101 (101-AZ) has been identified as one of the early tanks to be retrieved for waste pretreatment and immobilization. Retrieval of the tank waste from other tanks may require dilution. This test is to determine the effects of dilution on the mass of solids and their composition, which can be compared with tanks where dilution is required. This test plan gives test instructions, example data sheets, a waste compatibility review, and a waste stream fact sheet.

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LIST OF TERMS

101-AZ	Tank 241-AZ-101
AT	total alpha
DQO	data quality objective
G	gravity
g	gram
gal	gallon
GEA	gamma energy analysis
IC	ion chromatography
ICP	inductively-coupled plasma
L	liter
mL	milliliter
NHC	Numatec Hanford Corporation
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
PNNL	Pacific Northwest National Laboratory
QA	quality assurance
SAP	sampling and analysis plan
TIC	total inorganic carbon (C present as CO_3^{2-})
TOC	total organic carbon
vol%	volume percent
wt%	weight percent

1.0 INTRODUCTION

Tank 241-AZ-101 (101-AZ) has been identified as one of the early tanks to be retrieved for waste pretreatment and immobilization. Retrieval of the tank waste from other tanks may require dilution. This test is to determine the effects of dilution on the mass of solids and their composition, which can be compared with tanks where dilution is required. This test plan gives test instructions, example data sheets, a waste compatibility review, and a waste stream fact sheet.

The 101-AZ tests will be done on centrifuged solids separated from composite samples prepared from core samples taken in 1999. This document is the Test Plan for Step 10 of Section 3.1 of the Sampling and Analysis Plan (SAP, Templeton 1999b). A closely related test plan has been prepared for tank 241-AZ-102 (Person 1999).

2.0 BACKGROUND

As of March 1999, tank 101-AZ contained a total waste volume of approximately 3202 kL (846 kgal), consisting of 3024 kL (799 kgal) of supernatant liquid, and 178 kL (47 kgal) of sludge (Hanlon 1999). This waste volume is equivalent to 7.83 meters (308 inches) of waste as measured from the inside bottom of the tank.

The liquid in tank 101-AZ has lower salt concentrations than those present in many of the other Hanford tanks. The grab samples of liquid taken in March 1995 have a sodium molarity of 4.1 M. The concentrations in this paragraph are from Revision 0-C (Templeton 1999a) of the tank characterization report (Hodgson 1995). The analyses of sludge from core samples taken in 1989 indicate the dry solids to be primarily oxides of iron, aluminum, and zirconium. There are also minor contributions to the solids from water-insoluble oxides of Si, Cd, and U. There is 0.9 wt% of TOC in the sludge, which is likely to be primarily in the form of insoluble sodium oxalate. It is possible that some anions in the sludge might be present as sodium salts. However, the relatively low solution concentrations indicate that the great bulk of these anions are present in the interstitial liquid, rather than the dry solids. In any case, the analyses indicate that the contribution of any water-soluble sodium salts (other than oxalate) will be less than 15 wt% of the other solids. Thus, the bulk of the solids are expected to be insoluble in water, or to have a low solubility (oxalate). The solubility of sodium oxalate depends on the ionic strength and the temperature. Sodium oxalate is expected to be rather insoluble for the dilutions used in these tests.

3.0 DESCRIPTION OF TEST

Sample preparation and all of the testing will be done in hotcells at the 222-S Laboratory. Solids composite samples (containing representative fractions of the solids in each segment of the core) and liquid composite samples will be prepared in the large hotcells in room 11A of the 222-S Laboratory. It is currently planned that the other activities described in

this test plan (except for analysis) will be performed in the 11A5 hotcell. Other portions of the 11A hotcells may be used, as needed or as space is available.

The solids composite and the liquid composite samples will be prepared by the 11A hotcell personnel. Sufficient composite samples (estimated to be 100-120 g of solids composite, together with enough liquid composite to make the slurry composite match the tank) from each riser will be submitted to Technology, Operations and Process Science personnel for the Solids Solubility Tests (and to prepare samples of slurry composites for wt% solids and wt% oxide measurements) described in this test plan. An additional slurry composite sample will be prepared by 11A hotcell personnel. This composite will be used to prepare three subsamples of the separated liquid and three subsamples of the separated solids to be submitted for the series of analyses listed in Tables 1 and 2 of the SAP (Templeton 1999b).

