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Engineering Task Plan for the Integrity Assessment Examination of Double-Contained Receiver Tanks, Catch Tanks, and Ancillary Facilities

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KEY WORDS: Double-Contained Receiver Tank (DCRT), Double-Shell Tank (DST), catch tank, ancillary facility, integrity examination, leak test, leak check, in-tank video inspection, closed circuit television (CCTV), corrosion assessment, pump pit inspection, annulus inspection, vault inspection, integrity assessment report.

REFERENCE DOCUMENT: WAC-173-303-640

ABSTRACT: This Engineering Task Plan (ETP) presents the integrity assessment examination of three DCRTs, seven catch tanks, and two ancillary facilities located in the 200 East and West Areas of the Hanford Site. The integrity assessment examinations, as described in this ETP, will provide the necessary information to enable the independently qualified registered professional engineer (IQRPE) to assess the

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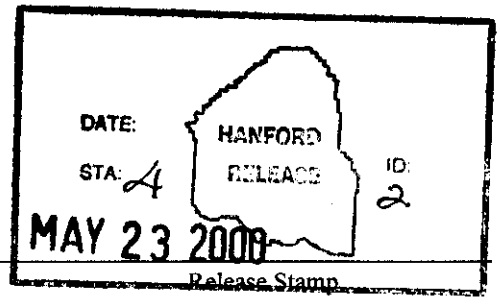
5/23/00
Release Approval Date



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condition and integrity of these facilities. The plan is consistent with the Double-Shell Tank Waste Transfer Facilities Integrity Assessment Plan (Hundal 1998).

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ENGINEERING TASK PLAN FOR THE INTEGRITY ASSESSMENT EXAMINATION OF DOUBLE-CONTAINED RECEIVER TANKS, CATCH TANKS, AND ANCILLARY FACILITIES

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COGEMA
ENGINEERING CORP.

ENGINEERING TASK PLAN FOR THE INTEGRITY ASSESSMENT EXAMINATION OF DOUBLE-CONTAINED RECEIVER TANKS, CATCH TANKS, AND ANCILLARY FACILITIES

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LIST OF ACRONYMS

ALARA	as low as reasonably achievable
CCTV	closed circuit television
CHG	CH2M HILL Hanford Group, Inc.
DCRT	double-contained receiver tank
DOE	U.S. Department of Energy
DST	double-shell tank
ENRAF	tradename for liquid level gage
ETP	engineering task plan
FY	fiscal year
HPT	health physics technician
IAR	integrity assessment report
IQRPE	independent qualified registered professional engineer
LC	leak check
LED	light-emitting diode
LLG	liquid level gauge
MCCS	motorized control camera system
PIC	person in charge
VITIS II	video in-tank inspection system
UT	ultrasonic testing
USQ	unreviewed safety question
WAC	Washington Administrative Code
WP	work package

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ENGINEERING TASK PLAN FOR THE INTEGRITY ASSESSMENT EXAMINATION OF DOUBLE-CONTAINED RECEIVER TANKS, CATCH TANKS, AND ANCILLARY FACILITIES

1.0 INTRODUCTION

The CH2M HILL Hanford Group, Inc. (CHG) operates a number of waste handling and storage facilities for the U.S. Department of Energy (DOE) at the Hanford site. These facilities are part of a network of interconnected, underground tanks, piping, and ancillary equipment that require periodic integrity assessment examination. The components addressed in this task plan are:

- double-contained receiver tanks (DCRTs)
- catch tanks
- ancillary facilities.

These facilities are contained within the double-shell tank (DST) waste storage systems, and are located in the 200 East and 200 West Areas of the Hanford Site.

Some of the DCRTs, catch tanks, and ancillary facilities have been in service for more than 50 years and essentially all contain dangerous waste constituents. Chapter 173-303-640(2) of the *Washington (State) Administrative Code* (WAC 1998) requires the performance of integrity assessments for each existing tank system that stores or treats dangerous waste. It further states that the owner and/or operator must obtain and keep on file at the facility, a written assessment reviewed and certified by an independent qualified registered professional engineer (IQRPE). Such integrity assessment reports (IARs) require the evaluation of the facility design as well as an evaluation of its physical condition, through an examination. This document only addresses the examination requirements and related details. The related design evaluations were completed in 1999.

Overall planning and implementation for the Integrity Assessment Program are described in the *Double-Shell Tank Waste Transfer Facilities Integrity Assessment Plan* (Hundal 1998). Integrity assessment examinations were planned for fiscal year (FY) 1999. But, because of conflicts with higher priority tasks, most of the examinations were extended into FY 2000.

To obtain agreement on the remaining scope of examinations, including specific examination methods and facility access locations, working session meetings were held. These meetings included staff members from CHG (Planning/Scheduling, Cognizant Engineers, Tank Farm Operations, and Environmental Operations/Compliance), COGEMA Engineering personnel, and the IQRPE. The meetings resulted in the set of examinations presented in this task plan.

2.0 PURPOSE

This Engineering Task Plan (ETP) identifies the elements of integrity assessment examination scope and examination methods for three DCRTs, seven catch tanks, and two ancillary facilities (one Lift Station and one Waste Unloading Facility). The purpose of the examinations is to determine the present condition of dangerous waste storage tank systems and to determine their leak tightness and structural stability, as required by WAC 173-303-640(2). From these examinations, appropriate conclusions and recommendations will be documented and maintained on record at each facility. Some parts of the examination scope have already been conducted. For example, leak checks have been conducted on two DCRTs, seven catch tanks, and the lift station.

The facility examination, described in this ETP, will provide the necessary information to enable the IQRPE to certify the integrity assessment reports for the 12 facilities.

3.0 SCOPE

This ETP describes the performance requirements for integrity examinations that are to be conducted on:

- three DCRTs (244-A, 244-BX, and 244-TX)
- seven catch tanks (AX-152, AZ-151, ER-311, EW-151, TX 302C, U-301B, and UX-302A)
- two ancillary facilities
  - Lift Station A-350
  - Waste Unloading Facility 204-AR.

The following plans are consistent with the requirements of the *DST Waste Transfer Facilities Integrity Assessment Plan* (Hundal 1998) and are detailed in Appendix A, Tables A-1 through A-4.

The plans were made after considering the age and use of the facility components. All the facilities are old and have not been assessed since their initial service date. Each of the facility components that store waste will be leak tested and visually inspected internally.[1, 2] Pump pits, pits, and/or vaults that are essentially the support components for each facility, and do not routinely hold waste will be visually examined but will not undergo a leak test.

[1] The 204-AR facility tank is an exception. Because of the difficulty of internal access, the tank will undergo ultrasonic wall thickness measurements.

[2] The AX-152 catch tank is another exception because of the difficulty of internal access, maintaining radiation levels as low as reasonably achievable (ALARA), and operational impacts.

4.0 DESCRIPTION OF FACILITIES

The three DCRTs, seven catch tanks, and two ancillary facilities to be examined are described below. Facility site maps, drawings, and photographs for each facility are shown in Appendix B.

4.1 DOUBLE CONTAINED RECEIVER TANKS (DCRTS)

There are three DCRTs to be examined in the 200 Areas: two in the 200 East Area and one in the 200 West Area. The DCRT systems function as small-capacity (about 19,000 to 31,000 gallons) short-term waste holdup stations during waste transfers. At the Hanford Site, the terms "lift station" (including saltwell station) and "DCRT" have often been used synonymously with the term "catch station." The three units of each DCRT to be examined are:

- receiver tank vault (often termed annulus)
- receiver tank
- pump pit.

Receiver-Tank Vault. Each receiver tank is located inside a reinforced concrete vault to provide secondary (double) containment against contamination release to the environment. The vaults are designed to contain potential leakage of waste solutions from their primary vessels until the waste can be removed. The vaults are sized to contain 100% of the maximum allowed tank capacity. Each vault floor drains to a sump. The vault walls, floor, and sump are lined either with carbon steel or are painted with Amercoat[3]. The space between the steel tank and the concrete vault is termed the annulus.

The DCRT vault ceilings have penetrations that provide access for liquid-level detection devices, inspection equipment (such as video cameras), pumps and ventilation air supply and exhaust.

Receiver Tank. Each receiver tank is constructed of either carbon steel or stainless steel.

Pump Pit. In each DCRT, a pump pit is located above the receiver tank vault. The pit is separated from the annulus by a reinforced concrete floor supported by steel beams. Most penetrations into the primary tanks and into the annuli are through the pump pits. The pump pits contain pumps, valves, connectors, motors, and piping that are used for tank waste transfers and operations such as leak detection.

The three DCRTs, including basic examination information are shown in Table 1.

[3] Manufactured by Protective Coating Division of Ameron, Brea, California

TABLE 1. DCRT BASIC INFORMATION[4]

DCRT (Location)	Structural Materials		Nominal Tank Volume [tank orientation]	Components to be Examined
	Primary Tank (size)	Secondary Containment (wall thickness)		
244-A (200 East)	Type 347 SS (5/16 in. tk. x 14 ft. dia. x ~ 20 ft. high)	Reinforced concrete with a CS liner (1/4 in.)	~ 17,800 gal. [vertical]	Pump pit, vault (annulus) and receiver tank
244-BX (200 East)	A 537 Cl. 1CS (3/8 in. tk. x 12 ft. dia. x ~ 39 ft. long)	Reinforced concrete with a coating of Amercoat	~ 31,000 gal. [horizontal]	Pump pit and annulus completed Receiver tank.
244-TX (200 West)	A 537 Cl. 1 CS (3/8 in. tk. x 12 ft. dia. x ~ 39 ft. long)	Reinforced concrete with a CS liner (1/4 in.)	~ 31,000 gal. [horizontal]	Pump pit, annulus, and receiver tank

CS = carbon steel
SS = stainless steel
tk = thickness

4.2 CATCH TANKS

There are seven catch tanks in the 200 Areas: four in 200 East and three in the 200 West (for basic information, see Table 2a and 2b below). One tank in the 200 E Area (241-EW-151) is enclosed in a concrete pit. The other six tanks are direct buried with no access for examination of the outside of the tank. Two of the catch tanks are part of systems that each has a nominally different name. For example, 241-EW-151, is an air vent station that contains a catch tank, and 241-AX-152 is a diverter station that contains a catch tank.

These catch tanks are small-capacity underground tanks (nominal volumes from about 800 to 36,000 gallons). They provide interim containment for fluids associated with waste spillage, transfer-line flush water, or collection of rain and snowmelt water from other facilities or pipelines. The tanks are constructed from either carbon steel, stainless steel, concrete lined with metal, or concrete lined with gunite (essentially concrete without any aggregate).

[4]See document SD-WM-TI-352 for discussion of nominal tank volumes.

Table 2a. Catch Tank Basic Examination Information – 200 East Area[4]

Catch Tank	Tank Structural Materials	Nominal Tank Volume [orientation]	Components to be Examined
241-AX-152	Type 304L SS liner (1/8-in. tk.) with reinforced concrete backing (6 ft. wide x 12 ft. deep x 22 ft. long)	~11,000 gal. [horizontal]	Pump pit and diverter pit.
241-AZ-151	A 569 CS (10-gage tk.) With reinforced concrete backing. (6 ft. wide x 12 ft. deep x 24 ft. long.	~ 12,000 gal. [horizontal]	Pump pit, diverter pit, and catch tank
241-ER-311	Type 18-8-S-Cb SS[(a)] (1/2 in. tk. x 9 ft. dia. x 36 ft. long)	~17,670 gal. [horizontal]	Catch tank and pump pit.
241-EW-151[(b)]	Type 309 SS (3/8 in. tk. x ~ 5 ft. dia x ~ 7 ft. high)[(c)]	~ 790 gal. [vertical]	Catch tank, annulus, and nozzle pit

(a) Essentially type 347 SS
(b) 241-EW-151 air vent station is located between the 200E and 200W areas.
(c) The tank vault is constructed of reinforced concrete and is coated with Amercoat.
CS = carbon steel
SS = stainless steel
tk = thickness

[4]See document SD-WM-TI-352 for discussion of nominal tank volumes.

Table 2b. Catch Tank Basic Examination Information – 200 West Area[4]

Catch Tank	Tank Structural Materials	Nominal Tank Volume [Orientation]	Components to be Examined
241-TX-302C	A 285-46 Gr. B CS (9/16 in. tk. x 9 ft. dia. x 39 ft. long)	~ 17,670 gal. [horizontal]	Catch tank and pump pit
241-U-301B	Gunite liner (3/4-in. tk.) with prestressed concrete backing (21 ft. dia. x 21 ft. high)	~ 36,430 gal. [vertical]	Catch tank and pump pit
241-UX-302A	A 285-46 Gr. B CS (9/16-in. tk x 9 ft. dia. x 39 ft. long)	~ 18,600 gal. [horizontal]	Catch tank and pump pit

CS = carbon steel
Gunite = cement-sand combination (no aggregate)
tk = thickness

4.3 ANCILLARY FACILITIES

The ancillary facilities include one lift station and one waste unloading facility, each of which contains a catch tank in a concrete tank pit. Basic examination information regarding the two ancillary facilities is shown in Table 3.

TABLE 3. BASIC EXAMINATION INFORMATION ON ANCILLARY FACILITIES[4]

Ancillary Facility (location)	STRUCTURAL MATERIALS		Nominal Tank Volume [orientation]	Components To Be Examined
	Primary Tank (wall thickness)	Secondary Containment (wall thickness)		
Lift Station 241-A-350 (200 E)	Type 309 SS (3/8-in. tk. x 4.5.ft. dia. x 7 ft. high)	Corrugated galvanized steel caisson backed by grout (12 gauge)	~790 gal. [vertical]	Pump pit, catch tank pit (caisson), and catch tank
Waste Unloading Facility 204-AR (200 E)	Type 304L SS (1/4 in. tk. x 5.5 ft. dia x 8.5 ft. high)	Reinforced concrete lined with ¼ in. tk. SS	1,500 gal. [vertical]	Catch tank and Catch tank pit

SS = stainless steel
tk = thickness.

5.0 INTEGRITY EXAMINATION ELEMENTS

The requirements for assessment of an existing tank system's integrity are provided in WAC 173-303-640(2) (WAC 1998). Section WAC 173-303-640(2)(c) states as follows.

> *This assessment must determine that the tank system is adequately designed and has sufficient structural strength to ensure that it will not collapse, rupture, or fail. At a minimum, this assessment must consider the following:*
> *(i) Design standard(s), if available, according to which the tank system was constructed;*
> *(ii) Dangerous characteristics of the waste(s) that have been and will be handled;*
> *(iii) Existing corrosion protection measures;*
> *(iv) Documented age of the tank system, if available (otherwise, an estimate of the age); and*
> *(v) Results of a leak test, internal inspection, or other tank system integrity examination such that:*
> *(A) For nonenterable underground tanks, the assessment must include a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets, and high water table effects; and*
>
> *(B) For other than nonenterable underground tanks and for ancillary equipment, this assessment must include either a leak test, as described above, or other integrity examination, that is certified by an independent, qualified, registered professional engineer, in accordance with WAC 173-303-810 (13)(a), that addresses cracks, leaks, corrosion, and erosion.*

Items *(i)* through *(iv)* require an assessment of design-related elements, whereas item *(v)* requires an assessment of examination-related elements. The approach that has been applied for compliance with the design-related elements is documented in *Double-Shell Tank Waste Transfer Facilities integrity Assessment Plan* (Hundal 1998). The approach for compliance with the examination-related elements is discussed below.

The WAC 173-303-640 (2)(c) requires, for "nonenterable" underground waste tanks "a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets, and high water table effects." For "other than nonenterable" underground tanks, this regulation requires either a leak test or other means of integrity examination, as an alternative to a leak test, "that is certified by an independent, qualified, registered professional engineer, in accordance with WAC 173-303-810 (13)(a), that addresses cracks, leaks, corrosion, and erosion." Because of radiological hazards, the DCRTs, catch tanks, and miscellaneous tanks that are the subject of this engineering task plan, are not enterable by humans, but are enterable by means of remotely operated equipment. It is not clear which definition is intended in the WAC regulations in use of the terms "nonenterable" and "other than nonenterable". Therefore, because of the radiological hazards, the waste tanks identified for evaluation in this engineering task plan are considered to be "nonenterable", due to the need to comply with 10 CFR 835, 29 CFR 1910 and 29 CFR 1926. Removal of waste and decontamination of the tanks is not feasible at this time.

Per the above stated requirements of WAC 173-303-640 (2)(c), the minimum requirement for tank examination of any tank (nonenterable or other than nonenterable) is satisfied by conducting a leak test. Acceptance criteria will be established by the independent qualified professional engineer for each leak test. Historical liquid level monitoring data and data from leak detection instruments may be documented and used for assessment of leak tightness and compliance with the leak test requirement. To minimize waste generation, and where historical liquid level data cannot be used, leak tests will in general be performed with liquid from normal process operations, i.e., without addition of liquid solely for the purpose of conducting the required leak test. The only exceptions to this are 241-AX-152, which is currently empty and not expected to be filled to sufficient depth for a leak test, through normal process operations, in the foreseeable future, and 204-AR which may require the addition of a small quantity of raw water.

In addition to meeting the minimum requirements for tank examination by leak testing, additional examinations will be performed utilizing CCTV and video recording equipment, where practical, to address cracks, leaks, corrosion and erosion. (Deployment of remotely operated CCTV for examination of the interior of tanks, or for examination of the exterior of tanks, is certainly not as effective as would be visual examination by a trained professional, where tank conditions permit human access). Deployment of remotely operated CCTV for examination of tank interiors, exteriors, pump pits, and vaults may provide additional useful information for the purpose of assessing overall condition of a tank system, including identification of large cracks, coating failures, and structural deterioration. Given the age of many of these tanks, and the potential environmental, cost, and schedule impacts of tank failure, examination by CCTV, where practical, is considered prudent, even though not required by the regulations. The additional information obtained through deployment of CCTV will allow for a more inclusive assessment of the tank system and more appropriate recommendations for future operation and use. For some tanks, gaining such access for CCTV examination would be particularly difficult, since tanks were in general not designed or constructed to permit human access. For such tanks, the value of the additional information to be gained may not be sufficient to justify cost, risk of worker exposure to radiation and chemical hazards, and potential impacts to operations. Because of these factors, internal CCTV examination of tanks 241-AX-152 and 204-AR was ruled out. However, the exterior of 204-AR is accessible for remote ultrasonic examination, which will be conducted to supplement the tank leak test. The facilities' planned examination work scope and operations schedule is presented in Appendix A and Appendix C respectively.

Ecology's guidance (Ecology 1994) for integrity assessment of tank systems addresses secondary containment, as well as primary tanks. This guidance suggests visual inspection alone is an adequate method of integrity examination for secondary containment. Thus, where vaults are provided for the tanks covered by this engineering task plan, the required visual examination will be accomplished by CCTV.

6.0 RESPONSIBILITIES

Table 4 identifies the engineering tasks, by responsible individual, that need to be performed in order to complete the integrity assessment examination. Nothing in this ETP prevents a person from assuming more than one role for a task (such as the field engineer and lead engineer being the same person), or two persons dividing up the responsibilities of one role.

Table 4. Assignment of Engineering Tasks

RESPONSIBLE INDIVIDUAL	ENGINEERING TASKS	RESPONSIBLE COMPANY
Cognizant Engineer/Cognizant Manager	1. Coordinate and integrate scope of tank examination 2. Approve schedules 3. Manage overall project 4. Approve final reports	CHG
Facility Manager/PIC	1. Provide personnel to support scope of work (PIC, planners, camera crew, operators, and HPTs)	CHG
Planner	1. Develop work package 2. Provide support to work package preparation 3 Help resolve tank farm interface issues (radiological, permits, safety, etc.)	CHG
Field Engineer	1. Prepare documentation supporting field activities (ETPs, test plans, USQs, status, etc.) 2. Provide support to WP preparation. 3. Provide support during facility visual inspection.	COGEMA Engineering
Lead Engineer	1. Overall activity leader 2. Ensure work is performed in accordance with this ETP 3. Prepare integrity assessment examination report	COGEMA Engineering
IQRPE	1. Concur with examination scope 2. Examine and evaluate examination data and CCTV recordings. 3. Certify "fitness for use"	COGEMA Engineering

ETP = engineering task plan
HPTs = health physics technicians
PIC = person in charge
USQs = unreviewed safety questions
CCTV = closed circuit television

7.0 PLAN FOR FIELD ACTIVITIES (FACILITY TEST/INSPECTION)

Individual work packages will be prepared for each tank inspection. The inspection will proceed according to the work instruction in the approved work package. In addition, the work instructions will point to the applicable guideline, procedure, or charter, as needed.

The facility manager will designate an operations PIC who has overall authority over the field performance of the inspections. This person will work closely with the lead engineer and the IQRPE to ensure that work proceeds according to the work instruction. Discovery of any leaks, structurally significant defects, gross deformation, or cracks will be documented. The inspection is expected to continue after discovery of any condition as just noted. Unless a problem is an emergency, or is of immediate safety concern, the PIC is expected to obtain input from the lead engineer before rendering decisions.

The specific items listed below address the major field activities. The responsible individual listed under each item has authority and responsibility for that aspect of the inspection work.

- Work to be performed by tank farms personnel (e.g., removal of facility cover blocks and any other equipment blocking leak test/visual access that is feasible to be moved; establishing CCTV [or equivalent] access to the facility pit/tank/annulus/sump, etc.), will have designated steps in the work package.

  Responsible Individual: PIC

- Write procedure for leak test and visual inspection.

  Responsible Individual: Field Engineer

- Setup, examination, and evaluation of visual examination equipment before deployment to the facility of interest.

  Responsible Individual: PIC with support from Lead Engineer.

- Setup and operation of visual examination equipment, including supplementary lights, at the facility of interest.

  Responsible individual: PIC with support from Lead Engineer.

8.0 RECORDS

The following records will be prepared for this work, including reporting at the end of the facility test and inspections:

- Procedure for leak tests
- Procedure for entering the facility annulus and/or sump region (outside of tank), with a CCTV camera and lighting equipment, either through an inspection riser, manway, or spare riser
- Procedure for removal (and replacement) of cover blocks (where necessary)
- Procedure for entering the tank interior with a CCTV camera and lighting equipment, through a spare inspection riser/manway
- Procedure for deployment and retrieval of CCTV equipment from a tank interior
- CCTV examination procedure
- USQ screening or determination.
- CCTV report and video tapes containing, as a minimum, facility identification, date, time, location, reference elevation, depth, azimuth, pan, tilt, and position
- An interim integrity assessment examination report that presents and explains the leak test and visual examination data from the facility examinations.

9.0 INTEGRITY ASSESSMENT EXAMINATION REPORTING DETAILS

A written report will provide the results of the facility integrity assessment examination proposed under the direction of the IQRPE and shall be prepared by a qualified person. The report shall be reviewed by the IQRPE to ensure that it contains the information needed to assess the facility as described in this ETP and in the integrity assessment plan (Hundal 1998). The assessment report should contain the following items:

- a site map of the facility, showing the location of the tank system within the overall facility
- a sketch of the tank system with the location of the inspected items clearly indicated and cross-referenced in the results of the integrity assessment
- an assessment of the existing tank system's integrity according to WAC 173-303-640(2)
- results of the visual examination, including the leak testing or other methods used to assess tank system integrity
- results of the secondary containment assessment examination (if applicable)
- a statement by the IQRPE stating that the information collected is sufficient to support the assessment and is consistent with the integrity assessment plan
- conclusions and recommendations.

10.0 INTEGRITY ASSESSMENT EXAMINATION REPORTS

During interim stages of their preparation, the integrity assessment examination reports and supporting information and documentation will be provided to the IQRPE for review and comments. The format of these reports should be consistent with the *DST Waste Transfer Facilities Integrity Assessment Plan* (Hundal 1998) so that they can be incorporated into the final certified integrity assessment report.

11.0 REFERENCES

10 CFR 835, *Occupational Radiation Protection*, Code of Federal Regulation, 10 CFR 835, U. S. Department of Energy, Washington, DC.

29 CFR 1910, *Occupational Safety and Health Standards,* Code of Federal Regulation, 29 CFR 1910, U. S. Department of Labor, Occupational Safety and Health Administration, Washington, DC.

29 CFR 1926, *Safety and Health Regulations for Construction,* Code of Federal Regulation, 29 CFR 1926, U. S. Department of Labor, Occupational Safety and Health Administration, Washington, DC.

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APPENDIX A

INSPECTION WORK SCOPE

Table A-1. DCRT Integrity Examination Details

DCRT FACILITY	GENERAL INFORMATION	VISUAL INSPECTION OF ANNULUS[1]	VISUAL INSPECTION OF PUMP PIT[1]	VISUAL INSPECTION OF TANK INTERIOR[1]	LEAK CHECK
244-A	USQ# TF-00-0196 WP-2E-98-2544 VITIS II camera system for inspections.	Two 6-in. risers located at grade at East and West end of the pump pit.	Perform video inspection through a valve handle penetration or when the cover block is removed for in-tank inspection.	Remove pump pit cover block and perform in-tank video through riser 'E' (12- in.) Perform inspection at current liquid level.	Historical level data check completed 1/00
244-BX	USQ# TF-99-0095 WP-2W-98-2032 VITIS II Camera for inspections.	Completed in FY 1999	Completed in FY 1999	Perform inspection at current level. Inspection will be through the #8 (4-in.) riser with riser #16 as alternate entry point.	Completed FY1999. Actual filling of tank performed.
244-TX	USQ# TF-00-0196 WP-2W-98-2033 VITIS II Camera system for inspections.	Inspection through two risers, one in the NE corner riser #18 (24-in.) and the second entry point through riser #26 (4-in. LLG) located in the cover block above the sump pit.	Perform video inspection through a valve handle penetration.	Perform inspection at current level through riser #8 (4-in.). Riser #16 is an alternate entry point.	Fill under normal process operations and perform a 40-hour leak check.

