

Work Plan & Procedures Manual

Thorium Remediation Project
Located at
Kaiser Aluminum & Chemical Corporation
Tulsa, Oklahoma

MAY 2004

Prepared by:



9720 Derrington
Houston, Texas 77064
(281) 955-2442

Revision 01
MAY 2004

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RECON EHASP

RECON's Environmental Health & Safety Plan

Thorium Remediation Project
Tulsa, Oklahoma

REVISION: 01

EFFECTIVE DATE: MAY 2004

 5/7/04

Danny P. Brown – Project Manager / Date

 5/7/04

Michael Page – Lead Health Physics Technician / Date

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RECON Environmental Health and Safety Plan

Environmental Health and Safety Plan Kaiser Aluminum & Chemical Corporation Thorium Remediation Project Tulsa, Oklahoma

1.0 Introduction

This Environmental Health and Safety Plan (EHASP) is consistent with the basic policies, objectives, organizational structure, and guidelines of the Kaiser HASP and governs all non-radiological aspects of the Thorium Remediation Project at the Kaiser Tulsa, Oklahoma facility. This EHASP was written in accordance with Occupational Safety and Health Administration (OSHA) standards codified in 29 Code of Federal Regulations (CFR) 1910.120.

1.1 Purpose

The RECON EHASP identifies potential hazards and specifies an appropriate level of response to protect the health and safety of workers and the general public. In addition to the guidelines established in the EHASP, additional safety guidelines and procedures are provided in the RECON Radiation Health and Safety Plan (RHASP).

1.2 Quality Assurance

1.2.1 Records and Documentation

- Records required by regulations, permits, plans, and procedures implementing the health and safety program shall be maintained on site, and preserved.
- Records may be the original document, a reproduced copy or microform, if such reproduced copy or microform is duly authenticated by authorized personnel and capable of producing a clear and legible copy after storage.

1.2.2 Record Retention and Ownership

Records shall be maintained, as a minimum, for the period of time specified in the applicable regulations, unless disposition is otherwise directed by the Nuclear Regulatory Commission (NRC)/OSHA/U.S. Environmental Protection Agency (USEPA)/Department of Transportation, or other regulatory agency which maintains jurisdiction over those records.

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1.2.3 Variances

If conditions develop requiring a deviation from the EHASP, a written request for variance shall be made to one or more persons in a position authorized to approve the Plan.

1.2.4 Safety Work Permit

The purpose of the Safety Work Permit (SWP) is to identify special instructions or precautions pertinent to performing work in a safe manner not covered or detailed by the EHASP or a standard operation procedure or instruction. SWP's are prepared at the discretion of RECON's Health and Safety Supervisor (H&S Supervisor). A copy of the SWP is provided in Attachment No.1. In addition, prior to any new intrusive work task or activity, the RECON Health and Safety Supervisor and site workers that will be performing the work will perform a Job Hazards Analysis (JHA). A copy of the JHA form is located in Attachment No. 9.

2.0 Policy and Standards

2.1 Policy

It is the policy of RECON to conduct its operations in a manner that minimizes health and safety risks to its employees, contractors, and the general public. This EHASP applies to RECON employees, contractors, subcontractors, and visitors to the site including local, state, and federal government employees.

2.2 Visitors

Persons visiting or conducting work at the Kaiser facility in Tulsa, Oklahoma are required to be familiar with Kaiser and RECON's health and safety requirements of the site. Visitors will be required to read and understand the Visitor Health and Safety Plan Synopsis, sign in and out on the Visitor Log, and be accompanied by facility personnel while on the site. A copy of the Visitor's Health and Safety Plan Synopsis is located in Attachment 4.

2.2.1 Visitor Activities

Visitor activities are limited to observation. Visitors are not to be present in restricted areas when remediation activities are being conducted. Under these conditions, visitors will have a limited potential for contact with contaminated materials. Persons accessing active remediation areas, exclusion zones, or contamination reduction zones; conducting activities other than observation; and unescorted visitors will be required to read and understand the EHASP and complete the facility orientation program.

2.2.2 Visitor Responsibilities

Visitors to the Kaiser facility are admitted as a courtesy and must leave when requested to do so. Visitors are responsible for signing in and out. All visitors are responsible for behaving in a mature manner and following instructions, particularly in emergency situations.

2.2.3 Prohibited Activities

Visitors may not smoke, drink, eat, chew gum or tobacco, or apply cosmetics while in the restricted areas of the Kaiser facility. Visitors may not enter the restricted areas unescorted.

2.2.4 Personal Protective Equipment

Visitors accessing the restricted areas of the site must wear the required personal protective equipment (PPE) for the area. As a minimum, visitors will wear rubber overboots. Hard-toe boots, hard hats, cotton coveralls, safety glasses, and gloves, and/or rain gear may be required depending on site conditions and operations at the time of the visit. Visitors who enter areas where respiratory protection is necessary must provide evidence that they possess the training, medical surveillance, and fit testing required by OSHA regulations.

3.0 General Site Information

The former Kaiser Aluminum Specialty Products facility is located at 7311 East 41st Street in Tulsa, Oklahoma (Figure 3-1). It is situated in Tulsa County, Oklahoma, about 5 miles southeast of the downtown center of the City of Tulsa. The site initially occupied approximately 23 acres of land on both sides of 41st Street. Currently, a 3-acre parcel south of 41st Street contains an active aluminum extrusion and fabrication facility. North of East 41st Street are several parcels of land previously devoted to refining, processing, and waste disposal functions. This acreage is split by the Union Pacific Railroad right-of-way. An approximate 3.5-acre parcel south of the railroad (known as the former operational area) houses an active office building and several inactive industrial structures. An approximate 14.0-acre land area (known as the pond parcel) located north of the railroad contains a freshwater pond, a retention pond, a former reserve pond area, and the Flux Building area. The Thorium Remediation Project involves the former operational area and the pond parcel.

The Retention Pond currently occupies 8 acres of the 14-acre land parcel north of the railroad. The water level in the Retention Pond varies, based on seasonal precipitation. The Retention Pond is surrounded by a well-maintained berm and there are no surface water discharges from the pond. The Retention Pond is permitted by the Oklahoma Water Resources Board. Occupying approximately 4 acres on the western portion of this parcel is the area of the former Freshwater Pond. The Freshwater Pond was backfilled in October and November 2002. Northeast of the Retention Pond is the area of the former Reserve Pond (approximately 1.5 acres). The Reserve Pond was backfilled in the late 1960s and is currently covered with grass.

Extensive site characterization activities have been conducted since 1994 within the 14.0-acre land area of the facility known as the pond parcel. These characterization activities have indicated the presence of residual radioactive material within a 10-acre portion of the pond parcel. The radioactive material identified within this portion of land is a thorium-bearing dross containing the isotopes Th-232, thorium-230 (Th-230), and thorium-228 (Th-228). The affected portion of the parcel contains the Retention Pond and former Reserve Pond area. The unaffected portion of the pond parcel contains a former Freshwater Pond area.

The pond parcel area considered for remediation is bounded by the south fence line, the former Fresh Water Pond embankment on the west, Fulton Creek ditch on the north, the east fence line, and the

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northern and eastern edges of the Flux Building and paved area. A central feature of this area is the Retention Pond and associated embankments. Thorium-bearing dross was present on land adjacent to current Kaiser property along the east and south fence lines and represented the margins of the material. Kaiser has remediated this land by excavation and storing affected soil within the pond parcel. Affected soil generated during remediation of the adjacent land is considered as part of the on-site decommissioning.

4.0 Responsibilities

4.1 Key Personnel

The following personnel and organizations will be responsible for all environmental health and safety aspects during site activities at the Kaiser remediation site. The Health and Safety Supervisor (HSS) responsibilities are discussed later in this section. The Lead Health Physics Technician (LHPT) responsibilities are discussed in the RHASP. The LHPT will be responsible for all aspects of radiation health and safety.

NAME/TITLE/ORGANIZATION

Mike Phillips II	(713) 875-0711
Health and Safety Supervisor	9720 Derrington Rd.
RECON	Houston, TX 77064

(To be supplemented by contractors as applicable)

4.2 Responsibilities

The RECON Project Manager is responsible for the general management, oversight, and administration of the project. The RECON Project Manager, working with the RECON H&S Supervisor, is responsible for planning and controlling site activities in compliance with the project EHASP, as well as notifying the Kaiser Site Administrator (SA) of deficiencies and/or deviations.

The RECON H&S Supervisor has responsibility for developing, implementing, and maintaining the Health and Safety Program. The RECON H&S Supervisor is functionally separate from project operations management, and has the authority to stop any activity that is not being conducted in a safe manner in accordance with the EHASP. Specific responsibilities may be delegated in part to qualified health and safety personnel.

RECON's H&S Supervisor is responsible for on-site direction and oversight of project activities in compliance with the project EHASP.

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RECON's H&S Supervisor or his designee shall be present at all times during site activities. Respective functions will primarily include the following duties:

- advising on-site personnel, RECON's Project Manager, and the Kaiser SA of potential health and safety hazards during field investigations
- ensuring potential hazards are monitored as stipulated in this plan
- evaluating potential changes of on-site activities and personnel protective equipment as needed to ensure employee safety
- terminating field work if unsafe conditions develop or an imminent hazard is perceived
- preparing procedure deviation, variances, and interim-change notices from this plan, if needed
- maintaining health and safety oversight of field activities with subcontractor personnel or visitors

4.3 RECON and Contractor Site Personnel

Report to RECON's H&S Supervisor and Project Manager on matters of safety. Subcontractor personnel shall be classified as site personnel. Specific responsibilities include:

- performing tasks in compliance with the project EHASP as well as posted, verbal, and other written safety instructions
- stopping work upon discovering, and reporting to the RECON's Project Manager and/or H&S Supervisor, any condition which jeopardizes industrial safety
- stopping work and reporting to RECON's H&S Supervisor and/or the RECON Project Manager anytime he or she is unsure that their action or work environment is safe
- promptly obeying "Stop Work" orders
- reporting to the RECON Project Manager and RECON H&S Supervisor noncompliance with the project EHASP
- assisting the RECON H&S Supervisor with investigations as necessary
- not eating, drinking, smoking, chewing, or applying cosmetics in any controlled area
- wearing protective clothing properly and wherever required by the SWP, procedure, or the RECON's H&S Supervisor

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- removing protective clothing properly
- reporting the presence of treated or open wounds to RECON's Project Manager or the H&S Supervisor prior to working in a controlled area, and immediately exiting if a wound occurs while in such an area

5.0 Hazard Identification and Risk Assessment

5.1 Chemical Hazards

No potential chemical hazards have been identified at the site that has the potential to be present in the water or the subsurface soils being remediated or sampled. However, RECON will perform limited organic chemical monitoring with a photoionization detector (PID) should organic contaminants be discovered. While organics are not believed to be encountered at the site, should a visible sheen or oily substance be discovered or a substantially visible change in the material occurs, a PID will be utilized to verify if the material has volatile organics. The Kaiser SA will be notified immediately should substantially differing material be encountered. The PID and its use are discussed further in Section 8.0.

In addition, particulate/dust emissions will be monitored daily utilizing an MIE Personal DataRAM (PDR) Model 1000, or equivalent. The PDR is a direct reading particulate monitor with data logging capabilities which is discussed further in Section 8.0.

5.2 Indigenous Biological Hazards

Insects including ticks, mosquitoes, ants, and spiders at the Kaiser site are common to the general area as well as both poisonous and nonpoisonous snakes. However, these indigenous biological hazards are not considered likely.

In the unlikely event that an employee comes into contact with a poisonous plant or is bitten by a snake or rodent, the RECON H&S Supervisor shall immediately be notified. The employee will be transported to a medical facility for medical attention, if warranted.

5.3 Adverse Weather Procedures

Adverse weather conditions can severely affect field operations. The RECON Project Manager and/or RECON H&S Supervisor will make the determination to "stop work" if inclement weather jeopardizes employee safety or field operations.

6.0 Personal Protective Equipment

This section describes the general requirements of the USEPA designated Levels of Protection (A-D), and the specific levels of protection required for each task at the Kaiser site. The rationale for selected levels of protection and modification procedures are also discussed. RECON's H&S Supervisor will monitor for dust emissions daily and perform limited real-time organic chemical monitoring should suspected organic contamination be discovered as discussed in Section 5.1. After monitoring data is available, then an objective decision will be made to don respiratory protection, if required. Should respiratory equipment be required, this plan shall be modified as necessary to conform to applicable regulations.

Disposable PPE, such as gloves and coveralls, will be of a type suitable for disposal at a sanitary landfill. Specifically, PPE will not be of a color or bear markings identifying it as hazardous or radioactive waste.

6.1 Designated Levels of Protection

Site Personnel shall wear protective equipment when activities involve known or suspected atmospheric contamination; when vapors, gases, or particulates may be generated by site activities; or when direct contact with skin-affecting substances may occur. Full face-piece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and necessary components have been established by the USEPA (USEPA, 1984) into four categories, according to the degrees of protection afforded.

- | | |
|----------|--|
| Level A: | Should be worn when the highest level of respiratory, skin, and eye protection is needed. |
| Level B: | Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments. |
| Level C: | Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed. |
| Level D: | Should be worn only as a work uniform and not on any site with respiratory or skin hazards. It provides minimal protection against chemical hazards. |

The level of protection selected for this project is based upon the following criteria:

- type and measured concentration of hazardous chemical
- potential for exposure to hazardous chemicals in air, splashes of liquids, or other direct contact with material due to work being done

6.2 Modification of Protection Program

The prescribed level of protection shall be upgraded or diminished as warranted by a change in site conditions or findings of investigations. When a significant change occurs, the hazards shall be reassessed. Some examples of the need for reassessment include:

- contaminants other than those previously identified are encountered
- change in work scope which affects the degree of contact with contaminants
- temperature extremes or individual medical considerations limit the effectiveness of PPE
- change of season/weather
- change in job tasks during a work phase

A modified Level D is expected to be required. The following is a description of the modified Level D PPEs:

- steel toed boots
- safety glasses
- gloves
- leather gloves for heavy labor

Should a one-step upgrade in PPE prove necessary (i.e., Level D to Level C), site activities shall be temporarily halted until the appropriate PPE upgrade is accomplished. The RECON H&S Supervisor shall provide documentation of such action, and shall notify both the RECON Project Manager and Kaiser SA. Should a two-step upgrade be necessary (i.e., Level D to Level B), site activities shall be halted until such time that both the RECON Project Manager and Kaiser SA have been advised of the situation and have provided written concurrence that work may proceed with the upgraded level of protection.

NOTE

Full-face respirator with particulate cartridges will be provided to personnel to be used only at the direction of the RECON H&S Supervisor.

7.0 Accident/Incident Reports

Accidents or incidents that occur during activities at the Kaiser remediation site shall be reported in writing to the Kaiser SA and the RECON Project Manager, and investigated where appropriate to prevent reoccurrence. A copy of the Incident/Accident report form is located in Attachment 10. Examples of incident reports include:

- a recordable occupational injury, i.e., a cut, fracture or sprain which results from a work accident or from an exposure involving a single incident
- animal bites and one-time exposure to chemicals
- a recordable occupational illness caused by exposure to environmental factors associated with employment including acute and chronic illnesses that may be caused by inhalation, absorption, ingestion, or direct contact
- in the event of an accident, a medical accident/incident form shall be completed and sent to the RECON Medical Program Coordinator located in the RECON main office.

7.1 Employee Information

The standards concerning employee's right-to-know OSHA requirements of 29 CFR 1910.120 will be available at the work site.

8.0 Chemical Monitoring

8.1 Organic Monitoring

No chemical hazards have been identified to date by Kaiser. However, since the site has not been completely characterized for potential chemical hazards, limited organic monitoring with a photoionization detector (PID) will be performed if suspected organic contamination is discovered. The Recon Health and Safety Supervisor (HSS) will have an instrument onsite to perform the initial monitoring of a suspected organic material.

Site workers will be trained to notify the RECON HSS and Kaiser SA as soon as a material is discovered that has a sheen, discoloration, or looks similar to an oily/grease type substance. Once notified, the RECON HSS will calibrate the PID per the manufacturers recommendations. A copy of the calibration form is located in Attachment No. 6. Measurements from the PID will be logged on a form. A copy of the form is located in Attachment No. 8.

8.2 Particulate Monitoring

RECON will utilize a PDR to perform particulate/dust monitoring on a daily basis. The real-time meters will be used to determine particulate levels onsite so that an immediate response can be taken. An instrument such as the MINIRAM or *personal* DataRAM (PDR), both manufactured by MIE, Inc. will be used. Both instruments are light-scattering photometers that incorporate a pulsed, high output near-infrared light emitting diode source, a silicon detector/hybrid preamplifier, collimating optics and a source reference feedback PIN silicon detector. The intensity of the light scattered of the forward angle of 45° to 95° by airborne particles passing through the sensing chamber is linearly proportional to their concentration. The optical configuration produces optimal volume response to particles in the size range of 0.1 to 10 μm , achieving high correlation with standard gravimetric measurements of the respirable and thoracic fractions. The instruments are battery operated and highly portable and therefore can be moved as necessary to maintain downwind position. The instrument's detection limit is 0.01 mg/m^3 . The manufacturer's instructions and recommendations regarding calibration and use will be followed.

Prior to use, a calibration will be performed on each monitor (Attachment 5). The monitors will be strategically placed, one upwind and one downwind, in areas that have the highest potential for generating

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dust. The RECON H&S Supervisor will also, at his/her discretion place a PDR in the cabs of the heavy equipment to monitor dust in the breathing zones of the operators. The PDR's will datalog the monitoring throughout the day and be downloaded to a computer for printing. A copy of the data log is located in Attachment No. 7. Should excessive dust be observed by anyone working on the site or the monitors exceed 1 mg/m^3 for a sustained period, RECON will take the necessary steps to reduce airborne dust. This could include revising material handling procedures, watering down the area, or other means necessary to suppress the dust.

9.0 Standard Safety Procedures**9.1 Buddy System**

The potential hazards associated with field activities at the Kaiser remediation site do not warrant utilizing the buddy system concept. However, as an additional safety precaution, and as a means of expediting field activities, a team of at least two people will be used when the supervisor or RECON H&S Supervisor specifies so.

9.2 Communications

Due to the nature of planned field activities, the use of communication devices such as radios, megaphones, and air horns will not be necessary. However, all personnel shall be familiar with the following hand signals.

SIGNAL	DEFINITION
Hands clutching throat	Out of air/cannot breath
Hands on top of head	Need assistance
Thumbs up	OK/I am alright/I understand
Thumbs down	No/negative
Arms waving upright	Send back support
Grip partner's wrist	Exit area immediately

9.3 Safe Work Practices

The following safe work practices shall be followed:

- Designated personal protective and safety equipment shall be worn while working within work and decontamination areas.
- Eating, drinking, chewing gum or tobacco, smoking, or applying cosmetics is prohibited in the contaminated or potentially contaminated areas.
- Contact with potentially contaminated substances shall be avoided to the extent practicable; placing monitoring equipment on potentially contaminated surfaces should be avoided.
- Field staff will be alert for potentially dangerous situations (e.g., presence of strong, irritating or nauseating odors), and immediately take appropriate measures.

- Good housekeeping shall be practiced; equipment and materials shall be kept orderly and out of potentially harmful situations.
- Site workers will be familiar with the physical characteristics of the site including the following:
 - the nearest emergency assistance
 - prevailing wind direction
 - access to associates, equipment, and vehicles
 - communication facilities at and near the site
 - areas of known or suspected contamination
 - site access and egress
- The number of personnel and amount of equipment in the contaminated area shall be minimized to the extent consistent with safety requirements.
- Waste generated during activities at the site shall be contained appropriately.
- Injuries shall be reported, regardless of how minor.
- Daily and weekly health and safety meetings shall be conducted by RECON's H&S Supervisor or his designee for personnel involved in field activities; and prior to commencing a new task, these meetings shall address health and safety concerns related to the planned activities and shall review emergency response plans.

9.4 Site Map

A site map will be provided to field personnel to familiarize them with the work area. The map shall be detailed with important features, such as the location of medical facilities (Figure 11-3) and evacuation routes. This information will be disseminated to all RECON employees and subcontractors at a site orientation meeting prior to workers commencing work on site.

10.0 Routine and Special Training

10.1 Site Orientation

Site orientation concerning site-specific health and safety shall be administered to all personnel. Health and Safety Plan acceptance forms shall be completed by site personnel to document their understanding of the health and safety requirements.