3.1 Composite Slurry Sample Preparation Job Steps

The solids in tank 101-AZ were deposited in different compositions at different times. Some of the solids may not have equilibrated with the liquid currently in the tank. Thus, the composite solids must be mixed with the composite liquid to allow equilibration of the composite slurry before separating the solids and liquids for testing. Observations are made on this slurry. In addition, composite slurries are prepared for the analysis of wt% solids and wt% oxide under a separate test plan. This subsection describes these steps.

3.1.1. Record the weights of composite samples received.

Note: Maintain a log of bottle weights for each transfer; perform a material balance to account for all material sampled.

3.1.2. Tare and label ("1AZ-99-Test #") four tall jars of the appropriate size (e.g., 125 to 500 mL) to contain the mixed slurry composites.

3.1.3. Add solids composite and liquid composite by mass to each jar. Add solids composite and liquid composite in the mass ratio calculated to match the mass ratio for the core sample. Use a smaller amount of solids composite when preparing the Test 4 slurry composite, in order to save enough of solids composite to make slurry composite samples for wt% solids and wt% oxide analyses (Step 3.1.10, reserve enough solids to make about 30 g of slurry composite, if sample quantities permit).

Note: If the solids contain a significant fraction of water soluble solids, then the solids composite should be divided so that larger fractions of the solids composite are used to form the slurry composites for the tests with larger dilutions (Tests 2 and 3). The object is to divide the solids composite between the amount used for the measurement of wt% solids (the same sample is used for the wt% oxide) and the amount used for Tests 1 - 4 in Step 3.4.

- 3.1.4. Mix for 24 hrs.
 - 3.1.4a. Shake vigorously at hourly (approximately) intervals during working hours. It is expected that the shaking will begin on one day with several shakings and end 24 hours later after some additional shakings during working hours.
- 3.1.5. Settle for at least 48 hrs.
 - 3.1.5a. Record hotcell ambient temperature during the settling. Record observations of solids properties and gelation; record any visual observation of a separate organic layer.
 - 3.1.5b. Measure the amounts of settled solids (vol%) at times during the period.
 - 3.1.5c. If the liquid is too turbid to determine the top of the solids, allow the material to settle longer (wait at least 24 hrs more).
- 3.1.6. Measure and record the volume and mass of each composite slurry.

Note: Steps 3.1.7 - 3.1.9 can be performed in parallel with Steps 3.1.2 - 3.1.6.
- 3.1.7. Tare and label ("IAZ-99-Wt%SolOx #") a number of 15 mL cones (three, if sufficient sample is available) to contain the slurry composites to be analyzed for wt% solids and wt% oxide.
- 3.1.8. Add solids composite and liquid composite by mass to the cones to prepare slurry sample (5-10 g, if material available). Add solids composite and liquid composite in the mass ratio estimated to match the mass ratio for the core sample.
- 3.1.9. Follow Steps 3.1.4 to 3.1.6, using the wt%SolOx cones.
- 3.1.10. Submit the sample cones of the mixed slurry composite for wt% solids (drying at 105 °C) and wt% oxide (heating at 1050 °C) analyses, using the methods outlined in the DQO (Section 7.3.4 of Patello 1999).

3.2 Centrifuged Solids (C-Sol) Preparation Job Steps

The next step is to separate the solids and liquids from the slurry composites for the four tests. This is done by centrifugation, although clear liquid may be decanted when there is a clear liquid layer.

- 3.2.1. Record the weights of composite samples received.
- 3.2.2. Separate the liquids and solids by centrifugation (use approximately 300 G force for 30 min), observing and documenting the degree of separation (completion of centrifugation determined by technical judgment of chemist).

Note: Dilution of sample minimized during all transfers by rinsing containers with the separated liquid fraction.

