



Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

June 4, 1997

Mr. Joseph J. Holonich, Chief
Uranium Recovery Branch
Office of Nuclear Materials Safety and Safeguards
Mail Stop T7J9
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852-2738

Dear Mr. Holonich:

Enclosed are responses to the comments received from the Nuclear Regulatory Commission (NRC) on February 21, 1997, regarding the Vitro Completion Report. Responses to some of the comments required minor modifications to the Completion Report. Therefore, please remove and destroy Sections 6 and 7, the document cover and spine, and the title page. Replace these pages with the new pages that are provided.

The property owner, Central Valley Water Reclamation Facility, and the state of Utah have agreed to the annotation of the property deed. Enclosed is the proposed deed annotation language. Annotation of the property deed fulfills the state of Utah's responsibility under subsection 104(d) of the Uranium Mill Tailings Radiation Control Act. This action should resolve NRC's concerns for ensuring long-term protection of public health and safety at the Vitro site.

This information is provided for your review and approval. Should you have comments or questions, please contact me at (505) 845-5668.

Sincerely,

Sharon J. Arp
Site Manager
Uranium Mill Tailings Remedial Action Team
Environmental Restoration Division

3 Enclosures

cc w/enclosures:
W. Sinclair, state of Utah

cc w/o enclosures:
E. Brummett, NRC
S. Hamp, ERD
E. Artiglia, TAC
S. Cox, TAC

NL 041/
WM-65



9706130175 970604
PDR WASTE
WM-65 PDR

RESPONSE TO NRC COMMENTS VITRO COMPLETION REPORT

ISSUE 1.C

4. **Comment:** The NRC staff accepts the CR page changes provided in response to Issue 1, but page 7-1 apparently contains an error.

Response/Implementation: DOE has reviewed sentence 1 of paragraph 4 on page 7-1 and agrees that this sentence contains an error. The sentence will be changed to read:

"In all cases, the depth of backfill exceeds limits for the 5-pCi/g plus background standard; the only standard applicable for the Vitro site is 15 pCi/g plus background."

ISSUE 2

Comment: DOE should revise the Vitro status report and CR page 7-6 to indicate the backfill depth assumed for the flux modeling, the potential consequences and radon mitigation procedures if a habitable structure is built on the deposit with minimal intervening fill, and that the UMTRA Project WL limit is 0.02 WL. Also, because the highest radium value could increase the potential health risk under certain conditions, staff recommends that DOE take steps to enable future owners of the property to be aware of this residual contamination.

Response: DOE agrees that the CR should be modified to indicate the backfill depth assumed for the radon flux modeling, and that 0.02 WL is an acceptable radon exposure level as outlined in the EPA requirements of 40 CFR 192. In addition, we will address radon mitigation procedures and potential consequences associated with building on the deposit if the depth of backfill is decreased. This information will not be modified in the Vitro Status Report since NRC does not consider this to be an acceptable mechanism for controlling future use and development of the site. The state of Utah and CVWRF have developed proposed language for annotation of the property deed.

Implementation: Beginning with sentence 6, paragraph 5, page 7-6 of the CR, the text will be modified as follows:

"To determine the potential health hazards associated with these grids, an analysis was performed to determine the projected radon flux if a hypothetical slab-on-grade house were built on the grid with 42 pCi/g. Using a backfill depth of 4.7 feet, a radon flux of 3.7 pCi/m²/s is projected. A radon flux of this magnitude is essentially equivalent to a radon working level of 0.02, which is in compliance with the EPA cleanup standard as outlined in 40 CFR 192.12(b). If a slab-on-grade house were constructed over this grid with a reduced depth of backfill, the radon working level would increase, thus increasing the health risks associated with exposure to radon gas. Because of the relatively low radioactivity and small

quantity of contaminated material remaining, these grids are not considered to be health hazards as long as the backfill that covers them remains in place. Therefore, these grids will remain in place and no further remediation will be performed."

In addition, a new paragraph will be added after paragraph 5 stating:

"It is advisable that any building constructed over radioactive material be designed in compliance with EPA guidelines for reducing or minimizing radon gas exposure."

ISSUE 3.f

Comment: This issue will be closed when the CR is revised to demonstrate that the elevated Th-230 remaining on site is in compliance with the EPA standards. Alternatively, since a convincing ALARA determination for the Th-230 is unlikely, DOE should demonstrate that long-term protection of the public health will be provided for in the land annotation rule.