10.2 Training

If on-site personnel engage in hazardous waste activities, they shall receive classroom training and supervised field experience as required by 29 CFR 1910.120. The training they will receive will cover hazard awareness, personnel protection, toxic properties of hazardous materials, site control, and sampling hazardous materials as per 29 CFR 1910.120. A training outline for site activities is provided below:

Training Outline – Site Activities

- I. Purpose and objectives of training.
- II. Recognizing and identifying health and safety hazards at the Kaiser Tulsa, Oklahoma site.
 - A. Physical hazards
 - structures
 - equipment (operators of heavy equipment will have a certified training card)
 - terrain
 - weather
 - B. Biological hazards
 - indigenous site hazards (insect, snake, plant)
 - C. Potential health effects

III. Safety and monitoring requirements

A. Controlled area restrictions

- eating/drinking/smoking
- access control points

B. Protective equipment requirements

- clothing, boots, gloves, coveralls, goggles

C. Procedures for using protective equipment

- clothing
- respirator

D. Personal contamination monitoring and decontamination

IV. Emergency response requirements

A. Getting emergency assistance

B. Emergency notification procedures

C. Names of personnel and alternates responsible for site safety and health

11.0 Emergency Response and Notification

The purpose of this section is to provide guidance for responses to emergency situations.

11.1 Contingency Plans and Emergency Contacts

Emergency response contingency plans in this section shall be followed during field investigations. A copy of this plan will be available at the work site, and personnel working on the site shall be familiar with the plan. Evacuation plans and routes shall be discussed with field personnel before field activities begin.

Persons and services to contact in case of emergencies are identified in Figure 11-1. This emergency contact form will be posted at the work site.

11.1.1 Fire/Explosion

A fire emergency will be handled by evacuating the work area and immediately notifying the Tulsa Fire Department (911). Field personnel should attempt to put out the fire only if it appears to be small and easily extinguishable. The Fire Department shall be notified of such an occurrence. In the event of an explosion, personnel will be evacuated and no one shall enter the work area until clearance is given by the appropriate Tulsa authorities.

11.1.2 Personnel Injuries

In case of minor injuries to personnel, first aid treatment shall be initiated in the field. In case of serious injuries, the victim shall be transported to a hospital as soon as possible.

11.1.3 Severe Weather

In the event that severe weather threatens the safety of employees, contractors, and visitors, it is important that each person minimize the chance for injury and proceed to the nearest designated shelter.

11.2 Notification Requirements

Should any doubt be encountered as to who or what authority should be contacted, a conservative approach shall be used so as to contact all appropriate authorities. The SA shall also be informed of any emergency situation.

Any reporting and notification of emergency situations shall be documented. RECON's H&S Supervisor has the major responsibility for overseeing the response to emergency situations and shall ensure that the appropriate actions are taken.

11.3 Emergency Route to Hospital

A map of the emergency route will be provided to each field staff member (see Figures 11-2 and 11-3).

Emergency Contacts
Figure 11-1

Revision 01

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Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

FIGURE 11-1
EMERGENCY CONTACTS

RECON's HEALTH AND SAFETY OFFICER

Mike Phillips II @ 713-875-0711

KAISER ALUMINUM (Paul Handa)

Call: (918) 384-3169

FIRE ! Call: 911

AMBULANCE ! Call: 911

POISON CENTERS

National Poison Control Center, 404-588-4400

Regional Poison Control Center, 1-800-672-1697

Medical Center Poison Control Center, 716-5900

POLICE ! Call: 911

YOU ARE LOCATED AT:

7311 East 41st Street, Tulsa, Oklahoma 74145

THE NEAREST EMERGENCY MEDICAL SERVICES ARE LOCATED AT:

St. Francis Hospital

6161 South Yale Avenue

Phone Number: 918-494-1225

THE NEAREST NONEMERGENCY MEDICAL SERVICES ARE LOCATED AT:

Med Center

2929 South Garnett Road

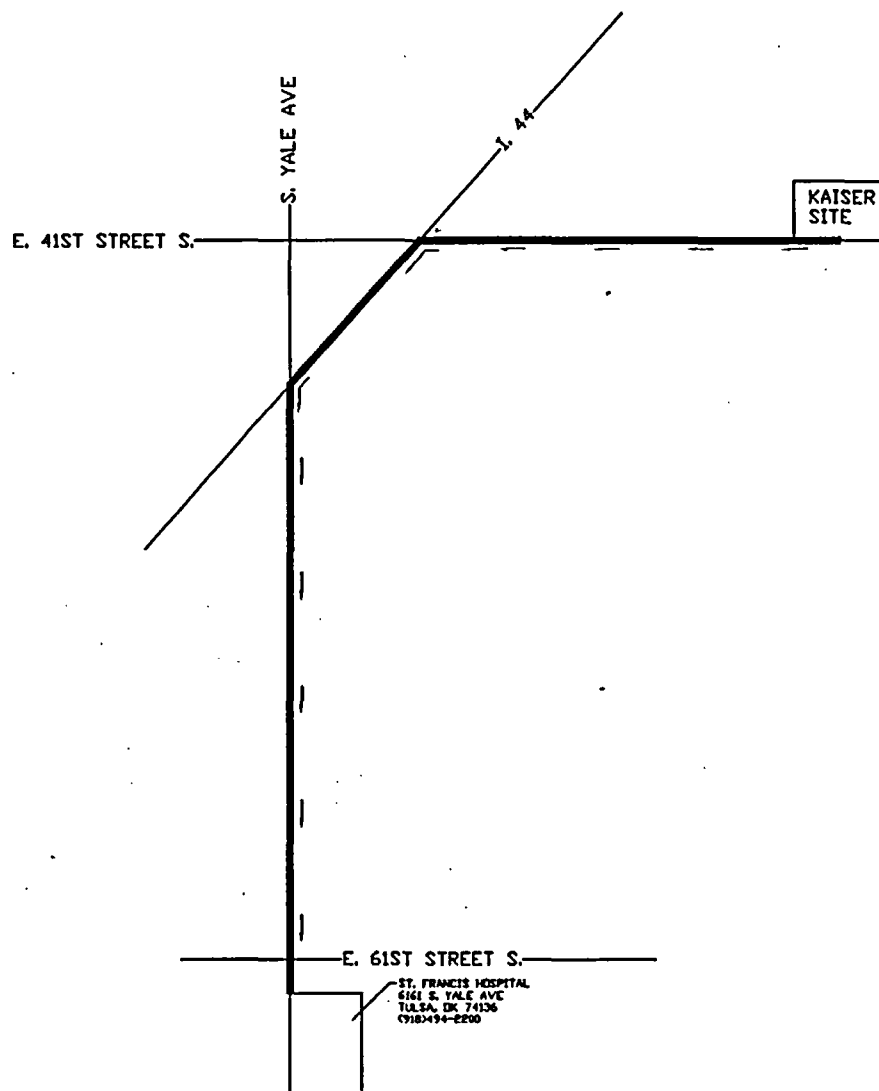
Phone Number: 918-665-1520

Map to St. Francis Hospital
Figure 11-2

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May 2004

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9720 Derrington
Houston, Texas 77064
(281) 955-2442



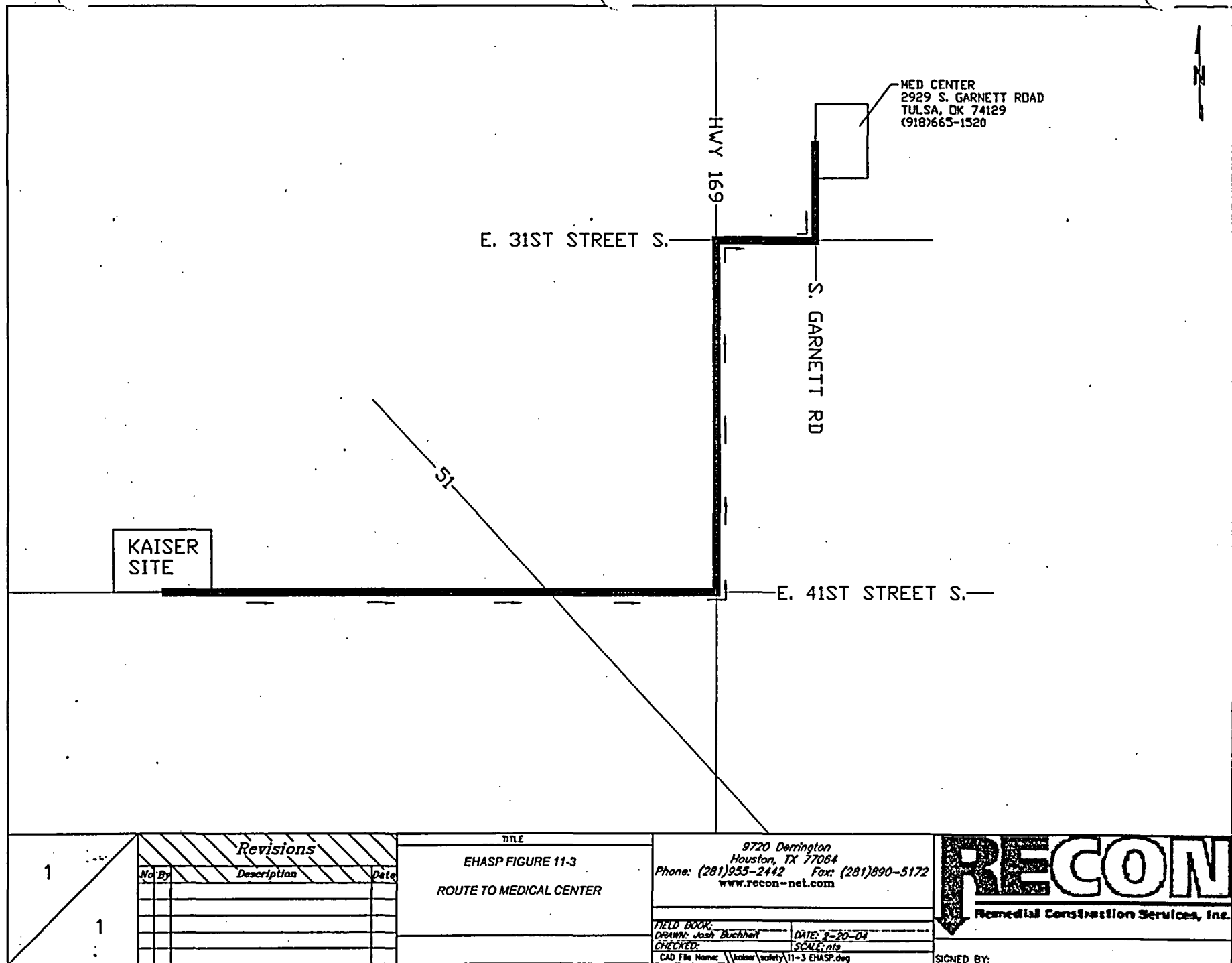
1	Revisions			TITLE		9720 Derrington Houston, TX 77064 Phone: (281)955-2442 Fax: (281)890-5172 www.recon-net.com		RECON Remedial Construction Services, Inc.
	No.	By	Description	Date	EHASP FIGURE 11-2 ROUTE TO ST. FRANCIS HOSPITAL			
1							FIELD BOOK: DRAWN: Josh Buchheit CHECKED: CAD File Name: \\kaiser\safety\11-3 EHASP.dwg	DATE: 2-20-04 SCALE: nls SIGNED BY:

Map to Medical Center
Figure 11-3

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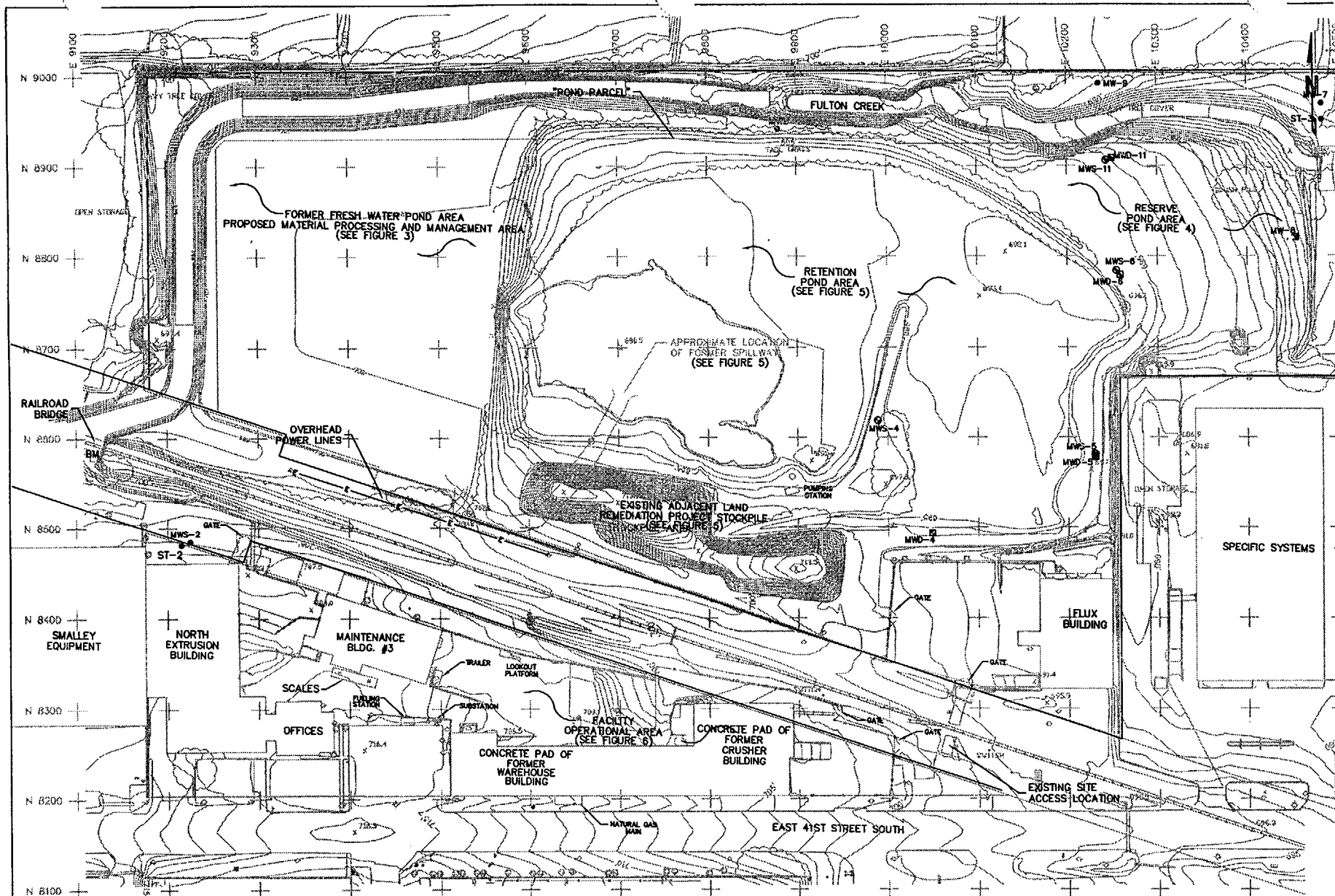


Kaiser Aluminum Site
Figure 11-4

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442



Revisions				TITLE		9720 Derrington Houston, TX 77064 Phone: (281)955-2442 Fax: (281)890-5172 www.recon-net.com		RECON Remedial Construction Services, Inc.
No.	By	Description	Date	FIGURE 11-4 SITE MAP		FIELD BOOK: DRAWN: Josh Buchheit CHECKED: CAD File Name: \\job\name.DWG		
1						DATE: 2-20-04 SCALE:		
						SIGNED BY:		

Safety Work Permit (SWP)
Attachment 1

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Remedial Construction Services, L.P.
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Houston, Texas 77064
(281) 955-2442

ATTACHMENT 1

Safety Work Permit **Copy To Be Posted In The Work Area**	
Project Name: Thorium Remediation Project Issue Date: Expiration Date:	
Emergency Contact(s): Phone No.:	
Specific Job Location and Task to be Performed:	
Personnel Monitoring	Protective Equipment and Clothing
Bioassay:	Respiratory Protection:
Radiation Dosimeter	Protection Clothing:
Area Airborne Monitoring	Other:
Near Representative Workers	
Other	
Non-Radiological Hazards	Radiological Conditions and Hazards
	Exposure Rate:
	Contamination:
	Air Sample Results:
Access Control Instructions	Survey Requirements
Special Use or Restraints:	
Review and Approvals	
Review:	Date:
Approval:	Date:

EHASP Permit Authorized Personnel List
Attachment 2

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EHASP Acceptance Form
Attachment 3

Revision 01

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Houston, Texas 77064
(281) 955-2442

ATTACHMENT 3

REMEDIAL CONSTRUCTION SERVICES, L.P. (RECON)
THORIUM REMEDIATION PROJECT

HEALTH AND SAFETY PLAN
ACCEPTANCE FORM

Instructions: This form is to be completed by each person prior to working on the subject project work site and returned to the Project Radiation Safety Officer or Health and Safety Officer.

Project: _____

Date: _____

I understand my health and safety responsibilities and agree to perform my work in accordance with those responsibilities.

Signed _____

Print Name _____

Company Name _____

Date _____

Visitor Health and Safety Plan Synopsis
Attachment 4

Revision 01

May 2004

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Houston, Texas 77064
(281) 955-2442

EHASP Attachment No. 4

**Kaiser Aluminum & Chemical Corporation
7311 East 41st Street
Tulsa, Oklahoma
Visitor Health and Safety Plan Synopsis**

Persons visiting or conducting work at the Kaiser Aluminum & Chemical Corporation facility in Tulsa, Oklahoma are required to be familiar with the health and safety requirements of the site. This document is a synopsis of the Health and Safety Plan for this facility. It is designed to impart the necessary health and safety information to site visitors in a condensed format. Visitors will be required to read and understand this synopsis, sign in and out on the Visitor Log, and be accompanied by facility personnel while on the site. This synopsis is not intended to be a replacement for the Health and Safety Plan for site workers and facility employees.

General Site Description

The Kaiser facility is located at 7311 East 41st Street in Tulsa, Oklahoma. It includes property on both sides of 41st Street and the fenced area located to the north of the facility buildings referred to as the remediation area. Except for specifically designated support and office areas, access to all site properties is restricted to authorized and trained personnel. The restricted areas include, but may not be limited to exclusion zones, contamination reduction zones, the fresh water pond, the retention pond, and the backfilled reserve pond. These restricted areas will be separated from free access areas by fencing and locked gates. Signs indicating restricted areas will be posted as necessary.

Visitor Activities

For the purpose of this document, visitor activities are limited to observation. Visitors are not to be present in restricted areas when remediation activities are being conducted. Under these conditions, visitors will have a limited potential for contact with contaminated materials. Persons accessing active remediation areas, exclusion zones, or contamination reduction zones; conducting activities other than observation; and unescorted visitors will be required to read and understand the facility Health and Safety Plan and complete the facility orientation program.

Visitor Responsibilities

Visitors to the Kaiser facility are admitted as a courtesy and must leave when requested to do so. Visitors are responsible for signing in and out. They must be familiar with the contents of this document and

EHASP Attachment No. 4

applicable information from the Health and Safety Plan. All visitors are responsible for behaving in a mature manner and following instructions, particularly in emergency situations.

Site Hazards

The principal hazard at the Kaiser site is radioactivity associated with Thorium 232 and its decay products. Thorium 230 has also been found at the site. The exposure levels are kept as low as reasonably achievable for the forms of radioactivity at the site. It is not anticipated that visitors would be exposed to radiation levels exceeding the annual worker exposure limits defined in the standards for protection against radiation. Exposure levels for declared pregnant women are restricted to 1/10 the annual dose for the gestation period by this standard.

Prohibited Activities

Visitors may not smoke, drink, eat, chew gum or tobacco, or apply cosmetics while in the restricted areas of the Kaiser facility. Visitors may not enter the restricted areas unescorted.

Exposure Control

At the discretion of the health physics technician, visitors may be required to wear dosimeters to evaluate exposure to radioactivity. Visitors may be requested to submit to a direct personal survey to detect incidental radiological contamination and prevent the spread of contamination to clean areas.

Personal Protective Equipment

Visitors accessing the restricted areas of the site must wear the required PPE for the area. As a minimum, visitors will wear rubber overboots. Hard toe boots, hard hats, cotton coveralls, safety glasses, and gloves, and/or rain gear may be required depending on site conditions and operations at the time of the visit. Visitors who enter areas where respiratory protection is necessary must provide evidence that they possess the training, medical surveillance and fit testing required by OSHA regulations.

Decontamination

Decontamination procedures will be utilized to remove contamination from persons, clothing, or objects. Overboots will be washed at the boot wash station and removed before leaving the contamination reduction zone. Disposable PPE and items requiring additional cleaning will be carefully removed and placed in the designated containers. Decontamination of the skin will consist of washing the affected area with soap and water. Visitors leaving a restricted area must wash their hands and face before returning to the support or clean areas of the site.

