

TA53

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science and Technology
Responsible Chemistry for America
CST-9, Inorganic Trace Analysis
Los Alamos, New Mexico 87545

To/MS: Dave Moss, MS E518
From/MS: Kathy Lao, CST-9, MS E518
Phone/FAX: 5-3250/5-6561
Date: 10/5/99

Pete Lindahl
for KL

Subject: Case Narrative for Submission #100040565

A water sample from TA-53, tank 3, was received on 9/27/99 by CST-9 personnel at TA-50 for metals analysis. Samples were prepared 9/27/99 by EPA method 3051. Analysis was completed 9/27/99 and 9/28/99 as follows:

OES - EPA Method 6010 analysis on 9/27/99.

Analytes: Ag, Al, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mn, Mo, Na, Ni, Pb, Si, Sn, Sr, Ti, V, Zn.

IMS - EPA Method 6020 analysis on 9/28/99.

Analytes: Pb, Sb, Tl, U.

ETVAA - EPA Method 7000 series analysis on 9/28/99.

Analytes: As, Se.

CVAA - Samples requiring analysis for Mercury were prepared and analyzed using EPA method 7470A on 9/28/99.

Preliminary results were given to Dave Moss 9/28/99. Differences between the preliminary results and final results are summarized below:

| | Preliminary result | Final Result |
|-----|--------------------|--|
| As: | < 2 ppb | 3 +/- 2 ppb |
| Sb: | 7 +/- 7 ppb | 10 +/- 10 ppb |
| Tl: | 7 +/- 6 ppb | 10 +/- 10 ppb |
| Pb: | 13 +/- 7 ppb | < 30 ppb (reported by OES rather than IMS) |
| U: | 7 +/- 6 ppb | 10 +/- 10 ppb |

QC Summary

Reagent Blank

OES: Blank values are below detection limit except for Al, B, Ca, Mg and Zn. These values will be used as the detection limit for this analysis.

IMS: Blank values for Sb, Tl, Pb and U were greater than detection limit. These values will be used for the detection for these samples.

ETVAA: Blank results for Se and As were less than detection limit.

CVAA: The blank result for Hg was less than detection limit.



Laboratory Control Sample (LCS):

OES: All values are in control except for Ca and Fe. The values for Ca and Fe are high and may indicate contamination.

IMS: All values in control.

ETVAA: All values in control.

CVAA: All values in control.

Duplicates:

OES: All RPD's are within 20% for all values greater than 10x's the MDL.

IMS: All analytes were less than 10x's MDL, therefore this calculation was not required.

ETVAA: All analytes were less than 10x's MDL, therefore this calculation was not required.

CVAA: Sample concentration was less than detection limit.

Matrix Spikes:

OES: The postdigestion spike recoveries are all within the acceptable range. The predigestion spike recoveries are acceptable for all analytes except Cr, Fe, Mn, Mo and Ni. This is a new spiking solution and may have been prepared in error as recoveries for the postdigestion spike are ok.

IMS: All spike recoveries are within 15% of the expected value.

ETVAA: All spike recoveries are within 25% of the expected value.

CVAA: The predigestion spike had a recovery of 121%. The postdigestion spike was 98%.

Runtime QC's:

OES: Continuing calibration verification standards were all within 10% of expected values. Blank checks were all below detection limit.

IMS: Continuing calibration verification standards were all within 10% of expected values. The initial blank check was greater than the method detection limit for Tl and U, but was less than the preparation blank value being used for the detection limit of this run. Continuing blank checks were all below detection limit.

ETVAA: Continuing calibration verification standards were all within 10% of expected values. Blank checks were all below detection limit.

CVAA: Continuing calibration verification standards were all within 10% of expected values. Blank checks were all below detection limit.

Blind QCs:

OES: No blind QCs were run with these samples.

IMS: No blind QCs were run with these samples.

ETVAA: No blind QCs were run with these samples.

CVAA: No blind QCs were run with these samples.

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NATIONAL LABORATORY
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Chemical Science and Technology
Responsible Chemistry for America

CST-9, Inorganic Trace Analysis
Los Alamos, New Mexico 87545

To/MS: Dave Moss, MS E518
From/MS: Kathy Lao, CST-9, MS E518
Phone/FAX: 5-3250/5-6561
Date: 9/28/99

Peter C. Lindahl
for KL

Subject: Sample analysis for TA53 Tank 3 – additional data for Hg, Sb, Tl, Pb and U

Following are preliminary results for the analysis of the water sample collected 9/27/99 from TA53, Tank 3. The samples were prepared by EPA method 3015. The IMS values have been revised after the samples were diluted to reduce matrix effects and reanalyzed. Mercury values have also been included. Analysis was completed as stated below. These results have not gone through the complete review process and are therefore considered preliminary. While these results are correct to the best of my knowledge at this time, they are subject to change.

IMS (atomic mass spectrometry) – EPA 6020 (all values reported in ug/L or ppb)

Matrix effects are present in the sample. The following results are values obtained after additional dilution of the sample.

Sb = 10 +/- 10 ppb

Tl = 10 +/- 10 ppb

Pb = 20 +/- 10 ppb

U = 10 +/- 10 ppb

CVAA (cold vapor atomic absorption) – EPA 7470A (all values reported in ug/L or ppb)

Hg = < 0.03 ppb

Los Alamos

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Chemical Science and Technology
Responsible Chemistry for America

CST-9, Inorganic Trace Analysis
Los Alamos, New Mexico 87545

To/MS: Dave Moss, MS E518
From/MS: Kathy Lao, CST-9, MS E518
Phone/FAX: 5-3250/5-6561
Date: 9/28/99

Peter J. Lindahl
for KL

Subject: Sample analysis for TA53 Tank 3

Following are preliminary results for the analysis of the water sample collected 9/27/99 from TA53, Tank 3. The samples were prepared by EPA method 3015. Analysis was completed as stated below. These results have not gone through the complete review process and are therefore considered preliminary. While these results are correct to the best of my knowledge at this time, they are subject to change. The mercury analysis is still in process. The mercury result will be reported as soon as the analysis is complete.

ETVAA (graphite furnace) – EPA 7000 series (all values reported in ug/L or ppb)

As = < 2 ppb

Se = < 2 ppb

IMS (atomic mass spectrometry) – EPA 6020 (all values reported in ug/L or ppb)

Matrix effects are present in the sample which will require dilution and rerun of the sample for final results.