(1) Perform inspection using CCTV color camera and record on S-VHS tape
CCTV = closed circuit television
LLG = liquid level gauge
WP = work package
VITIS II = video in-tank inspection system
USQ = unreviewed safety question

TABLE A-2. CATCH TANK INTEGRITY EXAMINATION DETAILS – 200 EAST AREA

CATCH TANK FACILITY	GENERAL INFORMATION	VISUAL INSPECTION OF ANNULUS[1]	VISUAL INSPECTION OF PUMP PIT[1]	VISUAL INSPECTION OF TANK INTERIOR[1]	LEAK CHECK
241-AX-152	USQ# TF-00-0196 WP-2E-00-00273 WP-2E-00-00630 WP-2E-00-00585 MCCS camera system for inspections.	N/A	Perform video inspection through cover block inspection risers (12"). [2]	N/A	Fill with raw water and caustic from deentrainer flushing to approx. 80% of operating capacity and monitor for 24 hours (LC). The 702-AZ exhaust system will be shut down. Raw water and caustic used for this LC will be pumped to AY-101 to adjust tank chemistry.
241-AZ-151	**USQ# TF-00-0196** WP-2E-98-2684 WP-2E-00-00448 VITIS II camera system for inspections.	N/A	Perform inspection when cover block is removed for in-tank inspection.	Remove cover block and perform in-tank inspection through the 4" pump pit floor drain.	Fill tank to as full as practical under normal process operations and perform leak check (24 hours). The 702-AZ exhaust system will be shut down.
241-ER-311	**USQ# TF-00-0196** WP-2E-00-00195 MCCS camera system for inspections.	N/A	Perform video inspection through a valve handle penetration	Pump-out the tank then perform in-tank inspection through 4-in. riser located at the east and west ends of tank.	Historical level data check was completed 9/99.
241-EW-151	USQ# TF-00-0196 WP-2E-00-00193 Circumspecter camera system for inspections.	Perform inspection through the 3-in. carbon steel riser on the northeast corner (blank flanged).	Remove cover block(s) and perform pump pit inspection.	Perform inspection through the 3-in. stainless steel riser (breather filter) or the 3" carbon steel riser (LLG) located on the east side of the facility.	Historical level data check completed 9/99.

(1) Perform inspection using CCTV color camera and record on S-VHS tape
(2) Includes diverter pit
CCTV = closed circuit television
LC = leak check
MCCS = motorized control camera system
LLG = liquid level gauge
USQ = unreviewed safety question
VITIS II = video in-tank inspection system
WP = work package

TABLE A-3. CATCH TANK INTEGRITY EXAMINATION DETAILS – 200 WEST AREA

CATCH TANK FACILITY	GENERAL INFORMATION	VISUAL INSPECTION OF ANNULUS[1]	VISUAL INSPECTION OF PUMP PIT[1]	VISUAL INSPECTION OF TANK INTERIOR[1]	LEAK CHECK
241-TX-302C	USQ# TF-99-0196 WP-2W-98-2034 VITIS II camera system for inspections.	N/A	Remove pump pit lid and perform inspection.	Move pump to the side and enter the tank through the pump pit riser.	Historical level data check completed 9/99.
241-U-301B	USQ# TF-00-0196 WP-2W-00-00086 VITIS II camera system for inspections.	N/A	Remove pump pit lid and perform inspection or inspection through a valve handle or inspection riser.	Perform in-tank inspection through a 12-in. riser at current liquid level.	Historical level data check completed 9/99.
241-UX-302A	USQ# TF-99-0090 WP-2W-98-2036 VITIS II camera system for inspections.	N/A	Remove pump pit lid and perform inspection through the inspection riser.	Perform in-tank video at current liquid level through 4–in.spare riser located at the east or west ends of the tank.	Historical level data check completed 9/99.

(1) Perform inspection using CCTV color camera and record on S-VHS tape
CCTV = closed circuit television
USQ = unreviewed safety question
VITIS II = video in-tank inspection system
WP = work package

Table A-4. Ancillary Facility Integrity Examination Details

ANCILLARY FACILITY	GENERAL INFORMATION	VISUAL INSPECTION OF ANNULUS[1]	VISUAL INSPECTION OF PUMP PIT[1]	VISUAL INSPECTION OF TANK INTERIOR[1]	LEAK CHECK
241-A-350 Lift Station	USQ# TF-00-0196 WP-2E-00-00194 Circumspecter Camera System for inspections.	Remove coverblock(s). Perform inspection through the 8-in. riser port (LDE-350-2-PORT) located in the pump pit floor just west of sump pump.	Perform pit inspection through a valve handle penetration or when a cover block is removed for the annulus/in-tank inspection.	Remove cover block and perform in-tank inspection through the dip tube riser LE-350-1 (3 in.) located in the southwest quadrant between transfer and sump pumps. Must remove sump pump jumper.	Historical level data check completed 9/99.
204-AR Waste Unloading Facility	USQ# TF-99-0196 WP-2E-98-2686 VITIS II or Circumspecter Camera System for inspections	Remove floor grating from area surrounding tank, use existing openings in grating or cut new as required for inspection (2 points 180 degrees apart).	N/A	Remove floor grating, use existing openings, or cut as required to perform UT inspection of tank exterior wall in place of in-tank video inspection.	Perform leak check (4 hours) with current tank waste volume plus add 300-500 gallons of raw water.

(1) Perform inspection using CCTV color camera and record on S-VHS tape
CCTV = close circuit television
USQ = unreviewed safety question
UT = ultrasonic testing
VITIS II = video in-tank inspection system
WP = work package

APPENDIX B

DESCRIPTION OF FACILITY,

FACILITY SITE MAPS,

DRAWINGS,

AND

PHOTOGRAPHS

DOUBLE-CONTAINED RECEIVER TANK 244-A

The 244-A DCRT/Lift Station is a reinforced concrete structure consisting primarily of three adjoining compartments that house different facility components:

- receiver tank containment vault
- pump pit
- filter pit

Receiver tank containment vault. The receiver tank containment vault is located directly below the pump pit. It is cylindrical in plan view, with a 17-ft. inside diameter and 1-ft. thick concrete sidewalls. The vault floor slab is 1.5-ft. thick. Inside height of the vault is 22-ft. and 4-in. A collection sump is located 1-ft. below the floor elevation, offset toward the northwest edge of the vault. One-quarter (¼)-in. thick carbon steel plate lines the vault floor, sump and sidewalls up to the underside of the pump pit floor slab

Receiver tank. The tank is positioned inside the vault with the tank centerline offset 8-in. to the south of the vault centerline. The 244-A DCRT (originally designated TK-387) is a cylindrical, 16,280-gal tank, constructed of welded type 347 stainless steel, 5/16-in.-thick, with hemispherical ends. The tank is installed in the 244-A vault with the cylinder axis vertical. Nominal dimensions are 14-ft diameter by 14 ft high (overall height is 21 ft, 1 in. measured from bottom of skirt and base ring to top of riser flange).

The tank was originally designed and fabricated in 1950 for the 276-U Solvent Handling Facility. This facility was used for makeup and treatment of organic solutions used in the 221-U Building (U-Plant operations). The 276-U mission began in 1952 and ended in 1957. It is unknown whether TK-387 was ever used at the original location. Tanks at 276-U were cleaned out and isolated in 1957. As part of Project B-103, TK-387 was relocated and modified for service at 244-A. Age, based on date of installation (in 244-A) is about 25 years (1975) while its physical age is as much as 50 years (1950).

Pump pit. The pump pit has inside dimensions of 13-ft. by 15-ft (plan) by 11-ft high and is located directly over the receiver vault. Coverage of the pump pit is provided by an 18-in.-thick concrete cover slab in three sections. The concrete floors and sidewalls of the pit are 1-ft thick.

Filter Pit. The filter pit has inside dimensions of 11-ft by 13-ft (plan) by 5.5-ft high. The filter pit cover is constructed of 3/8-in. thick steel plate. Floors and sidewalls of the two upper compartments are all 1 ft thick. No examinations are planned for the filter pit.

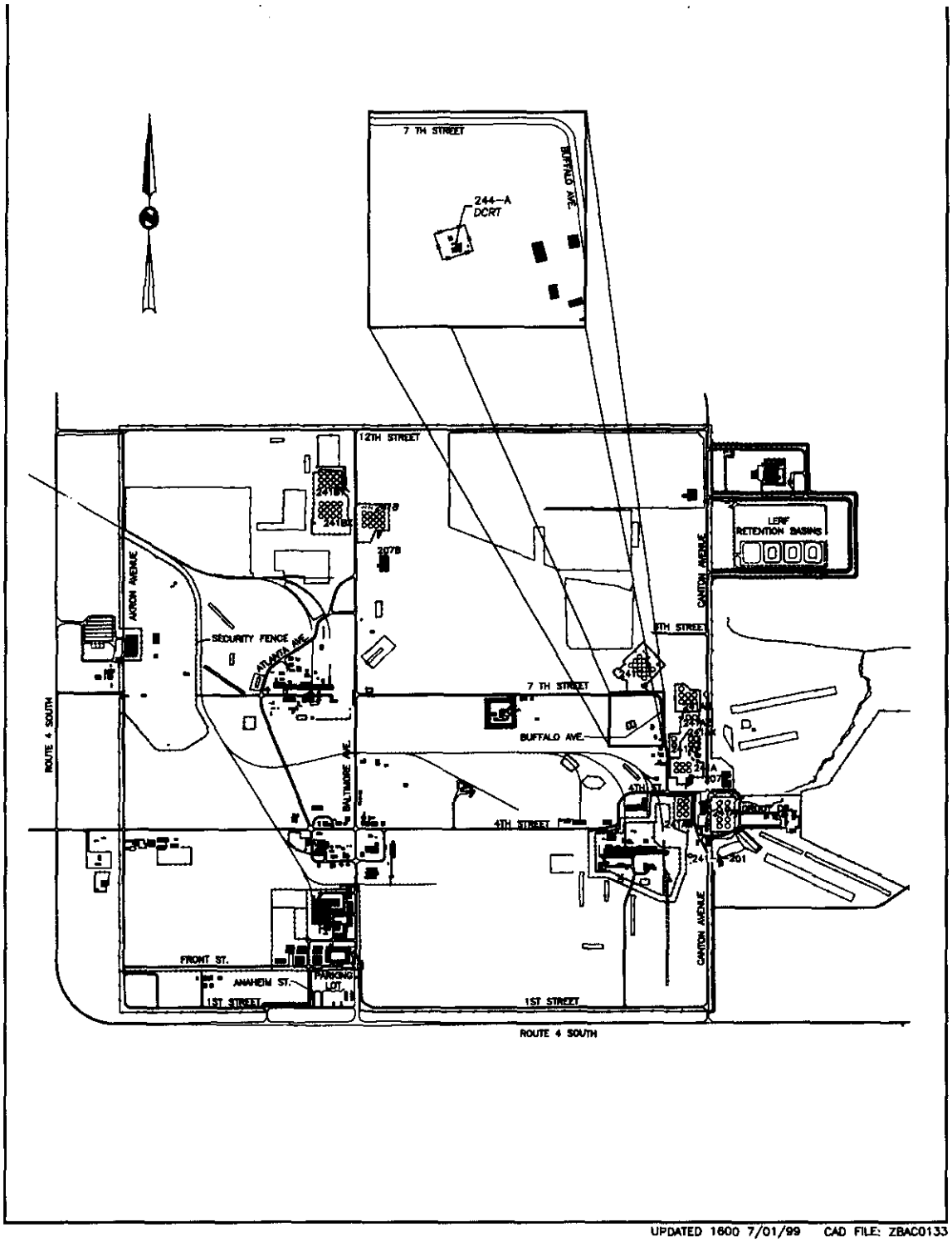


Figure B-1. SITE PLAN – 244-A Double-Contained Receiver Tank.

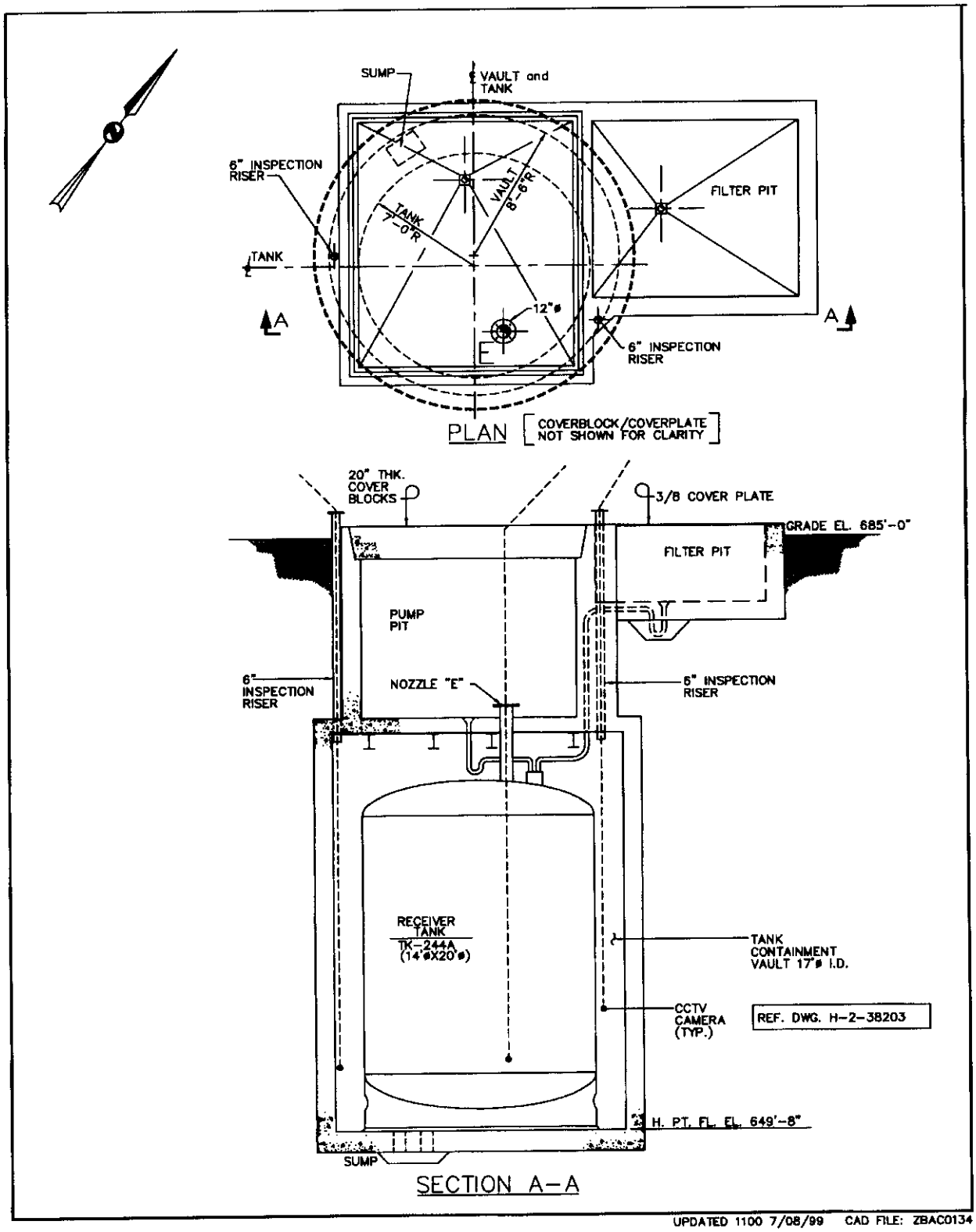


Figure B-2. 244-A Double Contained Receiver Tank

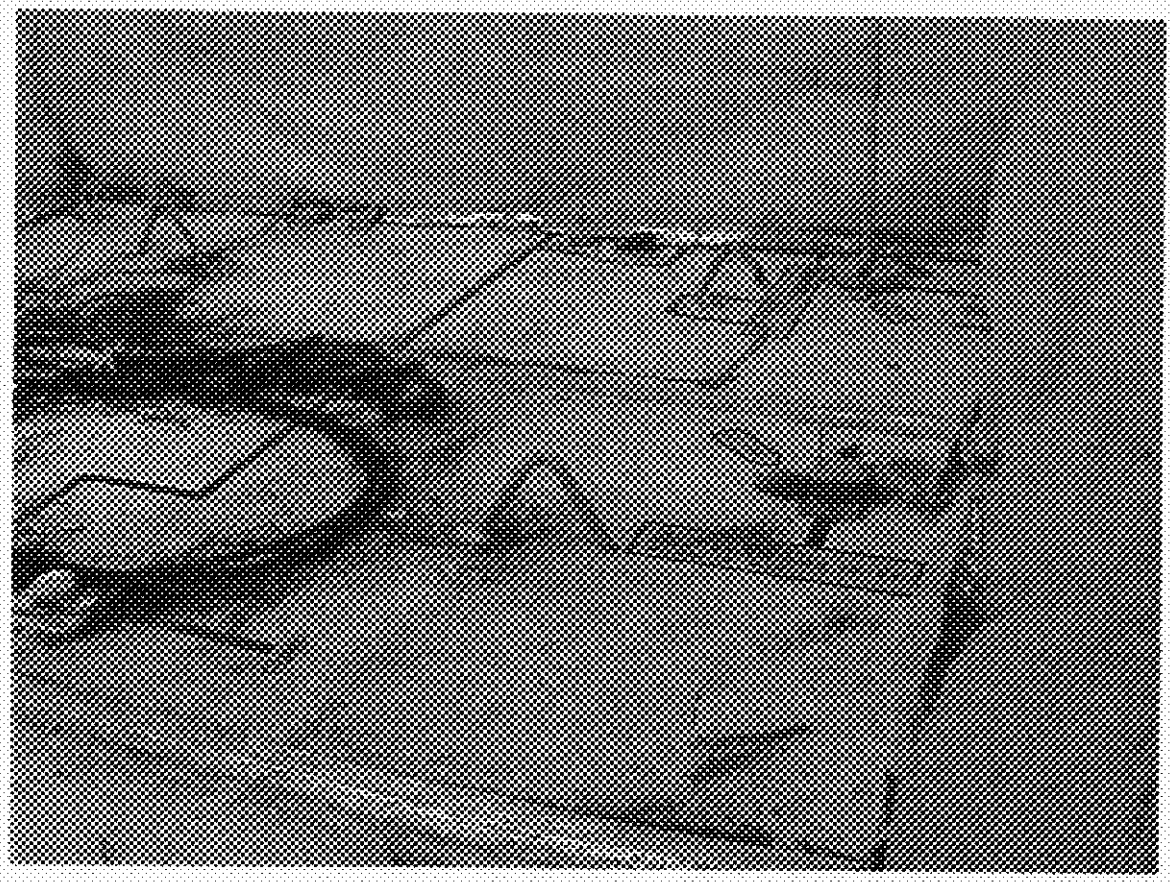


Figure B-3. Portion of Cover blocks atop the 244-A Double-Contained Receiver Tank Pump Pit.

DOUBLE-CONTAINED RECEIVER TANK 244-BX

The 244-BX DCRT facility is an underground reinforced concrete structure consisting primarily of three main compartments that house different facility components. The three main compartments described below are:

- receiver tank containment vault
- pump pit
- filter pit.

Receiver tank containment vault. The receiver tank containment vault is a rectangular reinforced concrete structure, approximately 20-ft. W x 48-ft. x 23-ft. H outside dimension with 2-ft. thick walls and a 3-ft. to 4-ft. thick bottom foundation slab. Amercoat No. 33 liner material (manufactured by Protective Coating Division of Ameron, Brea California) protectively coats the vault concrete. The foundation slab slopes down towards a trench on the east side of the vault, which slopes to a sump to collect liquids. The vault houses the primary receiver carbon steel (ASTM A 537 Class 1) horizontal tank.

Receiver tank. Receiver tank dimensions are: 3/8-in. thick by 12-ft. diameter cylindrical shell with ½-in. thick dished heads on each end of the shell. Nominal capacity of the tank is 31,000 gallons with a maximum operating capacity limited to 24,800 gallons. Design corrosion allowance is 0.001 in./year, for each side of the tank, for 10 years of minimum intended useful life or 0.02 in. total. Secondary containment of the receiver tank is provided by the vault. Age of the tank is about 19 years (based on Construction Procurement Specification B-180 initiation date of Sep. 1979, and an assumed completion date of about 1981).

Pump Pit. The pump pit is 20-ft.(W) x 22-ft. (L) x 11-ft.-6-in.(H) with 18-in. thick walls. Its approximate 3-ft., thick floor slab is supported on steel beams and 4 1/2-inch metal decking. Location of the pump pit is directly above the vault on its south end. Transfer lines enter the pump pit walls at different elevations.

Filter Pit. Adjoining the pump pit, also above the vault but on its north side, is the filter pit. It is a 13-ft. (W) x 20-ft. (L) x 11-ft.-6-in. (H) concrete structure with 18-in. thick walls and an approximate 3-ft., thick floor slab. No examinations are planned to be conducted in the filter pit.

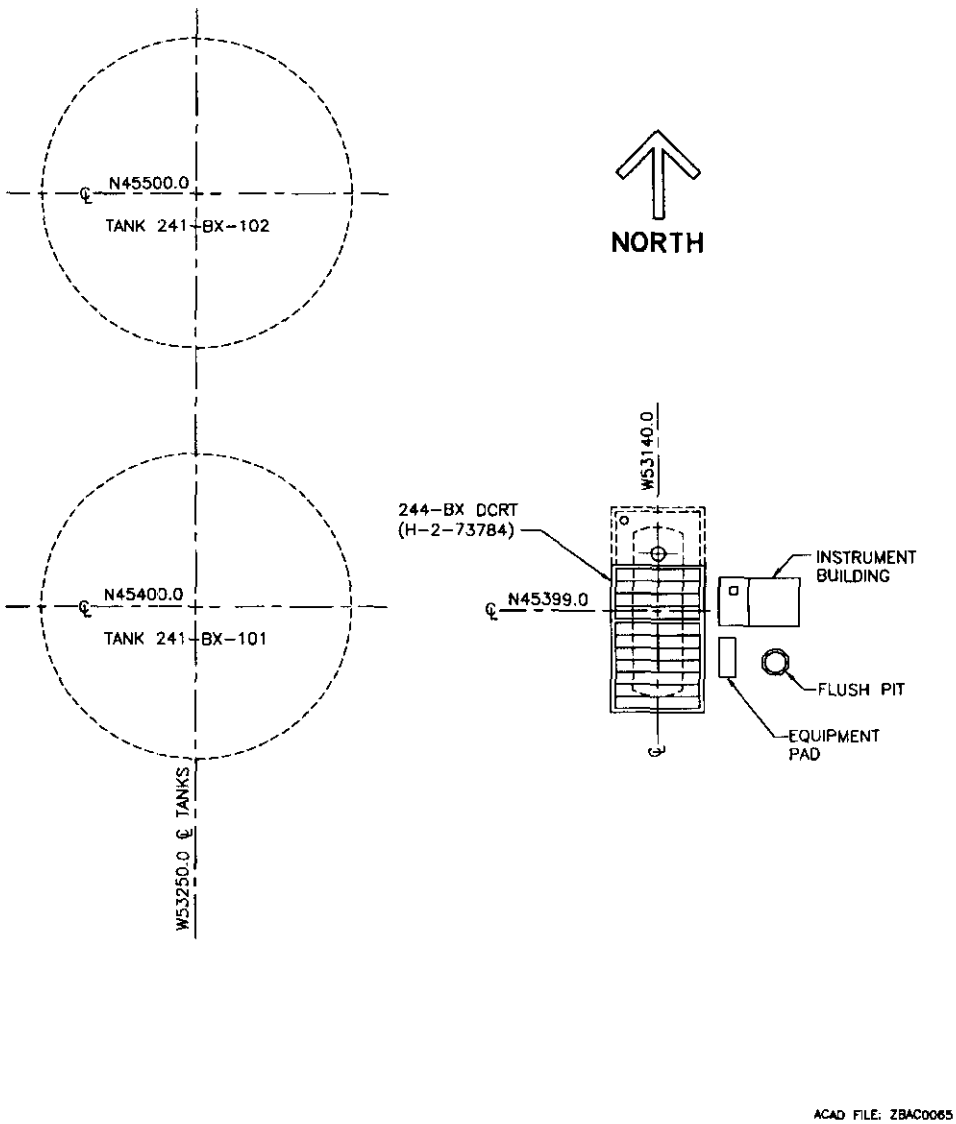


Figure B-4. SITE PLAN - 244-BX Double-Contained Receiver Tank.