- 3.2.3. Record the weights of separated liquid and of c-sol.
- 3.2.4. Record the volumes and the calculated densities of the separated liquid and of c-sol.
- 3.2.5. Record visual observations, including (1) quality of separation, (2) presence of floating layers (organics or solids) and (3) any indications of gas generation within sample.
- 3.2.6. Use the c-sol from each of the four composite samples to form the four test mixtures, following directions in Step 3.4.2. For the composite mixture used to prepare the solids for Test 4, save the liquids to prepare samples for analysis in Step 3.4.6. The tests in this test plan have no need for the liquids from the other composite samples.
- 3.2.7. Record the weights of emptied jars of composite.

3.3 Solubility Screening Test Overview

The experiment listed below will indicate the effects of dilution on the solids. These data will be used in assessing the impact of solids on meeting Privatization Contract envelope specifications and will provide input to aid in designing solids dissolution testing for waste retrieval. An additional objective is to use a standardized solubility testing procedure to allow waste-to-waste comparisons to be made easily. Additional analyses of the solids may be requested by the chemist in consultation with the Tank Coordinator.

3.4 Solubility Screening Test Job Steps

- 3.4.1. Tare and label ("1AZ-99-Test #") four tall jars of appropriate sizes (e.g., 22 to 125 mL). Consider the volume of diluted material to be used when choosing the size. The jar size should be around 1.3 to 2.5 times as large as the volume after the dilution in step 3.4.2, in order to accommodate shaking the diluted material.
- 3.4.2. Add c-sol by mass to the jars.
 - 3.4.2a. Test 1: 100 parts (by mass) c-sol plus 25 parts (by mass) diluent (inhibited water).
 - 3.4.2b. Test 2: 100 parts (by mass) c-sol plus 75 parts (by mass) diluent (inhibited water).
 - 3.4.2c. Test 3: 100 parts (by mass) c-sol plus 100 parts diluent (inhibited water).

3.4.2d. Test 4: 100 parts (by mass) c-sol with no dilution.

Note: Inhibited water is 0.01 M NaOH and 0.01 M NaNO₂ (sodium nitrite).

3.4.3. Mix for 24 hrs.

3.4.3a. Shake vigorously at hourly (approximately) intervals during working hours. It is expected that the shaking will begin on one day with several shakings and end 24 hours later after some additional shakes during working hours.

3.4.4. Settle for at least 72 hrs.

3.4.4a. Record hotcell ambient temperature at the beginning, end, and at times during the settling. Record observations of solids properties and gelation; record any visual observation of a separate organic layer.

3.4.4b. Measure the amounts of settled solids (vol%) at several times during the period (e.g., at 1, 2, 4, 20, 24, 28, 48, and 72 hrs).

3.4.5. Separate the solids and liquids.

3.4.5a. Decant the liquid fraction from each test with the goal of having the remaining material fit in one 50 mL centrifuge cone (measure the volume and mass of the liquid removed). Transfer the decanted liquid into a clean (tared) jar (or 50 mL cone, if the total liquid volume is less than 50 mL) labeled "1AZ-99-Test #-L". Leave enough liquid with the solids to allow efficient transfer of the solids.

3.4.5b. Gather the solids from the test jar into a tared centrifuge cone that is labelled "1AZ-99-Test #" (use suffix "-B" if a second cone is needed). Centrifuge the cone (use approximately 300 G force for about 30 min), observing and documenting the degree of separation (completion of centrifugation determined by technical judgment of chemist). Record any visual observation of a separate organic layer. Decant the liquid into the liquid container (see step 3.4.5a). If necessary to collect solids from different cones, use some supernate from that sample (collected in step 3.4.5a) to slurry the solids into one cone and recentrifuge that cone, decanting the liquid into the liquid container. Weigh the cone before and after any supernate addition.

3.4.5c. Measure and record the volumes and masses (to determine the densities) of the solids and liquids.

3.4.6. Submit an aliquot of the separated liquids (mix first) of each test mixture for the analyses listed in steps 3.4.6a and 3.4.6b. Prepare two vials with 10 to 14 mL in each vial (only one vial if

less than 14 mL total volume available). If volume is less than 14 mL for Test 4, add the separated liquid saved from this sample in Step 3.2.6 to give a total volume of 20 to 28 mL (half in each vial). If volume is less than 9 mL for Tests 1 through 3, add a known weight of deionized water to make the diluted volume 12 mL or more. Record vol% dilution.