PDR Calibration and Inspection Form
Attachment 5

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Attachment 5



Personal DataRAM(PDR)
Daily Inspection and Zero Form

Date: _____
Wind Direction: _____
Weather: _____

PDR #: _____
Condition: _____
Zeroed: ☐ Yes ☐ No
Location _____

Notes: _____

PDR #: _____
Condition: _____
Zeroed: ☐ Yes ☐ No
Location _____

Notes: _____

PDR #: _____
Condition: _____
Zeroed: ☐ Yes ☐ No
Location _____

Notes: _____

PDR #: _____
Condition: _____
Zeroed: ☐ Yes ☐ No
Location _____

Notes: _____

PID Calibration Form
Attachment 6

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May 2004

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(281) 955-2442

Attachment 6



MiniRAE PID (photoionization detector) Handheld VOC Monitor

CALIBRATION(CAL) SHEET

Date: _____

CAL-LOT#: _____

CAL-GAS, ISOBUTYLENE AT 100PPM

PID#: _____

PRE-CAL READING _____ PPM TIME: _____

POST-CAL READING _____ PPM TIME: _____

TECHNICIAN _____

SIGNATURE _____

PDR Data Log
Attachment 7

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

PDR # 4799

pDR-1000 S/N: 0000032 User
 ID: RECON TEX-TIN32 Tag
 Number: 0432 Number of
 logged points: 10232 Start time
 and date: 07:15:23 02-Oct
 32 Elapsed time:
 08:30:0032 Logging period
 (sec): 30032 Calibration Factor
 (%): 10032 Max Display
 Concentration: 0.742
 mg/m³32 Time at maximum:
 07:18:07 Oct 0232 Max STEL
 Concentration: 0.217
 mg/m³32 Time at max STEL:
 15:48:54 Oct 0232 Overall Avg
 Conc: 0.164 mg/m³32 Logged
 Data: 32 Point, Date , Time ,
 Avg.(mg/m³)32
 1, 02 Oct, 07:20:23, 0.26232
 2, 02 Oct, 07:25:23, 0.19332
 3, 02 Oct, 07:30:23, 0.14932
 4, 02 Oct, 07:35:23, 0.12432
 5, 02 Oct, 07:40:23, 0.11832
 6, 02 Oct, 07:45:23, 0.11232
 7, 02 Oct, 07:50:23, 0.11032
 8, 02 Oct, 07:55:23, 0.11032
 9, 02 Oct, 08:00:23, 0.10932
 10, 02 Oct, 08:05:23, 0.10632
 11, 02 Oct, 08:10:23, 0.10232
 12, 02 Oct, 08:15:23, 0.10532
 13, 02 Oct, 08:20:23, 0.10232
 14, 02 Oct, 08:25:23, 0.10132
 15, 02 Oct, 08:30:23, 0.10032
 16, 02 Oct, 08:35:23, 0.10132
 17, 02 Oct, 08:40:23, 0.10632
 18, 02 Oct, 08:45:23, 0.10532
 19, 02 Oct, 08:50:23, 0.10632
 20, 02 Oct, 08:55:23, 0.10532
 21, 02 Oct, 09:00:23, 0.10532
 22, 02 Oct, 09:05:23, 0.10832

23, 02 Oct, 09:10:23, 0.10932
 24, 02 Oct, 09:15:23, 0.11132
 25, 02 Oct, 09:20:23, 0.11332
 26, 02 Oct, 09:25:23, 0.11832
 27, 02 Oct, 09:30:23, 0.11632
 28, 02 Oct, 09:35:23, 0.12532
 29, 02 Oct, 09:40:23, 0.13032
 30, 02 Oct, 09:45:23, 0.12932
 31, 02 Oct, 09:50:23, 0.13132
 32, 02 Oct, 09:55:23, 0.13632
 33, 02 Oct, 10:00:23, 0.13332
 34, 02 Oct, 10:05:23, 0.13832
 35, 02 Oct, 10:10:23, 0.14032
 36, 02 Oct, 10:15:23, 0.13832
 37, 02 Oct, 10:20:23, 0.14332
 38, 02 Oct, 10:25:23, 0.14332
 39, 02 Oct, 10:30:23, 0.14632
 40, 02 Oct, 10:35:23, 0.15032
 41, 02 Oct, 10:40:23, 0.14932
 42, 02 Oct, 10:45:23, 0.15232
 43, 02 Oct, 10:50:23, 0.15432
 44, 02 Oct, 10:55:23, 0.15732
 45, 02 Oct, 11:00:23, 0.16232
 46, 02 Oct, 11:05:23, 0.16832
 47, 02 Oct, 11:10:23, 0.17332
 48, 02 Oct, 11:15:23, 0.17232
 49, 02 Oct, 11:20:23, 0.17532
 50, 02 Oct, 11:25:23, 0.17832
 51, 02 Oct, 11:30:23, 0.17932
 52, 02 Oct, 11:35:23, 0.18132
 53, 02 Oct, 11:40:23, 0.18432
 54, 02 Oct, 11:45:23, 0.18732
 55, 02 Oct, 11:50:23, 0.18632
 56, 02 Oct, 11:55:23, 0.18832
 57, 02 Oct, 12:00:23, 0.18832
 58, 02 Oct, 12:05:23, 0.18932
 59, 02 Oct, 12:10:23, 0.18932
 60, 02 Oct, 12:15:23, 0.18832
 61, 02 Oct, 12:20:23, 0.18832
 62, 02 Oct, 12:25:23, 0.19032

63, 02 Oct, 12:30:23, 0.19032
 64, 02 Oct, 12:35:23, 0.19032
 65, 02 Oct, 12:40:23, 0.19032
 66, 02 Oct, 12:45:23, 0.19132
 67, 02 Oct, 12:50:23, 0.19332
 68, 02 Oct, 12:55:23, 0.19132
 69, 02 Oct, 13:00:23, 0.19132
 70, 02 Oct, 13:05:23, 0.19132
 71, 02 Oct, 13:10:23, 0.19332
 72, 02 Oct, 13:15:23, 0.19432
 73, 02 Oct, 13:20:23, 0.19232
 74, 02 Oct, 13:25:23, 0.19432
 75, 02 Oct, 13:30:23, 0.19432
 76, 02 Oct, 13:35:23, 0.19332
 77, 02 Oct, 13:40:23, 0.19332
 78, 02 Oct, 13:45:23, 0.20032
 79, 02 Oct, 13:50:23, 0.19532
 80, 02 Oct, 13:55:23, 0.19232
 81, 02 Oct, 14:00:23, 0.20332
 82, 02 Oct, 14:05:23, 0.19832
 83, 02 Oct, 14:10:23, 0.19432
 84, 02 Oct, 14:15:23, 0.19432
 85, 02 Oct, 14:20:23, 0.19332
 86, 02 Oct, 14:25:23, 0.19332
 87, 02 Oct, 14:30:23, 0.19732
 88, 02 Oct, 14:35:23, 0.19332
 89, 02 Oct, 14:40:23, 0.19532
 90, 02 Oct, 14:45:23, 0.19432
 91, 02 Oct, 14:50:23, 0.19332
 92, 02 Oct, 14:55:23, 0.19432
 93, 02 Oct, 15:00:23, 0.19432
 94, 02 Oct, 15:05:23, 0.19432
 95, 02 Oct, 15:10:23, 0.19432
 96, 02 Oct, 15:15:23, 0.19632
 97, 02 Oct, 15:20:23, 0.19732
 98, 02 Oct, 15:25:23, 0.21532
 99, 02 Oct, 15:30:23, 0.20032
 100, 02 Oct, 15:35:23, 0.22232
 101, 02 Oct, 15:40:23, 0.21332
 102, 02 Oct, 15:45:23, 0.20732

Down wind FL (north wind)

PID Monitoring Log
Attachment 8

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442



MINI-RAE PID (photoionization detector) Handheld VOC Monitor

Field Form

Date: _____
Location: _____
Wind Direction: _____
Background: _____ ppm
Contaminated Area: _____ ppm
Breathing Zone: _____ ppm

Description of Area: _____

Description of Contamination: _____

Notes: _____

Was the PID Calibrated: ☐ YES ☐ NO

TECHNICIAN _____

SIGNATURE _____

Job Hazards Analysis Form
Attachment 9

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

Attachment No. 9

JOB HAZARD ANALYSIS

Task Description (Sequence of Steps):

1.
2.
3.
4.
5.

Hazard Identification (Problem)	Hazard Control (Possible Recommendation)
<input type="checkbox"/> Asphyxiation	<input type="checkbox"/> Ventilation <input type="checkbox"/> Supplied Air <input type="checkbox"/> Air Monitoring
<input type="checkbox"/> Chemical Exposure	<input type="checkbox"/> Isolation, Lockout/Tagout <input type="checkbox"/> PPE <input type="checkbox"/> Decontamination <input type="checkbox"/> Body Position <input type="checkbox"/> Exposure Monitoring
<input type="checkbox"/> Harmful Dust	<input type="checkbox"/> Dust Suppression <input type="checkbox"/> Exposure Monitoring <input type="checkbox"/> PPE
<input type="checkbox"/> Thermal Burns <input type="checkbox"/> Hot Surface <input type="checkbox"/> Welding Slag	<input type="checkbox"/> Splash Guard <input type="checkbox"/> Isolation, Lockout/Tagout <input type="checkbox"/> PPE <input type="checkbox"/> Equipment Covers <input type="checkbox"/> Barricades
<input type="checkbox"/> Slips, Wet Surfaces	<input type="checkbox"/> Clean Surface <input type="checkbox"/> Barricade <input type="checkbox"/> Eyes on Path <input type="checkbox"/> Use Alternate Route
<input type="checkbox"/> Cleaning Equipment	<input type="checkbox"/> PPE <input type="checkbox"/> Stand Upwind <input type="checkbox"/> Waste Containers
<input type="checkbox"/> Falls <input type="checkbox"/> Less than 6 feet <input type="checkbox"/> More than 6 feet	<input type="checkbox"/> Construct Platform <input type="checkbox"/> Tie-Off <input type="checkbox"/> Move Work to Ground <input type="checkbox"/> Fall restraint, Guardrails, Short Lanyard
<input type="checkbox"/> Electrical Shock	<input type="checkbox"/> Isolate, Lockout/Tagout <input type="checkbox"/> Testing <input type="checkbox"/> Grounding <input type="checkbox"/> Shielding on Equipment <input type="checkbox"/> PPE <input type="checkbox"/> GFCI <input type="checkbox"/> Electrically Qualified
<input type="checkbox"/> Airborne/Flying Material	<input type="checkbox"/> Cover/Shield Source <input type="checkbox"/> PPE, Eye & Face <input type="checkbox"/> PPE, Arms & Body <input type="checkbox"/> Positioning
<input type="checkbox"/> Fire Explosion	<input type="checkbox"/> Isolate, Lockout/Tagout <input type="checkbox"/> Air Testing/Monitoring <input type="checkbox"/> PPE
<input type="checkbox"/> Heat/Cold Stress	<input type="checkbox"/> Ventilation <input type="checkbox"/> Cooling Vests, etc. <input type="checkbox"/> Task Rotation, Shared Tasks <input type="checkbox"/> Work/Rest Regimen
<input type="checkbox"/> High Noise	<input type="checkbox"/> Hearing Protection <input type="checkbox"/> Relocate Work <input type="checkbox"/> Muffle Source
<input type="checkbox"/> Lifting, Pulling, Pushing	<input type="checkbox"/> Get Proper Equipment <input type="checkbox"/> Proper Technique <input type="checkbox"/> Smaller, Lighter Loads <input type="checkbox"/> Move Feet to Turn Load
<input type="checkbox"/> Lighting	<input type="checkbox"/> Adequate for Task <input type="checkbox"/> Nighttime Considerations

<input type="checkbox"/> Fire, Combustible Materials	<input type="checkbox"/> Remove Materials <input type="checkbox"/> Relocate Work <input type="checkbox"/> Shields <input type="checkbox"/> Wet Area <input type="checkbox"/> Fire Extinguishers <input type="checkbox"/> Fire Watch <input type="checkbox"/> PPE
<input type="checkbox"/> Repetitive Motion	<input type="checkbox"/> Proper Technique <input type="checkbox"/> Proper Tools <input type="checkbox"/> Get Help, Take Breaks <input type="checkbox"/> Seek Advice
<input type="checkbox"/> Rotating Equipment	<input type="checkbox"/> Isolate, Lockout/Tagout <input type="checkbox"/> Guarding, Barricading <input type="checkbox"/> No Loose Clothing <input type="checkbox"/> Positioning
<input type="checkbox"/> Utility Lines	<input type="checkbox"/> Call Local Authorities <input type="checkbox"/> Hand Dig
<input type="checkbox"/> Sharp Objects	<input type="checkbox"/> Guarding <input type="checkbox"/> PPE, Gloves, etc. <input type="checkbox"/> Positioning
<input type="checkbox"/> Falling Objects	<input type="checkbox"/> Secure Objects <input type="checkbox"/> Guarding, Covers <input type="checkbox"/> PPE <input type="checkbox"/> Barricades
<input type="checkbox"/> Hazards from others working in vicinity	<input type="checkbox"/> Communication <input type="checkbox"/> Barricading <input type="checkbox"/> Shielding
<input type="checkbox"/> Environmental Spill	<input type="checkbox"/> Containment <input type="checkbox"/> Waste Plan <input type="checkbox"/> Waste Containers <input type="checkbox"/> Other
<input type="checkbox"/> Reactive Chemicals	<input type="checkbox"/> Chemical OK'd <input type="checkbox"/> Containers Labeled <input type="checkbox"/> Like for Like
<input type="checkbox"/> Pressure	<input type="checkbox"/> Communication <input type="checkbox"/> Barricading <input type="checkbox"/> Shielding <input type="checkbox"/> Positioning
<input type="checkbox"/> Fire Protection	<input type="checkbox"/> Accessible <input type="checkbox"/> Correct Type for Purpose
<input type="checkbox"/> Radiation	<input type="checkbox"/> Exposure Monitoring <input type="checkbox"/> PPE
<input type="checkbox"/> Heavy Equipment	<input type="checkbox"/> Spotter <input type="checkbox"/> Back-Up Alarms <input type="checkbox"/> Complete Inspection Checklist
<input type="checkbox"/> Hazards, Not Listed	<input type="checkbox"/> Description:

	YES	NO	N/A
Is a permit required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the client's procedure/policy supplied?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have proper tools and/or equipment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have you planned the escape route?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you know where safety equipment is?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did you review AHA with crew?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is barricade tape required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are danger signs posted, if required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signed: _____

Certified by: _____ Date: _____

Incident Report Form
Attachment 10

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

ACCIDENT/INCIDENT REPORT

Person Completing Report _____ Incident Date _____

Incident Time: _____ Location _____ Project # _____

Person Involved in Incident _____ Telephone _____

Driver Name (if motor vehicle accident) _____ Telephone _____

Type of Incident:

☐ Personal Injury/Illness

☐ Near Miss Event

☐ Motor Vehicle Accident

☐ Chemical Exposure

☐ Unsafe Condition/Action

☐ Other _____

☐ Equipment Damage

☐ Fire/Explosion

☐ Theft

☐ Spill/Release

☐ Property Damage

☐ Customer Incident

Circle one, based on initial findings:

☐ Pit/Code Compliance

☐ Newspaper/Radio/TV

Preventable/Non-Preventable

Personal Injury ☐ Yes ☐ No (If no, go to next section)

☐ First Aid Only

☐ Hospitalization

☐ Medical Treatment

☐ Possible Injury, Not Confirmed

Person Injured:

Employee (If so, complete First Report of Injury)

☐ Subcontractor

☐ Client/Public/Other

Nature of Injury, Illness, or Exposure:

Describe nature of incident, how it occurred, who was involved, witnesses and possible causal factors: (Attach additional sheets if necessary)

☐ First Report of Injury Attached

☐ Police Report Attached

Describe immediate actions taken and persons notified: (Attach additional sheets if necessary)

Action Taken to Prevent Recurrence (Attach additional sheets if necessary)

Report Prepared by (signature): _____ Date: _____

Employee's Signature _____

Date: _____

RECON RHASP

RECON's Radiation Health & Safety Plan
Thorium Remediation Project
Tulsa, Oklahoma

REVISION: 02

EFFECTIVE DATE: MAY 2004

 5/7/04

Danny P. Brown – Project Manager / Date

 5/7/04

Michael Page – Lead Health Physics Technician /Date

RECON Radiation Health & Safety Plan

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RECON Radiation Health & Safety Plan

Radiation Health and Safety Plan Remedial Construction Services, L.P. (RECON) Thorium Remediation Project Tulsa, Oklahoma

1.0 Purpose

The goals of the Radiation Health and Safety Plan (RHASP) are to minimize the potential exposure to radiation of employees, contractors, visitors, and the general public as a result of working with and around radioactive materials and to demonstrate compliance with applicable laws and regulations related to radiation protection and control of radioactive materials. This RHASP has been developed to guide generation and implementation of RECON radiation safety plans and procedures and to ensure that plans and procedures to implement radiological controls for workers, visitors, and the general public are developed commensurate with the risks associated with Thorium Remediation Project at the Kaiser Aluminum & Chemical Corporation (Kaiser), Tulsa, Oklahoma facility. Reference to the Kaiser site refers to the areas to be remediated and Remedial Construction Services, L.P. (RECON) support areas. Additional work plan contents are described in Sections 9.2.4, 10.0, and 11.0 of the Kaiser Decommissioning Plan (DP). Information about the current radiological status of the Kaiser facility is provided in Section 4.0 of the Kaiser DP and DP Addendum.

RECON Radiation Health & Safety Plan

2

2.0 Scope

This RHASP is designed to supplement an Environmental Health and Safety Plan (EHASP), Environmental Monitoring Plan (EMP), and Quality Assurance/Quality Control Plan (QA/QC Plan) and all other RECON prepared plans and applies to all RECON personnel, visitors, and employees at the Kaiser Tulsa, Oklahoma facility. In preparing the EHASP, EMP, QA/QC Plan, and all other plans, RECON shall address all the elements described in this RHASP, the RECON Environmental Health and Safety Plan, and Quality Assurance Plan.

3.0 References

- (1) Decommissioning Plan, Tulsa Facility, Tulsa, Oklahoma, Kaiser Aluminum & Chemical Corporation, Revised May 2003.
- (2) Decommissioning Plan Addendum, Tulsa Facility, Tulsa, Oklahoma, Kaiser Aluminum & Chemical Corporation, Revised May 2003.
- (3) Adjacent Land Remediation Plan for Kaiser Aluminum & Chemical Corporation, Tulsa, Oklahoma, Rev. 1, July 1999.
- (4) Environmental Health and Safety Plan, Kaiser Aluminum and Chemical Corporation, Tulsa, Oklahoma, Rev. 3, October 2003.
- (5) Quality Assurance Plan, Kaiser Aluminum and Chemical Corporation, Tulsa, Oklahoma, Rev. 2, October 2003.
- (6) Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations."
- (7) Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation."
- (8) Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
- (9) Title 29, Code of Federal Regulations, Part 1910, "Occupational Safety and Health Standards."
- (10) Title 29, Code of Federal Regulations, Part 1926, "Safety and Health Regulations for Construction."
- (11) ANSI N323 - American National Standard Institute, "Radiation Protection Instrumentation Test and Calibration," N323-1978, 1978.
- (12) Information Notice 96-18, Compliance with 10 CFR Part 20 For Airborne Thorium, dated March 25, 1996.
- (13) Information Notice 96-28, Suggested Guidance Relating to Development and Implementation of Corrective Action, dated May 1, 1996.
- (14) National Council on Radiation Protection and Measurements Report 127, Operational Radiation Safety Program, 1998.
- (15) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.21, Health Physics Surveys for Byproduct Material at NRC-Licensed Processing and Manufacturing Plants, Revision 1, October 1979.
- (16) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.25, Air Sampling in the Workplace, Revision 1, June 1992.

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- (17) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.7, Instructions for Recording and Reporting Occupational Radiation Exposure Data, Revision 1, June 1992.
- (18) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses, July 1992.
- (19) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.36, Radiation Dose to the Embryo/Fetus, July 1992.
- (20) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.9, Rev. 1, Acceptable Concepts, Models Equations, and Assumptions For A Bioassay Program, Revision 1, July 1993.
- (21) U.S. Nuclear Regulatory Commission, NUREG-1460, Guide to NRC Reporting and Recordkeeping Requirements, Rev. 1, July 1994.
- (22) U.S. Nuclear Regulatory Commission, NUREG-1506, Measurement Methods for Radiological Surveys in Support of New Decommissioning Criteria, 1995.
- (23) U.S. Nuclear Regulatory Commission NUREG-1507, Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions, 1997.
- (24) U.S. Nuclear Regulatory Commission NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Revision 1, 1997.
- (25) U.S. Nuclear Regulatory Commission NUREG-1549, Decision Methods for Dose Assessment to Comply With Radiological Criteria for License Termination, July 1998.
- (26) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.13, Instruction Concerning Prenatal Radiation Exposure, Revision 3, June 1999.
- (27) U.S. Nuclear Regulatory Commission, Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection, Revision 1, October 1999.
- (28) U.S. Nuclear Regulatory Commission, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material" in Policy and Guidance Directive FC 83-23.
- (29) U.S. Nuclear Regulatory Commission NUREG-1660, Specific Schedules of Requirements for Transport of Specified Types of Radioactive Material Consignments.