Response: In the NRC discussion it is implied that DOE ignored the presence of Th-230 on the Vitro site and failed to raise the issue to the NRC when it was discovered. The DOE is very concerned with these statements. The DOE did not, nor do we currently, have anything to gain by ignoring NRC issues and concerns or hiding information from NRC for this site or on any site that we are responsible for remediating. To better understand the history of the Th-230 issue, DOE reviewed records and discussed the issue with Project participants. Following is a summary of DOE's review.

The DOE and the NRC acknowledged the Th-230 issue in 1983 in relation to the Cannonsburg site (the letter referenced by NRC does not appear to contain any discussions regarding testing or remediation for Th-230). However, a Project-wide systematic approach for assessing the magnitude of Th-230 did not occur until the fall of 1987. As you know, full resolution for remediation of Th-230 did not occur until 1994, and even with that, the DOE and NRC continue have many points of contention with the approved protocol.

Between 1983 and the fall of 1987, Th-230 was evaluated as a site-specific issue, not a Project issue. The DOE has records documenting the issue for many of the UMTRA sites, however, there are no records during this time period indicating that Th-230 was thought to be an issue at Salt Lake City. In addition, the approved Remedial Action Plan, dated December 1984, does not specifically discuss testing or remediation for Th-230 in the absence of Ra-226. Our records indicate that NRC did not raise concerns regarding Th-230 at the Vitro site until after remedial action had been completed. The first such document found was a record of telephone conversation between RMurphy (TAC) and DSollenberger (NRC) in September 1988.

The RAC for the Salt Lake City site (state of Utah) became aware of the Th-230 on the processing site as early as 1986. However, this knowledge was not passed on to the DOE. It is not apparent in review of the records or in discussions with Project personnel why Th-230 was not identified as an issue before the fall of 1987. The fact that the Vitro site was remediated by a

different RAC than the rest of the UMTRA sites may have played a role in the late identification of Th-230 at this site. The DOE first identified the Th-230 issue at the Vitro processing site during a radiological audit in the fall of 1987. At this time remediation of the processing site was nearing completion with much of the site already backfilled. The concerns identified by the DOE prompted the DOE to retroactively test archived soil samples to better determine the extent of the problem.

Based on the above information, DOE feels that it is inappropriate for the NRC to make statements that DOE ignored NRC's concerns regarding Th-230. Unless the NRC can find information contrary to the information provided by the DOE, the DOE requests that these statements be rescinded.

The NRC also questioned DOE's cutoff value of 35 pCi/g Th-230 as being ALARA. The cutoff value of 35 pCi/g was established assuming 6.5 pCi/g of residual Ra-226 was left. The 6.5 pCi/g value was felt to be a conservative assumption since most of the site was remediated to below this level (< 5 pCi/g above background). DOE could have evaluated the cutoff value for each specific grid where Th-230 was identified. However, an in-depth analysis of this sort would not have enhanced our evaluation regarding the risks associated with the contamination that remains; the high-risk grids are associated with those grids containing the higher concentrations of Th-230. Should NRC not agree with the DOE's assumptions, we would appreciate if NRC would state and justify what cutoff value is appropriate.

The NRC requests that DOE show how leaving elevated levels of Th-230 (up to 650 pCi/g) complies with 40 CFR 192.22(b). As indicated above, when performing remedial action on the Vitro site neither DOE nor NRC knew that Th-230 had differentially migrated relative to Ra-226. This issue was not identified until the cleanup effort was almost completed and backfilling had occurred. Had DOE known that elevated levels of Th-230 remained on the property, additional remedial action would have been performed since the differential migration of the Th-230 is only expected to a maximum depth of 2 feet due to the geology of the site (see page 6-4, paragraph 4). It would not have been cost effective at the time of discovery to perform this remediation since most of the site had already been backfilled. The DOE agrees with the NRC comment that there could be additional areas on the processing site with elevated levels of Th-230 since it was not routinely analyzed. However, the actual location and extent of these areas would be speculative at best, given the information currently available.

The information regarding remediation to the water table contained in the March 1995 version of the CR could not be fully substantiated; therefore, it was removed. Discussions with the Utah Division of Radiation Control indicate that much of the site was remediated to ground water. As discussed above, remediation to ground water was not done in an effort to cleanup Th-230 to ALARA; it was the level required to remediate Ra-226. It is true that the health hazards associated with leaving Th-230 in saturated soil are insignificant. However, no analysis has been performed to evaluate the stability of the ground water table for predicting long-term health risks. It is questionable as to whether such an analysis could even be performed since long-term data (200 to 1000 years) is not available.