Sb = 7 +/- 7 ppb

Tl = 7 +/- 6 ppb

Pb = 13 +/- 7 ppb

U = 7 +/- 6 ppb

OES (atomic emission) – EPA 6010 (all values reported in mg/L or ppm)

Ag = < 0.003 ppm

Al = 1.7 +/- 0.3 ppm

B = 0.03 +/- 0.02 ppm

Ba = 0.042 +/- 0.004 ppm

Be = 0.001 +/- 0.001 ppm

Ca = 14 +/- 1 ppm

Cd = < 0.003 ppm

Co = < 0.006 ppm

Cr = 0.007 +/- 0.005 ppm

Cu = 0.019 +/- 0.002 ppm

Fe = 0.86 +/- 0.09 ppm

K = 1.5 +/- 0.7 ppm

Li = 0.021 +/- 0.002 ppm

Mg = 3.8 +/- 0.4 ppm

Mn = 0.018 +/- 0.002 ppm

Mo = < 0.006 ppm

Na = 12 +/- 1 ppm

Ni = < 0.01 ppm

Si = 42 +/- 4 ppm

Sn = < 0.02 ppm

Sr = 0.066 +/- 0.007 ppm

Ti = 0.05 +/- 0.02 ppm

V = 0.012 +/- 0.005 ppm

Zn = < 0.2 ppm (sample reading = 0.08 ppm, however blank contamination at 0.2 ppm)

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id : 100040565

| | | | | | |
|------------------|-----------|---------------------------------|------------------|-----------------|----------------------------|
| Requester Name: | DAVE MOSS | Customer Cost Code: | M3590623 | Due Date: | 30-SEP-99 |
| Requester Group: | EM-RLW | Logged Date: | 29-SEP-1999 | Screening Data: | NO SCREENING DATA RECEIVED |
| Mail Stop: | E518 | Study: | EH PLANT SAMPLES | Logged by: | STRAW |
| Requester Phone: | 667-4301 | Analytical Service Agreement #: | | | |
| Requester Fax #: | | | | | |

CUSTOMER SAMPLES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Customer Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|--------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237465 | 99.75002 | Ag | < .003 | | mg/L | |
| | | | Al | 1.7 | .26 | mg/L | |
| | | | B | .027 | .017 | mg/L | |
| | | | Ba | .042 | .004 | mg/L | |
| | | | Be | .001 | .001 | mg/L | |
| | | | Ca | 14 | 1.4 | mg/L | |
| | | | Cd | < .003 | | mg/L | |
| | | | Co | < .006 | | mg/L | |
| | | | Cr | .007 | .005 | mg/L | |
| | | | Cu | .019 | .002 | mg/L | |
| | | | Fe | .86 | .09 | mg/L | |
| | | | K | 1.5 | .7 | mg/L | |
| | | | Li | .021 | .002 | mg/L | |
| | | | Mg | 3.8 | .38 | mg/L | |
| | | | Mn | .018 | .002 | mg/L | |
| | | | Mo | < .006 | | mg/L | |
| | | | Na | 12 | 1.2 | mg/L | |
| | | | Ni | < .01 | | mg/L | |

**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id : 100040565

| <u>Sample Id</u> | <u>Task Id</u> | <u>Customer Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|--------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237465 | 99.75002 | Si | 42 | 4.2 | mg/L | |
| | | | Sn | < .02 | | mg/L | |
| | | | Sr | .066 | .007 | mg/L | |
| | | | Ti | .051 | .02 | mg/L | |
| | | | V | .012 | .005 | mg/L | |
| | | | Zn | < .024 | | mg/L | |
| | | | Pb | < .03 | | mg/L | |
| | | | Analysis Date | 27-SEP-1999 | | DD-MON-YYYY | |

DUPLICATE TASKS

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237465 | | Ag | < .003 | | mg/L | |
| | | | Al | 1.7 | .26 | mg/L | |
| | | | B | .027 | .017 | mg/L | |
| | | | Ba | .042 | .004 | mg/L | |
| | | | Be | .001 | .001 | mg/L | |
| | | | Ca | 14 | 1.4 | mg/L | |
| | | | Cd | < .003 | | mg/L | |
| | | | Co | < .006 | | mg/L | |
| | | | Cr | .007 | .005 | mg/L | |
| | | | Cu | .019 | .002 | mg/L | |
| | | | Fe | .86 | .09 | mg/L | |
| | | | K | 1.5 | .7 | mg/L | |
| | | | Li | .021 | .002 | mg/L | |
| | | | Mg | 3.8 | .38 | mg/L | |
| | | | Mn | .018 | .002 | mg/L | |
| | | | Mo | < .006 | | mg/L | |
| | | | Na | 12 | 1.2 | mg/L | |

**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id : 100040565

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237465 | | Ni | < .01 | | mg/L | |
| | | | Si | 42 | 4.2 | mg/L | |
| | | | Sn | < .02 | | mg/L | |
| | | | Sr | .066 | .007 | mg/L | |
| | | | Ti | .051 | .02 | mg/L | |
| | | | V | .012 | .005 | mg/L | |
| | | | Zn | < .024 | | mg/L | |
| | | | Pb | < .03 | | mg/L | |
| | | | Analysis Date | 27-SEP-1999 | | DD-MON-YYYY | |
| 200110968 | 300238559 | 300237465 | Ag | < .003 | | mg/L | |
| | | | Al | 1.7 | .26 | mg/L | |
| | | | B | .02 | .02 | mg/L | |
| | | | Ba | .041 | .004 | mg/L | |
| | | | Be | .001 | .001 | mg/L | |
| | | | Ca | 14 | 1.4 | mg/L | |
| | | | Cd | < .003 | | mg/L | |
| | | | Co | < .006 | | mg/L | |
| | | | Cr | .008 | .005 | mg/L | |
| | | | Cu | .018 | .002 | mg/L | |
| | | | Fe | .87 | .087 | mg/L | |
| | | | K | 1.6 | .7 | mg/L | |
| | | | Li | .023 | .002 | mg/L | |
| | | | Mg | .39 | .039 | mg/L | |
| | | | Mn | .018 | .002 | mg/L | |
| | | | Mo | < .006 | | mg/L | |
| | | | Na | 12 | 1.2 | mg/L | |
| | | | Ni | < .01 | | mg/L | |
| | | | Si | 43 | 4.3 | mg/L | |
| | | | Sn | .02 | .02 | mg/L | |
| | | | Sr | .067 | .007 | mg/L | |
| | | | Ti | .049 | .02 | mg/L | |

**** FINAL REPORT ****

Method: GENERIC ICPEs

Method Area: EH-OES

Submission Id : 100040565

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110968 | 300238559 | 300237465 | V | .013 | .005 | mg/L | |
| | | | Zn | .069 | .01 | mg/L | |
| | | | Pb | < .03 | | mg/L | |

SAMPLE SPIKES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Spike Type</u> | <u>Component</u> | <u>Amt. Spiked</u> | <u>Units</u> | <u>% Recovered</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|-------------------|------------------|--------------------|--------------|--------------------|------------------|
| 200110969 | 300238560 | 300237465 | PreDS | Ag | .555 | mg/L | 79.28 | |
| | | | | Al | 11.1 | mg/L | 92.79 | |
| | | | | B | .555 | mg/L | 96.04 | |
| | | | | Ba | .555 | mg/L | 95.14 | |
| | | | | Be | .555 | mg/L | 95.32 | |
| | | | | Ca | 11.1 | mg/L | 90.09 | |
| | | | | Cd | .555 | mg/L | 91.89 | |
| | | | | Co | .555 | mg/L | 97.30 | |
| | | | | Cr | .555 | mg/L | 1404.14 | |
| | | | | Cu | .555 | mg/L | 120.90 | |
| | | | | Fe | 4.44 | mg/L | 678.83 | |
| | | | | K | 11.1 | mg/L | 85.59 | |
| | | | | Li | .555 | mg/L | 93.51 | |
| | | | | Mg | 11.1 | mg/L | 91.89 | |
| | | | | Mn | .555 | mg/L | 249.01 | |
| | | | | Mo | .555 | mg/L | 234.23 | |
| | | | | Na | 4.44 | mg/L | 90.09 | |
| | | | | Ni | .555 | mg/L | 1081.08 | |
| | | | | Si | 11.1 | mg/L | 99.10 | |
| | | | | Sn | .555 | mg/L | 93.69 | |
| | | | | Sr | .555 | mg/L | 96.22 | |