4.0 ALARA

ALARA stands for "As Low As Reasonably Achievable." It is RECON's management policy to maintain radiation exposures to its employees, contractors, and the general public as far below the limits specified in 10 Code of Federal Regulations (CFR) 20 as is reasonably achievable. The ALARA program will be implemented through the training of employees and contractors, work procedures and practices, safe work permit use, good housekeeping, dust and contamination control practices, and, as necessary, use of personal protective equipment (PPE).

5.0 Radiation Safety Organization and Responsibilities

5.1 RECON Project Manager

Overall control and authority for management of remediation activities rest with the RECON Project Manager (PM). RECON's Management team; PM, Lead Health Physics Technician (LHPT) and Project Administrator collectively will ensure that the guidance provided in the RHASP is followed during the Thorium Remediation Project.

The responsibility of the RECON PM includes, but is not limited to, the following:

- Review and approval of plans and procedures to complete remedial actions and consult with the RECON LHPT for guidance on special issues; contractor plans and procedures and review of radiological health and safety issues; and
- Ensure that remediation activities and radiological safety practices meet the established environmental, health and safety, and QA requirements in accordance with the requirements of this RHASP and applicable permits/licenses and/or regulatory and contract requirements.

5.2 RECON Lead Health Physics Technician

The RECON LHPT shall be responsible for the radiological health and safety of all remediation activities involving radioactive material including the review of all elements of RECON's radiation protection program and procedures for radiation work, radioactive material handling, packaging and transportation. The RECON LHPT shall have the responsibility and authority to terminate any work activities involving radioactive material at the site. RECON's radiation protection program will be reviewed prior to the start of work and monthly by the RECON LHPT to ensure compliance with commitments.

Other duties and responsibilities of the RECON LHPT shall include the following:

- Reviewing radiological hazard assessments and ensuring the implementation of appropriate radiation safety precautions.
- Performing routine reviews of radiological procedures and of the implementation and documentation of all work activities involving radioactive material.
- Reviewing unusual incidents involving radioactive material and providing recommendations on preventing recurrence of such incidents.

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- Ensuring that the contractor has established appropriate criteria for determining the proper level of review and authorization for radiological work such as the safe work permit system.
- Ensuring that the commitments of the DP, RHASP, and permit conditions are met, and that all required records are maintained.
- Reviewing exposure results and ensuring that RECON is issuing dosimetry devices and maintaining personnel dosimetry records, and providing required reports of personnel exposure on a timely basis for review and copies sent to Kaiser.
- Ensuring that RECON is maintaining records of radiological surveys, evaluations, and audits.
- Ensure that RECON is arranging services for bioassay analysis if necessary.
- Ensuring that a training program for all personnel accessing restricted areas has been established.

5.3 Health Physics Technician (HPT) or other designee

In the onsite absence or unavailability of the RECON LHPT the authority for implementing the radiation protection program will be delegated to a RECON HPT by the RECON LHPT. This delegation will be assigned to RECON's PM for implementation.

RECON's HPT shall have "stop work" authority for all activities involving radioactive material at the site and have the responsibilities of the RECON LHPT when the RECON LHPT is not at the site.

5.4 RECON Health and Safety Supervisor

RECON's Health and Safety Supervisor will be responsible for implementing measures that provide safe and healthy work conditions, for assuring radiation exposures are maintained ALARA, and for minimizing release of radioactive material to the environment.

5.5 RECON Site Personnel / Individual Workers

Each individual assigned to the project is responsible for demonstrating familiarity with the radiation protection program, for strict adherence to the radiation protection rules and regulations, and for minimizing radiation exposure to the maximum extent practical. Flagrant or willful disregard of radiological protection rules, regulations, or practices shall result in disciplinary action. Each individual shall be pro-

vided training and, at the discretion of the RECON LHPT, successfully demonstrate competence through testing on the requirements of the radiation safety program.

All individuals working in the restricted area shall have a working knowledge of the radiological protection rules, regulations, and procedures. This knowledge shall be obtained through current training and instruction/briefings commensurate with the individual's work assignment.

The Safe Work Permit "SWP" (see attachment 4) is the one document that the individual must be most familiar with for radiological conditions and safety precautions in the individual's work area. Each individual working in areas covered by an SWP must comply with and obey all requirements of the SWP and attend a pre-job SWP briefing when stipulated by the SWP.

Individuals shall report unusual conditions or circumstances involving radioactive material that may lead to a hazardous condition or noncompliance with safe radiological work practices.

5.6 Visitors

Persons visiting or conducting work at the Kaiser facility in Tulsa, Oklahoma are required to be familiar with RECON's health and safety requirements of the site. Visitors will be required to attend a briefing covering Radiation Safety Awareness and Site Specific information. Visitors will be accompanied by facility personnel while on the site.

5.6.1 Visitor Activities

While most visitors will be limited to observation, official inspections and sampling will be allowed at the site, such activities will be coordinated through the RECON LHPT. Visitors are not to be present in restricted areas during remediation activities or when intrusive work is being performed. Under these conditions, visitors will have a limited potential for contact with contaminated materials. Persons accessing active remediation areas, exclusion zones, or contamination reduction zones; conducting activities other than observation; and unescorted visitors will be required to read and understand RECON's Environmental Health and Safety Plan and complete the facility orientation program.

5.6.2 Visitor Responsibilities

Visitors to the Kaiser facility are admitted as a courtesy and must leave when requested to do so. Visitors are responsible for signing in and out. All visitors are responsible for behaving in a mature manner and following instructions, particularly in emergency situations.

5.6.3 Prohibited Activities

Visitors may not smoke, drink, eat, chew gum or tobacco, or apply cosmetics while in the restricted areas of the Kaiser facility. Visitors may not enter the restricted areas unescorted.

5.6.4 Exposure Control

Visitors may be required to wear dosimeters to evaluate exposure to radiation. Visitors will be requested to submit to a direct personal survey to detect incidental radiological contamination and prevent the spread of contamination to clean areas.

5.6.5 Personal Protective Equipment

Visitors accessing the restricted areas of the site must wear the required PPE for the area. During the site-specific training, correct PPE usage will be discussed and displayed. Visitors who enter areas where respiratory protection is necessary must provide evidence that they possess the training, medical surveillance, and fit testing required by Occupational Safety and Health Administration (OSHA) regulations.

5.6.6 Decontamination

Decontamination measures will be utilized to remove contamination from persons, clothing, or objects. Overboots will be washed at the boot wash station and removed before leaving the Radiological Buffer Area. Disposable PPE and items requiring additional cleaning will be carefully removed and placed in the designated containers. Decontamination of the skin will consist of washing the affected area with soap and water. Visitors leaving a restricted area must wash their hands and face and complete a successful personal radiation frisk by a qualified Radiation Worker before returning to the support or clean areas of the site (see section 6.3 paragraph 2).

6.0 Radiation Protection Program Elements in RECON Radiological Plans

6.1 Plans and Procedures

RECON radiological plans and procedures shall be consistent with health and safety protection measures and policies as expressed in the appropriate Kaiser Environmental Safety and Health Plan, Kaiser QA and DP as well as Kaiser Site manuals and procedures.

6.2 Training

RECON will establish a radiological training program to meet the applicable training requirements specified by the U.S. Nuclear Regulatory Commission (NRC), OSHA, and the Department of Transportation (DOT). All employees and contractors will also receive training on the DP to ensure that all personnel understand the objectives of the plan and the routine operations and precautions to meet the plan objectives. The training program will include general radiation safety training/monitoring (including bioassay), site orientation, site-specific training, and training verification and documentation.

6.2.1 General Radiation Safety Training/Monitoring

At a minimum, all site personnel will be required to have radiation safety training commensurate with the radiological hazards that they will encounter and be required to wear radiation-monitoring devices. RECON will provide radiation dosimetry to personnel who enter restricted/controlled areas.

6.2.2 Site Orientation

Prior to entry into any restricted area of the Kaiser site, personnel and visitors will be given a site and radiological orientation. Objectives of this orientation will be to familiarize personnel and visitors to:

- Recognize labeled or posted radioactive materials and understand the meaning of radiological warning signs;
- Understand that as long as radiological control procedures and limits are followed, potential harmful effects to personnel and the environment from radioactivity will be minimized; and
- Recognize and understand the meaning of, and proper response to, emergency signals.

6.2.3 Site-Specific Training

Site-specific training will be required for all personnel involved in day-to-day operations of the remediation project, project and management personnel who visit the site regularly, and other personnel

identified by Kaiser's SA. Prior to being allowed unescorted access to the site and issuance of a radiation dosimetry, each person shall demonstrate a basic knowledge of radiation worker training given by the RECON LHPT or designee and sign the Radiation Health And Safety Acceptance Form (see attachment 2).

Radiation safety training for workers will be commensurate with their duties and responsibilities and the magnitude of the potential exposure to direct radiation and contamination in accordance with 10 CFR Parts 19 and 20.

Prior to the initiation of daily work activities, the PM or designee will hold a "kick-off" meeting to familiarize workers with the day's activities and their associated procedures, SWPs and safety requirements. A roster will be maintained for each daily meeting. Changes to standard procedures as a result of unique project conditions will also be discussed during these "kick off" meetings.

6.2.4 Training Verification and Documentation

Personnel working on site will present evidence of general radiation safety training and past exposure history in accordance with 10 CFR Parts 19 and 20 and pertinent refresher training (e.g., training certificates, letter of certification) prior to performing work in restricted areas of the site. Initial and annual refresher training shall include instruction in the fundamentals of radiation protection. The degree of instruction will be determined by work assignment and will ensure that workers understand how radiation protection relates to their jobs. The minimum training provided to any worker will include, but not necessarily be limited to, the following subjects:

- Radiation monitoring techniques
- Radiation monitoring instrumentation
- Emergency procedures
- Radiation hazards and controls
- Concepts of radiation and contamination
- Provisions of applicable sections of 10 CFR Parts 19 and 20
- Responsibilities of workers and supervisors
- Reporting requirements for workers
- ALARA and exposure control procedures
- PPE
- Biological effects of radiation
- Radiation control zone procedures

- Safe Work Permits
- Waste Management

Records of individual training and qualifications will be maintained at the site until the completion of all remediation activities and will include the trainee's name, training date, subjects covered during training, written test results, and the instructor's name.

RECON personnel will be required to have OSHA 1910.120 training and shall meet all the requirements in OSHA 1910.120. RECON shall provide evidence of this training for each worker. In addition, all site personnel shall sign a statement certifying and acknowledging that they have received site-specific training and that they understand the potential site hazards and the necessary control measures to reduce and/or eliminate those hazards. Training documentation, including the content of site-specific training and any other subsequent training (e.g., periodic safety meetings and specific task safety meetings), will be maintained by RECON for a suitable period. RECON will make training documentation available for inspection.

NRC Form 3 (see attachment 3) shall be conspicuously posted in a sufficient number of places to permit employees working in or frequenting restricted areas to have access to a copy on the way to or from their place of work.

6.3 Work Zones and Access Control Points

The entrance to Access Control will be located in the Flux Building. There the individual enters, signs in on the Access Control Log (See Attachment 4) and acquires his/her radiation dosimeter. The dosimeter will be placed on the front part of the body between the waist and the neck. Any pertinent SWP or radiological information will be posted in the Access Control area. PPE is located at the boundary of the Radiological Buffer Area where all PPE will be donned. Upon completion of these activities formal entrance into the Restricted Area will be allowed.

Individuals exiting a Restricted Area will proceed to the boot wash station located at the boundary of the Restricted Area and the Radiological Buffer Area, wash their over boots and then do a gross frisk of their boots with a Ludlum Model 3 Scaler/Ratemeter with a alpha/beta/gamma Model 44-9 Detector (or equivalent) that is located next to the boot wash. Upon completion of a successful preliminary frisk,

individual will then proceed to the Flux Building where they will doff all disposable PPE with careful attention not to contaminate personal clothing. PPE will be discarded in the appropriately marked waste disposal container prior to entrance into Access Control. Individuals will then proceed to the frisking station where a survey will be conducted utilizing a Ludlum Model 2221 Scaler/Ratemeter with a alpha Model 43-5 Detector or equivalent. Only qualified and trained personnel may complete these surveys. (The RECON LHPT or designee will frisk Visitors and this person shall initial the Access Control Log next to the visitor's name). Prior to picking up the probe, or equivalent, carefully frisk hands to prevent cross contamination of the instrument. Persons will be frisked at a rate not to exceed three inches per second at one half-inch distance away from the body. If contamination is detected, step away from the meter and inform the RECON LHPT or designee prior to any decontamination attempt. Decontamination efforts will be taken prior to performing another frisk. Personal clothing or other articles that are unable to be decontaminated will not be allowed to leave Access Control and will be placed in appropriately marked containers. When the frisking procedure is complete and no contamination is detected individuals will then surrender their dosimeter and sign out on the Access Control Log indicating the time of departure.

Radiological Buffer Areas shall be established at the boundary of restricted and unrestricted areas to control radiation exposure and limit the spread of radioactive material.

Unrestricted Area is any area that access is not controlled for the purpose of protection of individuals from exposure to radiation and radioactive materials.

Restricted and Controlled Areas are any area to which access is managed for purposes of protection of individuals from exposure to radiation and radioactive materials. Within the restricted areas, different radiological control zones may be designated to aid in radiation exposure control and control of the radioactive materials present. Such areas include, but are not limited to: RADIOACTIVE MATERIAL AREA (where radioactive materials are stored or located), RADIATION AREA, RADIOLOGICAL BUFFER AREA (decontamination buffer area between restricted areas and clean unrestricted areas), CONTROLLED AREA, CONTAMINATION AREA, and AIRBORNE RADIOACTIVITY AREA.

A Contamination Area is an area which contains radioactive material which can spread. The amount of contamination is measured in disintegrations per minute per 100 cm². Contamination limits for materials

and equipment specified in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct, Source, or Special Nuclear Materials" (NRC, August 1987) will constitute a Contamination Area. The posting will read "CAUTION - CONTAMINATED AREA".

Contamination reduction areas (Radiological Buffer Areas) will be marked in the field using flagging tape or temporary construction fencing with appropriate signs. Temporary control zone or contamination reduction area barriers will remain in place until the work in the zone is completed or until the potentially hazardous conditions that caused an area to be designated as a control zone are eliminated. Proper radiation postings will be used to warn of potential hazards.

Entry points to restricted areas will be posted in accordance with 10 CFR 20.1902. Instructions describing proper techniques of personal frisking, donning and doffing of protective clothing and other special entry requirements will be posted.

Personnel entering a restricted area shall have received the appropriate training or be escorted by trained personnel. Personnel entering these areas shall read and sign the appropriate SWP, which acknowledges their understanding of and adherence to the requirements set forth in the applicable SWP.

A controlled restricted area may include a step off area (pad) that separates the two sides. A personnel survey meter (frisker) will be available to be used for individuals to perform the required personnel survey upon exiting the Controlled Area.

Unrestricted/clean areas are to consist of areas of the site, which are not contaminated, and not being used for decontamination. Efforts will be taken to prevent the contamination of clean areas and the support zone/clean area. Personnel and equipment that enter clean areas after having been in a controlled/restricted area will be surveyed and decontaminated, if necessary. Large equipment will be subject to unrestricted release survey criteria to measure for both fixed and removable contamination. An Entrance/Unrestricted Release Form (see attachment 5) will be utilized to complete this survey. Prior to any entrance or unrestricted release survey, the equipment will be de-energized. An inspection will occur to ensure the equipment is visually clean. Using a Ludlum Model Ludlum 3 or equivalent frisking instrument the equipment will be examined for fixed contamination and the disintegrations per minute

(DPM) will be documented. A smear survey to measure removable contamination will also be taken covering approximately 100 cm² of the same location. The smear will be placed in an envelope and further evaluated utilizing Ludlum 2929 scaling instrument or equivalent to measure alpha and beta activity. Entrance survey information may be used as a baseline while unrestricted release survey data counted and measured are subject to NRC release limit criteria (see attachment 6). Before a piece of equipment receives an unrestricted release survey it will be visually inspected, if contamination is suspected a gross decontamination will occur in the decontamination area. Gross decontamination will consist of utilizing shovels, brooms, brushes, high pressure water, in any combination to remove the contaminate.

Clean areas will be surveyed weekly to ensure proper contamination control and an Area Survey Form (see attachment 7) will be filled out. Area surveys are utilized to ensure contamination has not occurred in unrestricted/clean areas. A map of the area is drawn or attached to the Area Survey Form and location points are designated. At each location a smear will be swiped covering approximately 100 cm² and placed in an envelope identifying where the smear was taken. A Ludlum 2929 scaling instrument or equivalent will be used to measure alpha and beta activity. Observed activity limits will be below NRC release limit criteria, but if this is not the case the survey area will be isolated and controlled for decontamination and a follow-up survey will be taken.

6.4 Radiation Exposure Control

Remediation activities at the Kaiser site will be controlled such that no occupationally exposed worker will exceed any 10 CFR 20 occupational limits set forth in 10 CFR 20 Subpart C and shall be kept ALARA. These limits apply to all Radiation Workers 18 years of age or older. Internal dose to a specific organ is given as Committed Dose Equivalent (CDE), while the internal dose relative to a whole body exposure is given as Committed Effective Dose Equivalent (CEDE). External dose is expressed as Deep Dose Equivalent (DDE), Shallow Dose Equivalent (SDE) and Lens of the eye Dose Equivalent (LDE).

The annual occupational exposure limits from 10 CFR 20 is as follows:

- | | |
|----------------------------|-------------------|
| • TEDE (CEDE + DDE) | 5 rems (0.05 Sv) |
| • Lens of Eye (LDE) | 15 rems (0.15 Sv) |
| • Other Organs (CDE + DDE) | 50 rems (0.5 Sv) |
| • Skin or Extremity (SDE) | 50 rems (0.5 Sv) |

The dose to an embryo/fetus due to occupational exposure of a woman who has voluntarily declared her pregnancy in writing is limited to 0.5 rems (0.005 Sv) TEDE during the entire pregnancy. Data relating to dose to the embryo/fetus of a declared pregnant worker or former declared pregnant worker will not appear on her NRC Form 4. Such data will only be provided to other individuals upon written request by the declared pregnant worker authorizing release of the data. The data may be provided to the declared pregnant worker herself upon verbal request. As part of the radiation safety training (and refresher training) and prior to issuance of a radiation dosimeter, women authorized to receive radiation exposure will be given specific instruction regarding prenatal exposure risks to a developing embryo and fetus. This instruction will include information contained in the Appendix to NRC Guide 8.13 "Instruction Concerning Prenatal Radiation Exposure".

Upon their initial visit to the site, personnel will be required to complete and sign a NRC Form 4 (see attachment 6). Personnel without a signed, up-to-date, NRC Form 4 or equivalent current year occupational exposure history on site shall be limited to a dose accumulation of less than 0.1 rem (0.001 Sv) TEDE until the individual to be monitored provides current year dose history. Visitor's exposures shall be limited too less than 0.1 rem (0.001 Sv) TEDE in a year. Note that persons (visitors) who need to exceed this limit, or enter restricted areas shall complete Radiation Worker Training and fully participate in the personnel monitoring program.

RECON will control the exposure of visitors at the site to levels that are ALARA. For exposure control purposes a "visitor" is defined as a person not qualified as a "radiation worker" and who requires access to a restricted area.

Entry by a visitor to a restricted area will require the following:

- (1) Assignment of a temporary radiation dosimeter.
- (2) Escort by a qualified radiation worker while in the restricted area.
- (3) Documentation:
 - (a) Name
 - (b) Social Security Number

- (c) Date of Visit
- (d) Area visited and length of time in that area

The annual occupational dose limit for minors (under age 18) is 10 percent of the annual dose limits specified for adult workers in 10 CFR 20.1201. Individuals under the age of 18 will not be permitted to enter any radiologically restricted area at the Kaiser site.