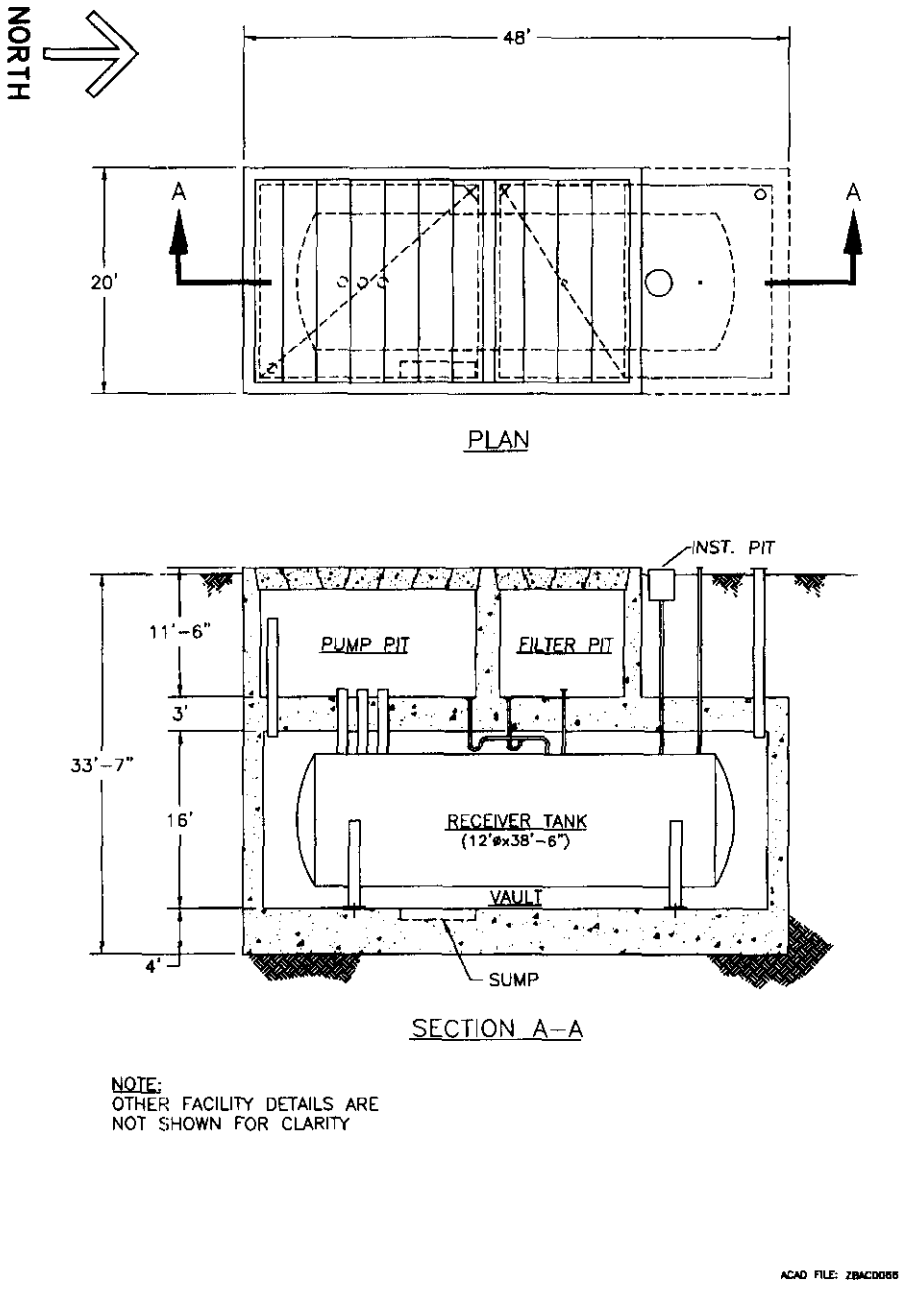


Figure B-5. 244-BX Double-Contained Receiver Tank.

Figure B-6. View of Instrumentation Pit Entrance over the 244-BX Double-Contained Receiver Tank.

DOUBLE-CONTAINED RECEIVER TANK 244-TX

The 244-BX DCRT facility is an underground reinforced concrete structure consisting primarily of three main compartments that house different facility components. The three main compartments described below are:

- The receiver tank containment vault
- The pump pit and,
- The filter pit.

Receiver tank containment vault. The receiver tank containment vault is a rectangular reinforced concrete structure, approximately 20-ft. W x 48-ft. x 23-ft. H outside dimension with 2-ft. thick walls and a 3-ft. to 4-ft. thick bottom foundation slab. Amercoat No. 33 liner material (manufactured by Protective Coating Division of Ameron, Brea California) protectively coats the vault concrete. The foundation slab slopes down towards a trench on the east side of the vault, which slopes to a sump to collect liquids. Leak detection devices and a pump (when required) are housed in the sump. The vault houses the primary receiver carbon steel (ASTM A 537 Class 1) horizontal tank.

Receiver tank. Receiver tank dimensions are: 3/8-in. thick by 12-ft. diameter cylindrical shell with ½-in. thick dished heads on each end of the shell. Nominal capacity of the tank is 31,000 gallons with a maximum operating capacity limited to 24,800 gallons. Design corrosion allowance is 0.001 in./year, for each side of the tank, for 10 years of minimum intended useful life or 0.02 in. total. Secondary containment of the receiver tank is provided by the vault. Age of the tank is about 19 years (based on Construction Procurement Specification B-180 initiation date of Sep. 1979, and an assumed completion date of about 1981).

Pump Pit. The pump pit is 20-ft.(W) x 22-ft. (L) x 11-ft.-6-in.(H) with 18-in. thick walls. Its approximate 3-ft., thick floor slab is supported on steel beams and 4 1/2-inch metal decking. Location of the pump pit is directly above the vault on its south end. Transfer lines enter the pump pit walls at different elevations.

Filter Pit. Adjoining the pump pit, also above the vault but on its north side, is the filter pit. It is a 13-ft. (W) x 20-ft. (L) x 11-ft.-6-in. (H) concrete structure with 18-in. thick walls and an approximate 3-ft., thick floor slab. No examinations are planned for the filter pit.

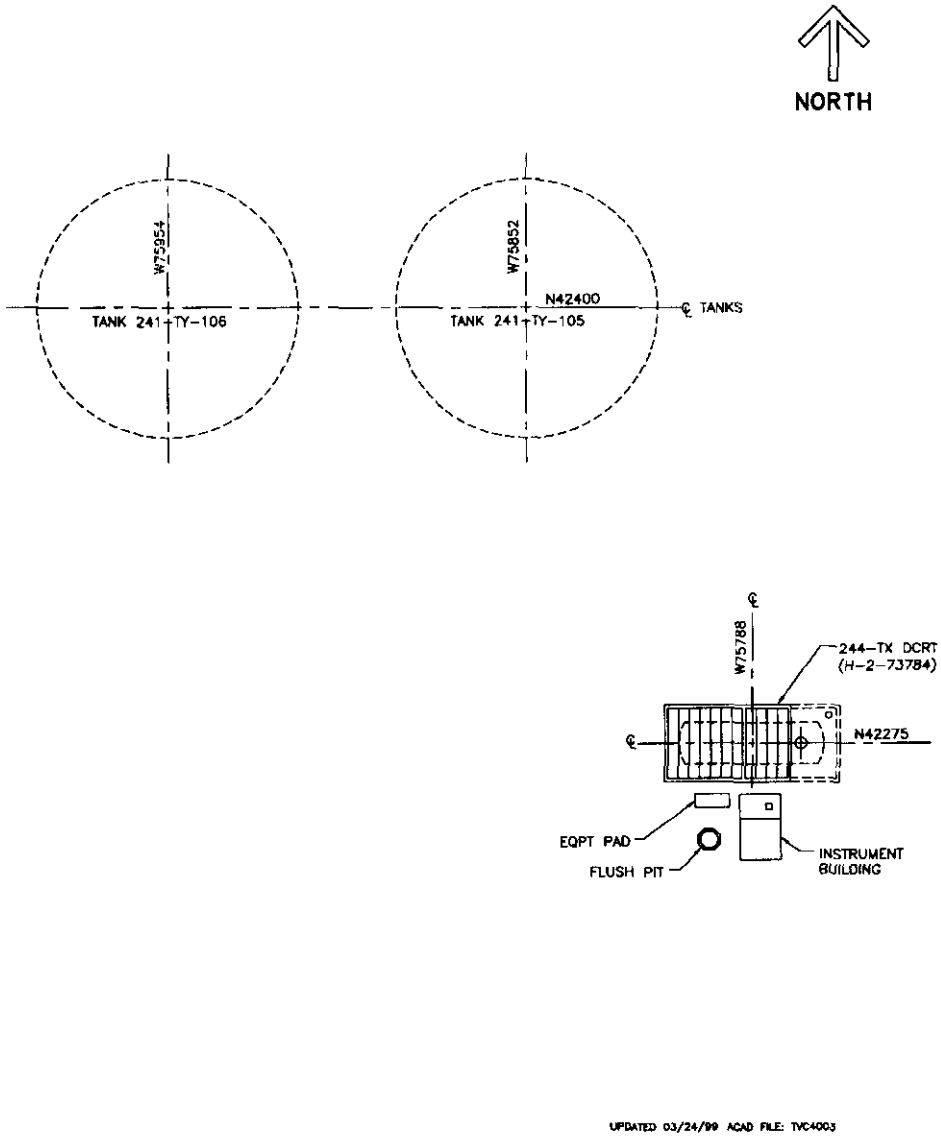


Figure B-7. SITE PLAN – 244-TX Double-Contained Receiver Tank

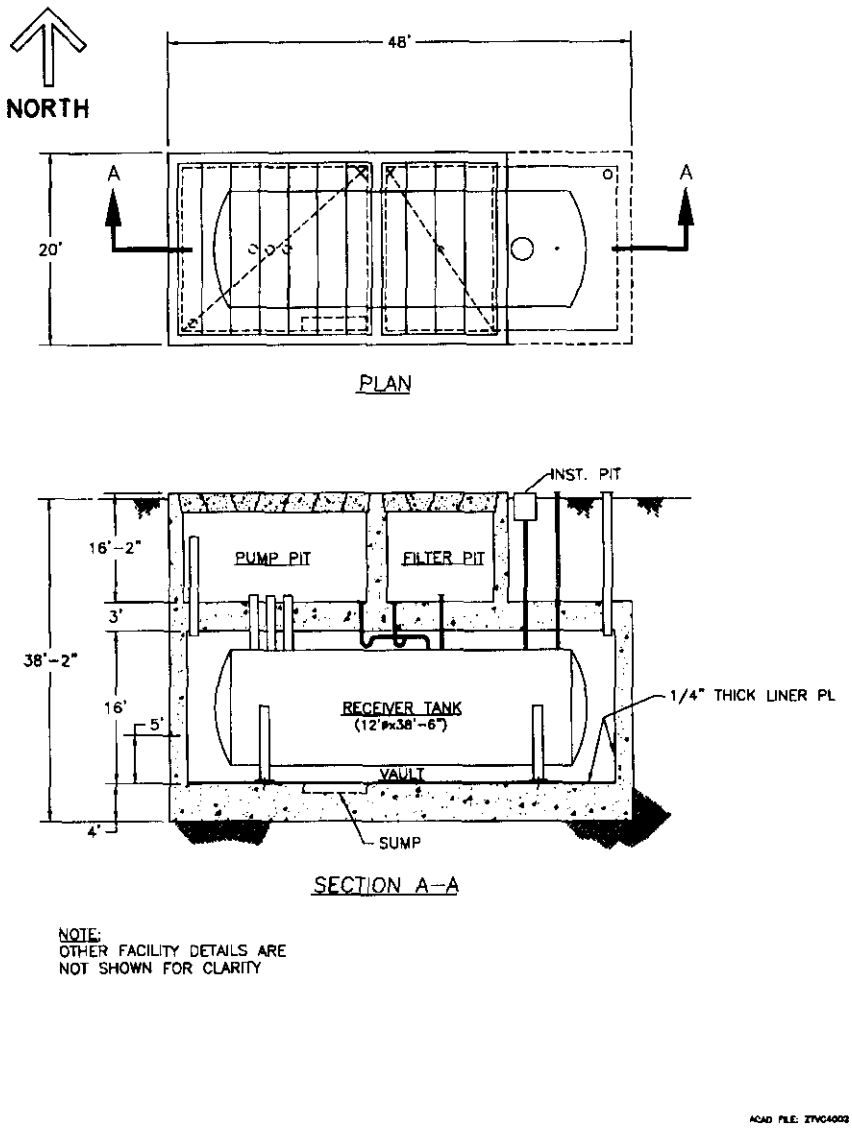


Figure B-8. 244-TX Double-Contained Receiver Tank.

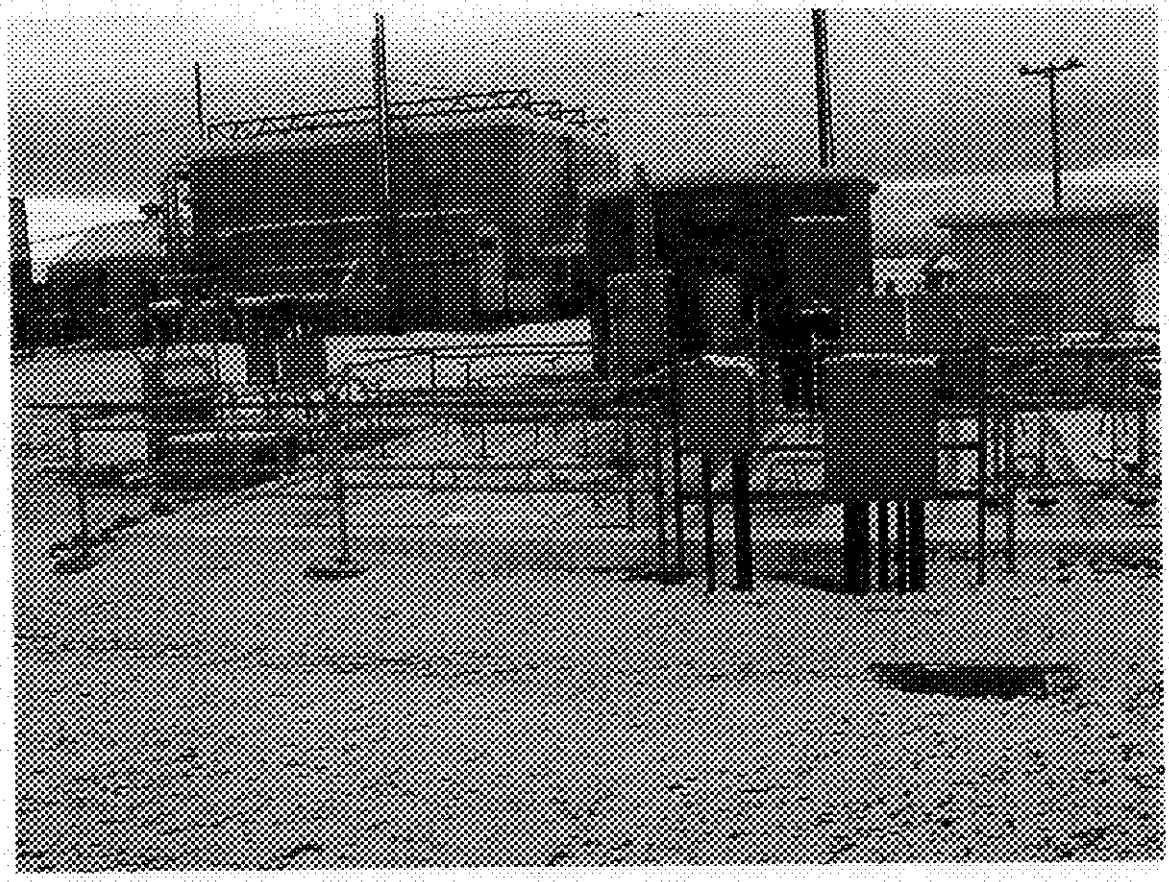


Figure B-9. 244-TX Double-Contained Receiver Tank. Instrument Pit (far left foreground), Pump Pit / Filter Pit (with concrete cover blocks) and Instrument Building (adjacent to middle of vault).

CATCH TANK 241-AX-152

The 241-AX-152 Diverter Station catch tank is located between the 241-AY double-shell tank farm and the 241-AX single-shell tank farm, in the 200 East Area. The diverter station consists of a pump pit, a cell (or diverter pit) containing two diverter assemblies, and a vault, with a liner, constituting the catch tank. The pump pit and diverter cell are situated above the catch tank vault. A 24-in. dia. riser extends up from the catch tank vault into the pump pit, but not through the pit cover blocks.

Catch tank (vault). The vault is a rectangular vault made of reinforced concrete and fully lined (floor, walls and ceiling) with 1/8-in. thick type 304L stainless steel sheet welded at all joints). Vault (tank) dimensions are 22-ft.-2-in. long by 6-ft wide by 11-ft.-5-in. deep. Depth, to the inside surface of the tank bottom is believed to be 27.2-ft. Age, based on date of installation (1962), is 38 years.

Pump pit. The pump pit, constructed of reinforced concrete, houses a submersible pump, jumpers, and other ancillary equipment and resides over the catch tank/vault. Pump pit dimensions are 6 ft. (L) x 6 ft (W) x 13 ft. – 7 in. (D). The pit is coated with a sealant to mitigate seepage through its walls and floor.

Diverter pit. The diverter pit, constructed of reinforced concrete, is adjacent to the pump pit and has dimensions 14 ft. – 8 in. (L) x 6 ft. (W) x 16 ft. (D). It contains two stainless steel vessels or assemblies (Operator A and Operator B), each with a capacity of 50 gallons. A movable spout is located at the bottom of each vessel and is used to direct waste out of its vessel and into a number of exit pipe nozzles. The pit floor is lined with 1/8 in. thick stainless steel sheet.

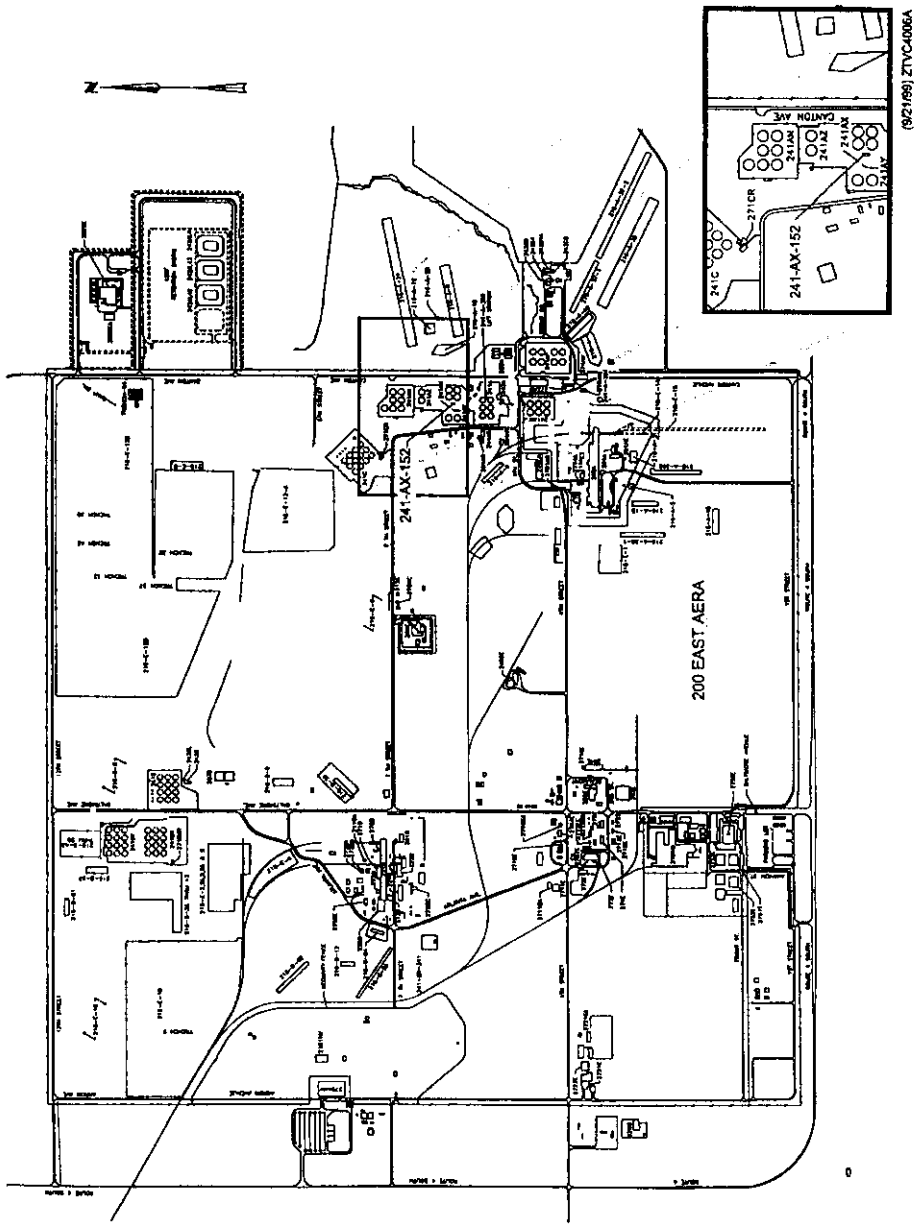


Figure B-10 SITE PLAN – 241-AX-152 Catch Tank.

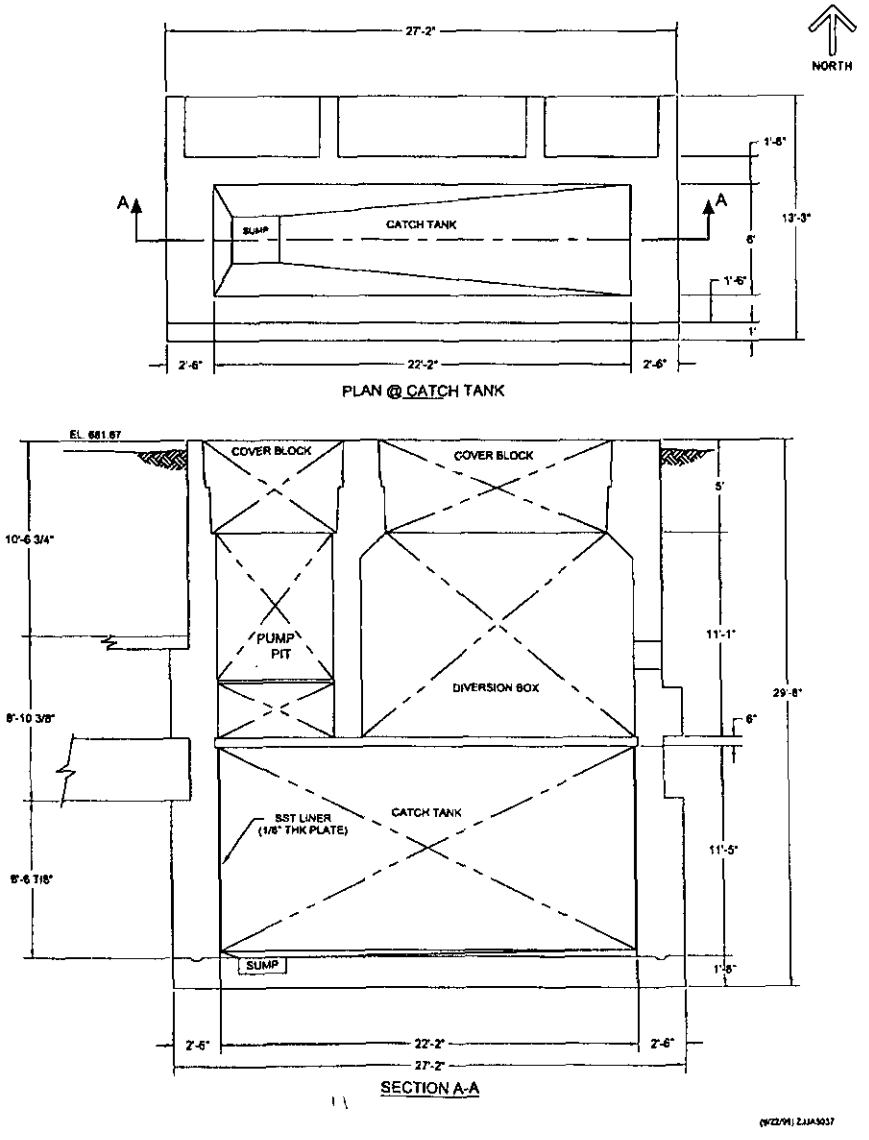


Figure B-11. 241-AX-152 Catch Tank.

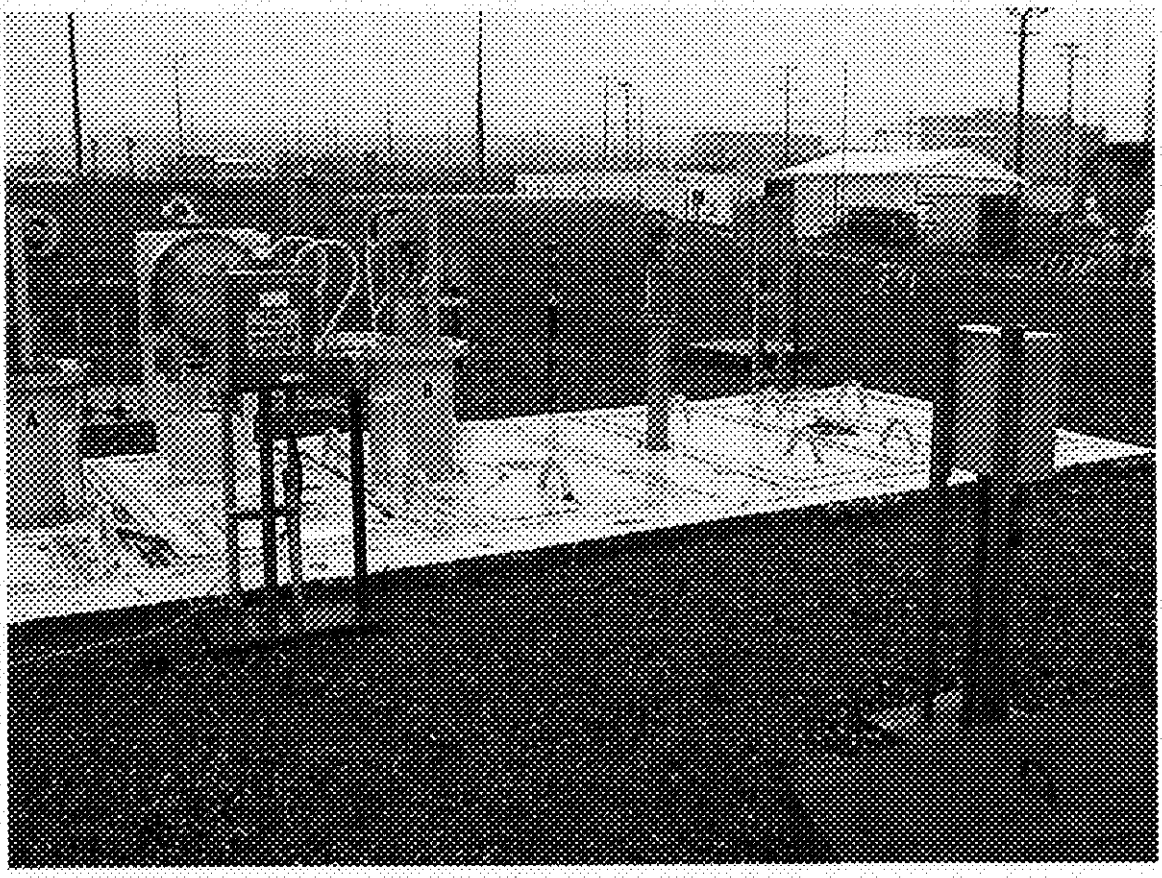


Figure B-12. 241-AX-152 Diverter Station. Large Flanged Vertical Piping are Top Portion of Diverters A and B.