**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id : 100040565

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Spike Type</u> | <u>Component</u> | <u>Amt. Spiked</u> | <u>Units</u> | <u>% Recovered</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|-------------------|------------------|--------------------|--------------|--------------------|------------------|
| 200110969 | 300238560 | 300237465 | PreDS | Ti | .555 | mg/L | 86.31 | |
| | | | | Zn | .555 | mg/L | 113.51 | |
| | | | | Pb | .555 | mg/L | 90.09 | |
| 200110970 | 300238561 | 300237465 | PostDS | Ag | 0.555 | mg/L | 82.88 | |
| | | | | Al | 11.1 | mg/L | 92.79 | |
| | | | | B | .555 | mg/L | 101.44 | |
| | | | | Ba | .555 | mg/L | 100.54 | |
| | | | | Be | .555 | mg/L | 98.92 | |
| | | | | Ca | 11.1 | mg/L | 99.10 | |
| | | | | Cd | .555 | mg/L | 95.50 | |
| | | | | Co | .555 | mg/L | 95.50 | |
| | | | | Cr | .555 | mg/L | 96.04 | |
| | | | | Cu | .555 | mg/L | 95.68 | |
| | | | | Fe | 4.44 | mg/L | 104.50 | |
| | | | | K | 11.1 | mg/L | 85.59 | |
| | | | | Li | .555 | mg/L | 98.92 | |
| | | | | Mg | 11.1 | mg/L | 91.89 | |
| | | | | Mn | .555 | mg/L | 95.86 | |
| | | | | Mo | .555 | mg/L | 99.10 | |
| | | | | Na | 4.44 | mg/L | 90.09 | |
| | | | | Ni | .555 | mg/L | 95.50 | |
| | | | | Si | 11.1 | mg/L | 90.09 | |
| | | | | Sn | .555 | mg/L | 102.70 | |
| Sr | .555 | mg/L | 103.42 | | | | | |
| Ti | .555 | mg/L | 91.71 | | | | | |
| Zn | .555 | mg/L | 113.51 | | | | | |
| Pb | .555 | mg/L | 95.50 | | | | | |

**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id : 100040565

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00 41984 | 300238558 | Ag | .082 | .008 | mg/L | 0.102 | 0.010 | mg/L | IN CONTROL |
| | | Al | .52 | .26 | mg/L | 0.407 | 0.041 | mg/L | IN CONTROL |
| | | B | .46 | .046 | mg/L | 0.315 | 0.032 | mg/L | WARNING 2-3SIG |
| | | Ba | .68 | .068 | mg/L | 0.673 | 0.067 | mg/L | IN CONTROL |
| | | Be | .22 | .022 | mg/L | 0.220 | 0.022 | mg/L | IN CONTROL |
| | | Ca | 67 | 6.7 | mg/L | 23.1 | 2.3 | mg/L | OUT OF CONTROL |
| | | Cd | .12 | .012 | mg/L | 0.120 | 0.012 | mg/L | IN CONTROL |
| | | Co | .63 | .063 | mg/L | 0.663 | 0.066 | mg/L | IN CONTROL |
| | | Cr | .4 | .04 | mg/L | 0.413 | 0.041 | mg/L | IN CONTROL |
| | | Cu | .43 | .043 | mg/L | 0.447 | 0.045 | mg/L | IN CONTROL |
| | | Fe | .7 | .07 | mg/L | 0.667 | 0.067 | mg/L | IN CONTROL |
| | | K | 79 | 7.9 | mg/L | 46.7 | 4.7 | mg/L | OUT OF CONTROL |
| | | Mg | 43 | 4.3 | mg/L | 43.5 | 4.4 | mg/L | IN CONTROL |
| | | Mn | .1 | .01 | mg/L | 0.10 | 0.01 | mg/L | IN CONTROL |
| | | Mo | .22 | .022 | mg/L | 0.227 | 0.023 | mg/L | IN CONTROL |
| | | Na | 72 | 7.2 | mg/L | 66.0 | 6.6 | mg/L | IN CONTROL |
| | | Ni | .54 | .054 | mg/L | 0.567 | 0.057 | mg/L | IN CONTROL |
| | | Pb | .63 | .063 | mg/L | 0.66 | 0.066 | mg/L | IN CONTROL |
| | | Sr | .16 | .016 | mg/L | 0.133 | 0.013 | mg/L | IN CONTROL |
| | | V | .16 | .016 | mg/L | 0.16 | 0.016 | mg/L | IN CONTROL |
| | | Zn | .34 | .034 | mg/L | 0.34 | 0.034 | mg/L | IN CONTROL |

**** FINAL REPORT ****

Method: GENERIC ICPES

Method Area: EH-OES

Submission Id : 100040565

METHOD BLANK

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00 24621 | 300238557 | Ag | < .003 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Al | .26 | .04 | mg/L | 0.0 | 0.0 | mg/L | OUT OF CONTROL |
| | | B | .02 | .005 | mg/L | 0.0 | 0.0 | mg/L | OUT OF CONTROL |
| | | Ba | .001 | .001 | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Be | .001 | .001 | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Ca | .41 | .041 | mg/L | 0.0 | 0.0 | mg/L | OUT OF CONTROL |
| | | Cd | < .003 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Co | < .006 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Cr | < .005 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Cu | < .002 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Fe | < .03 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | K | < .7 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Li | < .001 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Mg | .17 | .03 | mg/L | 0.0 | 0.0 | mg/L | OUT OF CONTROL |
| | | Mn | .001 | .001 | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Mo | < .006 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Na | < .08 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Ni | < .01 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Pb | < .03 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Si | < .1 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Sn | < .02 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Sr | .001 | .001 | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Ti | < .02 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | V | < .005 | | mg/L | 0.0 | 0.0 | mg/L | IN CONTROL |
| | | Zn | .24 | .024 | mg/L | 0.0 | 0.0 | mg/L | OUT OF CONTROL |

***** FINAL REPORT *****

Method: GENERIC ICPEs

Method Area: EH-OES

Submission Id : 100040565


Analyst


Review


Team Leader


QA Officer

10-5-99
Date

10/5/99
Date

10/5/99
Date

10/5/99
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: GENERIC ICPMS

Method Area: EH-IMS

Submission Id : 100040565

| | | | | | |
|------------------|-----------|---------------------------------|------------------|-----------------|----------------------------|
| Requester Name: | DAVE MOSS | Customer Cost Code: | M3590623 | Due Date: | 30-SEP-99 |
| Requester Group: | EM-RLW | Logged Date: | 29-SEP-1999 | Screening Data: | NO SCREENING DATA RECEIVED |
| Mail Stop: | E518 | Study: | EH PLANT SAMPLES | Logged by: | STRAW |
| Requester Phone: | 667-4301 | Analytical Service Agreement #: | | | |
| Requester Fax #: | | | | | |

CUSTOMER SAMPLES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Customer Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|--------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237470 | 99.75002 | Sb | 10 | 10 | ug/L | |
| | | | Tl | 10 | 10 | ug/L | |
| | | | U | 10 | 10 | ug/L | |
| | | | Analysis Date | 28-SEP-1999 | | DD-MON-YYYY | |