Remediation activities at the Kaiser site will be controlled such that: 1) no member of the public shall receive a TEDE in one calendar year exceeding 0.1 rem (1 mSv) in accordance with 10 CFR 20 Subpart D, 2) the dose in any unrestricted area from external sources shall not exceed 2 mrem (0.02 mSv) in any one hour, and 3) air emissions of radioactive material into the environment (excluding Radon) are controlled to preclude release to the environment of airborne radioactivity greater than the concentration limits of 10 CFR 20, Appendix B, Table 2, Column 1.

6.5 Personnel External Exposure Monitoring

Personnel dose monitoring is performed to demonstrate compliance with the dose limits in 10 CFR 20 and to assess successful implementation of ALARA. Individual dose monitoring includes internal and external exposure. Procedures for the issue, collection, processing, and recording of personnel radiation dosimetry and exposures shall be utilized. Dosimetry will be analyzed quarterly. Written dosimetry reports of exposure will be issued annually.

Personnel dosimetry for radiation workers shall include a whole body radiation badge. When the whole body is exposed uniformly, the radiation dosimeter shall be worn on the frontal area of the torso between the neck and the waist. Deep dose and shallow dose monitoring devices shall be worn in areas receiving the highest applicable dose. If relocation of the whole body dosimeter is required, the SWP will specify where the dosimeter is to be worn.

Radiation dosimeters will be processed only by vendors that maintain a processing program that is currently accredited by the National Voluntary Laboratory Accreditation Program for the energies and types of radiation expected to be encountered at the Kaiser site.

If monitoring is performed for personnel exposure to gamma radiation, it will be done using radiation dosimetry and/or radiation survey meters. The radiation exposure rate survey meter for occupational gamma surveys on this project will have a minimum detection rate of approximately 5 μ R/hr.

When not in use, radiation dosimeters are stored in designated low background areas, such as Access Control.

Lost or damaged radiation dosimeters shall be immediately reported to immediate supervisor and RECON's LHPT.

Certain radionuclides given to personnel for medical diagnostic purposes can result in measurable radiation levels for some period after receiving the treatment. The dose received from this treatment is exempt from regulation. Badged employees shall notify the RECON LHPT if they have received such treatment. In such a situation, the person may be restricted from wearing dosimetry until the medical isotope is eliminated from the body to the extent that it will not affect dose measurements. The only purpose of restricting this individual from wearing dosimetry is to avoid including radiation exposure from the medical isotope to that received from the remediation activities. Such personnel shall also be restricted from entering areas requiring monitoring for radiation until the medical radionuclide is eliminated from the body to the extent that it will not affect personnel monitoring.

6.6 Internal Exposure Monitoring

Internal exposures will be assessed singly or by a combination of measurements of: 1) airborne radioactivity in work areas; 2) quantities of radionuclides in the body, and 3) quantities of radionuclides excreted from the body.

Internal exposure monitoring shall be performed to assess the dose to personnel who are likely to receive, in 1 year, an intake in excess of 0.1 ALI (annual limit on intake) in 10 CFR 20, Appendix B, Table 1, Column 2 or if the committed effective dose equivalent to declared pregnant worker is likely to exceed 0.05 rem (0.5 mSv).

RECON will maintain the internal exposure of persons to radioactive materials ALARA. The use of engineered controls will be employed to the maximum extent practical. If engineered controls are not

adequate as demonstrated by work area air sampling, then respiratory protection will be considered to control internal exposures to radioactive materials. Internal exposure monitoring will generally consist of air sampling.

6.7 ALARA

The radiation protection responsibility at the Kaiser site is to maintain exposures ALARA for employees, visitors, contractors, the public, and the environment. This responsibility is carried out by means of the following:

- Information and policy statements to employees.
- Periodic management audit of operational efforts to maintain exposures ALARA.
- Delegation of sufficient authority to the RECON LHPT to enforce regulations and administrative policies regarding radiation safety.
- Administrative direction to ensure that any new operation that may affect radiation protection will be planned or designed in consultation with or approval from the RECON LHPT or designee.
- RECON prepared ALARA review and approval procedure.

6.8 QA/QC Program

The RHASP is subject to management controls and QA requirements. In addition to general QA review and independent oversight, surveillances and audits shall be performed as needed to assess whether the quality controls are adequate to assure radiological safety requirements are met. RECON shall designate a Quality Control Supervisor (QCS) who will report to the RECON PM. The QCS will communicate and coordinate directly with the PM and will have the delegated responsibility and authority to direct and control contractor QC functions to assure that QC objectives are met. Responsibilities of the RECON QCS include coordination of contractor QC activities and ensuring that appropriate quality management, policy, training, and verification controls are present. The RECON QCS shall provide all necessary QC information to the RECON PM and the RECON LHPT.

Radiological surveys, including sampling and analysis will be performed in order to evaluate the effectiveness of remediation and decontamination efforts in maintaining adequate radiological controls and to evaluate materials for removal and disposal.

Health Physics instrumentation and equipment as well as respiratory protection equipment is inspected prior to use. Equipment failing the inspection due to equipment malfunction, poor calibration, or inappropriateness due to use restrictions, will be tagged out of service.

Periodic surveillances and audits of the Health Physics Program shall be conducted and audited by Kaiser.

RECON personnel will determine the quantity, performance specifications, calibration, maintenance and testing requirements and capabilities for radiation detection, monitoring, and sampling instrumentation and equipment. RECON personnel and/or vendors will be responsible for calibration, maintenance, proper storage of such equipment, and the control of the instrument check sources.

Selection criteria for portable and laboratory counting equipment are based upon the types of radiation to be detected, maintenance and calibration requirements, ruggedness, interchangeability, and upper and lower limits of detection capabilities. MARSSIM contains a list of the typical types of radiation detection instruments to be used during remediation of the Kaiser site. This is the equipment or it's equivalent that RECON intends to utilize during the Thorium Remediation Project : Ludlum Model 3 Survey Meter, Ludlum Model 2929 Dual-Channel Scaler, Ludlum Model 43-10-1 Detector, Ludlum Model 44-9 Detector, Ludlum Model 177 Alarm Rate Meter, Ludlum Model 2221 Portable Scaler Ratemeter, Ludlum Model 2224 Scaler Ratemeter, Ludlum Model 43-93 Alpha/Beta Scintillator, Ludlum Model 43-5 Alpha Detector, Ludlum Model 19 μ R Meter and Shonkas' Subsurface Multi-spectra Contamination Monitor (SMCM).

Radiation detection and sampling instrumentation and laboratory counting instruments utilized for radiation safety purposes will be calibrated before initial use, after major maintenance, and on a routine basis. A qualified vendor will calibrate portable radiation detection and sampling equipment/instrumentation annually consistent with a radioactive source of known activity traceable to the National Institute of Standards and Technology. Portable instrumentation operability criteria and QA procedures (such as

source checks each day the instrument is in use) in compliance with Table 10.1 of NCRP Report 127 shall be implemented.

6.9 Radiation and Contamination Surveys

Routine radiation and contamination surveys will be performed in accordance with written procedures using calibrated instrumentation to ensure that personnel do not exceed occupational exposure limits and minimize personnel exposures ALARA. Contamination surveys will be performed to ensure that personnel do not spread surface contamination beyond the controlled area and to minimize unnecessary external and internal exposure resulting from the intake of loose radioactive material by inhalation, ingestion, or skin absorption.

Radiation and contamination surveys will also be used to determine the effectiveness of the overall radiological contamination control and protection program. Information obtained from radiation and contamination surveys are used to evaluate operations and activities as well as operation processes and methods to assure personnel exposures are ALARA.

Radiation and contamination control surveys will be performed by qualified personnel, using instruments appropriate to the type of radiation and / or contamination and type of survey required.

Types of routine radiation and contamination control surveys include the following:

- **Personnel Contamination Surveys (Self-Monitoring or frisking)** - Personnel contamination surveys (self-monitoring or frisking) are performed to detect and quantify the possible presence of radioactive material on the body or clothing. Self-monitoring (frisking) is a critical element of the contamination control program. Only individuals who are trained and qualified as radiation workers are permitted to perform self-monitoring. Qualified individuals will survey visitors and non-radiation workers.

Personnel will be instructed in the proper method of removing protective clothing and monitoring for personal contamination as part of the formal radiation safety training program. Friskers will be available at each exit from a controlled area or control point. In the event that personnel contamination is suspected or detected, appropriate HP personnel will be notified and appropriate action taken. In the event a person becomes radioactively contaminated that is not removed by simple decontamination techniques, then appropriate HP personnel will supervise further decontamination activities and evaluate the need for bioassay follow-up. Bioassay sampling will be performed at the discretion of the Kaiser RSO.

- **Area Contamination Surveys** - Routine surveys for radioactive contamination shall be conducted during remediation activities at the Kaiser site commensurate with the potential for contamination in the area. In general, area contamination surveys will be performed to provide data for determining radiological conditions that will be used for the issuance of SWPs and for termination of the SWP. (See attachment 3)
- **Remedial Action Surveys** - Surveys and sampling will be conducted to assess the effectiveness of decontamination activities.
- **Tools, Equipment, and Vehicle Surveys** - Tools, equipment, and vehicles in a restricted area will be surveyed for radioactive contamination before release into unrestricted/clean environs. (See attachment 2)
- **Shipping Surveys** - Radiation and contamination surveys will be performed on radioactive material packaged to be shipped off site in accordance with 49 CFR requirements. Shipping surveys are considered QA records and will be stored and maintained as part of the Kaiser Project file.

6.10 Airborne Radioactivity Control

Engineering controls will be utilized to the maximum extent possible to control the production of dust and airborne radioactivity during the Kaiser Remediation Project. Engineered controls may be, but are not limited to, water misting with or without dust control additives.

6.10.1 Locating Air Sampling Equipment

The combination of air samplers and sample counting systems should have a Minimum Detectable Activity (MDA) less than 10 percent of the most restrictive applicable derived air concentration (DAC). Airborne particulate surveys are performed with portable high volume air samplers or personal DataRAM Model pDR1000AN or equivalent as follows:

- (1) In work areas when the potential or existing conditions exist that may generate airborne radioactivity at levels approaching 10 percent of the DAC.
- (2) To ensure compliance with Airborne Radioactivity Area posting requirements.
- (3) Sampling locations should be downstream of potential airborne radioactivity release points.
- (4) The combination of sample collection volume, collection efficiency and counting system MDA should allow detection of intakes exceeding 10 percent of the applicable DAC.

- (5) Signs shall be posted at entrances to areas where airborne radioactivity levels exceed or have the potential to exceed 30 percent of a DAC. These signs shall contain the conventional three-bladed magenta symbol on yellow background and the words "CAUTION, AIRBORNE RADIOACTIVITY AREA."
- (6) In areas where there is the potential for airborne radioactivity in excess of 10 percent of the DAC, personal and/or area air samples will be collected to evaluate worker exposure. The results of air filter measurements in conjunction with worker stay times will be used to control worker inhalation (i.e., DAC-hour tracking).

The following process shall be used to assess compliance with Regulatory Guide 8.25 surveillance requirements.

- (1) Review characterization survey(s) for thorium concentration in soil where work will be performed that will disturb soil or create dust.
- (2) If the Th-232 + Th-228 are less than 200 picocuries per gram (pCi/g) soil, perform occasional air sampling near the dust source. If the Th-232 + Th-228 concentration is 200 pCi/g soil or greater, perform continuous, stationary air sampling near the dust source while workers are present.
- (3) Following collection and measurement compare the results with 10 CFR Part 20, Appendix B, Table 1, DAC limit, (2×10^{-12} mCi/ml). If the analytical results for the air samples exceed 10 percent of the DAC or 2×10^{-13} mCi/ml, respiratory protection such as supplied air or particulate masks may be provided for any workers in the affected area.

6.11 Respiratory Protection Program

With the application of process controls, engineering controls, and procedures to control concentrations of radioactive materials in air as required by 10 CFR 20.1701, the use of respiratory protection during the project is not anticipated. If engineering and process controls do not reduce the levels of airborne radioactivity below 1 derived air concentrations (DAC) limit (or when a worker could receive 12 DAC-hours in a week), the use of respiratory protection will be considered based on a prospective intake evaluation and consideration of industrial safety factors in accordance with 10 CFR 20.1702. The purpose of the respiratory protection program is to adequately limit intakes of airborne radioactive materials for workers in restricted areas and to keep the TEDE ALARA. The respiratory protection program shall incorporate the applicable requirements of 20.1701 - 20.1704, Appendix A of 10 CFR Part 20, and the applicable guidance in Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection," and NUREG-0041, Rev. 1, "Manual of Respiratory Protection Against Airborne Radioactive Material." The program will be implemented using written procedures to address all the elements of the respiratory protection

program as required by 10 CFR 20.1703. Training, medical screening, and fit testing shall be performed prior to the issuance of National Institute for Occupational Safety and Health-certified respiratory protection equipment that is used to limit intakes of airborne radioactivity.

6.12 SWP and Work Controls

The SWP is an administrative tool used to control work occurring inside a restricted area and to inform personnel involved with the work of specific hazards and precautions in the work area when safety precautions and controls are not specified in a procedure.

Additionally, the SWP will instruct the workers as to what protective equipment will be needed and what monitoring will be required. Work involving thorium in a restricted area at the Kaiser site will be performed under the authority of a SWP or a procedure. Work will be administratively controlled via SWP and/or procedures. A RECON SWP will be issued every week and reviewed and updated through out the week by the RECON LHPT or his designee. At a minimum, the SWP will include the following information:

- Task(s) to be performed
- Location of Task(s)
- Nonradiological Hazards Involved with the Task(s)
- Radiological Hazards Involved with the Task(s)
- Representative Radiological Survey Results
- Protective Measures and Engineering Controls
- Survey, Monitoring, and Dosimetry Requirements
- Special Use or Restraints
- Names and signatures of individuals performing the task(s)
- Issue and Expiration Dates

Prior to the initial start of work, a pre-job briefing shall be given to all personnel involved in performing the work. Personnel working under the SWP shall document (by their signature) that they have read and understand the SWP and that they have received and understand the instructions from the pre-job briefing, if performed. This applies to any and all subsequent SWP revisions.

6.13 Emergency Action Procedure

A procedure containing detailed instructions for medical, security, fire, and adverse weather emergency response is included with the RECON EHASP.

6.14 Posting and Labeling

Areas where radioactive materials are present will be posted in accordance with the requirements of 10 CFR 20.1902. Containers of radioactive materials and sealed source materials will be marked with the standard radiation symbol and the words CAUTION RADIOACTIVE MATERIAL. Areas will be classified and posted as RADIATION AREAS or RADIOACTIVE MATERIAL AREAS, per 10 CFR 20.1902. In addition, areas where radioactive material is handled in a dispersible form, such that the potential for inhalation of airborne radioactivity exists, are designated as controlled contamination areas and will be posted as CONTAMINATION AREAS OR AIRBORNE RADIOACTIVITY AREAS. The RECON LHPT or designee will routinely inspect the site for proper postings, damaged or missing postings, and evaluate the need for additional postings.

6.15 Records and Reports

The RECON LHPT will review exposure results. A copy of the dosimetry results as they relate to each named employee will be maintained on site and available for inspection. Personnel monitoring reports will be maintained in accordance with guidance from NRC Regulatory Guide 8.7, Rev. 1, 1992. Records of surveys and radiation dosimetry results will be considered quality records and will be stored and maintained as part of the Kaiser Remediation Project Files. Summation of internal and external doses will be performed in accordance with 10 CFR 20 and appropriate regulatory guidance such as NRC Regulatory Guide 8.34.

Air sampling results will be periodically reviewed by the RECON LHPT. Records of all air sampling results and air sampling instrumentation calibrations will be considered quality records and will be stored and maintained as part of the Kaiser Remediation Project Files.

Records of individual exposures to radiation, radiation surveys and monitoring results, and the disposal of material will be maintained in accordance with 10 CFR 20 Subpart L (Records). Records related to the radiation safety program will be maintained as part of the Kaiser Remediation Project Files.

Safe Work Permit (SWP)
Attachment 1

Revision 02

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

ATTACHMENT 1

Safety Work Permit **Copy To Be Posted In The Work Area**	
Project Name: Thorium Remediation Project Issue Date: Expiration Date:	
Emergency Contact(s): Phone No.:	
Specific Job Location and Task to be Performed:	
Personnel Monitoring	Protective Equipment and Clothing
Bioassay:	Respiratory Protection:
Radiation Dosimeter	Protection Clothing:
Area Airborne Monitoring	Other:
Near Representative Workers	
Other	
Non-Radiological Hazards	Radiological Conditions and Hazards
	Exposure Rate:
	Contamination:
	Air Sample Results:
Access Control Instructions	Survey Requirements
Special Use or Restraints:	
Review and Approvals	
Review:	Date:
Approval:	Date:

ATTACHMENT 1

SWP Authorized Personnel List****To Be Signed By All Personnel Performing Work On-Site****

By signing the form below, the Radiation Worker agrees to comply with all of the requirements listed in the Safety Work Permit and the instructions given by the RECON LHPT, HPT, HSS, or designee.

Name (Print):	Signature:	ID Number	Date

Attach to SWP

RHASP Acceptance Form
Attachment 2

Revision 02

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

Attachment 2

REMEDIAL CONSTRUCTION SERVICES, L.P. (RECON)
THORIUM REMEDIATION PROJECT

RADIATION HEALTH AND SAFETY PLAN
ACCEPTANCE FORM

Instructions: This form is to be completed by each person prior to working on the subject project work site and returned to the Project Radiation Safety Officer or Health and Safety Officer.

Project: _____

Date: _____

I understand my health and safety responsibilities and agree to perform my work in accordance with those responsibilities.

Signed _____

Print Name _____

Company Name _____

Date _____

NRC Form 3
Attachment 3

Revision 02

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442



NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST RADIATION (PART 20); NOTICES; INSTRUCTIONS AND REPORTS TO WORKERS; INSPECTIONS (PART 19); EMPLOYEE PROTECTION

WHAT IS THE NUCLEAR REGULATORY COMMISSION?

The Nuclear Regulatory Commission is an independent Federal regulatory agency responsible for licensing and inspecting nuclear power plants and other commercial uses to radioactive materials.

WHAT DOES THE NRC DO?

The NRC's primary responsibility is to ensure that workers and the public are protected from unnecessary or excessive exposure to radiation and that nuclear facilities, including power plants, are constructed to high quality standards and operated in a safe manner. The NRC does this by establishing requirements in Title 10 of the Code of Federal Regulations (10 CFR) and in licenses issued to nuclear users.

WHAT RESPONSIBILITY DOES MY EMPLOYER HAVE?

Any company that conducts activities licensed by the NRC must comply with the NRC's requirements. If a company violates NRC requirements, it can be fined or have its license modified, suspended or revoked.

Your employer must tell you which NRC radiation requirements apply to your work and must post NRC Notices of Violation involving radiological working conditions.

WHAT IS MY RESPONSIBILITY?

For your own protection and the protection of your co-workers, you should know how NRC requirements relate to your work and should obey them. If you observe violations of the requirements or have a safety concern, you should report them.

WHAT IF I CAUSE A VIOLATION?

If you engaged in deliberate misconduct that may cause a violation of the NRC requirements, or would have caused a violation if it had not been detected, or deliberately provided inaccurate or incomplete information to either the NRC or to your employer, you may be subject to enforcement action. If you report such a violation, the NRC will consider the circumstances surrounding your reporting in determining the appropriate enforcement action, if any.

HOW DO I REPORT VIOLATIONS AND SAFETY CONCERNS?

If you believe that violations of NRC rules or the terms of the license have occurred, or if you have a safety concern, you should report them immediately to your supervisor. You may report violations or safety concerns directly to the NRC. However, the NRC encourages you to raise your concerns with the

licensee since it is the licensee who has the primary responsibility for, and is most able to ensure, safe operation of nuclear facilities. If you choose to report your concern directly to the NRC, you may report this to an NRC Inspector or call or write to the NRC Regional Office serving your area. If you send your concern in writing, it will assist the NRC in protecting your identity if you clearly state in the beginning of your letter that you have a safety concern or that you are submitting an allegation. The NRC's toll-free SAFETY HOTLINE for reporting safety concerns is listed below. The addresses for the NRC Regional Offices and the toll-free telephone numbers are also listed below.

WHAT IF I WORK WITH RADIOACTIVE MATERIAL OR IN THE VICINITY OF A RADIOACTIVE SOURCE?

If you work with radioactive materials or near a radiation source, the amount of radiation exposure that you are permitted to receive may be limited by NRC regulations. The limits on your exposure are contained in sections 20.1201, 20.1207, and 20.1208 of Title 10 of the Code of Federal Regulations (10 CFR 20) depending on the part of the regulations to which your employer is subject. While these are the maximum allowable limits, your employer should also keep your radiation exposure as far below those limits as "reasonably achievable."

MAY I GET A RECORD OF MY RADIATION EXPOSURE?