DOE will add information in the CR to discuss the working level limit for structures as covered in 40 CFR 192. In their discussion NRC refers to a 100 mrem dose limit to the public. This does limit is the occupational worker dose limit as covered under 10 CFR 20 and DOE Order 5400.5. Discussing this standard in the Vitro CR would not be appropriate.

The DOE agrees with the NRC comments that due to the potential long-term health risk associated with the Th-230 remaining on the site there should be a mechanism that informs future owners of the property of the deposits, and the potential health risks associated with these deposits. Because we are in agreement with these concerns, DOE developed the Post-Remedial Action Status Report for NRC review and comment. The intent of the report was for the state of Utah to use the information to inform potential property owners of the risks associated with this property. The state of Utah did use this information, as well as the information to develop the enclosed document entitled, *Notice of Residual Radioactive Contamination*. This document will be attached to the property deed.

Implementation. The following sentence will be added between sentences 4 and 5 of the third paragraph on page 6-4:

"The EPA cleanup standard as outlined in 40 CFR 192.12(B)(1) requires reasonable effort to be made to reduce the working levels below 0.02 and not to exceed 0.03."

The following sentence will be added to the end of the third paragraph on page 6-4,

"The depth of fill as noted in Table 6.1 is the depth of uncontaminated backfill that currently covers each of the grids. If the radon flux calculation was performed using a lesser value for the depth of uncontaminated backfill the radon flux would increase, thus increasing the health hazard associated with exposure to radon gas."

The information contained from the third sentence to the end of the paragraph will be deleted from paragraph 6 on page 6-4.

NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION

THIS NOTICE IS TO ALERT BUYERS OR DEVELOPERS THAT RESIDUAL RADIOACTIVE CONTAMINATION EXISTS ON THE PROPERTY HEREIN DESCRIBED.

RECITALS

A. WHEREAS, the current owner of the property known as the Salt Lake Vitro Site ("Site") situated in Salt Lake County Utah, and more particularly described on Exhibit J attached hereto, is Central Valley Water Reclamation Facility Board, 800 West Central Valley Road, Salt Lake City, Utah 84119;

B. WHEREAS, the site was used by the Vitro Chemical Company to process uranium ore from 1951 to 1964 and to process vanadium ore from 1964 to 1968;

C. WHEREAS, when milling operations were discontinued in 1968, more than four million tons of uranium mill tailing waste remained on the Site's disposal impoundments;

D. WHEREAS, under the Uranium Mill Tailings Radiation Control Act of 1978 (Public Law 95-604), which requires the remediation of the identified uranium mill tailing sites, the United States Department of Energy and the State of Utah ("State") entered into Cooperative Agreement Number DE-FC04-81AL616309, dated March 30, 1983, for the remediation of the Salt Lake Vitro Site; between 1985 and 1987 excavation and disposal of the uranium mill tailings and site restoration were performed;

E. WHEREAS, not all residual radioactive materials were removed during remedial action, isolated areas of the radioactive contamination remain, examples of which are shown on the Site map attached hereto as Exhibit 2;

F. WHEREAS, the cleanup of the Site is documented in the *Completion Report for the UMTRA Project Vitro Processing Site Salt Lake City, Utah*, ("Report") dated June 1997 which provides a discussion of the known contaminated areas, including an estimate of the amount of contamination present, the approximate location of the radioactive contamination, and a health assessment resulting from exposure to the contaminants; and

G. WHEREAS, the Report may be examined at and copies obtained from the following:

State of Utah
Department of Environmental
Quality
Division of Radiation Control
168 North 1950 West, Building #2
Salt Lake City, UT 84114-4850
(801) 536-4250

Department Of Energy
Grand Junction Office
2597 B ³/₄ Road
Grand Junction, CO 81503
(970) 248-6000

Department of Commerce
National Technical Information
Services
5282 Port Royal Road
Springfield, VA 22161
(703) 487-4650

H. NOW THEREFORE the United States Department of Energy; the Utah Division of Radiation Control; and the Central Valley Water Reclamation Facility Board hereby recommend to prospective purchasers or developers of part or all of this site that the following actions be taken:

1. Verify that future construction plans do not occur in contaminated areas. If there is a possibility of encountering contaminated material, contract the Utah Division of Radiation Control
2. Prior to construction, conduct appropriate radiologic surveys to determine whether radioactive elements are present, and their identity, concentration, and distribution

3. If radioactive materials are encountered during construction, the materials may be: (a) dispensed of as radioactive waste in an appropriate waste facility; or (b) buried into the deepest part of the excavation during back filling.
4. Regardless of the results of the radiologic surveys, if there are construction plans for habitable structures (e.g., residential, institutional, commercial, or industrial buildings and the like), consider installing a passive sub-slab radon ventilation system that will vent radon soil gas to the atmosphere.