DUPLICATE TASKS

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237470 | | Sb | 10 | 10 | ug/L | |
| | | | Tl | 10 | 10 | ug/L | |
| | | | U | 10 | 10 | ug/L | |
| | | | Analysis Date | 28-SEP-1999 | | DD-MON-YYYY | |
| 200110904 | 300238488 | 300237470 | Sb | 7 | 7 | ug/L | |
| | | | Tl | 6 | 6 | ug/L | |
| | | | U | 6 | 6 | ug/L | |
| | | | Analysis Date | 28-SEP-1999 | | DD-MON-YYYY | |

**** FINAL REPORT ****

Method: GENERIC ICPMS

Method Area: EH-IMS

Submission Id : 100040565

DILUTION CHECKS

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237470 | | Sb | 10 | 10 | ug/L | |
| | | | Tl | 10 | 10 | ug/L | |
| | | | U | 10 | 10 | ug/L | |
| | | | Analysis Date | 28-SEP-1999 | | DD-MON-YYYY | |
| 200110906 | 300238490 | 300237470 | Sb | < 20 | | ug/L | |
| | | | Tl | 20 | 20 | ug/L | |
| | | | U | 20 | 20 | ug/L | |
| | | | Analysis Date | 28-SEP-1999 | | DD-MON-YYYY | |

SAMPLE SPIKES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Spike Type</u> | <u>Component</u> | <u>Amt. Spiked</u> | <u>Units</u> | <u>% Recovered</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|-------------------|------------------|--------------------|--------------|--------------------|------------------|
| 200110905 | 300238489 | 300237470 | PreDS | Sb | 555 | ug/L | 84.68 | |
| | | | | Tl | 555 | ug/L | 88.29 | |
| | | | | U | 555 | ug/L | 88.29 | |
| 200110907 | 300238491 | 300237470 | PostDS | Sb | 444 | ug/L | 94.59 | |
| | | | | Tl | 444 | ug/L | 94.37 | |
| | | | | U | 444 | ug/L | 94.59 | |

**** FINAL REPORT ****

Method: GENERIC ICPMS

Method Area: EH-IMS

Submission Id : 100040565

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00.41984 | 300238487 | Sb | 230 | 20 | ug/L | 227 | 23 | ug/L | IN CONTROL |
| | | Tl | 110 | 10 | ug/L | 93.3 | 9.3 | ug/L | IN CONTROL |

METHOD BLANK

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00.37909 | 300238486 | Sb | 7 | 6 | ug/L | 0 | 0 | ug/L | IN CONTROL |
| | | Tl | 6 | 6 | ug/L | 0 | 0 | ug/L | IN CONTROL |
| | | U | 6 | 6 | ug/L | 0 | 0 | ug/L | IN CONTROL |

**** FINAL REPORT ****

Method: GENERIC ICPMS

Method Area: EH-IMS

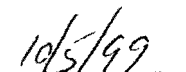
Submission Id : 100040565

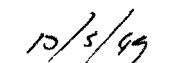

Analyst


Review


Team Leader


QA Officer


Date


Date


Date


Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
 CST Analytical Chemistry
 Analytical Results Report

Method: GENERIC CVAA

Method Area: EH-AA

Submission Id : 100040565

| | | | | | |
|------------------|-----------|---------------------------------|------------------|-----------------|----------------------------|
| Requester Name: | DAVE MOSS | Customer Cost Code: | M3590623 | Due Date: | 30-SEP-99 |
| Requester Group: | EM-RLW | Logged Date: | 29-SEP-1999 | Screening Data: | NO SCREENING DATA RECEIVED |
| Mail Stop: | E518 | Study: | EH PLANT SAMPLES | | |
| Requester Phone: | 667-4301 | Analytical Service Agreement #: | | Logged by: | STRAW |
| Requester Fax #: | | | | | |

CUSTOMER SAMPLES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Customer Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|--------------------|---------------------|---------------------|--------------------|---------------------|------------------|
| 200110380 | 300237469 | 99.75002 | Hg Analysis Date | <0.03 28-AUG-99 | | ug/L DD-MON-YYYY | |

DUPLICATE TASKS

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|---------------------|---------------------|--------------------|---------------------|------------------|
| 200110380 | 300237469 | | Hg Analysis Date | <0.03 28-AUG-99 | | ug/L DD-MON-YYYY | |
| 200110910 | 300238494 | 300237469 | Hg Analysis Date | <0.03 28-AUG-99 | | ug/L DD-MON-YYYY | |

**** FINAL REPORT ****

Method: GENERIC CVAA

Method Area: EH-AA

Submission Id : 100040565

SAMPLE SPIKES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Spike Type</u> | <u>Component</u> | <u>Amt. Spiked</u> | <u>Units</u> | <u>% Recovered</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|-------------------|------------------|--------------------|--------------|--------------------|------------------|
| 200110911 | 300238495 | 300237469 | PreDS | Hg | 2.5 | ug/L | 121.20 | |
| | | | | Analysis Date | 28-AUG-99 | DD-MON-YYYY | 0.00 | |
| 200110912 | 300238496 | 300237469 | PostDS | Hg | 2.5 | ug/L | 97.60 | |
| | | | | Analysis Date | 28-AUG-99 | DD-MON-YYYY | 0.00 | |

**** FINAL REPORT ****

Method: GENERIC CVAA

Method Area: EH-AA

Submission Id : 100040565

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00.41984 | 300238493 | Hg | 5.78 | 0.58 | ug/L | 6.27 | 0.63 | ug/L | IN CONTROL |

METHOD BLANK

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00.37909 | 300238492 | Hg | <0.03 | | ug/L | 0 | 0 | ug/L | IN CONTROL |

**** FINAL REPORT ****

Method: GENERIC CVAA

Method Area: EH-AA

Submission Id : 100040565

James E. Yeatts
Analyst

JL Lew
Review

JL Lew
Team Leader

PLZ
QA Officer

10-5-99
Date

10/5/99
Date

10/5/99
Date

10/5/99
Date

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: GENERIC ETVAA

Method Area: EH-AA

Submission Id : 100040565

| | | | | | |
|------------------|-----------|---------------------------------|------------------|-----------------|----------------------------|
| Requester Name: | DAVE MOSS | Customer Cost Code: | M3590623 | Due Date: | 30-SEP-99 |
| Requester Group: | EM-RLW | Logged Date: | 29-SEP-1999 | Screening Data: | NO SCREENING DATA RECEIVED |
| Mail Stop: | E518 | Study: | EH PLANT SAMPLES | Logged by: | STRAW |
| Requester Phone: | 667-4301 | Analytical Service Agreement #: | | | |
| Requester Fax #: | | | | | |

CUSTOMER SAMPLES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Customer Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|--------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237468 | 99.75002 | As | 3 | 2 | ug/L | |
| | | | Se | <2 | | ug/L | |
| | | | Analysis Date | 28-SEP-99 | | DD-MON-YYYY | |

DUPLICATE TASKS

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237468 | | As | 3 | 2 | ug/L | |
| | | | Se | <2 | | ug/L | |
| | | | Analysis Date | 28-SEP-99 | | DD-MON-YYYY | |
| 200110882 | 300238445 | 300237468 | As | 3 | 2 | ug/L | |
| | | | Se | <2 | | ug/L | |
| | | | Analysis Date | 28-SEP-99 | | DD-MON-YYYY | |