CATCH TANK 241-AZ-151

The 241-AZ-151 catch tank is located just west of sluice transfer box AZ-152 and consists of a pump pit and a catch tank/vault. The pump pit is square in cross-section and sits atop one end of the catch tank/vault.

Catch tank (vault). The vault is rectangular, made of reinforced concrete. All inside surfaces of the catch tank are lined with ASTM A 569 steel sheets of 10 gage (about 0.135 in.) thickness. The liner sheets were welded with a tungsten-inert gas process per Hanford welding specification, but were not thermally stress-relieved. Thus, weld-induced residual stresses remain high. The sheets are sealed at all joints, edges, and corners. Dimensions of the tank are 24 ft. (L) x 6 ft. (W) x 11 ft. (D). Catch tank pipe penetrations are welded to the liner. Tank maximum and administratively controlled volumes are 11,900 and 9,520 gallons, respectively. Age, based on date of installation (1973) is 27 years. The bottom of the tank is approximately 30 ft. below ground level.

Pump pit. The pump pit inside dimensions are 6 ft. (L) x 6 ft. (W) x 10 ft.-9 inches (D). The inside surfaces of the pit area coated with a protective coating. Housed in the pit are a submersible pump, jumpers, and other ancillary equipment.

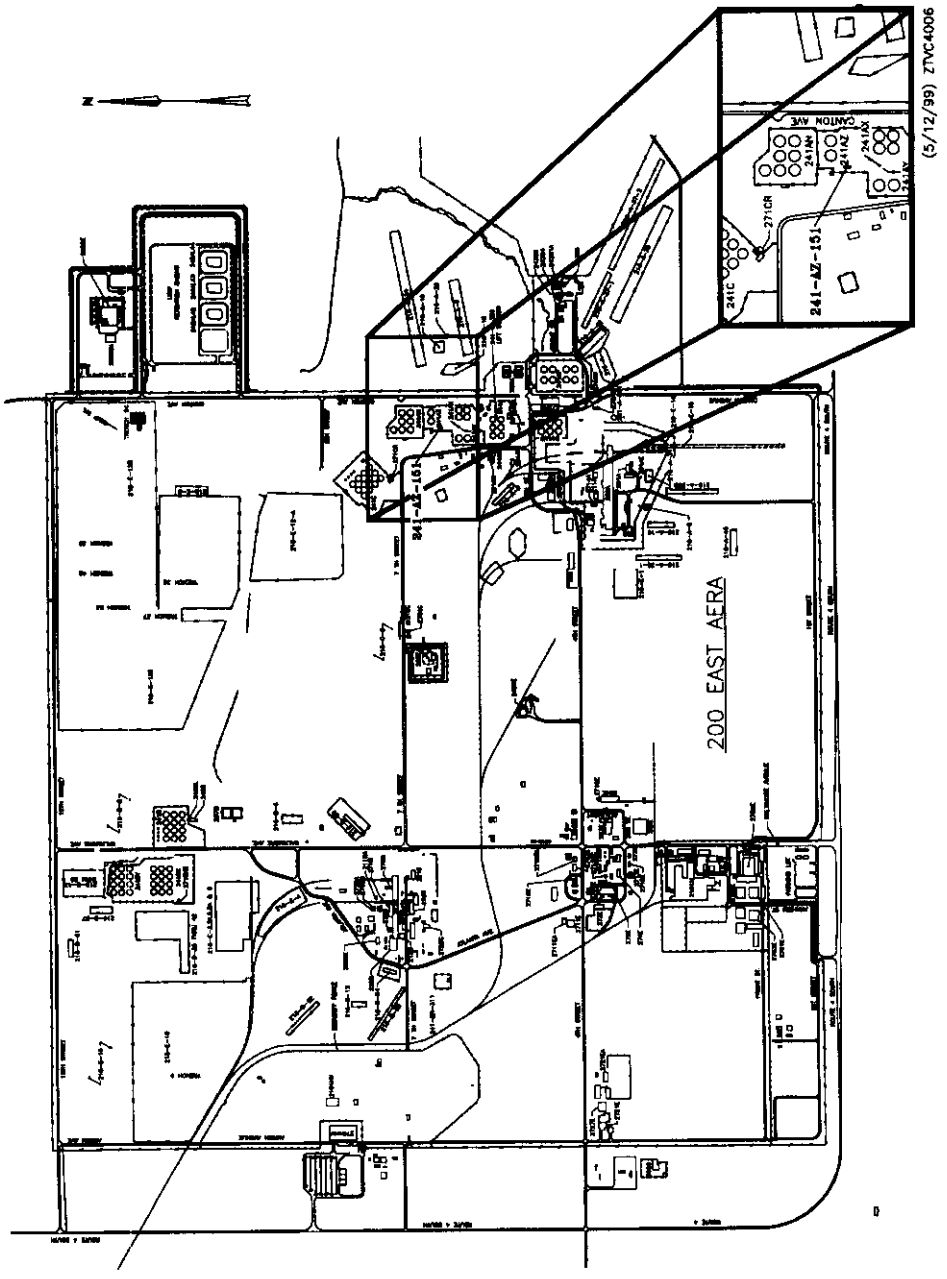


Figure B-13. SITE PLAN – 241-AZ-151 Catch Tank.

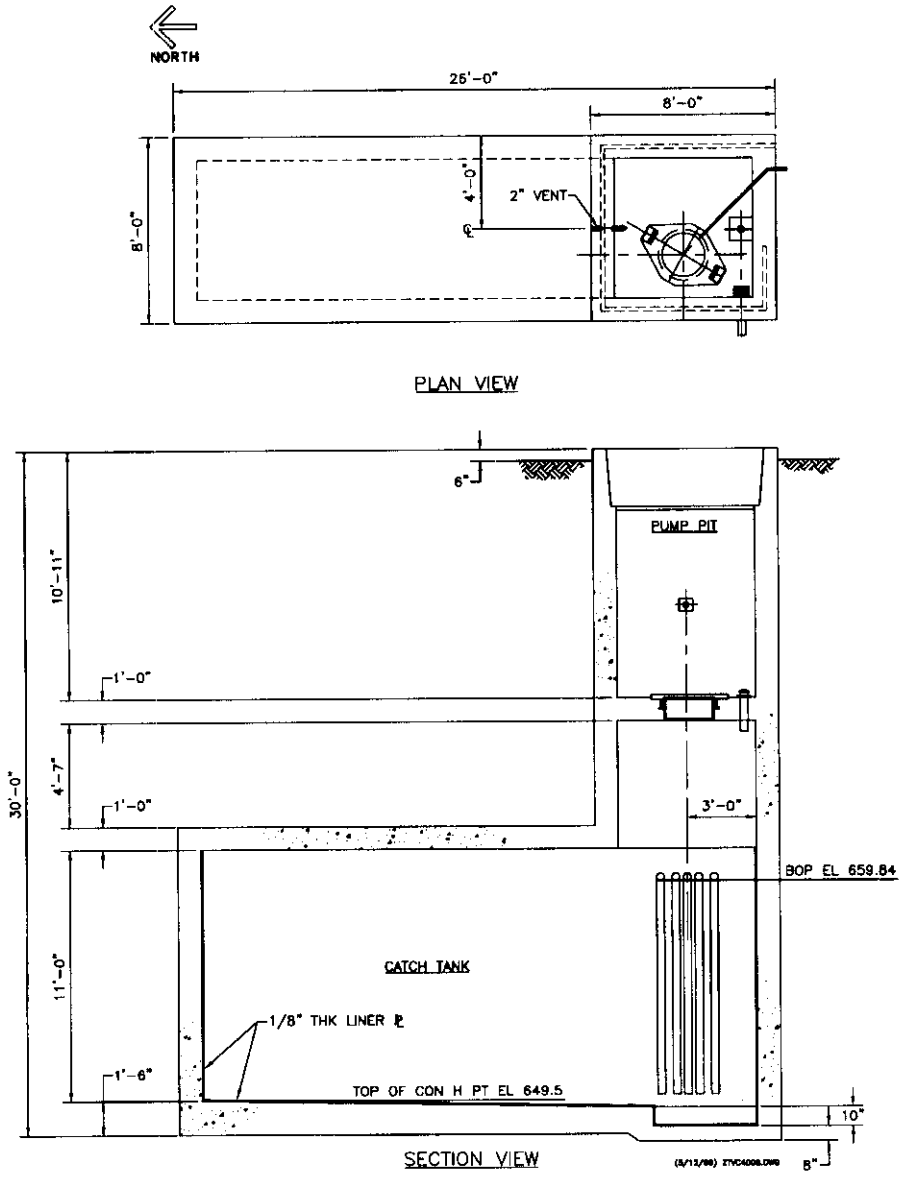


Figure B-14. 241-AZ-151 Catch Tank.

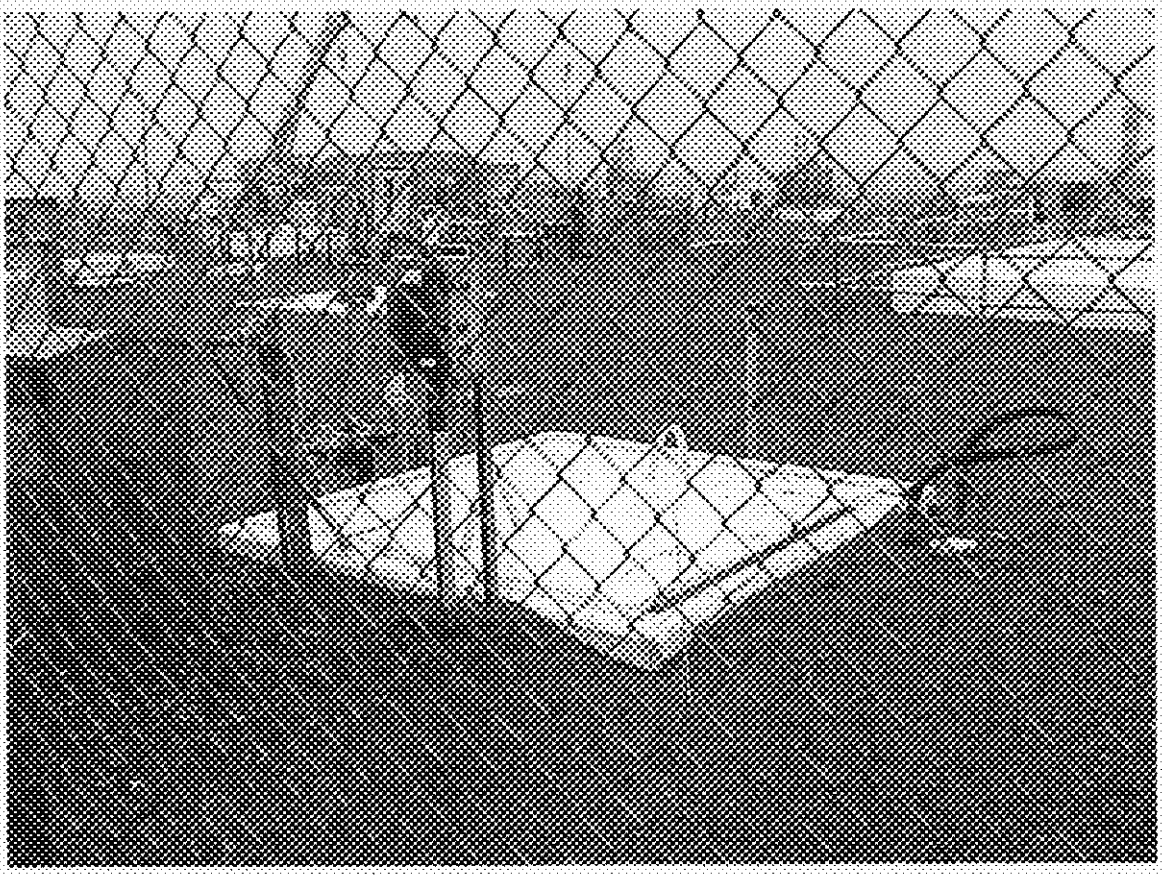


Figure B-15. 241-AZ-151 Catch Tank. Cover Block sits atop Catch Tank Pump Pit.

CATCH TANK 241-ER-311

Location of the catch tank is south and slightly west of B Plant in the 200 East Area of the Hanford Site. It consists of a pump pit at grade level with a 12-in. diameter riser connecting to the direct-buried tank.

Catch tank. ER-311 catch tank is a horizontal cylindrical vessel, 9 ft. outside diameter and 36 ft long, with dished ends. The tank is buried about 22 ft. (to the centerline of the tank) below grade.

The first ER-311 catch tank was replaced in 1954. The replacement tank was fabricated in 1943 from 1/2-in. thick 18-8 S Cb (essentially type 347) stainless steel plate and it had been used from 1944 to 1954 as tank 211-B-108, apparently above ground. The nature of the liquid stored in it during the 10-year period was not determined. The tank was modified in 1980 under Project B-231.

Pump pit. Modifications in 1980 resulted in ER-311 being provided with underground pump-out capability and addition of a pump pit. The pit contains a locally controlled submersible pump and pump-out jumper. The pit is approximately 7 feet square and 7 ft. – 4 in. (D).

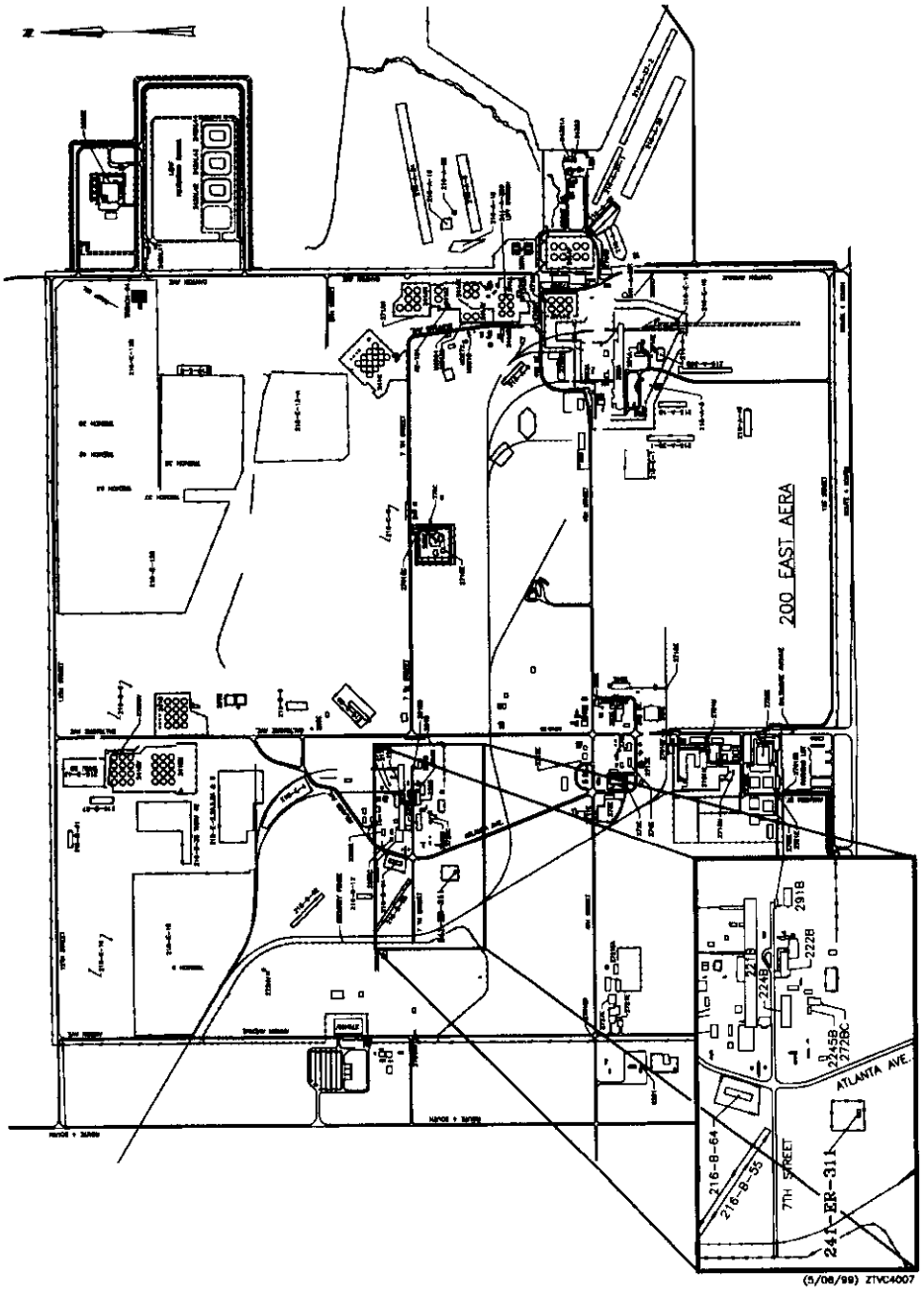


Figure B-16. SITE PLAN – 241-ER-311 Catch Tank.

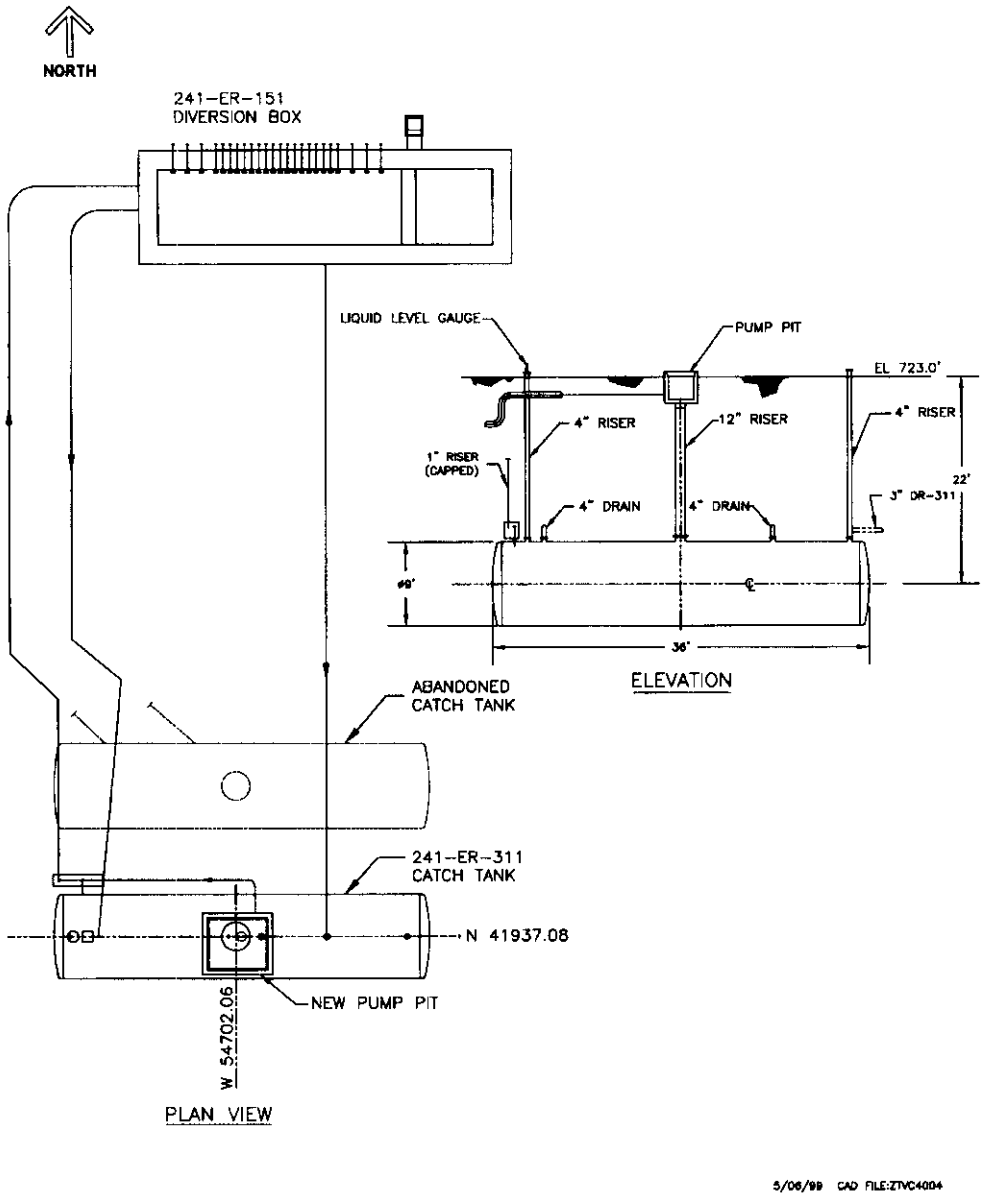


Figure B-17. 241-ER-311 Catch Tank.

Figure B-18. 241-ER-311 Catch Tank. Liquid level Gage Assembly (at left foreground) and Black Plastic-Wrapped Pump Pit Cover Block (right).

AIR VENT STATION 241-EW-151

The 241-EW-151 air vent station is located between the 200 West and East Areas of the Hanford Site and is approximately 1,500 feet south of the East/West Fire station. It is part of the EW-151 diversion box that consists of a nozzle pit atop the catch tank pit (or vault), the catch tank, and a stairway to an access pit. The access pit provides a door for access to ports the inside of the catch tank pit.

Catch tank pit. Inside dimensions of the catch tank pit are 8 ft. – 6 in. (L) x 8 ft. (W) x 8 ft.- 4 in. (H). Its walls are 1-ft. thick. The pit was constructed of reinforced concrete and is apparently coated with white Amercoat # 55.

Catch tank. Dimensions of the catch tank are 4 ft. - 6 in. outside diameter and 6 ft.-11 in. high and it is mounted vertically. In addition, the tank has a stainless steel cooling jacket (apparently made of type 18-8 Cb SS). The jacket was welded in place after the tank was heat treated. Prior to the tank being installed in 1951-1952 in the ER-311 facility, it had been used as tank 221-U-217 for an estimated 8 years. U Plant was intended to be used for the $BiPO_4$ fuels-separation process where waste sludge was to be dissolved in nitric acid. The plant was never used for this process as B Plant and T Plant had sufficient capacity. Because the tank was apparently removed (1951-1952) before the plant was eventually used for uranium recovery operations (1952 to 1958) the tank may not have seen any severe service (this has not been confirmed). Based on the U Plant construction start date of March 1943, the tank's age is assumed to be 56 years.

Nozzle pit. The nozzle pit was constructed of reinforced concrete and sits atop the catch tank pit. Its inside dimensions are 8 ft. x 6 ft. x 5 ft.- 8 in. and it was coated with white Amercoat # 55. The floor drain to the catch tank pit is reported to be plugged.

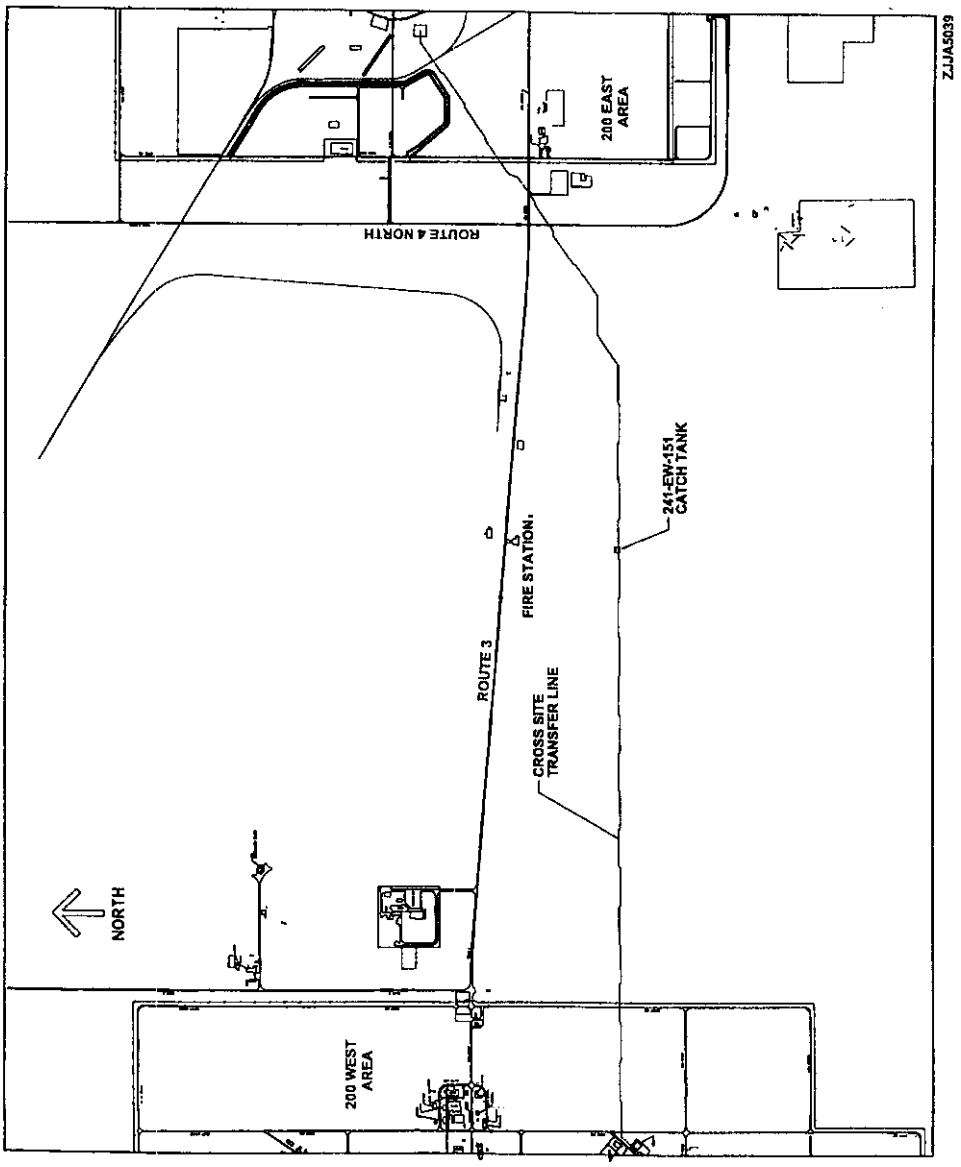


Figure B-19. SITE PLAN – 241-EW-151 Catch Tank.