Dated this _____ day of _____, 1997

UNITED STATES DEPARTMENT OF ENERGY

By: _____
George Rael
Director
Environmental Restoration Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

Before me, a Notary Public qualified for said County, personally appeared George Rael, who by me duly swore did say that he is the Director of the Environmental Restoration Division and he further acknowledged to me that the above NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION document was duly executed by him on behalf of the United States Department of Energy.

WITNESS my hand and Notarial Seal on this _____ day of _____, 1997.

Notary Public

Residing at: _____

My Commission Expires:

Dated this _____ day of _____, 1997

STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY

By: _____
William Sinclair
Director
Division of Radiation Control

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

Before me, a Notary Public qualified for said County, personally appeared William Sinclair, who by me duly swore did say that he is the Director and he further acknowledged to me that the above NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION document was duly executed by him on behalf of the state of Utah, Department of Environmental Quality.

WITNESS my hand and Notarial Seal on this ____ day of _____, 1997.

Notary Public

Residing at: _____

My Commission Expires:

Dated this _____ day of _____, 1997

CENTRAL VALLEY WATER RECLAMATION FACILITY BOARD

By: _____
Reed Fisher
General Manager

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

Before me, a Notary Public qualified for said County, personally appeared Reed Fisher, who by me duly swore did say that he is the General Manager and he further acknowledged to me that the above NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION document was duly executed by him on behalf of the Central Valley Water Reclamation Facility Board.

WITNESS my hand and Notarial Seal on this _____ day of _____, 1997.

Notary Public

Residing at: _____

My Commission Expires:

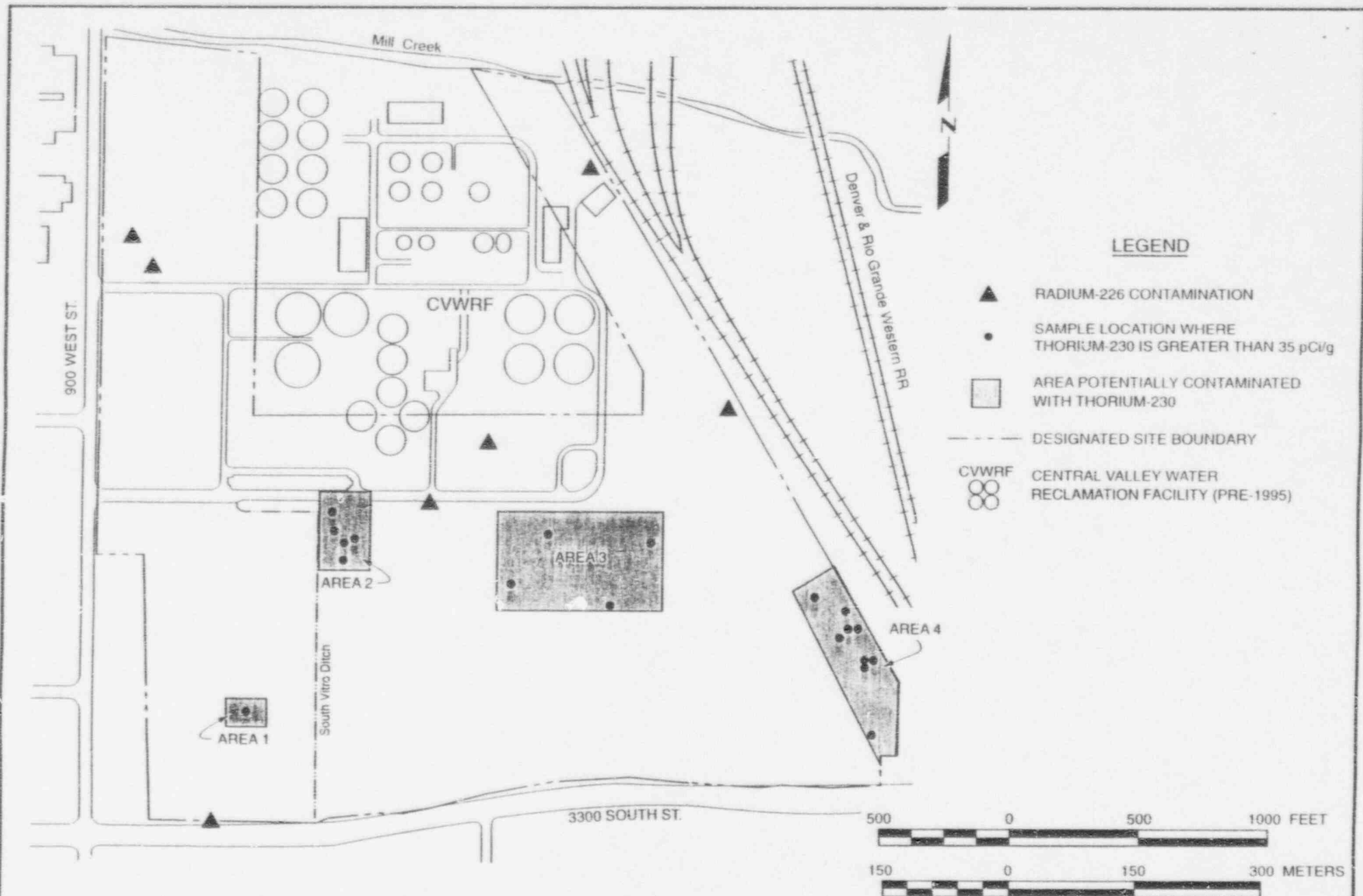


FIGURE 1
POST-REMEDIATION RADIOACTIVE CONTAMINATION AREAS
SALT LAKE CITY, UTAH, VITRO PROCESSING SITE



WAGNER INDUSTRIAL PARK

ZIONS BANK CORP

WB-02
2510
863388 704
E 884646 156

PAUL W. BUEHNER

ZIONS SECURITIES

D&RGW

MONCO INVESTMENT CO

KCPX RADIO

15 1W
4 95228 709
E 884646 345

GERALD H. & BEVERLY A.
CORNELL

MAX M. & SELIA LAVADIE

H.V. HIGLEY

EARL H. & MAGIE
WHITAKER

MICHAEL W. TERRY

JOHN G. & BERTHA

MARTINEZ

WON-DOOR CORP

HARRINGTON & CO

BLAINE H. & VERLA BERRETT

STEVE G. & HELEN A. PAPPAS

MOUNTAIN FUEL SUPPLY

D&RGW

D&RGW

PROPERTY OWNED BY
CENTRAL VALLEY WATER
RECLAMATION FACILITY
BOARD

POB

SOUTH VITRO DITCH

WATER TOWER

ZIONS SECURITY

FIGURE 2-5. LAND OWNERSHIP AND SITE DESIGN

ANSTEC APERTURE CARD

Also Available on
Aperture Card

SALT LAKE VITRO SITE

BEGINNING AT THE EAST QUARTER CORNER OF SECTION 26, T1S, R1W, SALT LAKE BASE AND MERIDIAN, AND RUNNING THENCE WEST 1154.5 FT, THENCE N 0°18'E, 1440.79 FT, THENCE N 83°16'W, 651.84 FT, THENCE S 0°03'14"W, 2078.58 FT, THENCE S 89°50'E, 179.5 FT, THENCE S 1°57'E, 1062.87 FT, THENCE N 89°43'47"E, 508.52 FT, THENCE N 86°50'27"E, 195.77 FT, THENCE N 80°45'E, 473.05 FT, THENCE N 81°42'32"E, 168 FT, THENCE N 80°44'E, 489.21 FT, THENCE N 89°35'16"E, 956.8 FT, THENCE N 70 FT, THENCE E 150 FT, THENCE N 0°01'E, 302.86 FT, THENCE N 29°59'W, 2731.01 FT, THENCE N 85°49'W, 298.89 FT, THENCE S 29°54'30"E, 1365.31 FT, THENCE S 170.75 FEET, THENCE W 379.35 FT TO THE POINT OF BEGINNING.

CONTAINS 127.9 ACRES (MORE OR LESS)

REFERENCE 3

FUEL SUPPLY

ATION MAP

9706130175-01