**** FINAL REPORT ****

Method: GENERIC ETVA

Method Area: EH-AA

Submission Id : 100040565

DILUTION CHECKS

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|------------------|---------------------|--------------------|--------------|------------------|
| 200110380 | 300237468 | | As | 3 | 2 | ug/L | |
| | | | Se | <2 | | ug/L | |
| | | | Analysis Date | 28-SEP-99 | | DD-MON-YYYY | |
| 200110884 | 300238447 | 300237468 | As | <10 | | ug/L | |
| | | | Se | <10 | | ug/L | |
| | | | Analysis Date | 28-SEP-99 | | DD-MON-YYYY | |

SAMPLE SPIKES

| <u>Sample Id</u> | <u>Task Id</u> | <u>Original Task</u> | <u>Spike Type</u> | <u>Component</u> | <u>Amt. Spiked</u> | <u>Units</u> | <u>% Recovered</u> | <u>Qualifier</u> |
|------------------|----------------|----------------------|-------------------|------------------|--------------------|--------------|--------------------|------------------|
| 200110883 | 300238446 | 300237468 | PreDS | As | 555 | ug/L | 91.35 | |
| | | | | Se | 555 | ug/L | 77.48 | |
| 200110886 | 300238457 | 300238447 | PostDS | As | 111 | ug/L | 108.11 | |
| | | | | Se | 111 | ug/L | 99.10 | |

**** FINAL REPORT ****

Method: GENERIC ETVAA

Method Area: EH-AA

Submission Id : 100040565

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00.41984 | 300238444 | As | 200 | 20 | ug/L | 200 | 20 | ug/L | IN CONTROL |
| | | Se | 180 | 20 | ug/L | 200 | 20 | ug/L | IN CONTROL |

METHOD BLANK

| <u>Customer Id</u> | <u>Task Id</u> | <u>Component</u> | <u>Result Value</u> | <u>Uncertainty</u> | <u>Units</u> | <u>QC Value</u> | <u>QC Uncertainty</u> | <u>QC units</u> | <u>QC Evaluation</u> |
|--------------------|----------------|------------------|---------------------|--------------------|--------------|-----------------|-----------------------|-----------------|----------------------|
| 00.24621 | 300238443 | As | <2 | | ug/L | 0.0 | 0.0 | ug/L | IN CONTROL |
| | | Se | <2 | | ug/L | 0.0 | 0.0 | ug/L | IN CONTROL |

**** FINAL REPORT ****

Method: GENERIC ETVAA

Method Area: EH-AA

Submission Id : 100040565

[Signature]
Analyst
10/5/99

[Signature]
Review

[Signature]
Team Leader

[Signature]
QA Officer

10/5/99
Date

10/5/99
Date

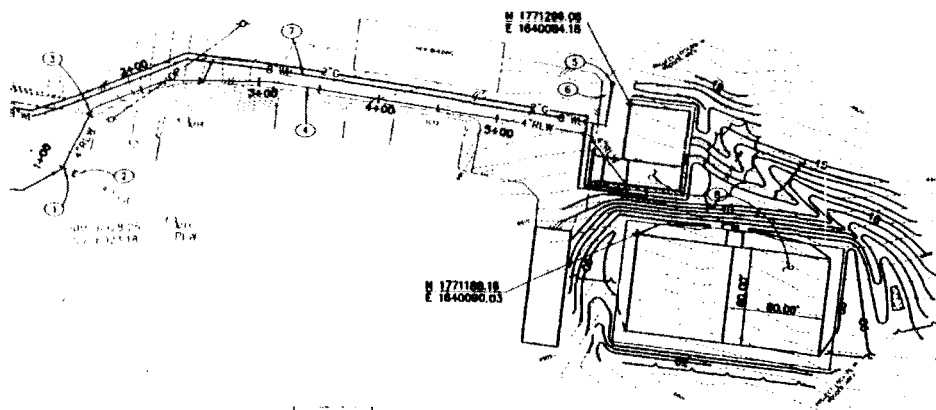
10/5/99
Date

10/5/99
Date

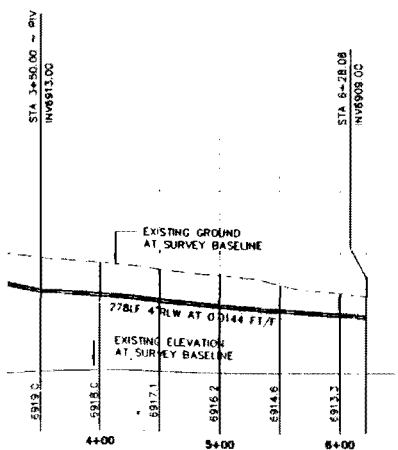
The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****



SCALE
 HORIZ. 1" = 50'
 VERT. 1" = 10'



RLW LINE

KEYED NOTES

- ① STA 1+00 CONNECT TO EXISTING 4" RWL VERIFY EXACT LOCATION AND ELEVATION PRIOR TO CONSTRUCTING RWL LINE
- ② CAP EXISTING 4" RWL LINE TO EAST.
- ③ VERIFY ELEVATION OF EXISTING SANITARY SEWER LINE PRIOR TO CONSTRUCTING RWL LINE
- ④ 4" DOUBLE WALL RWL LINE. SEE (E) FOR TRENCHING
- ⑤ FIRE HYDRANT. SEE (C)
- ⑥ 8"x6" WATERLINE, 6" GATE VALVE. SEE (H)
- ⑦ 8" WATERLINE. SEE (D)
- ⑧ TREATMENT FACILITY CONSTRUCTION

CONSTRUCTION NOTES

FOR THRUST BLOCKING SEE (A)

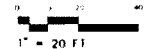
| NO. | DATE | BY | REV. | REVISIONS | OWN | DES. | CHKD. | REL. | SUB. | REC. | APP. |
|-----|------|----|------|-----------|-----|------|-------|------|------|------|------|
| | | | | | | | | | | | |

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TREATMENT PROJECT
 CIVIL UTILITY PLAN