Yes. Your employer is required to advise you of your dose annually if you are exposed to radiation for which monitoring was required by NRC. In addition, you may request a written report of your exposure when you leave your job.

HOW ARE VIOLATIONS OF NRC REQUIREMENTS IDENTIFIED?

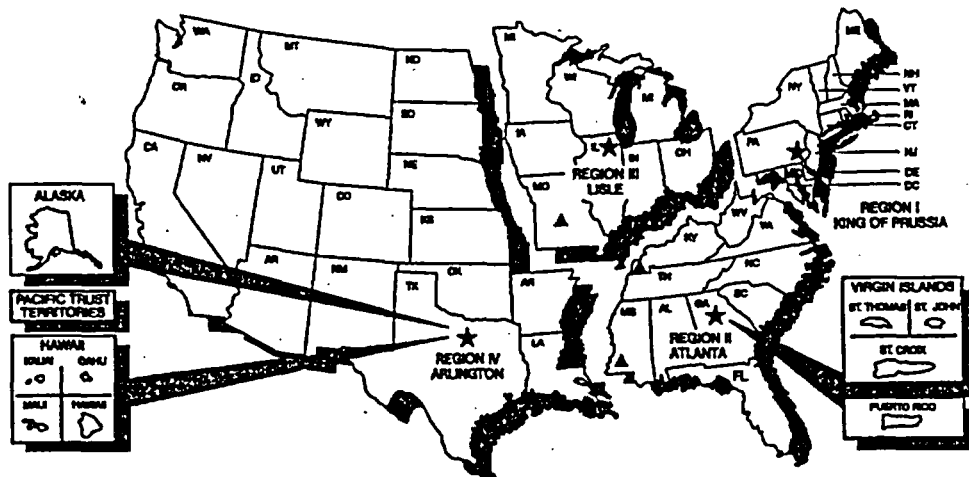
NRC conducts regular inspections at licensed facilities to assure compliance with NRC requirements. In addition, your employer and site contractors conduct their own inspections to assure compliance. All inspectors are protected by Federal law. Interference with them may result in criminal prosecution for a Federal offense.

MAY I TALK WITH AN NRC INSPECTOR?

Yes. NRC inspectors want to talk to you if you are worried about radiation safety or have other safety concerns about licensed activities, such as the quality of construction or operations at your facility. Your employer may not prevent you from talking with an inspector. The NRC will make all reasonable efforts to protect your identity where appropriate and possible.

MAY I REQUEST AN INSPECTION?

Yes. If you believe that your employer has not corrected violations involving radiological working conditions, you may request an inspection. Your request



▲ - Callaway Plant Site in Missouri and Grand Gulf Plant Site in Mississippi are under the purview of Region IV.
The Paducah Gaseous Diffusion Plant in Kentucky is under the purview of Region III.

should be addressed to the nearest NRC Regional Office and must describe the alleged violation in detail. It must be signed by you or your representative.

HOW DO I CONTACT THE NRC?

Talk to an NRC Inspector on-site or call or write to the nearest NRC Regional Office in your geographical area (see map below). If you call the NRC's toll-free SAFETY HOTLINE during normal business hours, your call will automatically be directed to the NRC Regional Office for your geographical area. If you call after normal business hours, your call will be directed to the NRC's Headquarters Operations Center, which is manned 24 hours a day.

CAN I BE FIRED FOR RAISING A SAFETY CONCERN?

Federal Law prohibits an employer from firing or otherwise discriminating against you for bringing safety concerns to the attention of your employer or the NRC. You may not be fired or discriminated against because you:

- ask the NRC to enforce its rules against your employer;
- refuse to engage in activities which violate NRC requirements;
- provide information or are about to provide information to the NRC or your employer about violations of requirements or safety concerns;
- are about to ask for, or testify, help, or take part in an NRC, Congressional, or any Federal or State proceeding.

WHAT FORMS OF DISCRIMINATION ARE PROHIBITED?

It is unlawful for an employer to fire you or discriminate against you with respect to pay, benefits, or working conditions because you help the NRC or raise a safety issue or otherwise engage in protected activities. Violations of Section 211 of the Energy Reorganization Act (ERA) of 1974 (42 U.S.C. 5851) include actions such as harassment, blacklisting, and intimidation by employers of (i) employees who bring safety concerns directly to their employers or to the NRC; (ii) employees who have refused to engage in an unlawful practice, provided that the employee has identified the illegality to the employer; (iii) employees who have testified or are about to testify before Congress or in any Federal or State proceeding regarding any provision (or proposed provision) of the ERA or the Atomic Energy Act (AEA) of 1954; (iv) employees who have commenced or caused to be commenced a proceeding for the administration or enforcement of any requirement imposed under the ERA or AEA or who have, or are about to, testify, assist, or participate in such a proceeding.

HOW DO I FILE A DISCRIMINATION COMPLAINT?

If you believe that you have been discriminated against for bringing violations or safety concerns to the NRC or your employer, you may file a complaint with the NRC or the U.S. Department of Labor (DOL) if you desire a personal

remedy, you must file a complaint with the DOL pursuant to Section 211 of the ERA. Your complaint to the DOL must describe in detail the basis for your belief that the employer discriminated against you on the basis of your protected activity, and it must be filed in writing either in person or by mail within 180 days of the discriminatory occurrence. Additional information is available at the DOL website at www.osha.gov. Filing an allegation, complaint, or request for action with the NRC does not extend the requirement to file a complaint with the DOL within 180 days. You must file the complaint with the DOL. To do so you may contact the Allegation Coordinator in the appropriate NRC Region, as listed below, who will provide you with the address and telephone number of the correct OSHA Regional office to receive your complaint. You may also check your local telephone directory under the U.S. Government listings for the address and telephone number of the appropriate OSHA Regional office.

WHAT CAN THE DEPARTMENT OF LABOR DO?

If your complaint involves a violation of Section 211 of the ERA by your employer, it is the DOL, NOT THE NRC, that provides the process for obtaining personal remedy. The DOL will notify your employer that a complaint has been filed and will investigate your complaint.

If the DOL finds that your employer has unlawfully discriminated against you it may order that you be reinstated, receive back pay, or be compensated for any injury suffered as a result of the discrimination and be paid attorney's fees and costs.

Relief will not be awarded to employees who engage in deliberate violations of the Energy Reorganization Act or the Atomic Energy Act.

WHAT WILL THE NRC DO?

The NRC will evaluate each allegation of harassment, intimidation, or discrimination. Following this evaluation, an investigator from the NRC's Office of Investigations may interview you and review available documentation. Based on the evaluation, and, if applicable, the interview, the NRC will assign a priority and a decision will be made whether to pursue the matter further through investigation. The assigned priority is based on the specifics of the case and its significance relative to other ongoing investigations. The NRC may not pursue an investigation to the point that a conclusion can be made whether the harassment, intimidation, or discrimination actually occurred. Even if NRC decides not to pursue an investigation, if you have filed a complaint with DOL the NRC will monitor the results of the DOL investigation.

If the NRC or DOL finds that unlawful discrimination has occurred, the NRC may issue a Notice of Violation to your employer, impose a fine, or suspend, modify, or revoke your employer's NRC license.

UNITED STATES NUCLEAR REGULATORY COMMISSION REGIONAL OFFICE LOCATIONS

A representative of the Nuclear Regulatory Commission can be contacted by employees who wish to register complaints or concerns about radiological working conditions or other matters regarding compliance with Commission rules and regulations at the following addresses and telephone numbers.

REGIONAL OFFICES

REGION	ADDRESS	TELEPHONE
I	U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, PA 19406-1415	(800) 432-1156
II	U.S. Nuclear Regulatory Commission, Region II Atlanta Federal Center 61 Forsyth Street, S.W., Suite 23T85 Atlanta, GA 30303-3415	(800) 577-8510
III	U.S. Nuclear Regulatory Commission, Region III 801 Warrenville Road Lisle, IL 60532-4351	(800) 522-3025
IV	U.S. Nuclear Regulatory Commission, Region IV 611 Ryan Plaza Drive, Suite 400 Arlington, TX 76011-8064	(800) 952-9677

To report safety concerns or violations of NRC requirements by your employer,

telephone:

NRC SAFETY HOTLINE

1-800-695-7403

To report incidents involving fraud, waste, or abuse by an NRC employee or NRC contractor,

telephone:

**OFFICE OF THE
INSPECTOR GENERAL**

HOTLINE

1-800-233-3497

Access Control Log
Attachment 4

Revision 02

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

Attachment 4

Remedial Construction Services, L.P. (RECON)
Thorium Remediation Project
Access Control Log

Date	Name	SSN / ID #	Signature	Time In	Time Out	Frisking Results

Reviewed by: _____

Entrance/Unrestricted Release Form
Attachment 5

Revision 02

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

Attachment 5

Remedial Construction Services, L.P. (RECON)
Thorium Remediation Project
Entrance / Unrestricted Release Form

Instrument:	Calibration Due:	Instrument:	Calibration Due:
-------------	------------------	-------------	------------------

Company	VIN/ID #	Survey Location	CPM - Fixed	CPM - Removable	DPM - Fixed	DPM - Removable

Completed by: _____

Reviewed by: _____

NRC Release Limit Criteria
Attachment 6

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

TABLE I
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDE ^a	AVERAGE ^{b c}	MAXIMUM ^{b d}	REMOVABLE ^{b e}
U-nat, U-235, U-238, and associated decay products	5,000 dpm α /100 cm ²	15,000 dpm α /100 cm ²	1,000 dpm α /100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm ²	3000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm β - γ /100 cm ²	15,000 dpm β - γ /100 cm ²	1000 dpm β - γ /100 cm ²

^aWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^bAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^cMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

^dThe maximum contamination level applies to an area of not more than 100 cm².

^eThe amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Area Survey Form
Attachment 7

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

Attachment 7

Remedial Construction Services, L.P. (RECON)
Thorium Remediation Project
Area Survey Form

Instrument	Calibration Due
------------	-----------------

Area Surveyed	Survey Location	CPM - Activity	DPM - Activity

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Completed by: _____

Reviewed by: _____

NRC Form 4
Attachment 8

Revision 01

May 2004

Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

NRC FORM 4
(10/2001)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0005

EXPIRES: 10/31/2004

CUMULATIVE OCCUPATIONAL DOSE HISTORY

Estimated burden per response to comply with this mandatory information collection request: 30 minutes. The record is used to ensure that doses to individuals do not exceed regulatory limits. This information is required to record an individual's lifetime occupational exposure to radiation to ensure that the cumulative exposure to radiation does not exceed regulatory limits. Send comments regarding the burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to bis1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0005), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. NAME (LAST, FIRST, MIDDLE INITIAL)				2. IDENTIFICATION NUMBER		3. ID TYPE		4. SEX MALE <input type="checkbox"/> FEMALE <input type="checkbox"/>		5. DATE OF BIRTH (MM/DD/YYYY)	
6. MONITORING PERIOD (MM/DD/YYYY - MM/DD/YYYY)				7. LICENSEE NAME		8. LICENSE NUMBER		9. RECORD ESTIMATE <input type="checkbox"/> NO RECORD <input type="checkbox"/>		10. ROUTINE PSE <input type="checkbox"/>	
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE		18. TODE			
6. MONITORING PERIOD				7. LICENSEE NAME		8. LICENSE NUMBER		9. RECORD ESTIMATE <input type="checkbox"/> NO RECORD <input type="checkbox"/>		10. ROUTINE PSE <input type="checkbox"/>	
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE		18. TODE			
6. MONITORING PERIOD				7. LICENSEE NAME		8. LICENSE NUMBER		9. RECORD ESTIMATE <input type="checkbox"/> NO RECORD <input type="checkbox"/>		10. ROUTINE PSE <input type="checkbox"/>	
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE		18. TODE			
6. MONITORING PERIOD				7. LICENSEE NAME		8. LICENSE NUMBER		9. RECORD ESTIMATE <input type="checkbox"/> NO RECORD <input type="checkbox"/>		10. ROUTINE PSE <input type="checkbox"/>	
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE		18. TODE			
6. MONITORING PERIOD				7. LICENSEE NAME		8. LICENSE NUMBER		9. RECORD ESTIMATE <input type="checkbox"/> NO RECORD <input type="checkbox"/>		10. ROUTINE PSE <input type="checkbox"/>	
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE		18. TODE			
6. MONITORING PERIOD				7. LICENSEE NAME		8. LICENSE NUMBER		9. RECORD ESTIMATE <input type="checkbox"/> NO RECORD <input type="checkbox"/>		10. ROUTINE PSE <input type="checkbox"/>	
11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE		18. TODE			
19. SIGNATURE OF MONITORED INDIVIDUAL				20. DATE SIGNED		21. CERTIFYING ORGANIZATION		22. SIGNATURE OF DESIGNEE		23. DATE SIGNED	

**INSTRUCTIONS AND ADDITIONAL INFORMATION PERTINENT TO THE
COMPLETION OF NRC FORM 4**
(All doses should be stated in rems)

1. Type or print the full name of the monitored individual in the order of last name (include "Jr," "Sr," "III," etc.), first name, middle initial (if applicable).
2. Enter the individual's identification number, including punctuation. This number should be the 9-digit social security number if at all possible. If the individual has no social security number, enter the number from another official identification such as a passport or work permit.
3. Enter the code for the type of identification used as shown below:

CODE	ID TYPE
SSN	U.S. Social Security Number
PPN	Passport Number
CSI	Canadian Social Insurance Number
WPN	Work Permit Number
PADS	PADS Identification Number
OTH	Other
4. Check the box that denotes the sex of the individual being monitored.
5. Enter the date of birth of the individual being monitored in the format MM/DD/YYYY.
6. Enter the monitoring period for which this report is filed. The format should be MM/DD/YYYY - MM/DD/YYYY.
7. Enter the name of the licensee or facility not licensed by NRC that provided monitoring.
8. Enter the NRC license number or numbers.
9. Place an "X" in Record, Estimate, or No Record. Choose "Record" if the dose data listed represent a final determination of the dose received to the best of the licensee's knowledge. Choose "Estimate" only if the listed dose data are preliminary and will be superseded by a final determination resulting in a subsequent report. An example of such an instance would be dose data based on self-reading dosimeter results and the licensee intends to assign the record dose on the basis of TLD results that are not yet available.
10. Place an "X" in either Routine or PSE. Choose "Routine" if the data represent the results of monitoring for routine exposures. Choose "PSE" if the listed dose data represents the results of monitoring of planned special exposures received during the monitoring period.

- If more than one PSE was received in a single year, the licensee should sum them and report the total of all PSEs.
11. Enter the deep dose equivalent (DDE) to the whole body.
 12. Enter the eye dose equivalent (LDE) recorded for the lens of the eye.
 13. Enter the shallow dose equivalent recorded for the skin of the whole body (SDE, WB).
 14. Enter the shallow dose equivalent recorded for the skin of the extremity receiving the maximum dose (SDE, ME).
 15. Enter the committed effective dose equivalent (CEDE).
 16. Enter the committed dose equivalent (CDE) recorded for the maximally exposed organ.
 17. Enter the total effective dose equivalent (TEDE). The TEDE is the sum of items 11 and 15.
 18. Enter the total organ dose equivalent (TODE) for the maximally exposed organ. The TODE is the sum of items 11 and 16.
 19. Signature of the monitored individual. The signature of the monitored individual on this form indicates that the information contained on the form is complete and correct to the best of his or her knowledge.
 20. Enter the date this form was signed by the monitored individual.
 21. [OPTIONAL] Enter the name of the licensee or facility not licensed by NRC, providing monitoring for exposure to radiation (such as a DOE facility) or the employer if the individual is not employed by the licensee and the employer chooses to maintain exposure records for its employees.
 22. [OPTIONAL] Signature of the person designated to represent the licensee or employer entered in item 21. The licensee or employer who chooses to countersign the form should have on file documentation of all the information on the NRC Form 4 being signed.
 23. [OPTIONAL] Enter the date this form was signed by the designated representative.

PRIVACY ACT STATEMENT

Pursuant TO 5 U.S.C. 552a(e)(3), enacted into law by Section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the U.S. Nuclear Regulatory Commission (NRC) on NRC Form 4. This information is maintained in a system of records designated as NRC-27 and described at 65 Federal Register 56434 (September 18, 2000), or the most recent Federal Register publication of the Nuclear Regulatory Commission's "Republication of Systems of Records Notices" that is available at the NRC Public Document Room, 11555 Rockville Pike, Rockville, Maryland, or located in NRC's Agencywide Documents Access and Management System (ADAMS).

1. **AUTHORITY:** 42 U.S.C. 2073, 2093, 2095, 2111, 2133, 2134, 2201(o) (1996); 10 CFR 20.2106, 20.2201-20.2204, and 20.2206 (2000); Executive Order 9397, November 22, 1943.
2. **PRINCIPAL PURPOSE(S):** The information is used by the NRC in its evaluation of the risk of radiation exposure associated with the licensed activity and in exercising its statutory responsibility to monitor and regulate the safety and health practices of its licensees. The data permits a meaningful comparison of both current and long-term exposure experience among types of licensees and among licensees within each type. Data on your exposure to radiation is available to you upon your request.
3. **ROUTINE USE(S):** The information may be used to provide data to other Federal and State agencies involved in monitoring and/or evaluating radiation exposure received by individuals monitored for radiation exposure while employed by or visiting or temporarily assigned to certain NRC licensed facilities; to return data provided by licensee upon request. The information may also be disclosed to an appropriate Federal, State, local, or Foreign agency in the event the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, local, or Foreign agency to the extent relevant and necessary for an NRC decision about you or to the extent relevant and necessary for that agency's decision about you. Information from this form may also be disclosed, in the course of discovery and in presenting evidence, to a Congressional office to respond to their inquiry made at your request, or to NRC-paid experts, consultants, and others under contract with the NRC, on a need-to-know basis.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** It is voluntary that you furnish the requested information, including social security number (identification number). The social security number is used to assure that NRC has an accurate identifier not subject to the coincidence of similar names or birth dates among the large number of persons on whom data is maintained and to assure that there are no missed doses or monitoring periods and an individual gets a complete dose history when requested. The licensee must complete NRC Form 5 on each individual for whom personnel monitoring is required under 10 CFR 20.2106. Failure to do so may subject the licensee to enforcement action in accordance with 10 CFR 20.2401.
5. **SYSTEM MANAGER(S) AND ADDRESS:** REIRS Project Manager, Radiation Protection and Health Effects Branch, Division of Regulatory Applications, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001

RECON Work Plan


RECON's Work Plan

Thorium Remediation Project
Tulsa, Oklahoma

REVISION: 01

EFFECTIVE DATE: MAY 2004


J. W. (Bill) Vinzant – Project Manager


Date

Kaiser Aluminum & Chemical Corporation

RECON Work Plan

RECON's Work Plan
Thorium Remediation Project
Tulsa, Oklahoma

REVISION: 01

EFFECTIVE DATE: MAY 2004

 5/7/04

Danny P. Brown – Project Manager / Date

 5/7/04

Richard Lewis – Quality Control Supervisor / Date

Remedial Construction Services, L.P.

Thorium Remediation Project
Tulsa Facility
Tulsa, Oklahoma

RECON Work Plan

Project No. 2-1719

Prepared for:

Kaiser Aluminum & Chemical Corporation

Baton Rouge, Louisiana

Prepared by:
Remedial Construction Services, L.P.
9720 Derrington
Houston, Texas 77064
(281) 955-2442

Revision 01
Effective Date: May 2004

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List of Acronyms and Abbreviations

ACM	Asbestos Containing Material
C/L	Center Line
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation
El.	Elevation
F/L	Flow Line
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
I.D.	Inside Diameter
NRC	U.S. Nuclear Regulatory Commission
OSHA	Occupational Health and Safety Administration
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
RECON	Remedial Construction Services, L.P.
RHASP	Radiation Health and Safety Plan
RI	Remedial Investigation
ROW	Right of Way
TOB	Top of Bank
TOS	Top of Slope
TSD	Transportation, Storage and Disposal Facility
UP	Union Pacific Railroad

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I.

PROJECT OVERVIEW

The former Kaiser Aluminum Specialty Products facility is located at 7311 East 41st Street in Tulsa, Oklahoma (Figure WP B 1). It is situated in Tulsa County, Oklahoma, about 5 miles southeast of the downtown center of the City of Tulsa. The site initially occupied approximately 23 acres of land on both sides of 41st Street. Currently, a 3-acre parcel south of 41st Street contains an active aluminum extrusion and fabrication facility. North of East 41st Street are several parcels of land previously devoted to refining, processing, and waste disposal functions. This acreage is split by the Union Pacific Railroad (UP) right-of-way. An approximate 3.5-acre parcel south of the railroad (known as the former operational area) houses an active office building and several inactive industrial structures. An approximate 14.0-acre land area (known as the pond parcel) located north of the railroad contains a freshwater pond, a retention pond, a former reserve pond area, and the Flux Building area. The Thorium Remediation Project involves the former operational area and the pond parcel.