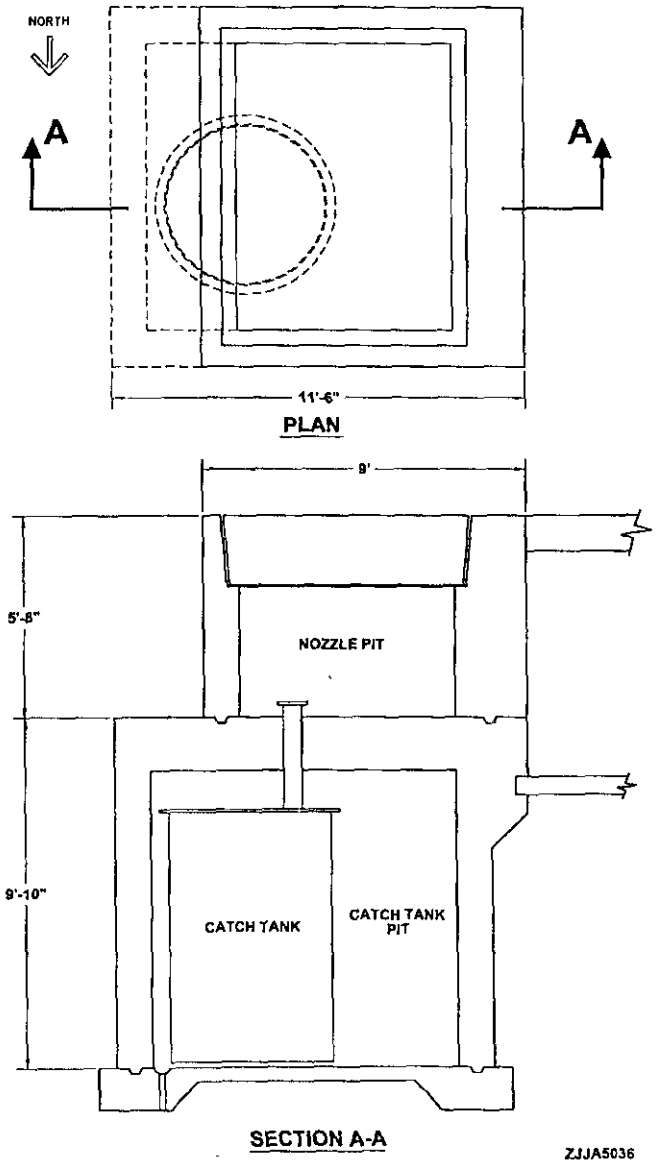


Figure B-20. 241-EW-151 Catch Tank.

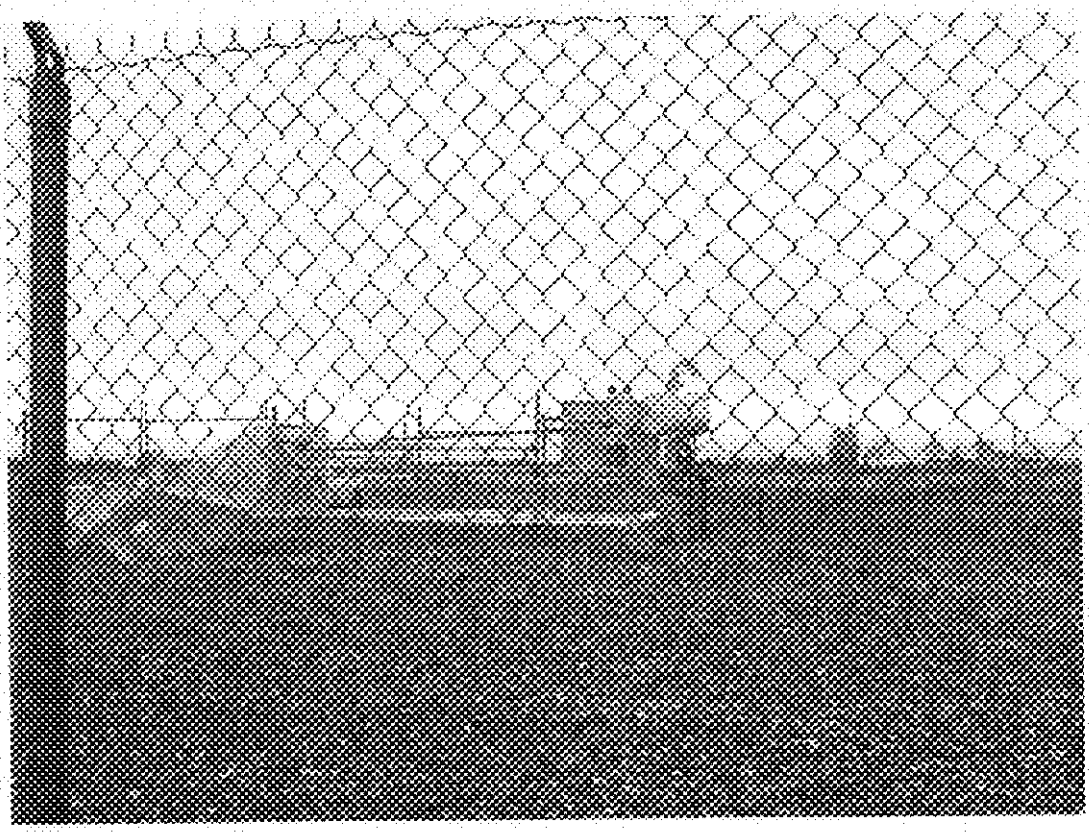


Figure B-21. 241-EW-151 Air Vent Station. From right-to-left: Breather Filter Assembly, Pit Monitoring Station, Pump Pit Cover Blocks, and Entrance to Access Pit.

CATCH TANK 241-TX-302C

The 241-TX-302C catch tank is located east of T Plant (200 West Area), near the middle of the building. The facility consists of a direct buried carbon steel tank with a pump pit located above the center of the tank.

Catch tank. The tank is a horizontal cylindrical vessel 8-ft., 10 and 7/8-in., inside diameter by 39-ft., 4 and 1/4-in. long. Material of construction was welded ASTM A-285-46 Grade B carbon steel, 9/16-in. thick. The tank was thermally stress-relieved following welding. Exterior and interior surfaces were cleaned and sand blasted. The exterior surface was coated with coal tar enamel and the interior surface was left untreated. Depth to the inside surface of the tank bottom is believed to be about 32-ft. Age, based on date of installation (1947), is 53 years.

Pump pit. The pump pit, including a 12 in. diameter ASTM A 53 carbon steel pipe riser that connects to the center of the tank, was added to the facility in 1984. The pit is a 5-ft. inside diameter galvanized, corrugated metal pipe that is 4-ft.-6-in. deep and sets on a concrete floor. The riser descends approximately 23-ft. from the pump pit to the tank. Age of the pump pit is about 16 years.

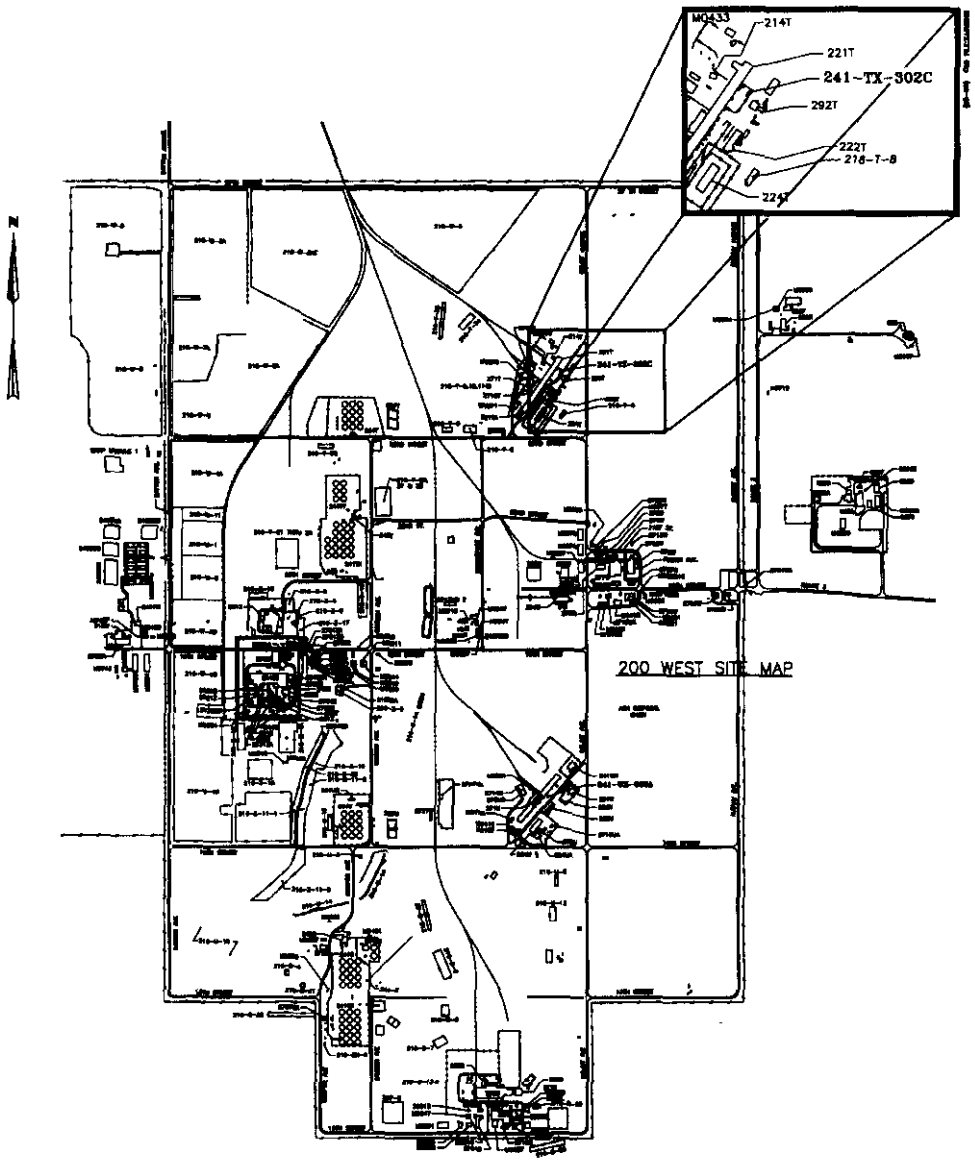


Figure B-22. SITE PLAN – 241-TX-302C Catch Tank.

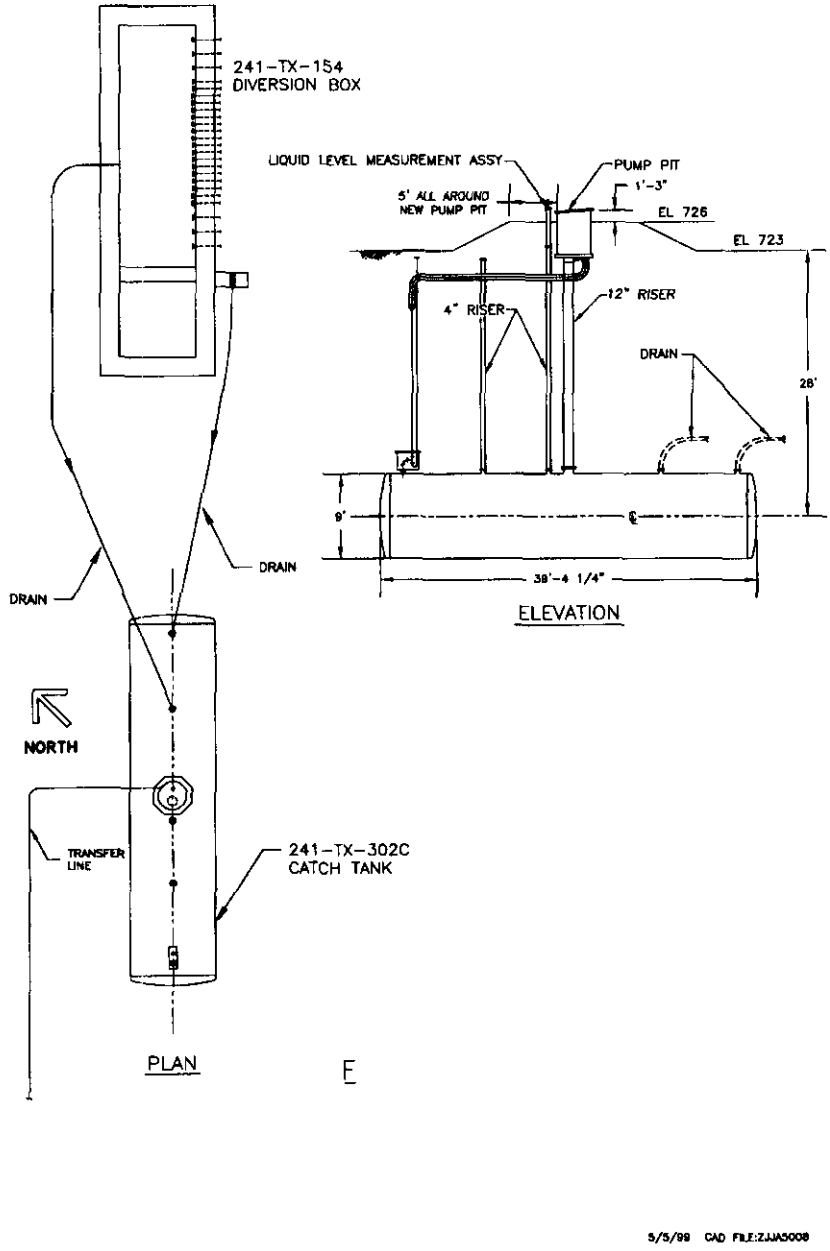


Figure B-23. 241-TX-302C Catch Tank.

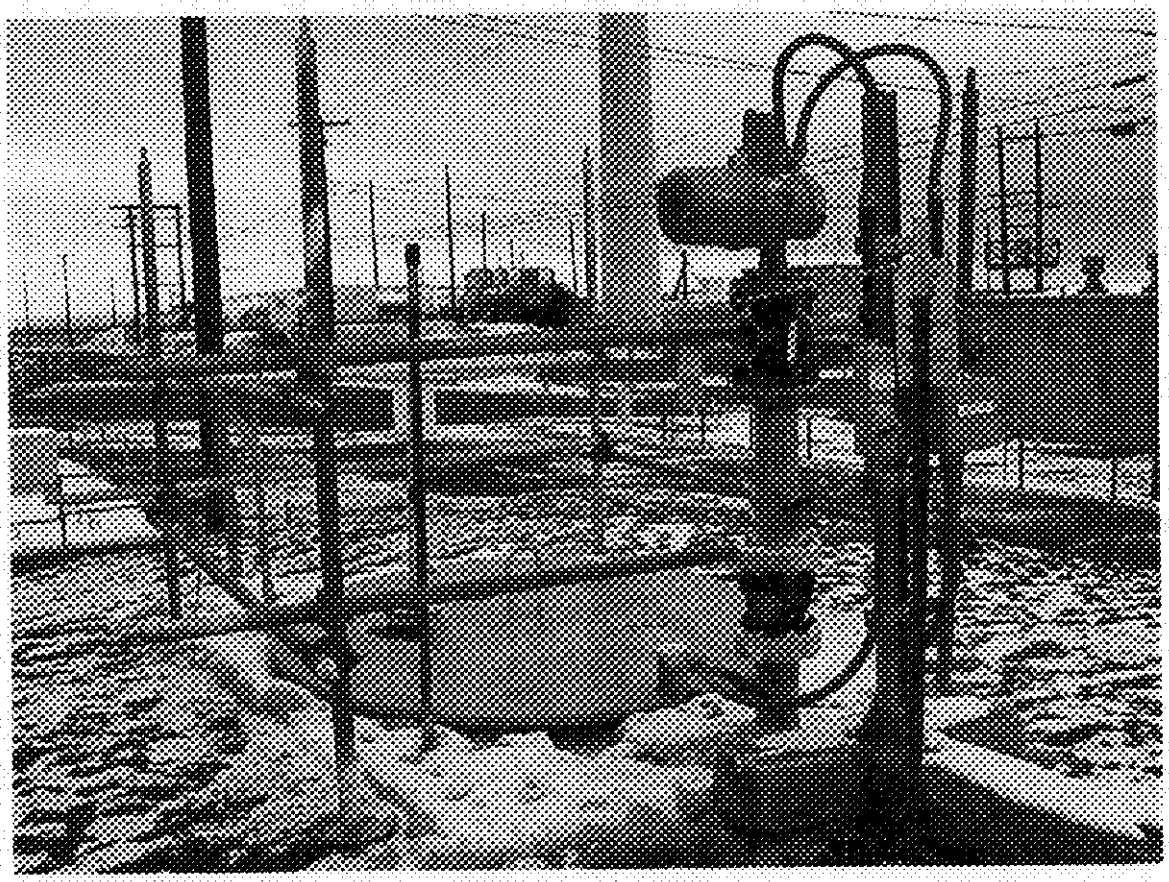


Figure B-24. 241-TX-302C Catch Tank. Round Pump Pit Cover in Foreground with Adjacent Liquid Level Gage Assembly.

CATCH TANK 241-U-301B

The 241 U-301B catch tank is located in the 200 West Area south of U-112 and east of U-252. The facility consists of a catch tank and a pump pit directly above the side of the tank.

Catch tank. The tank is made of prestressed concrete with an outside diameter of 20-ft., 10-in.and a wall thickness of 5 in. at the fill level tapering to 6-in. about 2 ft. above the radiused floor. The interior of the tank is coated with a 3/4-in. thick layer of Gunite (cement-sand with no aggregate). Overall height of the tank, to the top of the integrally cast dome, is 20-ft., 11 1/4-in. Capacity of the tank, is 36,000 gallons; it is approximately 6 to 7 ft. below grade. Age, based on date of installation (1944-1945), is 56 years.

Pump pit. The pump pit was made of 14 gage galvanized corrugated metal pipe and is 5 ft. in diameter and 5 ft. deep. It was installed in 1981 and has an age of 19 years.

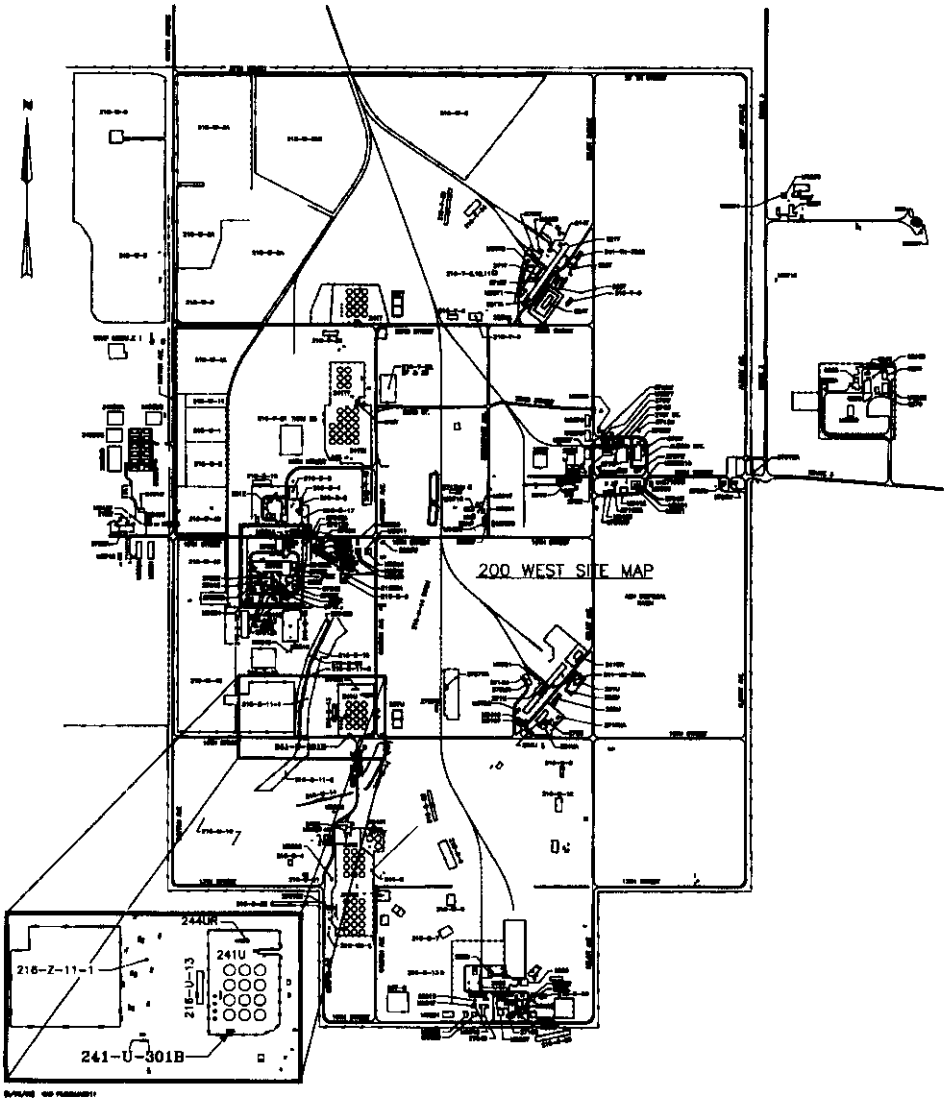


Figure B-25. SITE PLAN - 241-U-301B Catch Tank

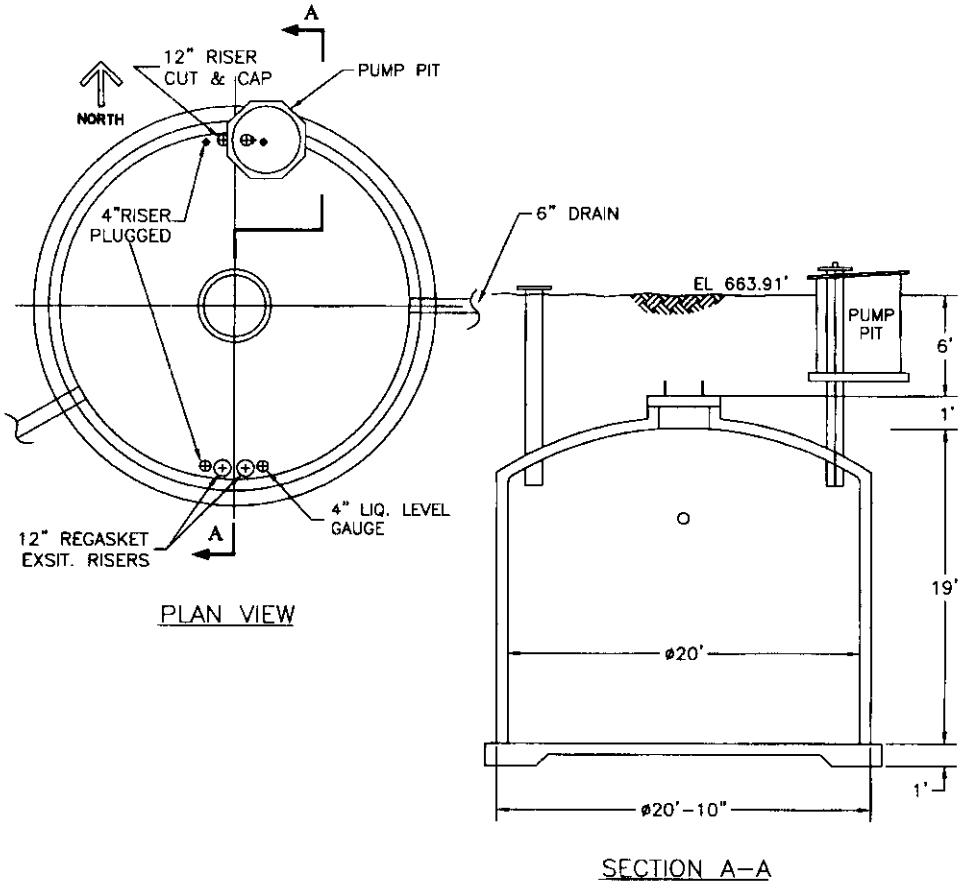


Figure B-26. 241-U-301B Catch Tank.

Figure B-27. 241-U-301B Catch Tank. Liquid Level Gage Assembly in Foreground, Round Pump Pit Cover in Background.

CATCH TANK 241-UX-302A

The 241-UX-302A catch tank is located in the 200 West Area east of U Plant. It is a direct-buried horizontal cylindrical vessel made of carbon steel with a pump pit above the tank.

Catch tank. The tank is a horizontal cylindrical vessel 8-ft.-10-in. ID by 39-ft., 4 1/4-in. long. The material of construction is 9/16-in.thick carbon steel plate per ASTM A-285-46 Grade B. It was welded and stress-relieved in accordance with ASME Code Section VIII, paragraphs U-69 and U-76. Interior and exterior surfaces of the tank were cleaned of all mill scale and grease and were sand blasted. The tank's exterior surface was coated with a coal tar enamel while the interior surface was left as is. Age, based on date of installation (1947), is 53 years.

Pump pit. The pump pit is a 5-ft. inside diameter, galvanized corrugated metal pipe which is 4-ft. - 6-in. deep and has a steel cover plate. A 12-in dia. schedule 40 riser, made of ASTM A 53 carbon steel, descends approximately 20-ft. from the pump pit to the tank.