- 3.4.6a. Analyze sample for Na, Al, Cr, P, S, Si, OH, NO₂, NO₃, Cl, F, TIC, TOC, ⁹⁰Sr, ¹³⁷Cs, ⁶⁰Co, ¹⁵⁴Eu, ¹⁵⁵Eu, and total alpha using the methods and QC parameters outlined in Table 7.1 of the DQO (Patello 1999). Report all analytical results recovered for opportunistic analytes (Kristofzski 1996) to the extent that no additional standards or reruns are required.
- 3.4.6b. Analyze sample for wt% solids (gravimetric by heating to constant weight at 105 °C). If the amount of liquid in the vial(s) in Step 3.4.6 is less than 20 mL, use approximately 1 g for the sample (and duplicate) when determining the wt% solids; otherwise, use 5 to 6 g.

Note: The specified sample sizes in Steps 3.4.6b and 3.4.7b are from the DQO specifications (Section 7.3.4 of Patello 1999) that use sample sizes of 5 to 10 g and allow smaller sample sizes due to sample quantity limitations.

- 3.4.7. Submit an aliquot of solids (mix well first) of each test mixture for the analyses listed in steps 3.4.7a and 3.4.7b. If there is only a small amount of solids after any dilution test (e.g., less than 2 g), do step 3.4.8 in place of this step.

3.4.7a. Analyze sample for Na, Al, Cr, P, S, Si, NO₂, NO₃, Cl, F, TIC, TOC, ⁹⁰Sr, ¹³⁷Cs, ⁶⁰Co, ¹⁵⁴Eu, ¹⁵⁵Eu, and total alpha using the methods and QC parameters outlined in Table 7.2 of the DQO (Patello 1999). Use an acid digest for the ICP analytes (cations), a water digest for the IC analytes (anions) and for TOC, direct solid samples for TIC and TOC, and a fusion digest for the radiochemical analytes (including total alpha). Report all analytical results recovered for opportunistic analytes (Kristofzski 1996) to the extent that no additional standards or reruns are required.

3.4.7b. Analyze sample for wt% solids (gravimetric by heating to constant weight at 105 °C). If the amount of solids in the vial in Step 3.4.7 is less than 20 g, use approximately 1 g for the sample (and duplicate) when determining the wt% solids; otherwise, use 5 to 6 g.

- 3.4.8. At the discretion of the chemist in charge, in consultation with the tank coordinator, other tests may be performed. This can help identify the solids, especially if the amount of solids remaining is insufficient for the full suite of tests. Possible other tests are x-ray diffractometry, polarized light microscopy

(PLM), and scanning electron microscopy/energy dispersive x-ray spectroscopy.

4.0 DATA INTERPRETATION

4.1 Chemical Data

Chemical analyses of centrifuged liquid and solid phases will be used to develop knowledge of the chemical properties of the solid phase. The analyses of the material from the four screening tests (Section 3.4) will be used together with the analyses of three subsamples of the liquid fraction and three subsamples of the solid fraction of the riser composite (samples prepared by 11A hotcell personnel). With analyses of both the liquid and the c-sol samples, it will be possible to calculate the contribution of the interstitial liquid to the centrifuged solids and to estimate a composition of the true solid phase at each dilution. Knowledge of the solid phases present as a function of dilution ratio should provide the information needed to explain the physical (solubility) data.

As a first approximation, the assumption will be made that all of the water in the centrifuged solids can be attributed to interstitial liquid. If the calculations and/or PLM results suggest that the true solid phase contains some salts that are highly hydrated [e.g. $\text{Na}_7\text{F}(\text{PO}_4)_2 \cdot 19\text{H}_2\text{O}$], then an iterative calculation may be required to distribute the water in the centrifuged solids between the true solid phase and the interstitial liquid phase.

The list of analytes from the ICP and IC analyses that will be reported will be longer than those requested (per "opportunistic" analysis memo [Kristofzski 1996]).