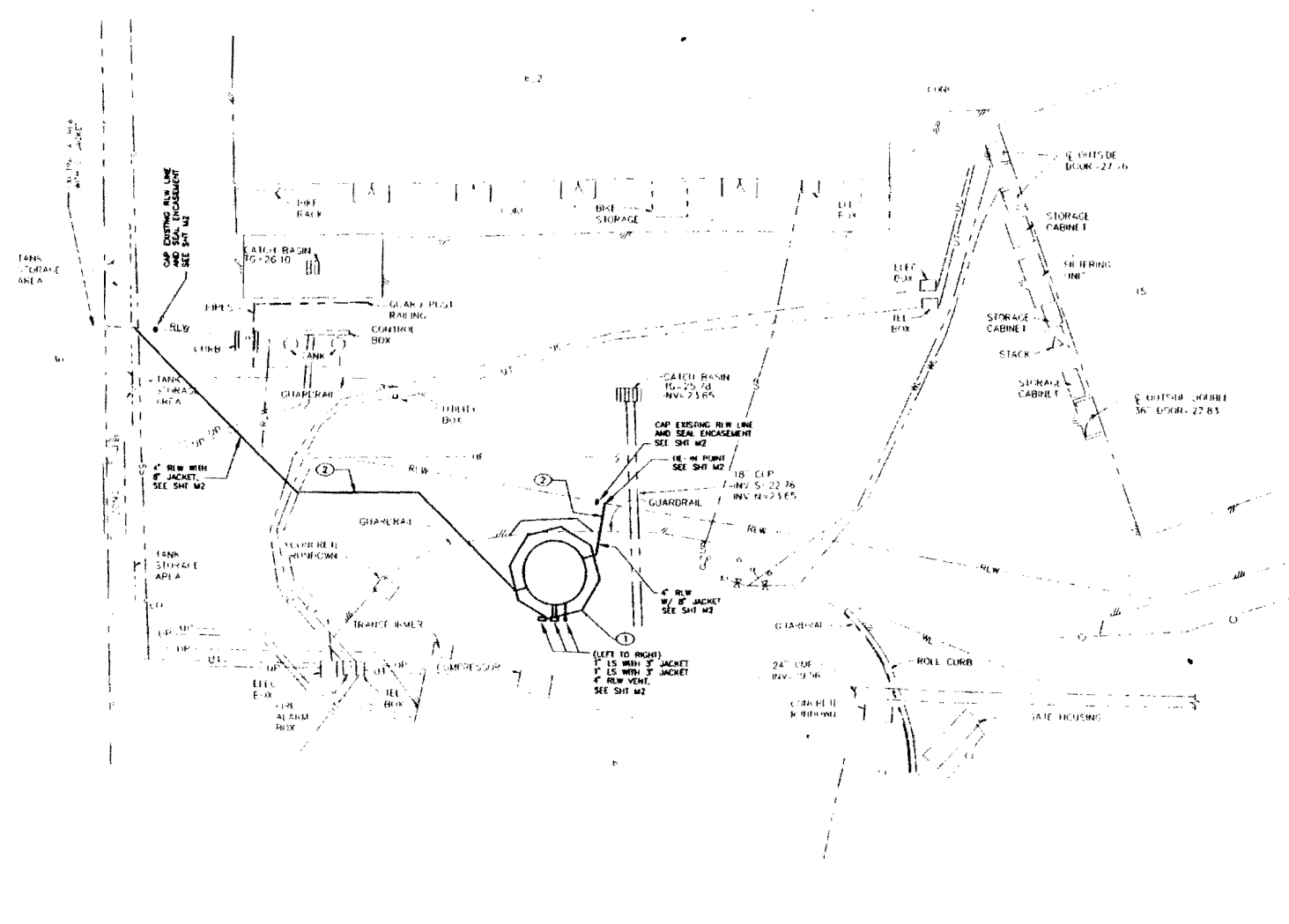
INDIC 945, 954 1A-53
 RECOMMENDED BY: [Signature] APPROVED FOR RELEASE BY: [Signature] APPROVED FOR RELEASE BY: [Signature]

Los Alamos Los Alamos National Laboratory Los Alamos New Mexico 87545
 CLASSIFICATION: UNREVIEWED BY: [Signature] DATE: 2/3/88
 PROJECT I.D. NO. 18649 DRAWING NO. C52076 SHEET 4 OF 68

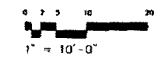


0043 GD DWG

DB NO. 14-182-508
 LE 0082-00.DWG (PAPER SPACE)
 10/10/82 JAW
 PL 1111-50 N



LIFT STATION NO. 943
 UTILITY PLAN



0067-00 DWG

KEYED NOTES

- ① LIFT STATION TOP OF SLAB ELEVATION 6925.20
 SEE
- ② TRENCH SECTION. SEE

| NO | DATE | CLASS REV | REVISIONS | OWN | DES | CHD | REL | SUB | REC | APP |
|----|------|-----------|-----------|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | |

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT
 CIVIL: LIFT STATION NO. 943
 UTILITY PLAN

| | |
|----------|---------------|
| DRAWN | A. BRIZENO |
| DESIGN | J. HILLINGTON |
| CHECKED | B. POWDER |
| RELEASED | L. WEDENBERG |



BLDG: 943,944
 RECOMMENDED: *[Signature]* APPROVED FOR RELEASE: *[Signature]* DATE: 11.16.98
 P. DEPENDENT: *[Signature]* S. HANSON: *[Signature]* J. FRASER: *[Signature]*

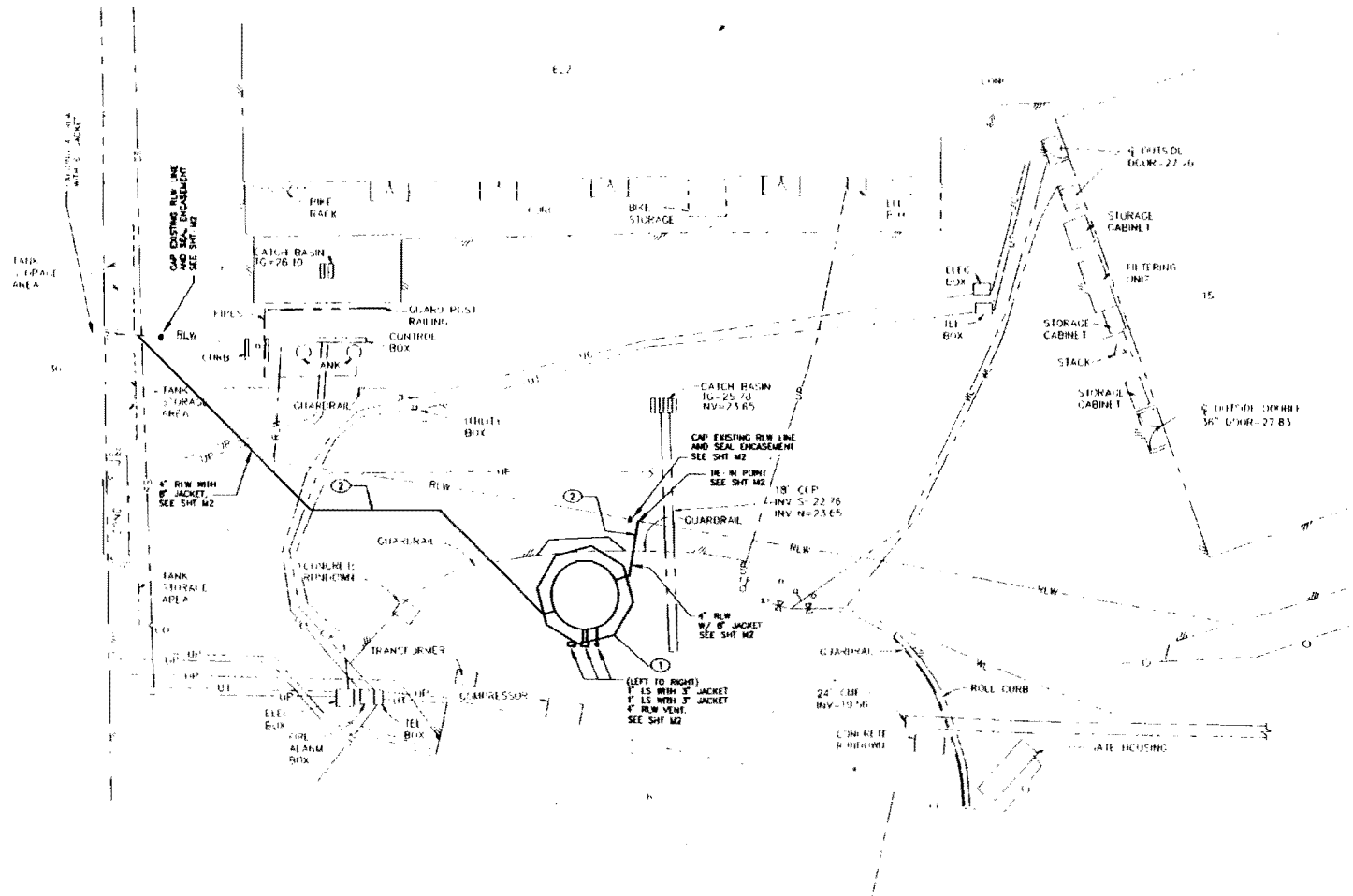
Los Alamos Los Alamos National Laboratory
 Los Alamos, New Mexico 87545