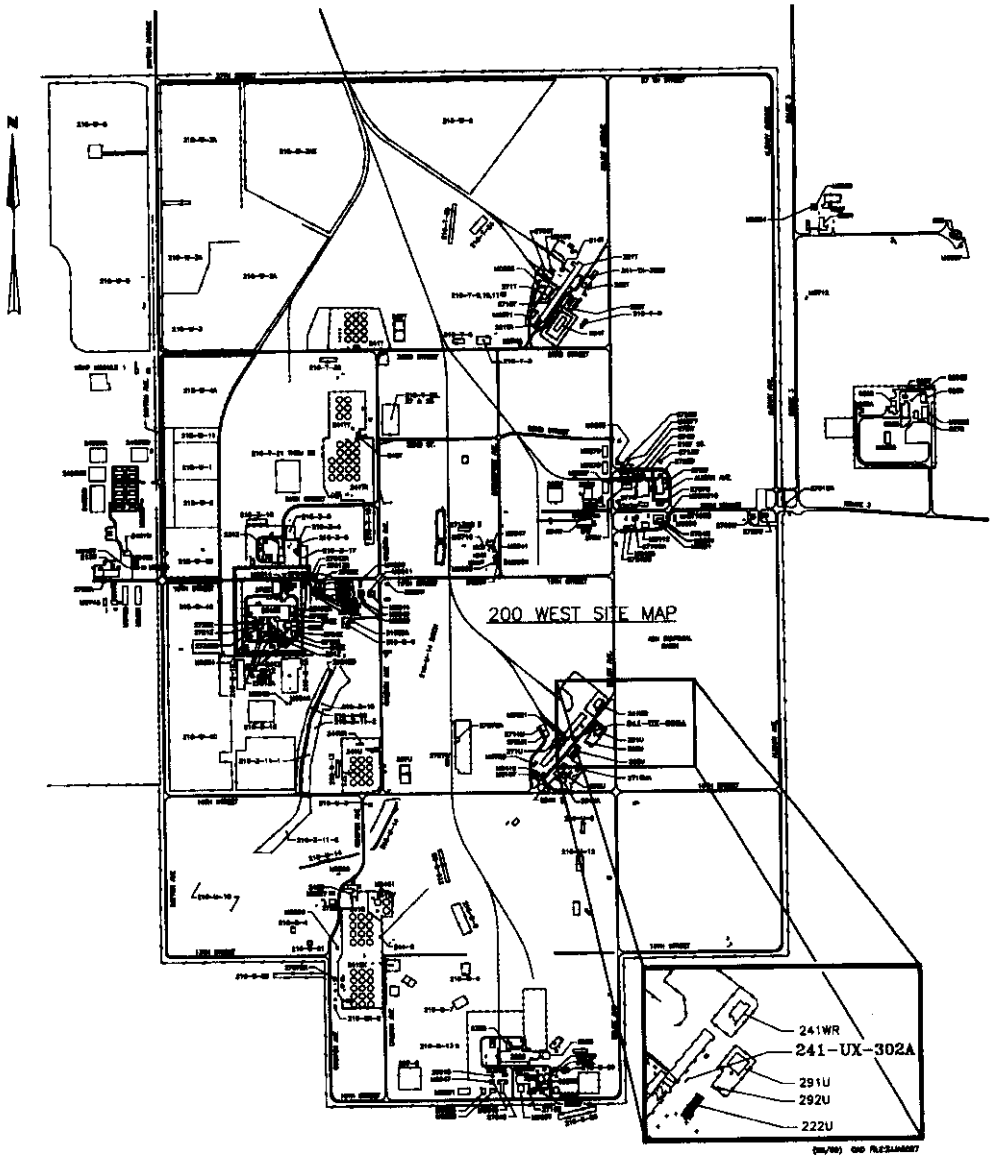


Figure B-28. SITE MAP - 241-UX-302A Catch Tank.

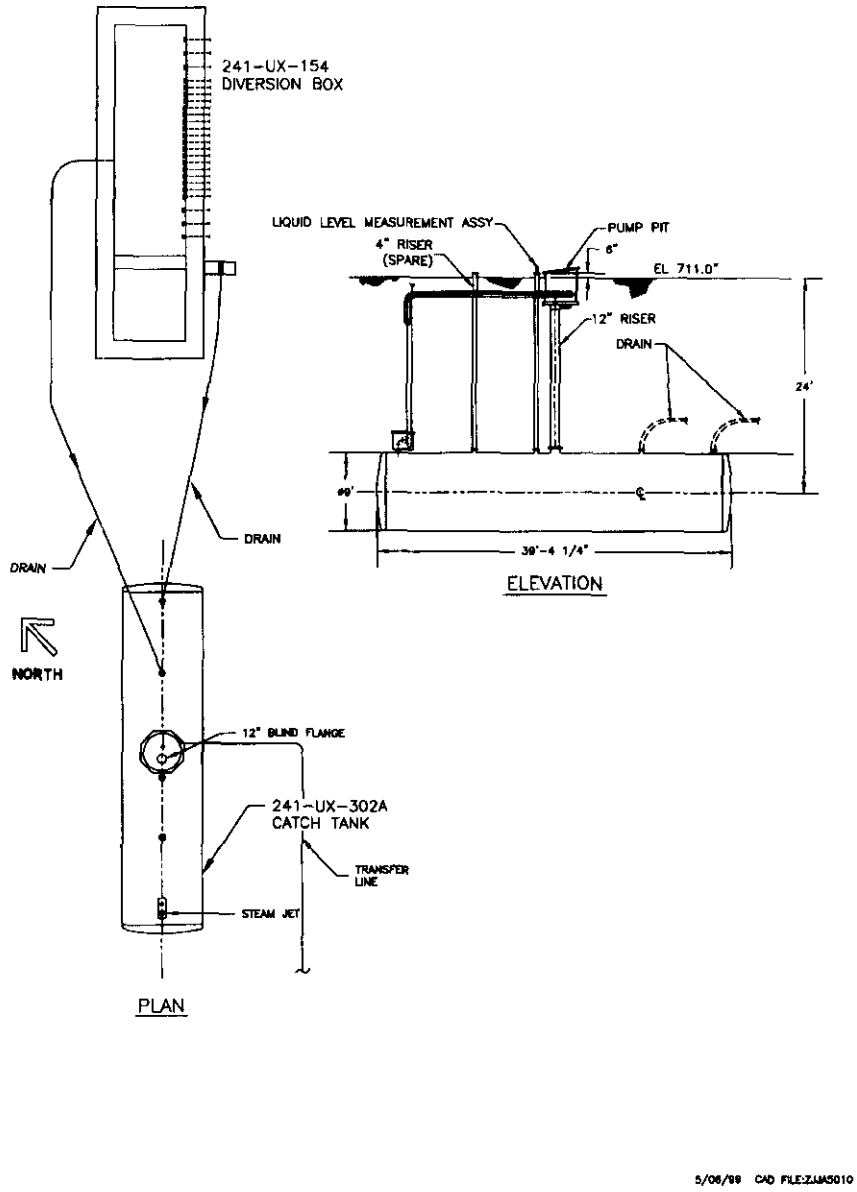


Figure B-29. 241-UX-302A Catch Tank.

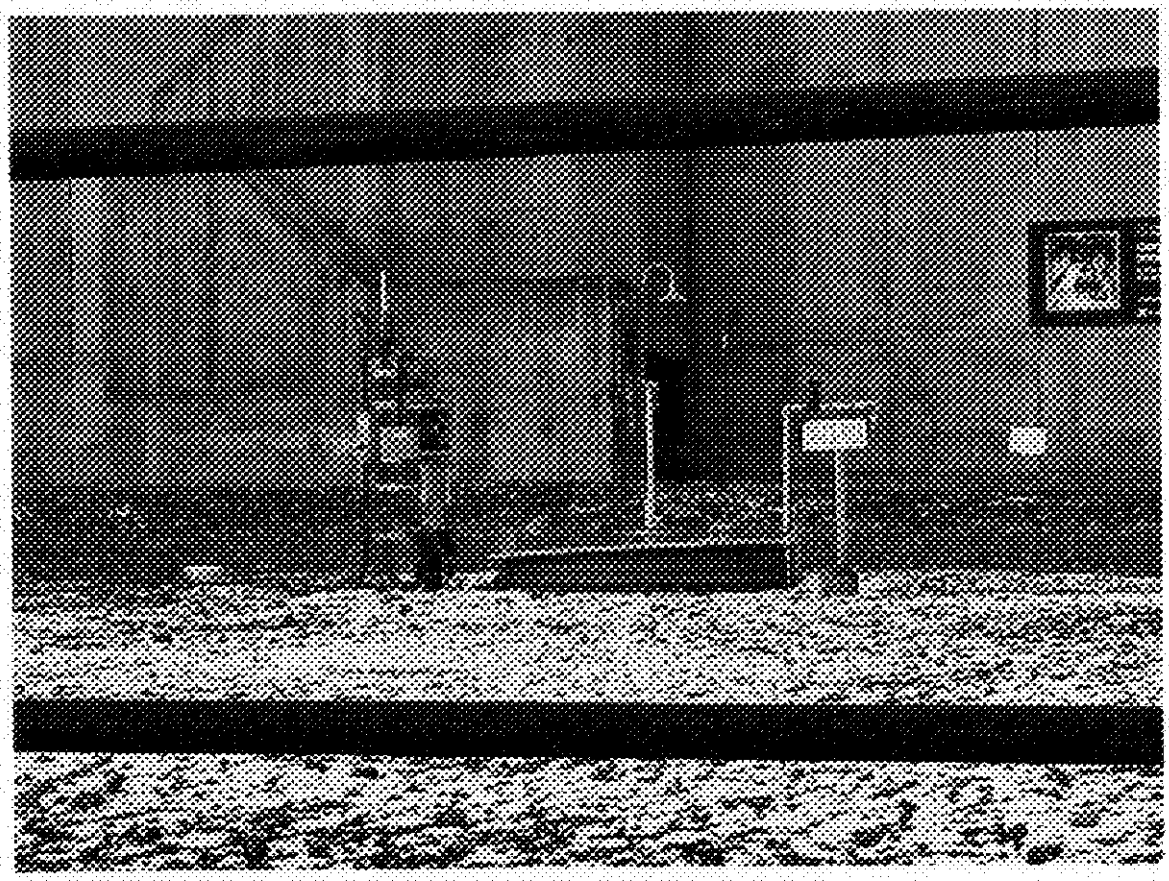


Figure B-30. 241-UX-302A Catch Tank. Liquid Level Gage Assembly (left) and round Pump Pit Cover (right).

LIFT STATION 241-A-350

The lift station is located southeast of Single-Shell Tank 241-A-106 in the 241-A SST Tank in the 200 East Area. The entire lift station structure consists of a pump pit located over a cylindrical-walled, corrugated steel caisson. The caisson, which is backed by a grout layer, sits atop a reinforced concrete floor that supports the catch tank.

Catch Tank Pit (Caisson). Directly below the pump pit is the cylindrical carbon steel-wall, grout-backed caisson; it is approximately 8-ft. in diameter and 17-ft. tall. Initially, the short, catch tank support feet sat directly on the one-ft. thick slab. Later, an additional concrete pour was made, with the tank in-place for improving the tank's seismic response. The result was an additional 1-ft. thick layer of concrete that enveloped the support feet, apparently extending up several inches surrounding the bottom of the tank.

Catch Tank. The catch tank, weld-fabricated from 3/8-in. thick 25-12-S-Cb (approximately type 309 Cb) stainless steel), is positioned with its cylindrical axis in a vertical orientation. Its capacity is listed as 776 gallons. Dimensions of the tank are 4.5-ft. diameter and 6-ft. 11-in. high, and it has a sloped floor to minimize waste heel. In addition, the tank has an unused metal jacket (apparently for either water cooling or steam heating). It was designed about 1943, fabricated as early as 1944 (by the General Electric Company – Hanford Works for the *Hot Semi-Works*), modified around 1950, and installed in the Lift Station in 1979. Prior service, if any, is unknown. Thus, its Lift Station service age is about 21 years (1979) while its physical age could be as much as 56 years (1943).

Pump Pit. The pump pit houses two pumps and an assortment of jumpers, connectors, and valves. Structurally, the pit is made of reinforced concrete with inside dimensions 9-ft. by 9-ft. by 11 ft. (L x W X H), and capped with a 20-in. thick cover block.

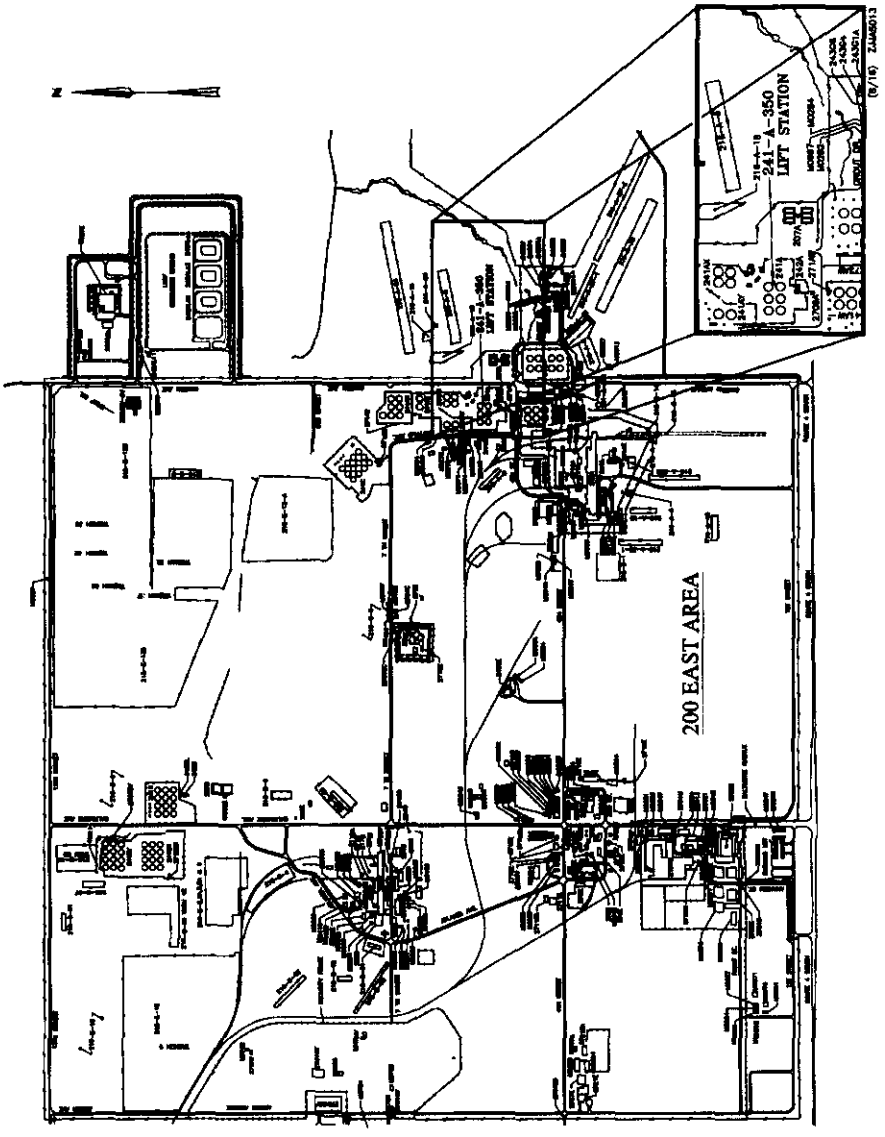


Figure B-31. SITE PLAN – 241-A-350 Lift Station.

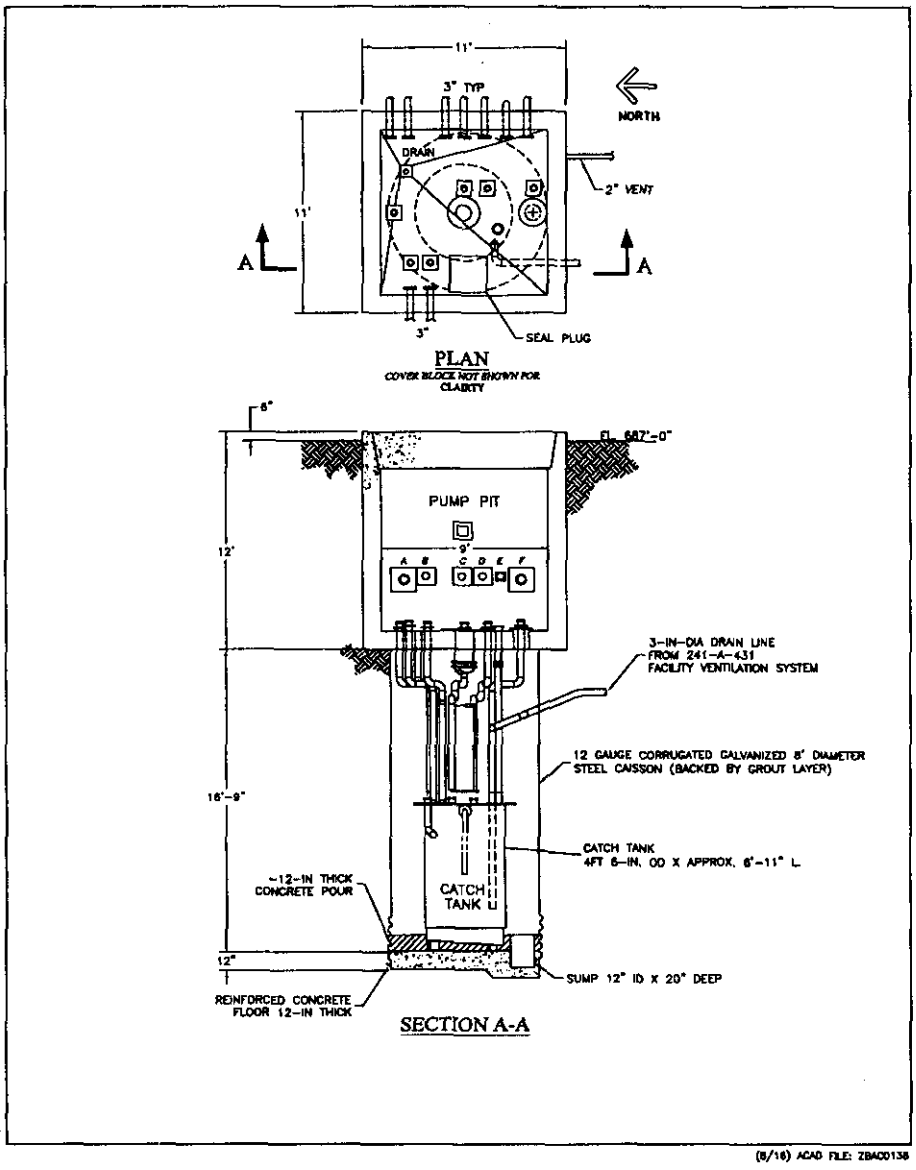


Figure B-32. 241-A-350 Lift Station

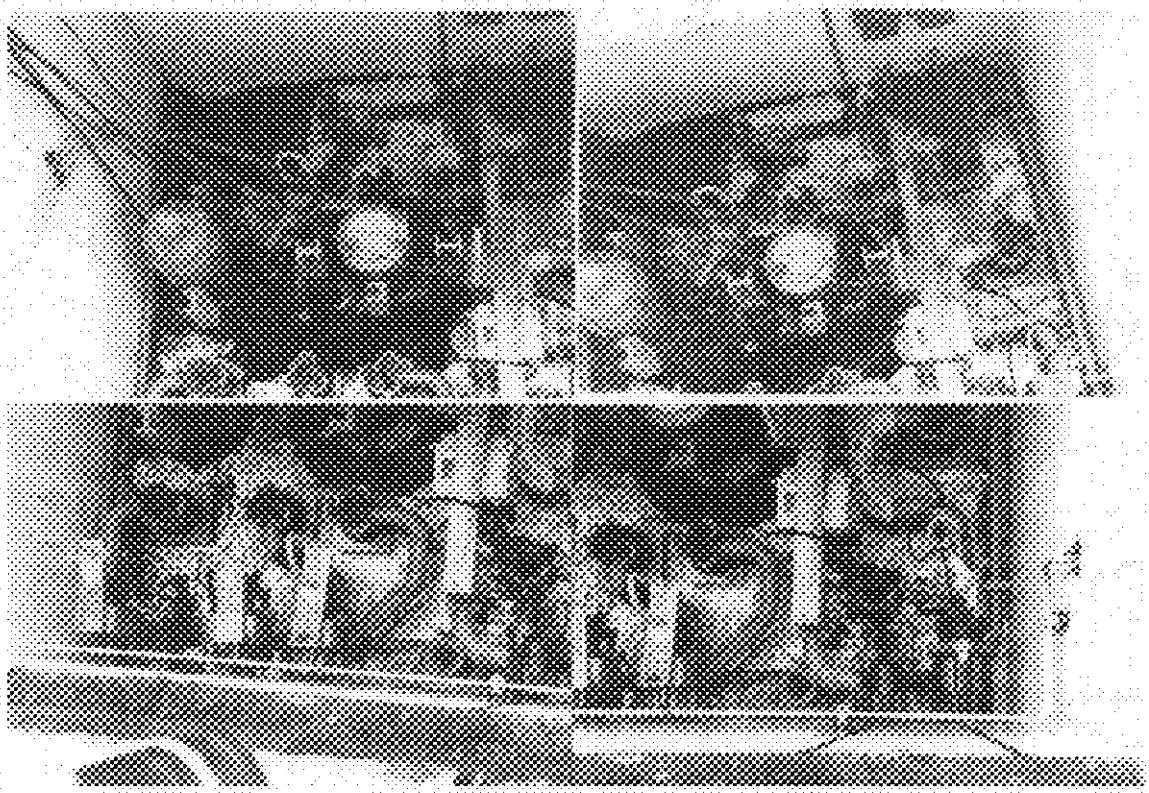


Figure B-33. 241-A-350 Lift Station. Composite Photo of Pump Pit.

WASTE UNLOADING FACILITY 204-AR

The 204-AR Waste Unloading Facility is located south of the 244-AR Vault and west of the 241-AX Tank farm, in the 200 East Area. Completed in 1981, the facility is a two-story reinforced concrete structure approximately 64-ft. (L) x 49-ft. (W) x 25.5-ft (H). The primary facility to be examined, is the catch tank and catch tank pit which are located below-grade in the Rail Tank Car Unloading Canyon.

Any liquid waste spills, any decontamination solutions that drain to the floor, and any overflow or spills from the chemical makeup tanks, are collected in a stainless steel drain system. That system connects to the, below-grade stainless steel catch tank, which in turn, is contained in a stainless steel-lined pit containing a sump.

Catch Tank Pit. The floor and walls of the catch tank pit are constructed of reinforced concrete with inside dimensions, 7-ft. (L) x 6-ft. (W) x 14.5-ft. (H). Pit walls are 10- to 23-in. thick and are lined with a ¼-in. thick stainless steel plate up to a height of 10.5-ft. The 18-in. thick, concrete floor slab is sloped towards a 1-ft. x 1-ft x 8-in. deep sump, both of which are covered with the same stainless steel plate as are the sidewalls. A removable steel grating is fitted to the top of the pit to allow access to the catch tank and pit.

Catch Tank. The 204-AR catch tank (nominal volume of 1,500 gallons and a maximum operating capacity of 1,200 gallons) is cylindrical in shape with its axial centerline oriented vertically. The tank was fabricated from ¼-in. thick, welded, type 304L stainless steel; it is approximately 102-inches high by 66-inches in diameter. Location of the tank is beneath the floor of the unloading area. The catch tank is equipped with liquid-level instrumentation and drain/overflow lines. Age, based on date of installation (1981), is 19 years.

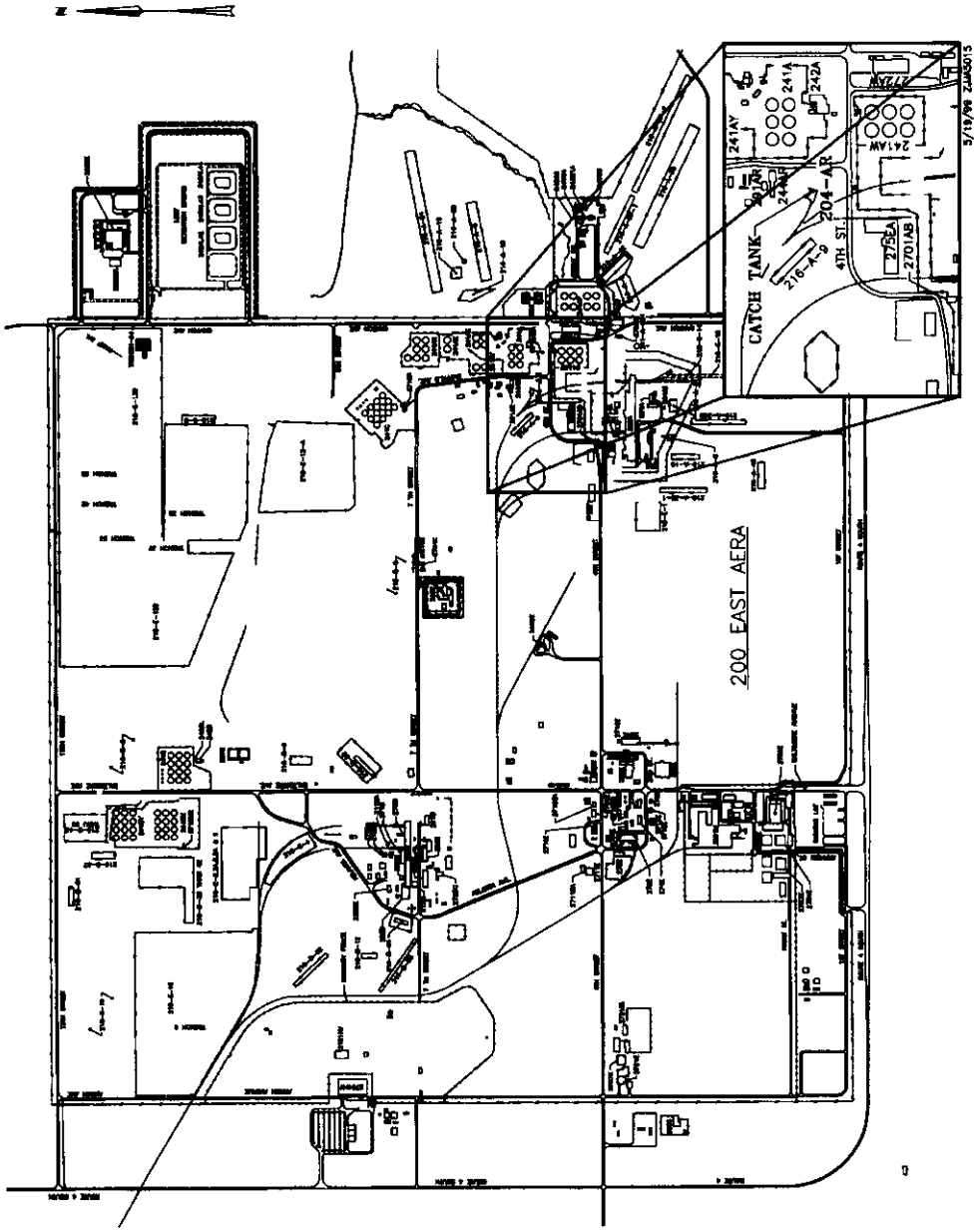


Figure B-34. SITE PLAN – Waste Unloading Facility.