The Retention Pond currently occupies 8 acres of the 14-acre land parcel north of the railroad. The water level in the Retention Pond varies, based on seasonal precipitation. The Retention Pond is surrounded by a well-maintained berm and there are no surface water discharges from the pond. The Retention Pond is permitted by the Oklahoma Water Resources Board. Occupying approximately 4 acres on the western portion of this parcel is the area of the former Freshwater Pond. The Freshwater Pond was backfilled in October and November 2002. Northeast of the Retention Pond is the area of the former Reserve Pond (approximately 1.5 acres). The Reserve Pond was backfilled in the late 1960s and is currently covered with grass.

Extensive site characterization activities have been conducted since 1994 within the 14.0-acre land area of the facility known as the pond parcel. These characterization activities have indicated the presence of residual radioactive material within a 10-acre portion of the pond parcel. The radioactive material identified within this portion of land is thorium-bearing dross containing the isotopes Th-232, thorium-230 (Th-230), and thorium-228 (Th-228). The affected portion of the parcel contains the Retention Pond and former Reserve Pond area. The unaffected portion of the pond parcel contains a former Freshwater Pond area.

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The pond parcel area considered for remediation is bounded by the south fence line, the former Fresh Water Pond embankment on the west, Fulton Creek ditch on the north, the east fence line, and the northern and eastern edges of the Flux Building and paved area. A central feature of this area is the Retention Pond and associated embankments. Thorium-bearing dross was present on land adjacent to current Kaiser Property along the east and south fence lines and represented the margins of the material. Kaiser has remediated the adjacent land by excavation and storing affected soil within the pond parcel. Affected soil generated during remediation of the adjacent land is considered as part of the on-site decommissioning.

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I.A

WORK PLAN COMPONENTS

The following Sections identify specific activities that will occur during the project. The Work Plan contains the following components:

- Pre-Work Submittals and Permits;
- Mobilization;
- Site Preparation;
- Site Management Plan;
- Water Management Plan;
- Excavation Plan;
- Radiation Sorting and Material Handling;
- Transportation and Disposal Plan;
- Backfill Operations (Below Criteria and Clean Offsite Materials);
- Demolition Plan;
- Site Restoration; and
- Demobilization.

Details on each component are provided below.

I.A.1

PRE-WORK SUBMITTALS AND PERMITS

Prior to mobilization and before any intrusive activities begin at the site, RECON, with the assistance of the oversight engineer and the owner, will prepare the following submittals;

- Railroad Access Agreement - The agreement will need to be executed prior to performing any work on Union Pacific (UP) ROW. RECON will work with Kaiser and PENN Environmental to expedite the processing of the agreement.
- Storm Water Pollution Prevention Plan (SWP3) and Earth Change Permit - RECON will be submitting the permit application with the assistance of A&M Engineering. The permit will be in place prior to earthmoving activities.

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- EHASP and RHASP – A site specific Environmental Health and Safety Plan, and a Radiation Health and Safety Plan have been submitted and approved under separate cover to the owner.
- Water Management Plan – The water management plan will identify how water from the site will be managed. Tasks that will require specific handling procedures will be identified in this plan and referenced in the Work Plan Procedures Manual (submitted under separate cover) and applicable permits.
- Others – As identified by the contract, required by the City of Tulsa, and established in the project submittal register.

I.A.2

MOBILIZATION

Following acceptance of the pre-work submittals or as approved by the owner, RECON will identify where the office trailers and temporary facilities will be installed. The Kaiser Site Administrator or his designee will approve these locations.

RECON will procure the services of a local RLS (Surveyor) who will establish property boundaries, monuments, identify limits of excavation as well as establishing/verifying a topographic survey of the site. A grid system will be laid out to identify specific areas of excavation for tracking purposes. See Figure WP B 2.

I.A.3

SITE PREPARATION

Immediately upon notification of Kaiser's approval of the Work Plan and the pre-work submittals/permits, RECON will initiate the field mobilization of personnel, equipment, and materials necessary to comply with the Work Plan. Initial mobilization and site preparation activities will include:

- Pre-mobilization activities
- Mobilization of field personnel to set up temporary facilities
- Installation of erosion control features
- Installation of the dewatering trench
- Installation/upgrade of vehicular and personnel decontamination station

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- Construction of a temporary holding tank(s)
- Installation of the rail switch and rail spur for material loading
- Construction of the material sorting system

I.A.3.1 PRE-MOBILIZATION ACTIVITIES

Radiation training will be performed initially in Houston with the core group of employees that will be on the project. The radiation-training program will be submitted under separate cover to Kaiser for review and comment.

Additional pre-mobilization activities involve the setup of administration offices and some of the temporary facilities as determined feasible by Kaiser and Penn Environmental.

I.A.3.2 MOBILIZATION OF PERSONNEL/TEMP FACILITIES

RECON will locate an office trailer east of the Maintenance Building for the administrative personnel as shown on Figure No. WP B 3. It is RECON's intent to utilize the Flux Building for holding tailgate safety meetings, a location for signing personnel in and out of the project, and part of the building will be used as Access Control. The Flux Building will be gross decontaminated (swept and pressure washed by RECON and swipe testing shall be conducted by owner and/or engineer) prior to utilizing for the purposes listed above. RECON will demolish the Flux Building and remove the debris at the end of the project as discussed in section I.A.10. Another office trailer for the RECON Radiation Safety Officer (RSO) and Health and Safety Officer will be located near the Flux Building as shown on Figure No. WP B 3. Additional storage boxes, equipment, Port-O-Cans, and materials will be mobilized as needed for Construction.

A local licensed electrician will connect the trailers to the electrical system currently active at the site. In addition, a high-speed internet connection will be installed at the site.

As discussed in previous sections, the surveyor will be mobilized to lay out the site as per the plans and specifications.

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Local, area, and state pre-excavation calls will be made to ensure that all underground and aboveground obstructions are located prior to any excavation tasks.

IA.3.3 *EROSION CONTROL FEATURES*

Erosion controls will be installed around the Site in areas of soil disturbance in order to control erosion and to reduce the potential for impacted material migrating offsite. These controls include berms, silt fencing, and soil barriers. Figure WP B 4 shows some of the proposed locations of erosion controls for construction. These controls will be monitored on a regular basis to ensure they are maintained and functioning properly.

A majority of the storm water at the Site currently drains towards the Fulton Creek either by sheet flow or by existing drainage-ways. The storm water will be allowed to follow the existing drainage ditches until it affects work in a particular area. Diversion systems will be installed so that storm water from non-affected areas does not come in contact with radiologically affected material.

IA.3.4 *INSTALLATION OF DEWATERING TRENCH*

The selected "One pass" contractor will be mobilized to the Site once site controls are established. The contractor will be required to attend a site-specific orientation and a radiation awareness briefing as per the RHASP (provided under separate cover). The lines of installation will be laid out by RECON as per Figure No. WP B 5. The materials that are excavated during the trenching operation will be used as backfill during the trenching activities no stockpiling will occur. A detailed work plan and procedure is under separate cover.

IA.3.5 *DECONTAMINATION STATIONS*

Decontamination pad will be located in the affected area and runoff directed to the retention pond. Prior to leaving the site, equipment that is used in the restricted area will be decontaminated at the decontamination station. The equipment shall then conform with the unrestricted release procedure, REC-WP-3-03 and the NRC Regulatory Guide 1.86, Table 1. The average and the maximum release criteria are 230 alpha dpm per 100cm² maximum 700 alpha dpm per 100cm². Orange barricade fencing or

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IA.3.6 *INSTALLATION OF TEMPORARY HOLDING TANK*

Prior to the installation of the temporary holding tanks a secondary containment area will be constructed with a minimum capacity of 110% of the storage tank. The secondary containment will be constructed of clean off-site material and have a 60 mil. HDPE liner to create a water tight, zero discharge area. The temporary holding tank will then be assembled according to the manufacturer's specifications. The temporary holding tank(s) will be located at the Fresh Water Pond Area as shown in Figure WP B 8.

IA.3.7 *INSTALLATION OF RAILROAD SWITCH AND SPUR*

The Rail Spur must be brought in from the west, just south of the Fresh Water Pond. The Rail Switch will be installed by UP. This will require a detailed work plan and engineering to be submitted to UP (Real Estate) by the installation contractor and specific insurance requirements be submitted. The railroad subcontractor will then install the spur at the location specified by the engineered drawings that have been approved by the UP. Approximately 620 feet of rail just north and parallel of the existing tracks will be built to implement the loading of above-criteria material i.e. Th-232, > 31.1 pCi/g net to < 55 pCi/g net above background. A drawing that depicts the planned location of the spur is located on Figure WP B 7.

An asphalt-loading ramp will be installed adjacent to the newly installed spur, just south of the existing adjacent land area stockpile.

A railroad access agreement will be obtained by Recon prior to any construction in the UP ROW.

IA.3.8 *CONSTRUCTION OF THE SEGREGATION SYSTEMS*

RECON has contracted with Shonka Research and Associates Inc. (SRA) to build, operate, and summarize data from the radiation monitors that will be described in detail in the SRA Work Plan (under separate cover).

IA.4 *SITE MANAGEMENT PLAN*

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existing fencing will be used to demark the Restricted Area from the Radiological Buffer Area to the Access Control Area as per the RHASP (provided under separate cover).

Most of the Site will be located within the Restricted Area. A decontamination area within the Radiological Buffer Area will be used for equipment and personnel leaving the site or entering the Access Control Area (See Figure WP B 6).

The procedure for personnel leaving the Restricted Area is:

Restricted:

Proceed to boot wash station and wash rubber boots.

Radiological Buffer Zone:

Proceed to preliminary frisking station and frisk boots

Proceed to the Flux Building

Remove rubber boots and place in designated location.

Remove coveralls (Tyvek) and place in marked container.

Remove respirator (if applicable)

Remove gloves and place in marked container.

Access Control Area:

Perform personal contamination survey (frisking).

Surrender dosimeter.

Sign out on the Access Control Log.

The procedure for equipment leaving the restricted area is:

Notify the RECON HPA/RSO that an equipment survey is required.

Move equipment to decontamination area.

Conduct visual inspection and remove suspect material.

RECON HPA/RSO (or designee) will conduct survey for fixed and removable contamination utilizing proper instrumentation.

RECON HPA/RSO (or designee) will complete the required Entrance/Unrestricted Release Form.

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I.A.4.1 *SITE SECURITY*

The perimeter fence will be maintained to ensure site security. Before excavation begins around the old spillway area that is outside the perimeter fence a temporary fence will be constructed around the outer limits of the excavation area prior to the existing fence being breached. The Field Superintendent or his designee will check that all gates are locked before leaving the site at the end of each workday.

I.A.4.2 *SITE ACCESS*

Site personnel will be allowed access to all areas of the site after they have completed the site orientation per the site specific Radiation and Environmental Health and Safety Plans and completed all the safety training as specified in the EHASP and RHASP (provided under separate cover).

Visitors - Persons visiting or conducting work at the Kaiser facility are required to be familiar with RECON's health and safety requirements for this site. Visitors will be required to review the Visitor Synopsis located in the RHASP provided under separate cover. Visitors will be accompanied by facility personnel while on the site.

I.A.4.3 *HAUL ROADS*

One way haul roads will be utilized wherever feasible. Haul roads will be of sufficient width with good visibility. Haul roads will be maintained throughout the project and a water truck will be utilized to control dust. When RECON moves to the old "Operations Area" on the south side of the site, a flag person may be posted at the railroad crossing to ensure safe passage.

I.A.4.4 *DUST CONTROL*

Dust will be controlled by spraying with water truck(s) to control dust from the excavation and loading areas, stockpiles, haul roads and backfill operations during the project. Stockpiles may also be covered utilizing plastic sheeting to control dust. Administrative controls such as equipment operation (speed) will be put in place to minimize the generation of dust. Monitoring of dust is described in detail in the EHASP which has been provided under separate cover.

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I.A.5

WATER MANAGEMENT

I.A.5.1 DEWATERING TRENCH

Recon will employ the services of a trenching contractor to install a dewatering trench and attached sumps around the areas to be excavated as identified in Figure WP B 5. The trench will consist of the following:

- Excavation up to 18 feet below existing grade.
- Installation of a perforated pipe within an erosion protecting sock placed along the bottom of the excavation.
- The bottom 3 feet of the trench will be backfilled with clean, washed gravel.
- The remaining portions of the trench will be backfilled with excavation spoils and compacted.
- Six sumps will be installed to collect water.

A detailed work plan and procedure is located in Mersino Trenching LLC's Work Plan (under separate cover).

I.A.5.2 TEMPORARY STORAGE TANK SYSTEM

Two weir tanks (clarifiers) with the capacity of 20,000 gallons each and two 125,000 gallon temporary storage tanks will be used for temporary storage of groundwater/storm water encountered during the remediation project and will be located as identified in Figure WP B 8. These tanks will be located in the former Fresh Water Pond area. Prior to the installation of the temporary storage tanks a secondary containment berm will be constructed with a minimum capacity of 110% of the storage tanks. The secondary containment berm will have a 60 mil. HDPE liner to create a water tight, zero discharge area. The temporary storage tanks will then be assembled according to the manufacturer's specifications. The two weir tanks will be plumbed into the temporary holding tanks and the piping from the sumps in the de-watering trench will be connected to the weir tanks as shown in Figure WP B 8.

A pump and transfer line (4 inch HDPE) will be installed from the holding tanks to the sanitary sewer system inlet located by the Flux Building for discharge of the effluent (upon approval from the City of Tulsa) as shown in Figure WP-B-8.

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I.A.5.3 GROUNDWATER/STORM WATER REMOVAL

After the dewatering trench and the temporary storage tanks are installed, RECON will begin dewatering. RECON expects to pump from the dewatering trench for a period of 4 to 6 weeks while pre-excavation activities are ongoing. Systems will be in place to divert as much of the storm water as possible around the excavation area. When the excavation begins, groundwater/storm water is expected to be encountered; a sump and pump will be used to transfer these waters to the weir tanks. Pumping will not affect any surface features.

I.A.5.4 TEMPORARY STORAGE TANK SAMPLING

Once the first 125,000 gallon tank is filled to a predetermined limit representative samples will be collected (per procedure REC-WP-4-03) for laboratory analysis of the following City of Tulsa discharge criteria.

Table 1
Maximum Allowable Discharge Concentrations

Pollutant	Limitation	Pollutant	Limitation
Arsenic (Total)	1.0 mg/l	Nickel (Total)	3.25 mg/l
Cadmium (Total)	0.60 mg/l	Zinc (Total)	3.00 mg/l
Chromium (Total)	4.0 mg/l	Cyanide (Total)	0.75 mg/l
Copper (Total)	2.0 mg/l	Silver (Total)	1.20 mg/l
Lead (Total)	0.70 mg/l	Oil & Grease	100 mg/l
Mercury (Total)	0.04 mg/l	PH	6.0 to 10.5 S.U.

Any water discharged to the City of Tulsa's sanitary sewer system will comply with the requirements specified in the City of Tulsa Ordinance 19991 and with the requirements and limitations set by 10 CFR Part 20 (Standards for Protection Against Radiation).

Once the results are received from the laboratory they will be forwarded to the City of Tulsa prior to any discharge. Per the City of Tulsa, discharge will be done on a batch basis until a pattern of consistency for sample results can be demonstrated; once that has been achieved a continuous discharge may be approved. Upon notice from the City of Tulsa that continuous discharge will be allowed the sampling frequency will be once

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a week for the first six weeks and then once a month for the duration of the project.

Table 2
NRC Allowable Thorium and Radium Concentrations to Sewers

Radiological Analyte	10 CFR, 20 Appendix B, Table 3 - Avg. Monthly Concentrations- Sewage Disposal (pCi/l)
Ra-226	600
Ra-228	600
Th-228	2,000
Th-230	1,000
Th-232	300

1.A.5.5 MEASUREMENT OF DISCHARGE VOLUME

RECON will install an inline flow meter along with two 4 inch butterfly valves to control and monitor the discharge volume. The net and gross volume will be recorded every time water is discharged and a record of analytical results and water volumes will be kept on site. If pumping or discharge activities are performed at times other than the normal work schedule, two RECON employees will be onsite to ensure safe operations.

1.A.6 EXCAVATION PLAN

1.A.6.1 EXCAVATION SAFETY OVERVIEW

Excavation is one of the most hazardous construction operations. Therefore, under no circumstances are employees allowed to enter an excavation unless the requirements for trenching and excavation found in OSHA regulation 29 CFR 1926 are followed. The general procedures for excavations or trenching sites where no people will be entering include, but are not limited to:

- Prior to excavation, determine the location of utility installations-sewer, telephone, fuel, electric, water lines or any other underground installation that could be encountered during digging. The limits of the excavation areas should be probed to the depth of the excavation.

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- If employees are exposed to public vehicular traffic, they should be given warning vests before digging begins.
- If materials or equipment could fall or roll into an excavation site, either keep them at a minimum of 2 feet (0.61 meters) from the edge of excavation or provide restraining devices.
- Place spoils far enough from the edge of the excavation so that they do not fall back, also a minimum of 2 feet from the edge.
- Provide warning systems such as barricades, hand or mechanical signals, stop logs, reflecting horses and/or post appropriate signage. If such warning is not possible, post a guard constantly to attend to the opening.
- Prohibit employees from working on faces of sloped or benched excavations.
- Ensure that personnel working near heavy equipment maintain a safe distance.
- Should water accumulate in an excavated area, diversion ditches, dikes, or other drainage mechanisms should be built.
- Curtail pedestrian traffic in areas where heavy equipment is operated for excavation purposes.
- If excavation occurs at night, ensure there is proper lighting.

I.A.6.2 EXCAVATION SEQUENCING

Figure WP B 9 depicts the excavation sequencing. RECON will begin excavating in cell D-6 on the south side of the site due to the location of the railroad spur, south of the existing fence, just north of the existing railroad tracks. This is required in order to avoid placing an asphalt loading platform on top of material that requires excavation. The excavation will be backfilled with clean off-site material that meets or exceeds the requirements as specified in Section 02220 Part 2, 2.01.B. The following cells will be excavated in order to provide "clean" loading conditions on the south side of the site;

Cells No.: D-6, D-5, E-5, E-4

To expose the old spillway there is a small area outside of the perimeter fence in cells F-4, F-5 & E-5. The perimeter fence will be opened and a temporary fence will be installed on the outside limits of the excavation to

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maintain security. This excavation area will also be backfilled with clean off-site material.

Once these cells are excavated and surveyed the following excavation areas can begin;

A-0, A-1, A-2, B-0, B-1, B-2, C-0, C-1, C-2, A-3, B-3, C-3, D-0, D-1, D-2, D-3, F-0, E-0, F-1, E-1, F-2, E-2, F-3, E-3, F-4, D-4, C-4, B-4,

The excavator(s) digging in cells will be equipped with a In-situ Contamination Bucket Monitor (ICBM) mounted on the boom so when the bucket is in the curled position it will detect whether it is below criteria or above criteria (setting to be determined). The ICBM is explained in detail in Shonka Research and Associates Inc (SRA) work plan and associated operating procedures (provided under separate cover).

The operator will begin the excavation at the bottom of the cell; these materials will be lifted in a manner that will maintain a consistent density throughout the excavation depths. Once a reasonable homogenous mixture is observed, then the operator will pre-sort the material with the ICBM and determine where the load should be transported, either to a drying pile, a pile identified for above criteria (Th-232, >31.1 pCi/g net), or a pile for below criteria (Th-232, <31.1 pCi/g net), in addition, the material may be utilized for bridging over the next cell for excavation safety or be used for processing. Excavation will cease when Th-232, 3 pCi/g net limit is reached. A surveying tool will be utilized to survey the cell bottom, described in Shonka Research and Associates Inc (SRA) work plan and associated operating procedures (provided under separate cover).

Concrete removal in the Operational Area as described in section 02070 of the project specifications and as shown on Figure 6 of the Contract Drawings or as directed by the engineer will be saw cut in approximately 30 square foot sections or as appropriate for managing. Concrete slabs will then be carefully turned over so that a radiological survey can be conducted, scabbling and or decontamination will occur based upon survey results. When concrete is free of contamination it will be disposed of at an approved disposal facility.

Once concrete is removed in the identified demolition areas, the soils will be excavated and moved to the sorting process area. Digging will start in

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G-5, G-6, F-6, F-7, E-6, E-7, D-6, D-7, C-7, B-6, B-5, C-5, and C-6. Once the area is excavated to below Th-232 3 pCi/g net, a sample will be sent to an approved laboratory for final verification before any backfill is placed. Field changes are anticipated for the grid sequencing and will not be considered a modification to the Work Plan.