CLASSIFICATION: UNREVIEWED
 PROJECT I.D. NO: 18405
 DRAWING NO: C52075
 SHEET 4 OF 32
 DATE: 28 Nov 98

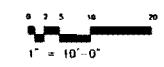


KEYED NOTES

- ① LIFT STATION TOP OF SLAB ELEVATION 6925.20
SEE 
- ② TRENCH SECTION, SEE 



LIFT STATION NO. 943
UTILITY PLAN



| NO | DATE | CLASS REV | REVISIONS | OWN | DES | CHKD | REL | SUB | REC | A |
|----|------|-----------|-----------|-----|-----|------|-----|-----|-----|---|
| | | | | | | | | | | |

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT
CIVIL: LIFT STATION NO 943
UTILITY PLAN

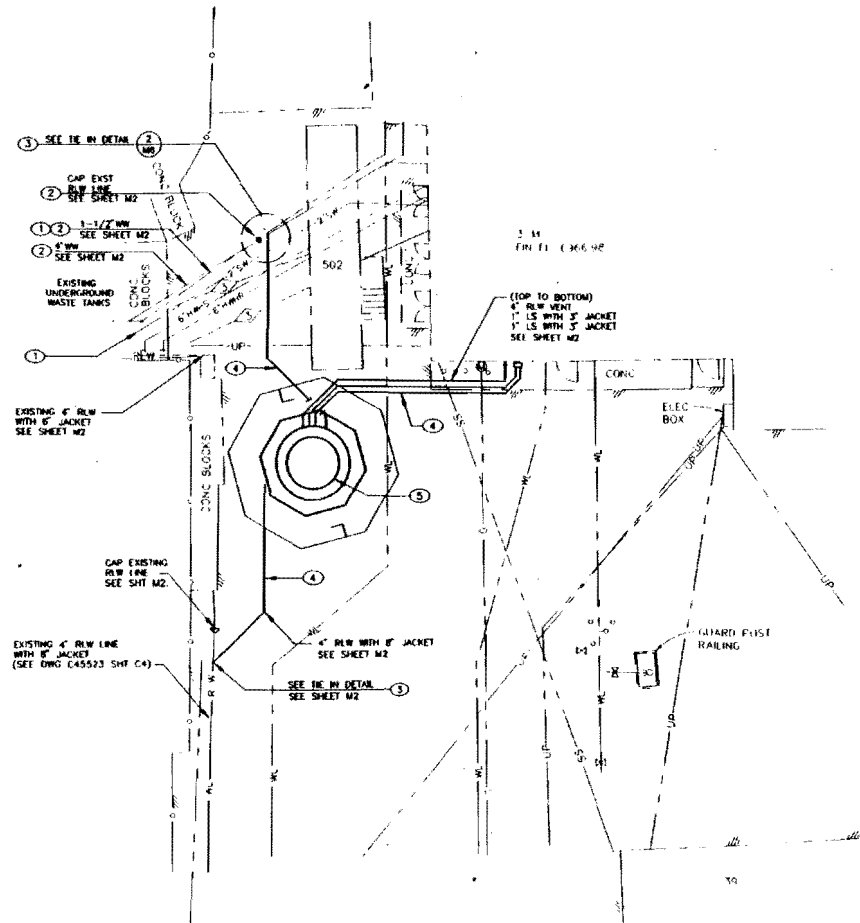
BLDG: 943.944 TA-53 DATE: 11.18.98
APPROVED FOR RELEASE: *[Signature]*
P. DEPOSEL *[Signature]* S. HANSON *[Signature]* J. FRASER *[Signature]*

Los Alamos Los Alamos National Laboratory
Los Alamos, New Mexico 87545

CLASSIFICATION: U REVIEWER: *[Signature]* DATE: 28 Feb 99
PROJECT ID NO: 18405 DRAWING NO: C52075

JOB NO. 11-182-8098
 FILE: 0082-CO.DWG (PAPER SPACE)
 ENG/TECH: JAW/JAW
 DATE: 11-18-98

0082-CO.DWG



- KEYED NOTES**
- THE 1-1/2\"/>
 - THE EXISTING WW AND RLW LINES ARE ASSUMED TO BE CAST IRON. SEE SHT M2.
 - THE EXACT TIE IN LOCATIONS SHALL BE DETERMINED PRIOR TO FABRICATION. SEE SHT M2.
 - TRENCH SECTION, SEE
 - LIFT STATION TOP OF SLAB ELEVATION 6966.00. SEE SHEET M2.

NOTES

- SEE GENERAL NOTES ON SHEET M1.

| NO | DATE | CLASS | REV | REVISIONS | DRW | DES | CHKD | REL | SLAB | REC | APP |
|------------|------|-------|-----|-----------|-----|-----|------|-----|------|-----|-----|
| REVISION 4 | | | | | | | | | | | |

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT
CIVIL: LIFT STATION NO. 944
UTILITY PLAN

| | |
|----------|---------------|
| DRAWN | A. BRICCO |
| DESIGN | J. MILLINGTON |
| CHECKED | B. POWDER |
| RELEASED | I. WELCH |

BLDG: 943.944 TA-53 DATE: 11-18-88

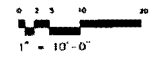
RECOMMENDED: P. DRISCOLL APPROVED FOR RELEASE: S. HANSEN APPROVED FOR RELEASE: J. FRASER