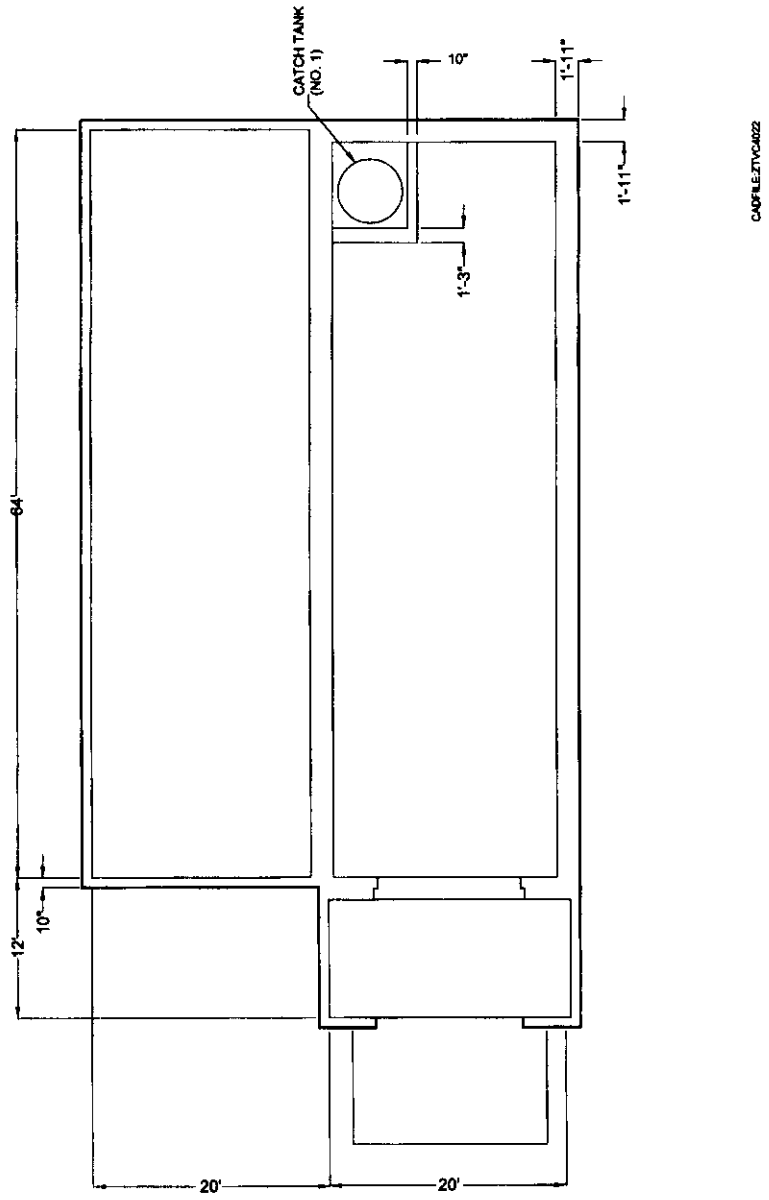


Figure B-35. 204-AR Waste Unloading Facility Layout

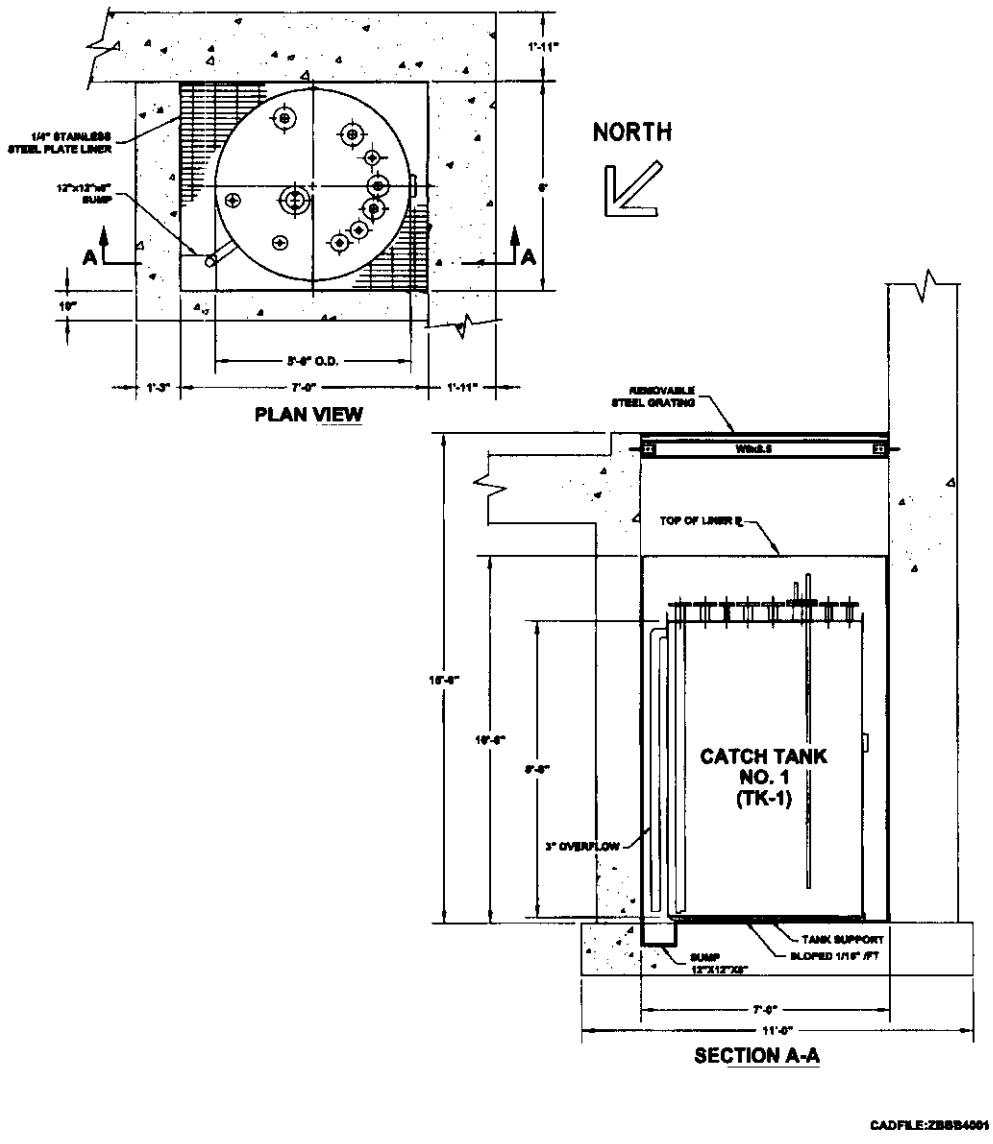


Figure B-36. 204-AR Catch Tank.

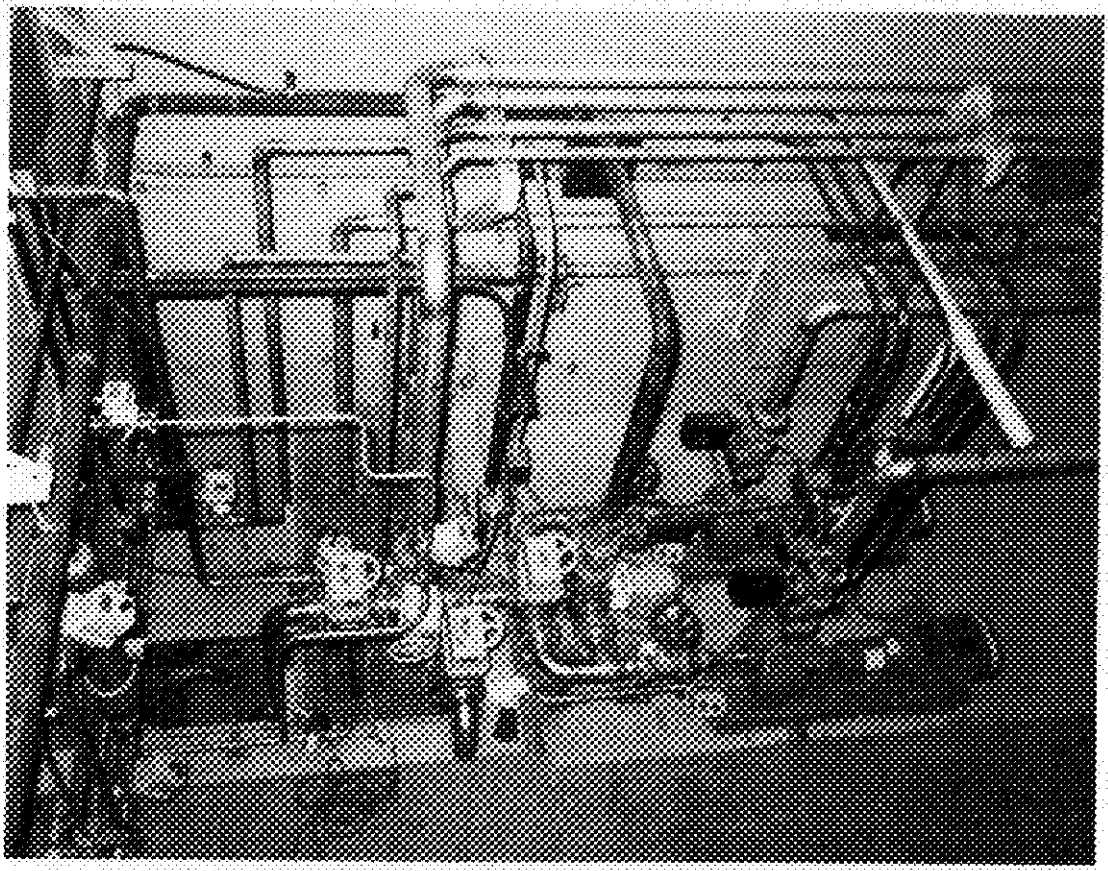
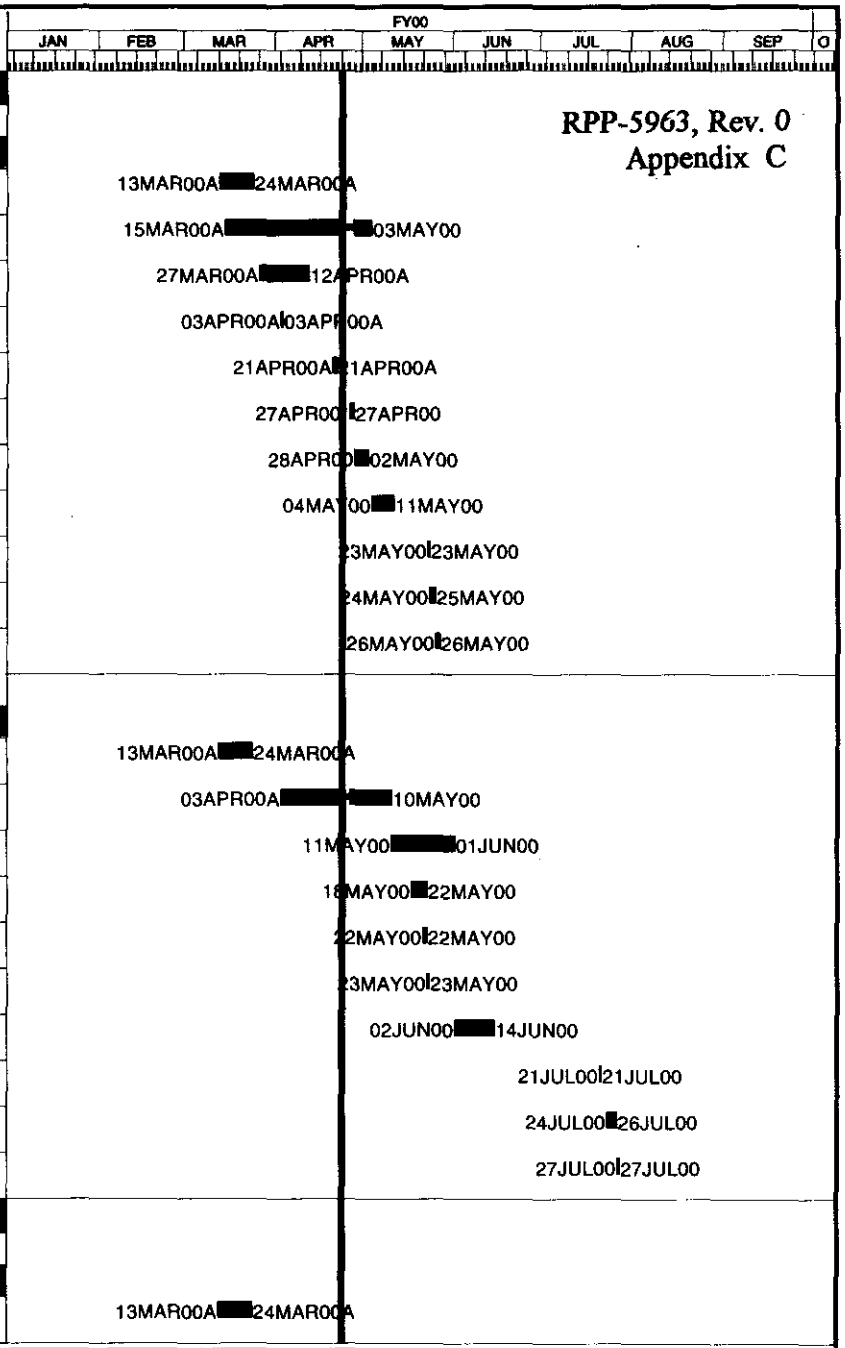


Figure B-37. 204-AR Waste Unloading Facility, Unloading Room.

APPENDIX C

OPERATIONS SCHEDULE

Activity ID	Activity Description	% Comp	Orig Dur	Rem Dur	Early Start	Early Finish
A Farm						
244 DCRT						
244-A Perfrom Video/Tank Integrity Inspection						
SBA77B1002	Revision of USQ Screening for 244-A	100	5	0	13MAR00A	24MAR00A
SBA77A1003	Rev W/package for 244A Tank Integrity	25	10	4	15MAR00A	03MAY00
SBA77B1009	Engineering Supports/Docs 244-A Tank Integrity	100	10	0	27MAR00A	12APR00A
SBA77B1003	Peform Walkdown of area/work package 244-A	100	1	0	03APR00A	03APR00A
SBG77N1001	EWP/AJHA 244-A Tank Integrity Testing	100	1	0	21APR00A	21APR00A
SBT77N1030	EWP/AJHA 244-A Tank Integrity Testing	0	1	1	27APR00*	27APR00
SBA77B1025	RadCon RWP/AMW for 244-A Annulus/PPit/In-Tank	0	3	3	28APR00	02MAY00
SBA77B1008	Approvals of 244-A Annulus/PPit/In-Tank	0	6*	6*	04MAY00	11MAY00
SBA77C1002	Set up for Pump pit/In-Tank inspection 244-A	0	1	1	23MAY00	23MAY00
SBA77C1003	Peform Annulus/Pump Pit/In tank Inspection 244-A	0	2	2	24MAY00	25MAY00
SBA77C1004	Restore Area/remove camera/replace riser 244-A	0	1	1	26MAY00	26MAY00
Drainage Lift Station 350						
A350 Annulus/Pump pit/In-Tank Inspection						
SBA77F1003	Draft USQ for A350 Tank Integrity	100	5	0	13MAR00A	24MAR00A
SBA77F1013	Eng Support/Docs for A350 Annulus/PPit/InTank	0	10	10	03APR00A	10MAY00
SBA77F1002	Develop W/package A350 Annulus/PPit/InTank	0	15	15	11MAY00	01JUN00
SBA77F1025	RadCon RWP/AMW for A350 Annulus/PPit/InTank	0	3	3	18MAY00	22MAY00
SBA77F1004	Perform W/package walkdown A350 Tank Inspection	0	1	1	22MAY00	22MAY00
SBA77F1005	EWP/AJHA A350 Annulus/PPit/In-Tank Inspections	0	1	1	23MAY00	23MAY00
SBA77F1012	Approvals for A350 Annulus/PPit/In-Tank Inspect	0	9*	9*	02JUN00	14JUN00
SBA77F1006	Setup for Annulus/PPit/ In-tank Inspection A350	0	1	1	21JUL00	21JUL00
SBA77F1007	A350 Inspection of Annulus/Pump Pit/Interior	0	3	3	24JUL00	26JUL00
SBA77F1008	A350 Restore Area Replace Riser/Remove Camera	0	1	1	27JUL00	27JUL00
AR						
Catch Tank 204						
204-AR Tank Integrity Testing						
SBR77C1002	USQ Screening for 204-AR Tank Integrity Testing	100	5	0	13MAR00A	24MAR00A



Start Date	01OCT99
Finish Date	18DEC00
Data Date	24APR00
Run Date	25APR00 14:55

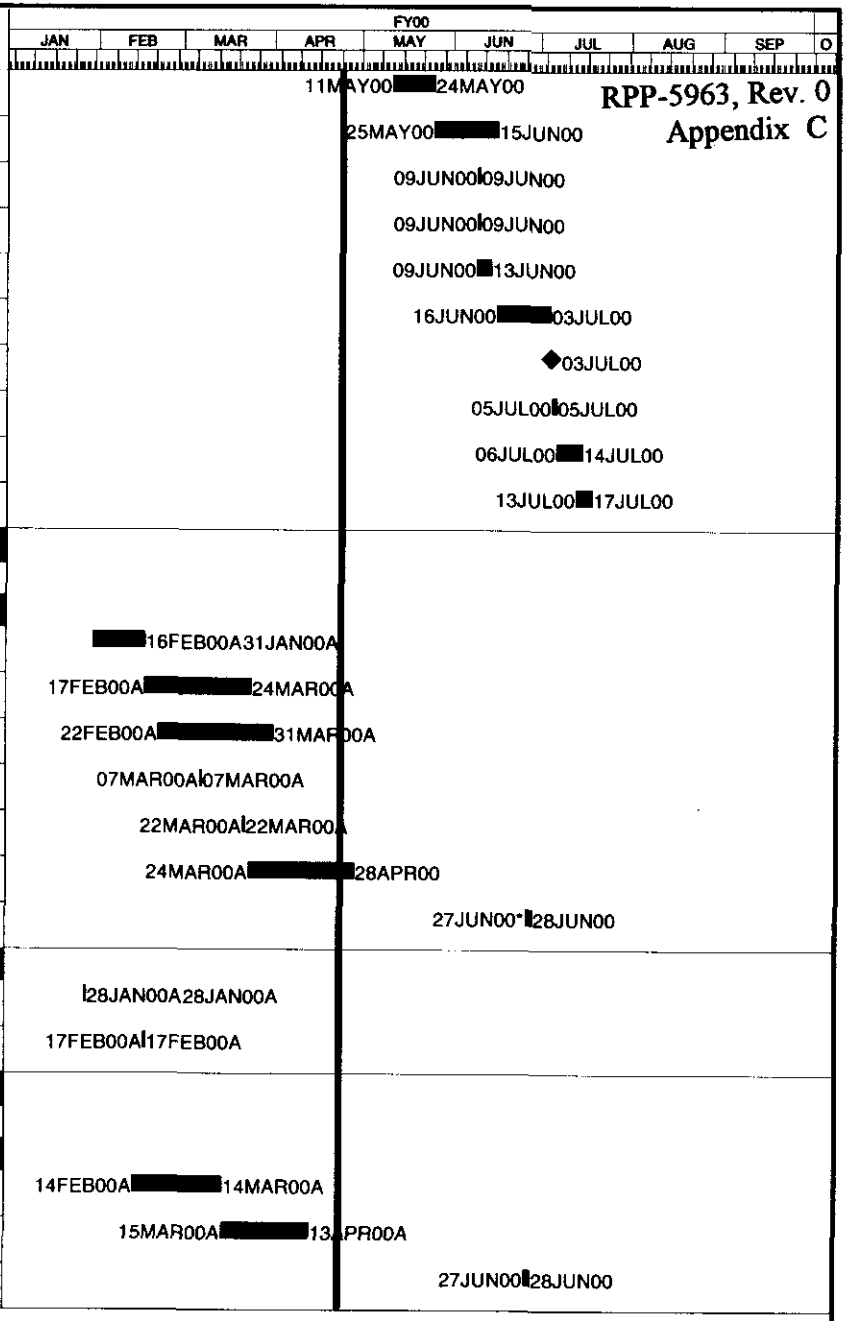
Early Bar
Progress Bar
Critical Activity

IS0A - SBC0 Integrity Testing Sheet 1 of 6

Field Work Schedule

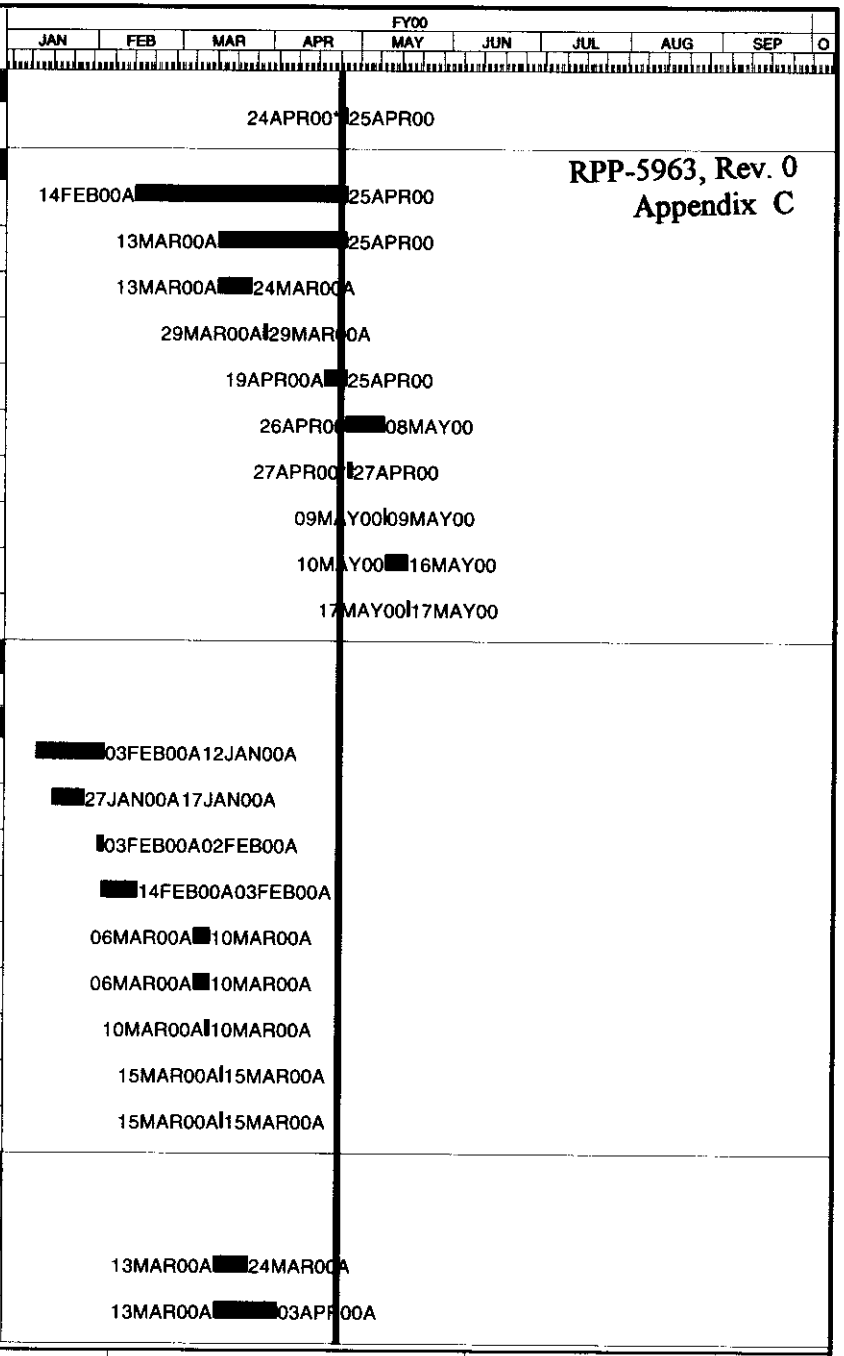
FY2000

Activity ID	Activity Description	% Comp	Orig Dur	Rem Dur	Early Start	Early Finish
SBR77C1010	Eng Support/Docs 204AR Annulus/Exterior Insp	0	10	10	11MAY00	24MAY00
SBR77C1001	Work package for 204-AR Annulus/Leak Check	0	15	15	25MAY00	15JUN00
SBR77C1004	Walkdown of 204-AR Annulus/UT Inspection	0	1	1	09JUN00	09JUN00
SBR77C1005	EWP/AJHA for 204-AR Annlus/UT Inspection	0	1	1	09JUN00	09JUN00
SBR77C1021	RadCon RWP/AMW 204AR Annulus/UT Inspection	0	3	3	09JUN00	13JUN00
SBR77C1003	W/P Approvals of 204-AR Annulus/Leak Check	0	12*	12*	16JUN00	03JUL00
SBR77C1025	Completion of W/packages for Integrity Testing	0	0	0		03JUL00
SBR77C1015	204AR Fill Tank for Leak Check	0	1	1	05JUL00	05JUL00
SBR77C1006	Annuls/Tank Exterior Inspection 204-AR/LCheck	0	7	7	06JUL00	14JUL00
SBR77C1007	Restore Area/Remove Camera 204AR Annulus/Exter	0	3	3	13JUL00	17JUL00
AX Farm						
Diversion Structure 152						
AX-152 Pump Pit & Diverter Box Inspection						
SBF77B1010	W/Package AX-152 Pump Pit & Diverter box Insp	100	10	0	31JAN00A	16FEB00A
SBF77B1011	W/P AX152 Pump Pit/Diverter Box Insp/LCheck	100	10	0	17FEB00A	24MAR00A
SBF77B1014	Eng Support/Documents for AX-152 PPit/LCheck	100	10	0	22FEB00A	31MAR00A
SBF77B1017	AJHA/EWP Inpsection of Pump pit/Diverter/L. Chec	100	1	0	07MAR00A	07MAR00A
SBF77B1021	EWP/AJHA 152-AX Pump Pit/Diverter/L.Check Inspec	100	1	0	22MAR00A	22MAR00A
SBF77B1015	W/P Approvals for Pump pit/Leak Check AX-152	0	26*	5*	24MAR00A	28APR00
SBF77B1012	F/W Pump pit/Diverter Insp/Leak Check AX-152	0	2	2	27JUN00*	28JUN00
AX-152 Tank Integrity Testing						
SBGF77B100	AJHA/EWP AX-152 Tank Integrity Testing	100	1	0	28JAN00A	28JAN00A
SBF77B1020	AJHA/EWP AX-152 Tank Integrity Testing	100	1	0	17FEB00A	17FEB00A
AZ Farm						
Diversion Structure 151						
2E000448						
SBG77A1001	Work package for AZ-151 Leak Check	100	10	0	14FEB00A	14MAR00A
SBG77A120	Work Package Approvals AZ-151 Leak Check	100	22*	0*	15MAR00A	13APR00A
SBG77A1002	Perform Leak Check of AZ-151	0	2	2	27JUN00	28JUN00