4.2 Quality Assurance

Based on the requirements in "Review and Approval of Documents", HNF-PRO-233, this test plan is assigned Approval Designator E. Approval signatures are required from the author, immediate manager, Environmental Compliance reviewer, and the customer.

Analyses that do not meet the QC requirements of the DQO (Tables 7.1 and 7.2 of Patello 1999) will either be rerun or reported as not meeting the requirements in the final report. Analytical QA will meet the requirements of the 222-S Lab QA plan (Markel 1998) as modified by the DQO (Patello 1999) and the SAP (Templeton 1999b).

The solubility screening tests will follow the "Process Chemistry & Statistics Quality Assurance Plan", WHC-SD-CP-QAPP-018, Rev. 0 (Meznarich 1996). The instructions will be recorded in a controlled laboratory notebook, showing observations and data recorded as the work is done. Example data sheets are shown in Appendix A. Minor changes to the work (as determined by the chemist in charge) will be noted in the laboratory notebook and in the test report. Substantive changes to the work will be reviewed by the author, immediate manager, and the customer. Changes that require reviews by

Radiological Control or Environmental Compliance or other entities will have those additional reviews before the changes are implemented.

5.0 SAFETY

All of the safety requirements that apply to this test plan are described in "Development of Instrumentation, Methods and Performance of Process Testing", Hanford Analytical Services Laboratory Operating Procedure LO-140-100, and in the WMH-310 Manual ("Hanford Analytical Services Laboratory Operations Administration"), Section 4.3, "222-S Laboratory Safety," Section 4.5, "Chemical Hygiene Plan," and Section 1.9, "Laboratory Test Planning."

The work described in this test plan will all be done inside a hotcell. Execution of this program will not involve any hazards beyond the usual laboratory activities. Standard laboratory safety practices will apply.

6.0 WASTE HANDLING

Two waste streams are expected to be generated from this test program. Stream #1 is the used and left-over tank waste material. This material consists primarily of liquid (containing less than 5 vol% solids). There may be a small amount of solids also. The total amount of this waste stream is expected to be less than 1 kg. This waste will be discarded to the 219-S Building tanks via a hotcell drain, per procedure LO-100-107, "Cubicle Housekeeping, Waste Disposal, and Management". This waste may be diluted with inhibited water, as noted on the Waste Stream Fact Sheet in Appendix C.

Stream #2 is the solid hotcell waste consisting of used centrifuge cones, used sample vials, used plastic syringes, etc. This waste will be rinsed with water, removed from the 11A5 hotcell, loaded into waste cans, and disposed of by 11A hotcell personnel according to LO-100-151, "Segregate and Manage Solid Laboratory Wastes".

The amounts of PCBs in 101-AZ material are expected to be below regulatory concern. If the 101-AZ material were found to be above regulatory concern for PCBs, all waste streams will be managed and disposed of according to LO-100-114, "Management of Polychlorinated Biphenyl (PCB) at the 222-S Laboratory Complex".

Other than the waste streams described here, there will be no accumulating of hazardous waste. The Waste Compatibility Review is attached as Appendix B. The Waste Stream Fact Sheet (listing the components of the diluent added to the waste) is attached as Appendix C.

7.0 SCHEDULE AND DELIVERABLES

This test plan should be issued by December 3, 1999. Laboratory work will begin when Technology, Operations and Process Science personnel are available and the composite samples are prepared (estimated to be around December 30, 1999).

A complete report of the test results will be issued by Technology, Operations and Process Science in the form of an internal memo to 222-S Laboratory. Informal interim status reports will be given to the customer (via cc:mail or teleconference) at the customer's request. An electronic version of the report and associated data spreadsheets will be provided to the customer. The 222-S Laboratory will issue a Format IV report (per the SAP, Templeton 1999b) that will include Technology, Operations and Process Science's report.

8.0 REFERENCES

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APPENDIX A: EXAMPLE DATA SHEETS

Preparation of Slurry Composite Sample.