Los Alamos Los Alamos National Laboratory
Los Alamos, New Mexico 87545

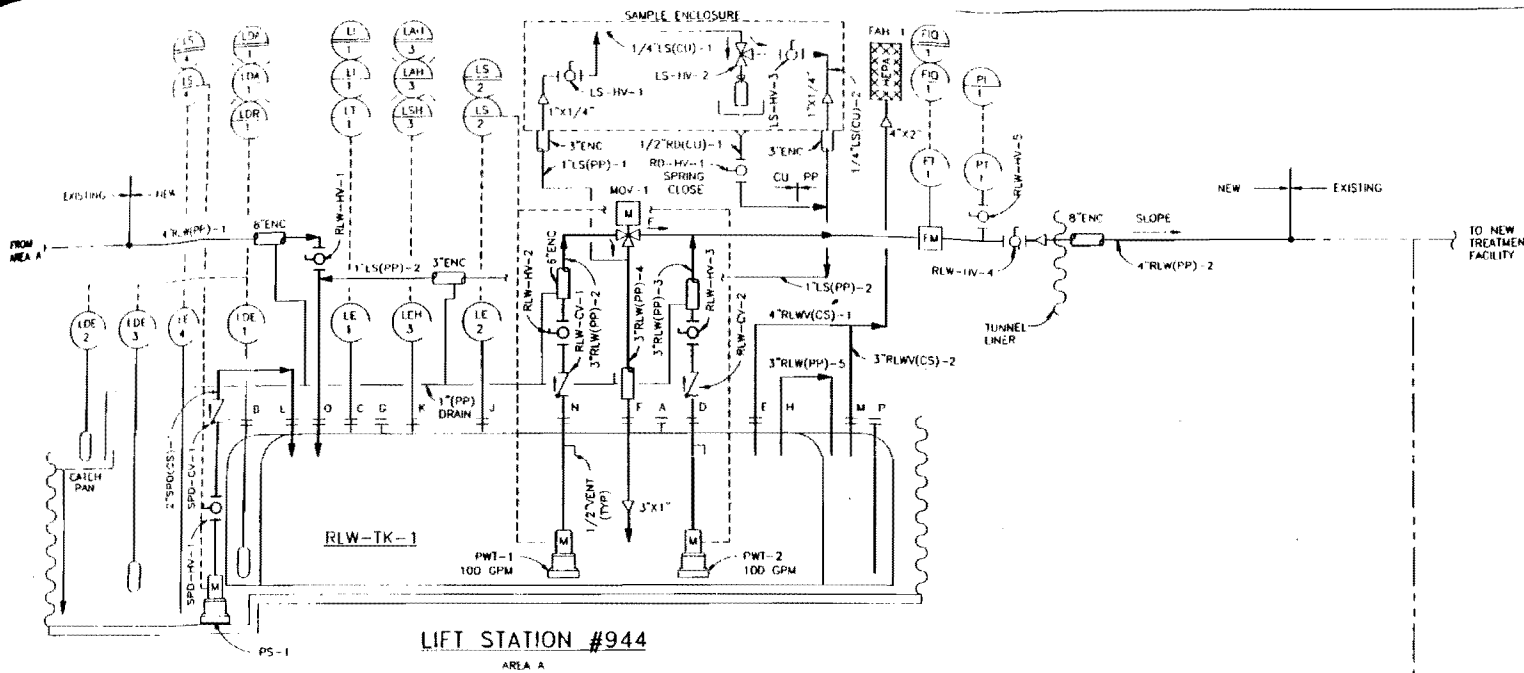
CLASSIFICATION: *U* REVIEWER: *M. R. ...* DATE: 3.3.89 SHEET 6 OF 32

PROJECT ID NO. 18405 DRAWING NO. C52075 REV.

N
↑
LIFT STATION NO. 944
UTILITY PLAN



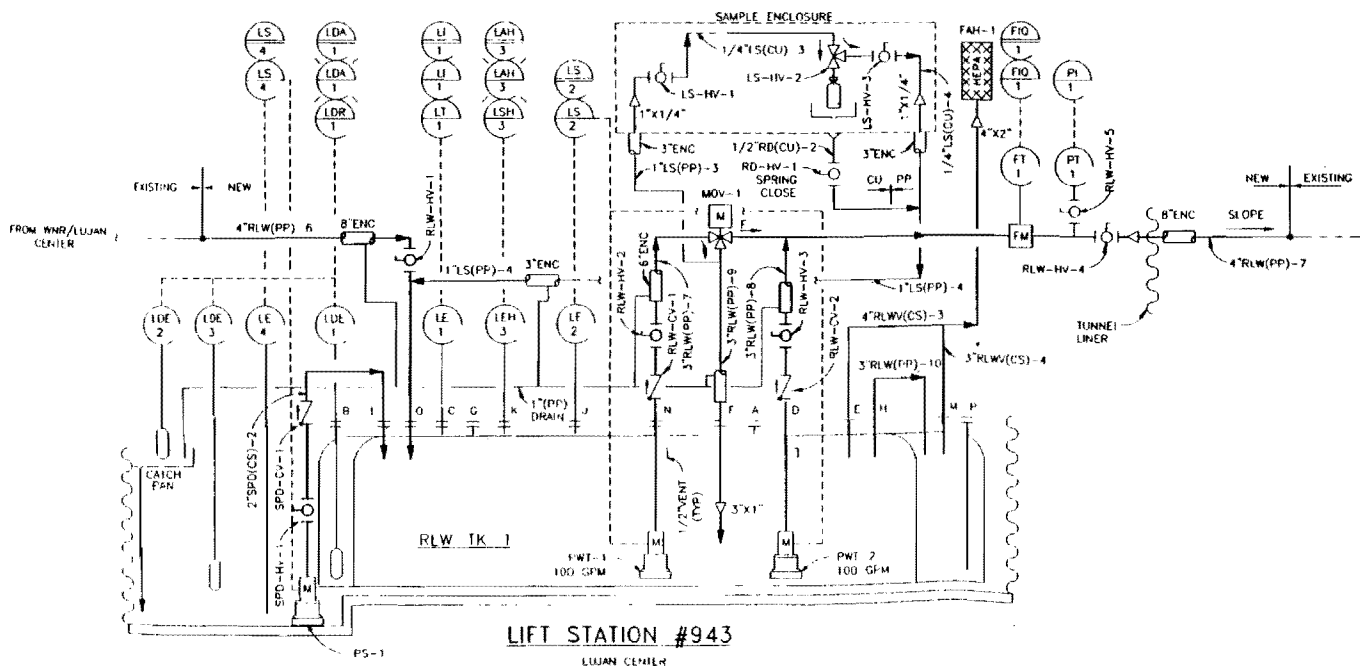
NO. 114-193-3000
 114-193-3000 (PAPER BACK)
 114-193-3000
 114-193-3000



LIFT STATION #944
AREA A

NOTES

1. FOR GENERAL NOTES AND LEGEND, SEE SHEET P1.



LIFT STATION #943
LUJAN CENTER

| NO | DATE | CLASS | REV | REVISIONS | OWN | DES | CHWD | REL | SLIB | REC | APP |
|----|------|-------|-----|-----------|-----|-----|------|-----|------|-----|-----|
| | | | | | | | | | | | |

CHAVEZ-GRIEVES CONSULTING ENGINEERS INC.
ARES Corporation

TA-53 RADIOACTIVE LIQUID WASTE TANK PROJECT
PIPING, PIPING & INSTRUMENTATION DIAGRAM

| | |
|----------|-------------|
| DRAWN | C. HICKS |
| DESIGN | [Signature] |
| CHECKED | [Signature] |
| RELEASED | [Signature] |

BLDG 943, 944 TA-53 DATE 11-10-88
 IN COMMENTED APPROVED FOR RELEASE APPROVED FOR RELEASE
 P. DEPOSITOR [Signature] S. HANSON [Signature] J. FRASER [Signature]

Los Alamos Los Alamos National Laboratory Los Alamos, New Mexico 87545
 SHEET 11 OF 32
 P2

| | | | | | |
|-----------------|-------|------------|-------------|------|----------|
| CLASSIFICATION | u | REVIEWER | [Signature] | DATE | 2.2 1988 |
| PROJECT I.D. NO | 18405 | DRAWING NO | C52075 | REV | 0 |

7603P2

PLOT SCALE: 1"=1' FILE: 7603P2.DWG

RLW PROJECTS - What and Why?

■ *Simplified Block Flow Diagram of TA-53 RLW Tank and Treatment Projects*