Start Date 01OCT99 Finish Date 18DEC00 Data Date 24APR00 Run Date 25APR00 14:55	Early Bar Progress Bar Critical Activity	**IS0A - SBC0 Integrity Testing Sheet 2 of 6** **Field Work Schedule** **FY2000**		C-3

Activity ID	Activity Description	% Comp	Orig Dur	Rem Dur	Early Start	Early Finish
AZ151 Pump Pit surveys/Video						
SBF77A1030	RWR - Investigative Surveys/Pump Pit Insp AZ151	0	2	2	24APR00*	25APR00
AZ-151 Tank IntegrityTesting						
SBF77A1021	Eng Support/Documents for AZ-151 InTank	0	10	2	14FEB00A	25APR00
SBF77A1001	Revise Work package for AZ-151 InTank	0	10	2	13MAR00A	25APR00
SBF77A1002	USQ Screening for AZ-151 Pump Pit Inspection	100	0	0	13MAR00A	24MAR00A
SBF77A1003	Peform Field walkdown of AZ-151 Pit Inspection	100	1	0	29MAR00A	29MAR00A
SBF77A1025	RadCon RWP/AMW for AZ-151 InTank	0	3	2	19APR00A	25APR00
SBF77A1022	Work Package Approvals for AZ151 InTank	0	9*	9*	26APR00	08MAY00
SBF77A1004	EWP/AJHA of InTank Inspeciton of AZ151	0	1	1	27APR00*	27APR00
SBF77A1005	Setup for InTank Inspection AZ-151	0	1	1	09MAY00	09MAY00
SBF77A1006	InTank Inspection of AZ-151	0	5	5	10MAY00	16MAY00
SBF77A1007	Restore Area- InTank Inspection AZ-151	0	1	1	17MAY00	17MAY00
BX Farm						
244 DCRT						
244-BX Tank Integrity Inspection						
SBA100A100	Revise Work package 244-BX Visual Inspection	100	10	0	12JAN00A	03FEB00A
SBA100A102	Modify USQ 244-BX Visual Inspection	100	5	0	17JAN00A	27JAN00A
SBA100A103	Pre-Job walkdown of 244-BX in support of Visual	100	1	0	02FEB00A	03FEB00A
SBA100A107	Work Package Approvals for 244-BX In-Tank	100	5	0	03FEB00A	14FEB00A
SBA100A115	Work Package for 244-BX In-Tank Inspection	100	10	0	06MAR00A	10MAR00A
SBA100A116	Engineering Support/Documents for J-7 244-BX	100	7	0	06MAR00A	10MAR00A
SBA100A117	J-7 Approvals for 244-BX In-Tank Inspection	100	5	0	10MAR00A	10MAR00A
SBA100A105	Perform 244-BX In-Tank Inspection	100	2	0	15MAR00A	15MAR00A
SBA100A106	Restore Area 244-BX In-Tank Inspection	100	1	0	15MAR00A	15MAR00A
ER						
0311						
ER-311 Tank Inspections						
SBE77C1006	USQ ER-311 Pump Pit & In-Tank Inpsection	100	5	0	13MAR00A	24MAR00A
SBE77C1016	Eng Support/Documents for ER311 Tank Inspection	100	7	0	13MAR00A	03APR00A



RPP-5963, Rev. 0
Appendix C

Start Date 01OCT99
Finish Date 18DEC00
Data Date 24APR00
Run Date 25APR00 14:55

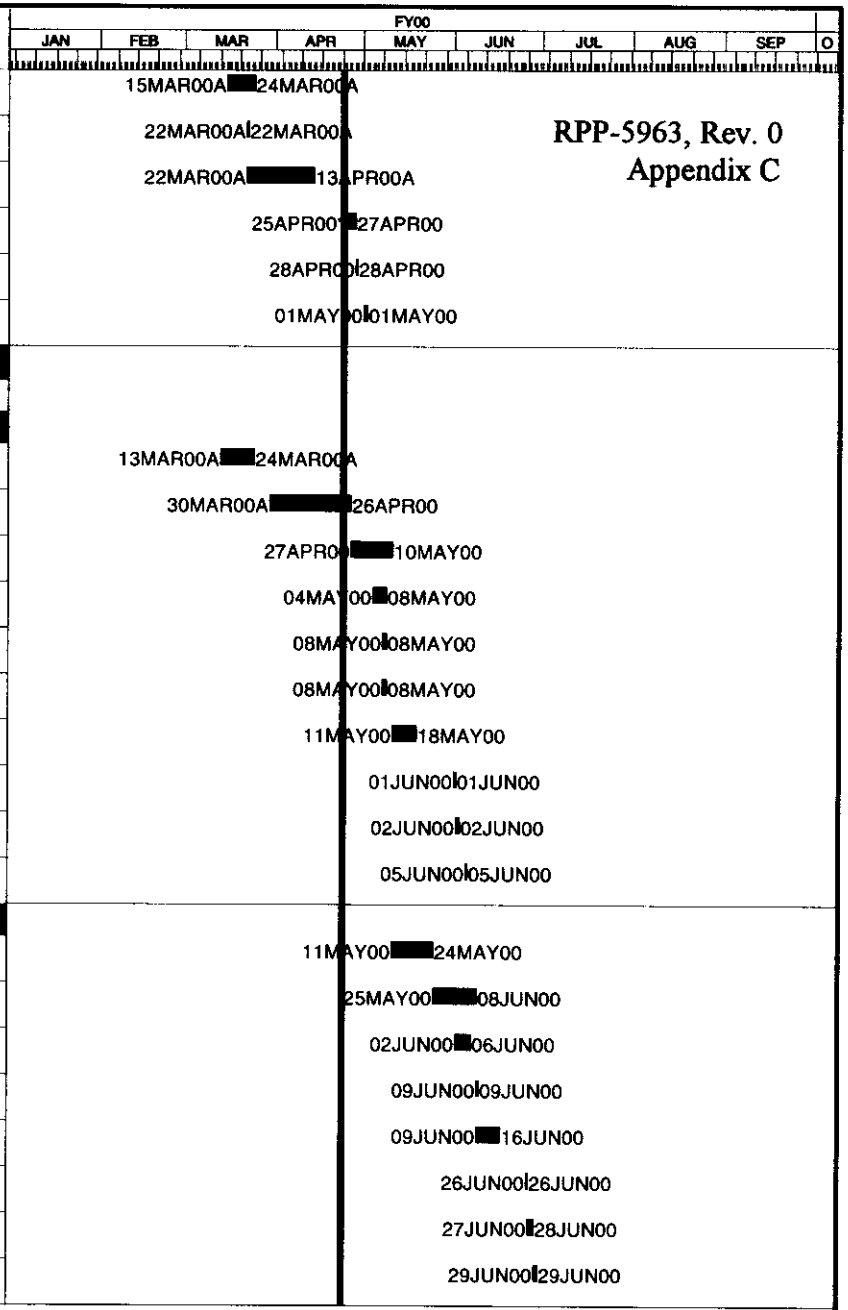
Early Bar
Progress Bar
Critical Activity

IS0A - SBC0 Integrity Testing Sheet 3 of 6

Field Work Schedule

FY2000

Activity ID	Activity Description	% Comp	Orig Dur	Rem Dur	Early Start	Early Finish
SBE77C1005	W/P prep for ER-311 Tank Inspeciton	100	10	0	15MAR00A	24MAR00A
SBE77C1008	EWP/AJHA of ER-311 Tank Inspections	100	1	0	22MAR00A	22MAR00A
SBE77C1015	W/P Approvals for ER-311 Tank Inpspection	100	17*	0*	22MAR00A	13APR00A
SBE77C1010	PERFORM ER311 Pump Pit & In-Tank Inspection	0	3	3	25APR00*	27APR00
SBE77C1011	Perform ER311 Pump Pit & In-Tank Inspection	0	1	1	28APR00	28APR00
SBE77C1012	Restore Area ER311 Pump Pit & In-Tank Inspection	0	1	1	01MAY00	01MAY00
East / West Vent Station						
Diversion Structure 151						
EW151 Annulus/Pit Inspections						
SBG77A1006	USQ for EW151 Annulus/In-Tank Inspections	100	5	0	13MAR00A	24MAR00A
SBG77A1021	Eng Support/Documents for EW151 Annulus/InTank	0	10	3	30MAR00A	26APR00
SBG77A1005	W/Package Prep EW151 Annulus/In-Tank Inspection	0	10	10	27APR00	10MAY00
SBG77A1030	RadCon RWP/AMW Annulus/InTank Inspection EW151	0	3	3	04MAY00	08MAY00
SBG77A1007	Walkdown W/P for EW151 Annulus/InTank Inspection	0	1	1	08MAY00	08MAY00
SBG77A1008	EWP/AJHA of EW151 Annulus/In-Tank Inspection	0	1	1	08MAY00	08MAY00
SBG77A1020	W/Package Approvals EW151 Annulus/InTank	0	6*	6*	11MAY00	18MAY00
SBG77A1009	Setup for EW151 Annulus/In-Tank Inspection	0	1	1	01JUN00	01JUN00
SBG77A1010	Perform Annulus/In-Tank Inspection EW151	0	1	1	02JUN00	02JUN00
SBG77A1011	Restore Area Remove Camera EW151	0	1	1	05JUN00	05JUN00
EW151 Perfrom Pump Pit Video/Inspection						
SBG77A1026	Eng Support/Docs for EW151 Pump Pit Inspection	0	10	10	11MAY00	24MAY00
SBG77A1012	EW151 W/package Pump Pit Inspection	0	10	10	25MAY00	08JUN00
SBG77A1031	RadCon RWP/AMW for EW151 Pump Pit Inspection	0	3	3	02JUN00	06JUN00
SBG77A1013	EWP/AJHA Pump Pit Inspection EW-151	0	1	1	09JUN00	09JUN00
SBG77A1025	EW151 W/Package Approvals Pump Pit Inspection	0	6*	6*	09JUN00	16JUN00
SBG77A1014	Setup for EW151 Pump Pit Inspection	0	1	1	26JUN00	26JUN00
SBG77A1015	EW151 Pump Pit Inspection	0	2	2	27JUN00	28JUN00
SBG77A1016	Restore area EW151 Pump Pit Inspection	0	1	1	29JUN00	29JUN00



RPP-5963, Rev. 0
Appendix C

Start Date 01OCT99
Finish Date 18DEC00
Data Date 24APR00
Run Date 25APR00 14:55

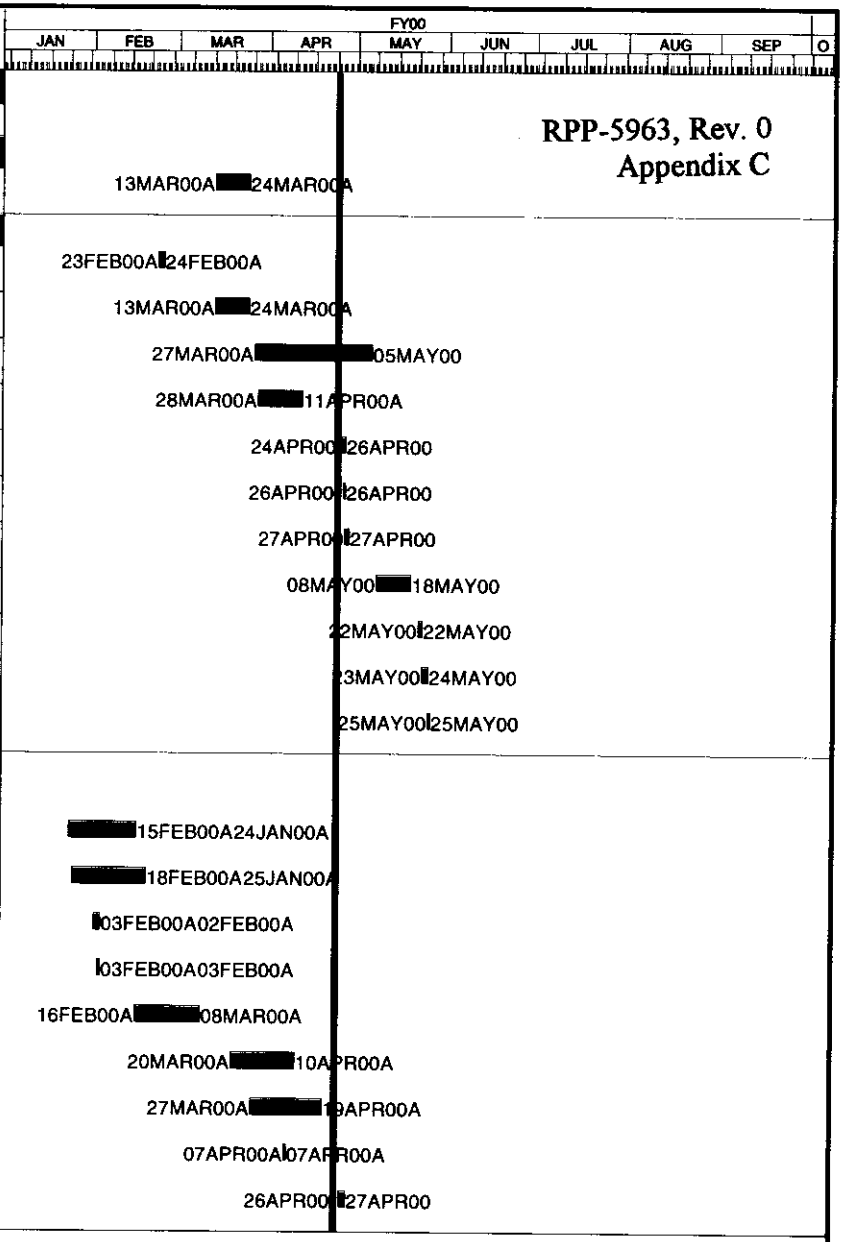
Early Bar
Progress Bar
Critical Activity

IS0A - SBC0 Integrity Testing Sheet 4 of 6

Field Work Schedule

FY2000

Activity ID	Activity Description	% Comp	Orig Dur	Rem Dur	Early Start	Early Finish
TX Farm						
244 DCRT						
244-TX Annulus Inspection /Leak Check						
SBT77C1004	Revision of USQ for 244-TX	100	5	0	13MAR00A	24MAR00A
244-TX Pump Pit/In-Tank Inspection						
SBT77C1008	Walkdown of 244-TX Inspections	100	1	0	23FEB00A	24FEB00A
SBT77C1013	USQ Revision 244-TX Pump Pit/In-Tank Inspection	100	5	0	13MAR00A	24MAR00A
SBT77C1012	W/package Pump Pit/In-Tank Inspection/LC 244-TX	50	10	10	27MAR00A	05MAY00
SBT77C1022	Eng Support/Documents for InTank Insp 244TX	100	10	0	28MAR00A	11APR00A
SBT77C1030	RadCon RWP/AMW PPit/In-Tank Inspection/LC 244-TX	0	3	3	24APR00	26APR00
SBT77C1014	Walkdown 244-TX Pump Pit/ In-Tank Insp/LC	0	1	1	26APR00*	26APR00
SBT77C1015	EWP/AJHA 244-TX Pump Pit/In-Tank Inspection/LC	0	1	1	27APR00	27APR00
SBT77C1021	W/package app PPit/InTank Inspection/LC 244TX	0	9*	9*	08MAY00	18MAY00
SBT77C1016	Setup for 244-TX In-Tank Inspection/Pump Pit/LC	0	1	1	22MAY00	22MAY00
SBT77C1017	Peform Pump Pit/In-Tank Inspection/LC 244-TX	0	2	2	23MAY00	24MAY00
SBT77C1018	Restore Area 244TX Pump Pit/InTank Inspection/LC	0	1	1	25MAY00	25MAY00
302C						
241-TX, 302C Video/Tank Intregrity Inpection.						
SBG77B1110	Work Package Revision of TX-302C Tank Integrity	100	10	0	24JAN00A	15FEB00A
SBG77B1004	Revise USQ Screening for TX-302C Inspections	100	5	0	25JAN00A	18FEB00A
SBG77B1111	Walkdown of TX-302C Pump Pit/Tank Inspections	100	1	0	02FEB00A	03FEB00A
SBG77B1112	EWP/AJHA of TX-302C Pump Pit/Tank Inspection	100	1	0	03FEB00A	03FEB00A
SBG77B1003	W/Package Approvals for Tank Integrity TX-302C	100	5	0	16FEB00A	08MAR00A
SBG77B120	J-7 for TX-302C Tank Inspection	100	15	0	20MAR00A	10APR00A
SBG77B1025	J-7 Approvals for TX-302C Pump Pit	100	18*	0*	27MAR00A	19APR00A
SBG77B1008	EWP/AJHA TX-302C Pump Pit (Integrity Testing)	100	1	0	07APR00A	07APR00A
SBG77B1005	Perform Video of Pump Pit TX-302C	0	2	2	26APR00*	27APR00



RPP-5963, Rev. 0
Appendix C

Start Date	01OCT99
Finish Date	18DEC00
Data Date	24APR00
Run Date	25APR00 14:55

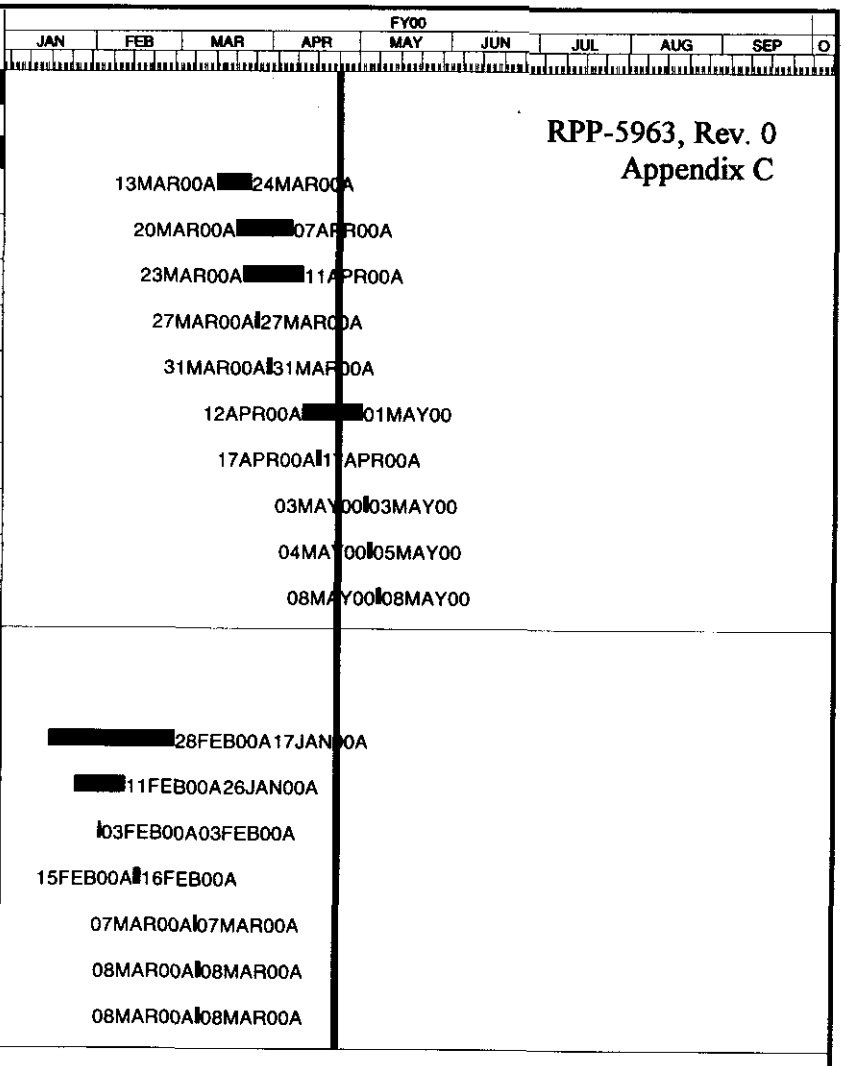
Early Bar
Progress Bar
Critical Activity

IS0A - SBC0 Integrity Testing Sheet 5 of 6

Field Work Schedule

FY2000

Activity ID	Activity Description	% Comp	Orig Dur	Rem Dur	Early Start	Early Finish
U Farm						
Catch Tank 301B						
Pump Pit/In-Tank Inspection U301B						
SBG77C1006	Develop USQ Inspection of Pump Pit/InTank U301B	100	5	0	13MAR00A	24MAR00A
SBG77C1013	Eng Support/Documents Pump Pit/In Tank U301B	100	10	0	20MAR00A	07APR00A
SBG77C1005	W/package Pump Pit/InTank Inspection U301B	100	10	0	23MAR00A	11APR00A
SBG77C1008	EWP/AJHA U301B Pump Pit/In-Tank Inspection	100	1	0	27MAR00A	27MAR00A
SBG77C1007	Conduct Walkdown of U301B	100	1	0	31MAR00A	31MAR00A
SBG77C1012	Work Package Appr for PPit/InTank Insp U301B	0	14*	11*	12APR00A	01MAY00
SBG77C1025	RWP/AMW U301B Pump Pit/InTank Inspection	100	1	0	17APR00A	17APR00A
SBG77C1009	Set-up for Pump Pit/In-Tank Inspection U301B	0	1	1	03MAY00	03MAY00
SBG77C1010	Peform Pump Pit & In-Tank Inspection U301B	0	2	2	04MAY00	05MAY00
SBG77C1011	Restore Area/Remove Camera U301B Inspections	0	1	1	08MAY00	08MAY00
UX						
UX-302A Catch Tank						
241-U, UX-302A, Perform Video Tank Inspection						
SBG77D1003	Revise/Approve W/P UX-302A Pump Pit/In-Tank	100	10	0	17JAN00A	28FEB00A
SBG77D1004	Revise USQ for UX-302A Pump Pit/In-Tank	100	5	0	26JAN00A	11FEB00A
SBG77D1006	Conduct EWP/AJHA for Pump Pit/In-Tank UX-302A	100	1	0	03FEB00A	03FEB00A
SBG77D1005	Walkdown of UX-302A work package	100	1	0	15FEB00A	16FEB00A
SBG77D1007	UX-302A Set up Pump Pit/In-Tank Inspection	100	1	0	07MAR00A	07MAR00A
SBG77D1008	Peform Inspection of Pump Pit/In-Tank UX-302A	100	2	0	08MAR00A	08MAR00A
SBG77D1009	Restore Area UX-302A Inspections	100	1	0	08MAR00A	08MAR00A



DISTRIBUTION SHEET

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DISTRIBUTION	TANK INTEGRITY ASSESSMENT ENG.	Date 05/16/2000
Project Title/Work Order		EDT No. 629587
Engineering Task Plan for the Integrity Assessment Examination of Double-Contained Reciever Tanks, Catch Tanks and Auxillary Fac.		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
Aardal, P. K.	S5-12	x			
Badden, J. J.	S5-07	x			
Baide, D. G.	S5-05	x			
Baird, K. A.	T4-01	x			
Becker, D. L.	R1-04	x			
Bingham, J. D.	S5-05	x			
Borrowman, J. E.	S5-03	x			
Bowen, K. M.	T4-08	x			
Bragg, D. A.	S5-05	x			
Brooks, R. L.	S7-90	x			
Brown, M. H.	T4-08	x			
Brown, T. M.	S5-05	x			
Cutforth, K. A.	S5-12	x			
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To	From	Page 2 of 2
Distribution	Tank Integrity Assessment Eng.	Date
Project Title/Work Order		EDT No. 629055 587
Engineering Task Plan for the Integrity Assessment Examination of Double - Contained reciever Tanks, Catch Tanks, and Ancillary Fac.		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
Nicholson, R. S.	S5-05	x			
Niebuhr, D. P.	S5-03	x			
Parkman, D. B.	S5-13	x			
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Sparks, D. L.	S5-03	x			
Sumsion, M. L.	S5-03	x			
Sutey, M. J.	S5-07	X			
Tardiff, G. R.	S5-05	x			
Wright, R. L.	S5-03	x			
Zilar, L. J.	S7-90	x			