Date:

Mix solids composite with liquid composite to form slurry composites. Check wt (20.00/500.0 g), g: Notes:				
Slurry Jar label				
Vial number, slurry comp for wt% oxide only				
Labcore num, slurry comp for wt% oxide only				
Gross wt, solids comp jar, start, g				
Gross wt, solids comp jar, end, g				
Wt, solids removed from comp jar, g				
Gross wt, liquid comp jar, start, g				
Gross wt, liquid comp jar, end, g				
Wt, liquid removed from comp jar, g				
Wt slurry jar + solids, g				
Tare slurry jar, g				
Wt solids added, g				
Desired wt liquid, g				
Desired total wt with liquid, g				
Total wt with liquid, g				
Net wt liquid added, g				
Net wt slurry, g				
Mix, date/time, T°C				
Settling, date/time, T°C: ssol/tot ht, vol				
Vol%, settled solids				
Volume, slurry, mL				
Mass, slurry, g				
Density, slurry, g/mL				
Notes:				

Solids/Liquid Separation of Composite Sample.

Date:

Sample _____							
Gross wt, sample jar, g		Check wt (20.00/500.0 g), g:					
Tare wt, sample jar, g							
Net sample wt, g		Notes:					
Date/Time							
Temperature, °C							
Total sample height, cm							
Settled solids height, cm							
Settled solids vol%							
Wt after decant liquid, sample jar, g							
Wt liquid removed, sample jar, g							
Wt empty sample jar, g							
Wt residue (and tare error), g							
Volume liquid decanted _____ mL	To container				Mass of liq	SpG =	
Wt decanted liquid + tare, g							
Tare wt, container for decanted liq							
Wt liq, g (added to container, mass of liq)							
Solids cone _____							
Gross wt, g		Notes:					
Tare wt, g							
Wt of solids/liquid in cone, g							
Total volume in cone, mL							
Cone wt after c-liquid decant, g							
Wt of c-liquid, g							
Wt of centrifuged solids, g							
Volume of centrifuged solids, mL							
Density of centrifuged solids, g/mL							
Volume, c-liquid decanted, mL							
Density of centrifuged liquid, g/mL							
Total volume liquid, mL							
Total wt liquid, g							
Density of total liquid, g/mL							
Wt% centrifuged solids							
Vol% centrifuged solids							

Solubility Screening Test: Prepare Mixture, Dilute, Settle. Date:

Prepare test mixture using c-sol plus diluent.				
1AZ-99	Test 1	Test 2	Test 3	Test 4
Solid+jar, g				
Tare, g				
Solid, g				
Dilute with 0.01 M NaOH + 0.01 M NaNO ₂				
Dil. factor	0.25	0.75	1.00	0.
Desire dil, g				
Desire tot wt				
Dil+liq+sol				
Diluent, g				
Dil. factor				
Mix for 24 hrs. Note shake times, also a few settled solids ht + total ht.				
Time: Temp°C: Test 1: Test 2: Test 3: Test 4:				
Settle for 72 hrs; note settled solids ht (SSH) + total ht (TH)				
Date/Time/°C	SSH/TH, #1	SSH/TH, #2	SSH/TH, #3	SSH/TH, #4

Solubility Screening Test: Solid/Liquid Properties. Date:

Properties of solids after dilution.				
1AZ-99-	Test 1	Test 2	Test 3	Test 4
Wt liq + sol + jar, g				
Tare test jar, g				
Wt liq + sol, g				
Wt test jar + resid, g				
Vol%, set sol				
Cone Label				
Liq vol cone, mL				
Wt liq + cone, g				
Tare cone, g				
Wt liq in cone, g				
SpG liq in cone				
Empty cone liquid into "-L" jar, weigh. Decant any additional liquid to "-L" jar -- end with liquid + solids in cone.				
Wt liq + -L jar, g				
Tare wt -L jar, g				
Wt liq + decant liq, g				
Wt decant liq, g				
Vol decant liq, mL				
Vol liq + sol (cone), mL				
Wt liq + sol + cone, g				
Wt solids + cone, g				
Wt c-liq, g				
Wt c-sol, g				
Vol c-sol, mL				
Vol c-liq, mL				
SpG c-liq (final cone)				
SpG c-sol				
Tot vol, liq + sol, mL				
Total wt, g				
Tot vol liq, mL				
Tot wt liq, g				
Tot liq SpG				
Wt% c-sol				
Vol% c-sol				

Solids Solubility Tests, Prepare Samples.

Date: _____

For the cones from the four tests, transfer liquid from cones, transferring 10-14 mL to each of two 15 mL sample vials. If <14mL, use one vial, compute volume from SpG, and dilute with water if volume <9 mL. Transfer solids from cones into solids sample vial; record wts.

Check Wts:

Prepare liquid samples, 1AZ.								
	Test 1		Test 2		Test 3		Test 4	
Vial number								
Labcore								
Samp + vial								
Tare vial, g								
Wt sample, g								
Vol, mL	Vol = _____ SpG = _____							
WtS + wat + v								
Wt H2O add								
Vol% Diln								
Notes								
Prepare solids samples.								
	Test 1		Test 2		Test 3		Test 4	
Vial number								
Labcore								
Samp + vial								
Tare vial, g								
Wt sample, g								
Notes								

APPENDIX B: WASTE COMPATIBILITY REVIEW

COMPATIBILITY REVIEW

PROCEDURE NUMBER: HNF-4752, Rev. 0 (Tank 101-AZ Solubility Screening Tests)

<u>CHEMICALS OF CONCERN IN WASTE STREAM</u>	<u>MAXIMUM CONCENTRATION</u>
NaOH (sodium hydroxide)	0.006 M
NaNO ₂ (sodium nitrite)	0.006 M

COMPATIBILITY HAZARDS, INCLUDING SPECIAL STORAGE REQUIREMENTS, POSSIBLE REACTIONS, AND RESULTS OF MIXING INCOMPATIBLE WASTE STREAMS

None, as NaOH and NaNO₂ are present within the waste at concentrations much greater than the concentrations added (tank 101-AZ waste contains 0.18 to 1.5 M NaOH and 0.21 to 0.27 M NaNO₂).

RECOMMENDED WASTE STREAMS

See section 6.0 of Test Plan. Procedure LO-100-107 is followed for waste disposal and management of waste stream #1 (used and left-over tank waste material) in the hotcell. Procedure LO-100-151 is followed for waste disposal and management of waste stream #2 (solid waste, such as used centrifuge cones, etc.) in the hotcell.

CONTAINER MATERIAL

glass or plastic

REFERENCE DOCUMENTS USED IN COMPATIBILITY STUDY

none required

J. C. Person 
Technical Authority

11/29/99
Date

D. L. Herting 
Reviewer

11/29/99
Date

APPENDIX C: WASTE STREAM FACT SHEET

222-S LABORATORY
DEVELOPMENTAL METHOD WASTE STREAM FACT SHEET

CONSTITUENTS OF WASTE GENERATED	CAS NUMBER	APPROXIMATE WEIGHT %
NaOH (sodium hydroxide)	1310-73-2	0.02
NaNO ₂ (sodium nitrite)	7632-00-0	0.03
Waste Codes: F001-F005	Waste Class: DW	
Disposal: Cubicle Hotcell Drains	Waste Container: None	
<p>Comments:</p> <p>Tank Farm listed waste must include F001-F005 waste codes.</p> <p>No Waste Stream Label required. Waste generated from this test plan will be disposed down cubicle hotcell drains.</p>		
<p>Intended Use:</p> <p>Solubility screening tests of tank waste.</p>		
Approvals - print name, sign, and date		
<p>Authored By J. C. Person</p>	<p><i>J. C. Person</i> 12/1/99</p>	
<p>Environmental Compliance Officer (or delegate) J. A. Winterhalder</p>	<p><i>J. A. Winterhalder</i> 12-3-99</p>	

Waste Stream Labeling Requirements: (Waste Stream type, container type, waste codes, and disposal criteria are required.) Waste class is optional. The label is considered to be an example label, but contains the required information for waste stream identification. Other hazardous waste labeling requirements may apply.

Waste Stream Type	Waste Stream Number	Page Number
Aqueous	1 of 2	1 of 1