I.A.6.3 SOIL SAMPLING AND ANALYSIS

Soil samples will be collected as required by the Decommissioning Plan and the Specifications. The samples will be collected in accordance with procedure REC-WP-4-01. A Chain of Custody will be filled out in accordance with procedure REC-WP-6-01 and the samples will be taken to Outreach Laboratory in Broken Arrow for analysis to ensure that the excavated area being tested is below the Th-232, 3 pCi/g net limit. These samples are not part of the Final Status Survey (FSS). The FSS will be conducted by others in accordance with Final Status Survey Plan.

I.A.6.3 EQUIPMENT

Equipment that will be utilized for the excavation portion of the project will include but not be limited to: Excavators, Dozers, Skid Steers, Articulated Dump Trucks, and Front End Loaders.

I.A.7 RADIATION SORTING AND MATERIAL HANDLING

Excavated soils will be tested in accordance with ASTM D 4643-00 (microwave moisture test) to ensure that prior to sorting operations the moisture content is within the optimum moisture range as determined by Standard Proctor Test for compaction. If materials are found to be too wet, then drying operations will be conducted before the material is stockpiled near the soil sorting system. Once enough material is on hand to start the sorting process, an excavator will place material on a vibrating screen to remove all debris and any material over 6 inches in diameter. The material that passes thru the vibrating screen will be carried to the conveyor that has the Conveyor Mounted SMCM on the vibrating screens' conveyor. Before it passes under the Conveyor Mounted SMCM, material will be leveled with a leveling bar placed across the conveyor to ensure that material is spread evenly across conveyor belt and that only 6-8 inches of material will pass under the Conveyor Mounted SMCM as per SRA requirements. Once material is found to be either below Th-232, 31.1 pCi/g net or above Th-232, 3.1.1 pCi/g net, it will fall into a pants leg

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chute. A gate inside the chute will be electronically controlled by the Conveyor Mounted SMCM, if material is below Th-232, 31.1 pCi/g it will be directed to a stacker conveyor to be stockpiled with other below Th-232, 31.1 pCi/g net material, if material is found to be above Th-232, 31.1 pCi/g net it will be directed to another stacker conveyor to be stockpiled and placed in the loading or blending area.

I.A.8 *TRANSPORTATION AND DISPOSAL PLAN*

Once the material has been sorted and is found to be within the range for offsite disposal, the material will be stockpiled in approximately 100 ton units that will be separated by jersey barriers or other means if not directly loaded into rail cars. The rail cars will be loaded with a front end loader that will be equipped with a bucket scale to maintain a consistent tonnage per rail car. A manifest will be generated for each rail car and a radiological screening will be conducted by the Transportation and Disposal Manager before being allowed to leave the site. US Ecology has been contracted for the Transportation and Disposal of the above criteria material that will be sent offsite. A Transportation and Disposal Manager will be onsite from US Ecology for the duration of this portion of the project. A Transportation and Disposal work plan and associated procedures which will include waste packaging and shipping is in progress from US Ecology and will be incorporated into this work plan (under separate cover).

I.A.9 *BACKFILL OPERATIONS (BELOW CRITERIA AND CLEAN OFFSITE MATERIALS)*

LA.9.1 *BACKFILL OVERVIEW*

Once cells that have been excavated and Th-232, 3 pCi/g net have been verified in the field, samples will be taken as per procedure REC-WP-4-01 and a chain of custody will be completed as per REC-WP-6-01 before being sent to a lab for final results. Once analytical verification and Final Status Survey clearance has been obtained backfill operations will begin using below criteria material or clean offsite material. The fill will be placed in 8 inch lifts and compacted to a minimum of 95 percent of the maximum dry density as determined by laboratory analysis in accordance with Standard Proctor Method and as per section 02220 of the specifications. One compaction test is required for every 10,000 ft² per lift

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as per section 02220 of the specifications. After the below criteria material has been placed and Final Status Survey clearance has been obtained as per section 14, 14.12 of the Decommissioning Plan, clean offsite material that has been tested (one test every 15,000 tons for common earth backfill and one test every 1,000 tons for topsoil) to meet the requirements provided in section 02220 of the specifications, will be used to place a 10 ft. cover over the below criteria material previously placed. This cover will include 6 inches of topsoil. All topsoil will be fine graded to the final contours as shown on the contract drawing and per the specifications. RECON will place topsoil in all disturbed areas as per the specifications.

I.A.9.2 GEOTECHNICAL TESTING

A geotechnical testing subcontractor will be contracted to perform all testing required by the specifications i.e., Gradation, Atterburg Limits, Proctor, Compaction, and Moisture.

I.A.9.3 RADIOLOGICAL ANALYSIS

Radiological soil sample analysis will be performed by Outreach Laboratory of Broken Arrow. Radiological characterization will be defined through gamma spectrometry method, DOE HASL 300. Chemical characterization will be defined as follows: Resource Conservation and Recovery Act (RCRA) metals, method SW 846 6010B, Mercury will be analyzed utilizing method SW 846 7470A. Target Compound List (TCL) Volatile Organic Compounds, method SW 846 8260. Semi-Volatile Organic Compounds, method SW 846 8270C. Polychlorinated biphenyls (PCB's), method SW 846 8081, and pesticides, method SW 846 8082.

I.A.9.4 EQUIPMENT

Equipment that will be utilized for the backfilling portion of the project will include but not be limited to: Dozers, Compactors, Excavators, Dump Trucks and Water Trucks.

I.A.10 DEMOLITION

An experienced Demolition Contractor will perform all demolition activities discussed in section 02070 of the specifications. The Demolition Contractor's detailed Work Plan (under separate cover).

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The Flux Building is to be demolished during construction. This building is considered to be radiologically affected and must be cleared by the owner and or the engineer before demolition can begin.

Coordination of sequential activities will be critical in efficiently completing the demolition of existing structures located at the Site. Activities to be completed prior to and during demolition activities include:

- De-energize/lock out tag out of building
- Removal or relocation of equipment, materials, and debris in and around buildings to be demolished
- Power washing of dust and remaining debris
- Management of wash water and sediments
- QA/QC check
- Demolition of building by subcontractor
- Sizing and loading of scrap metal by subcontractor
- Radiation scan of metal
- Transportation of concrete and wood debris to an approved disposal facility.
- Offsite shipment of metal debris for recycling by subcontractor

I.A.11

SITE RESTORATION

Site Restoration will be completed in phases so that weathering is minimized. All temporary erosion and sediment control features will be kept in place until permanent features can be established and/or constructed. Site restoration will include seeding and mulching, permanent surface water controls and permanent erosion and sedimentation controls as per the specifications and the Decommissioning Plan.

I.A.12

DEMOBILIZATION

The majority of the work will be complete before demobilization begins, as the project winds down personnel and equipment no longer needed to

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perform the remainder of the work will be de-mobilized. All equipment that has been in a controlled area will be decontaminated and pass the Unrestricted Release Criteria before being permitted to leave the site. See procedure REC-WP-3-03.

I.A.13

WORK PLAN MODIFICATION

Modifications to the Work Plan may occur during this project. Prior to any changes being made to the Work Plan a written request for a change will be submitted to the RECON Project Manager for his approval. Upon his approval, a written request will be made to the appropriate Kaiser Management Personnel for review and approval prior to the actual change being made.

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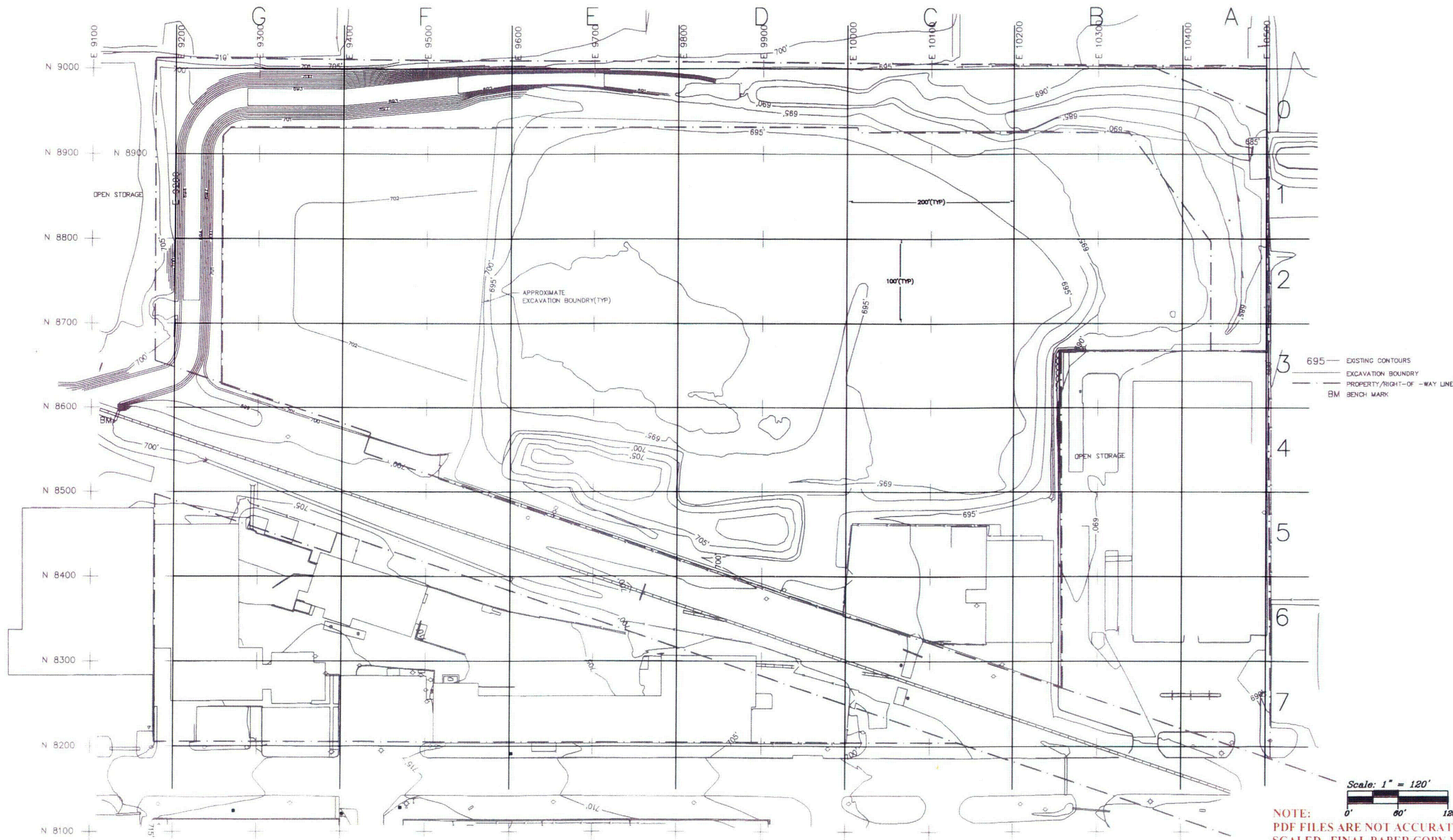
RECON Work Plan

Figures

May, 2004
Job No. 2-1719



1	Revisions			TITLE		9720 Derrington Houston, TX 77064 Phone: (281)955-2442 Fax: (281)890-5172 www.recon-net.com		RECON Remedial Construction Services, L.P.
	No.	By	Description	Date	FIGURE WP B 1 GENERAL LOCATION DRAWING	FIELD BOOK:	DATE: 3-24-04	
					KAISER ALUMINUM	DRAWN: Josh Buchheit	SCALE: Not to Scale	
					Tulsa, Oklahoma	CHECKED: RL		
						CAD File Name: \\kaise\info\kaiser\figures\general_f.dwg		
1						SIGNED BY:		



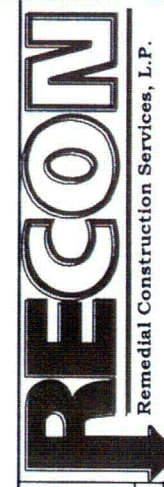
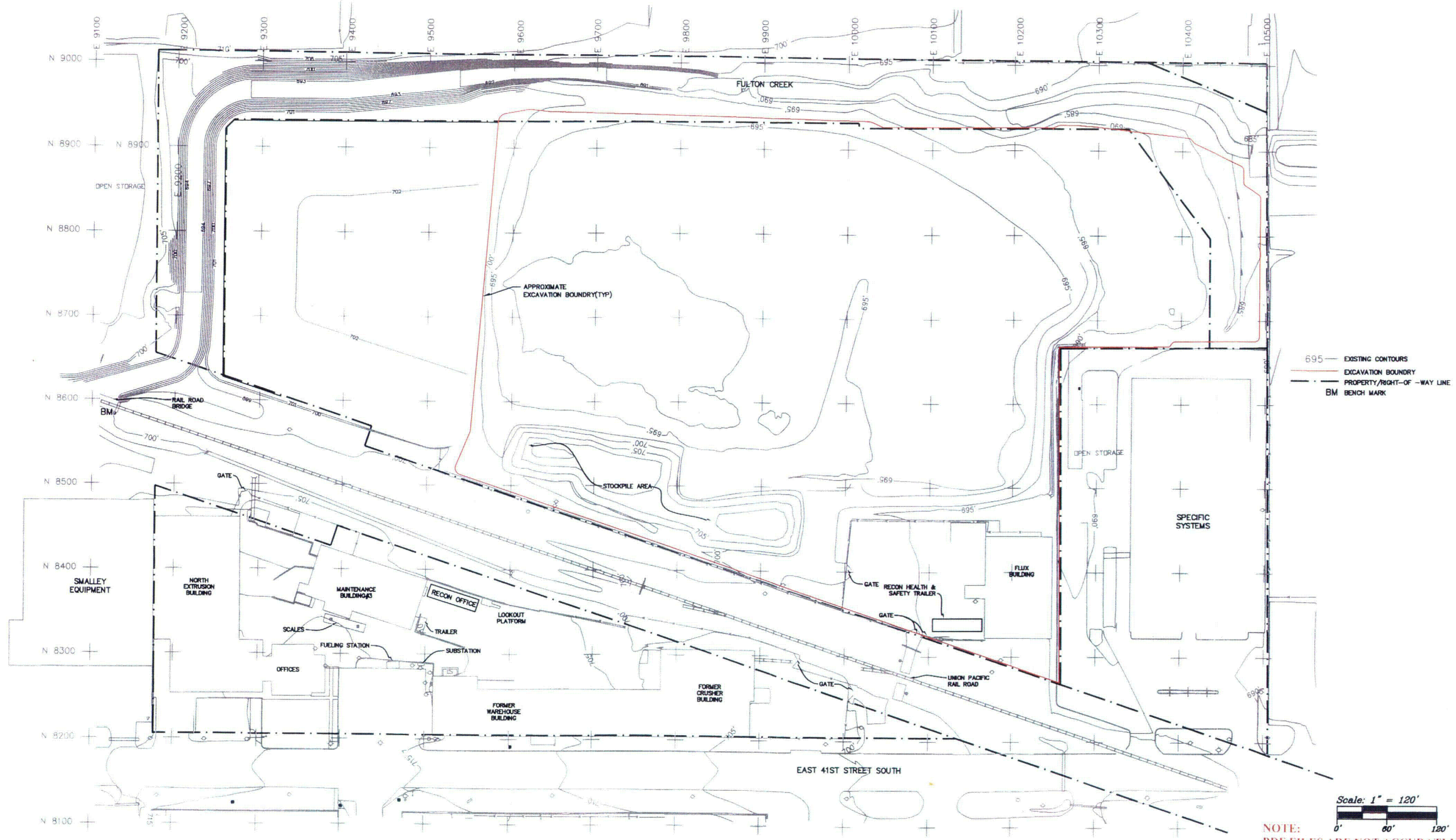
9720 Derrington
Houston, TX 77064
Phone: (281) 955-2442 Fax: (281) 890-5172
www.recon-net.com

DATE: 3-24-09
DRAWN: JEFFREY B. BARNETT
CHECKED: JEFFREY B. BARNETT
CADD File Name: \\Volserv\Jobs\Kaiser\Kaiser\Grid Layout.dwg

TITLE
FIGURE WP B 2
GRID LAYOUT DRAWING
KAISER ALUMINUM
Tulsa, Oklahoma

Revisions	Date
Description	

SIGNED BY:



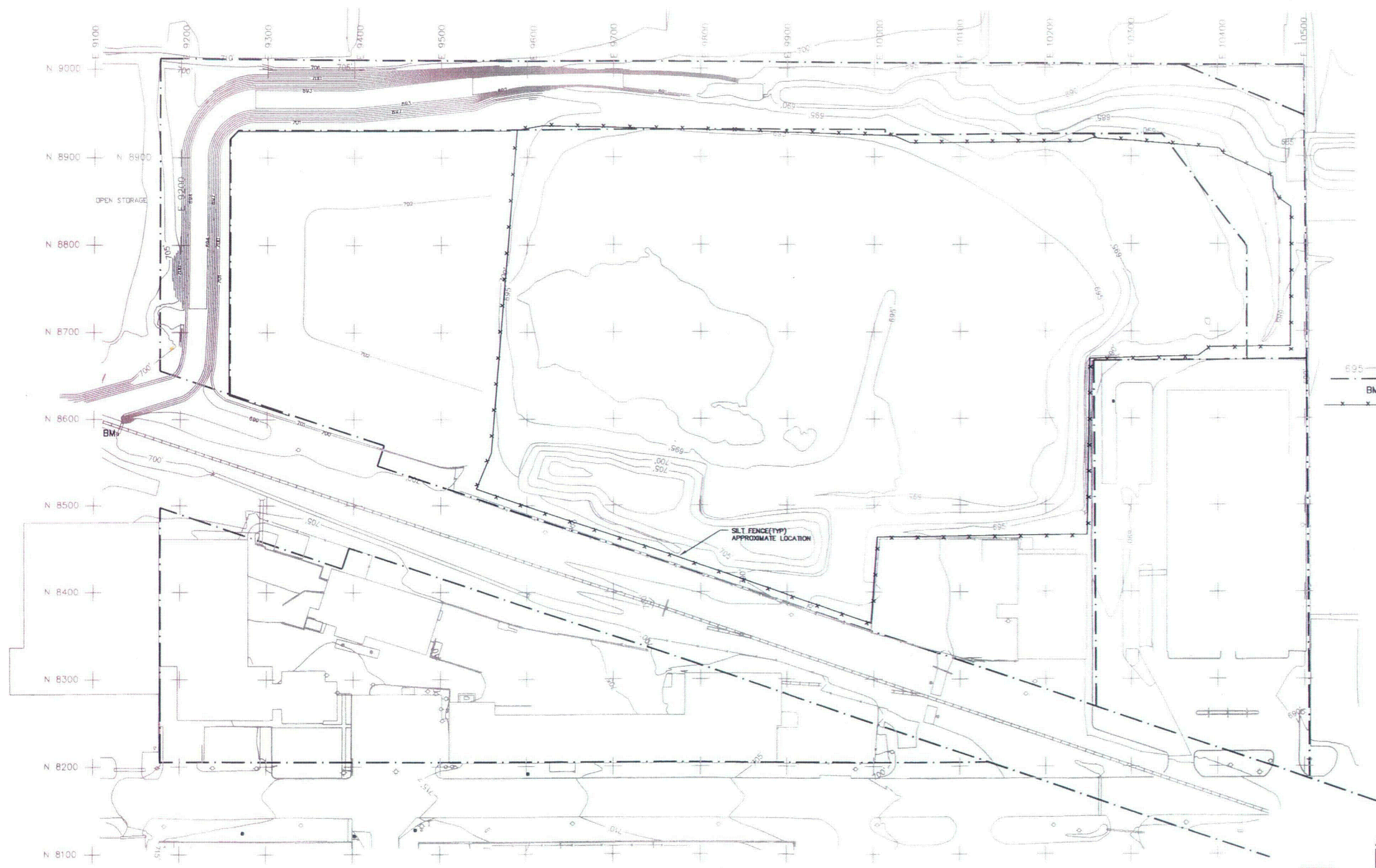
Remedial Construction Services, L.P.

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 Houston, TX 77064
 Phone: (281) 955-2442 Fax: (281) 890-5172
 WWW.RECON-REL.COM

SIGNED BY: [Signature] DATE: 5-24-04
 PROJECT: KAISER ALUMINUM
 DRAWING: GENERAL SITE DRAWING

TITLE
 FIGURE WP B 3
 GENERAL SITE DRAWING
 KAISER ALUMINUM
 Tulsa, Oklahoma

Revisions	Description	Date



- - - - - EXISTING CONTOURS
 - - - - - PROPERTY/RIGHT-OF-WAY LINE
 BM BENCH MARK
 - - - - - SILT FENCE

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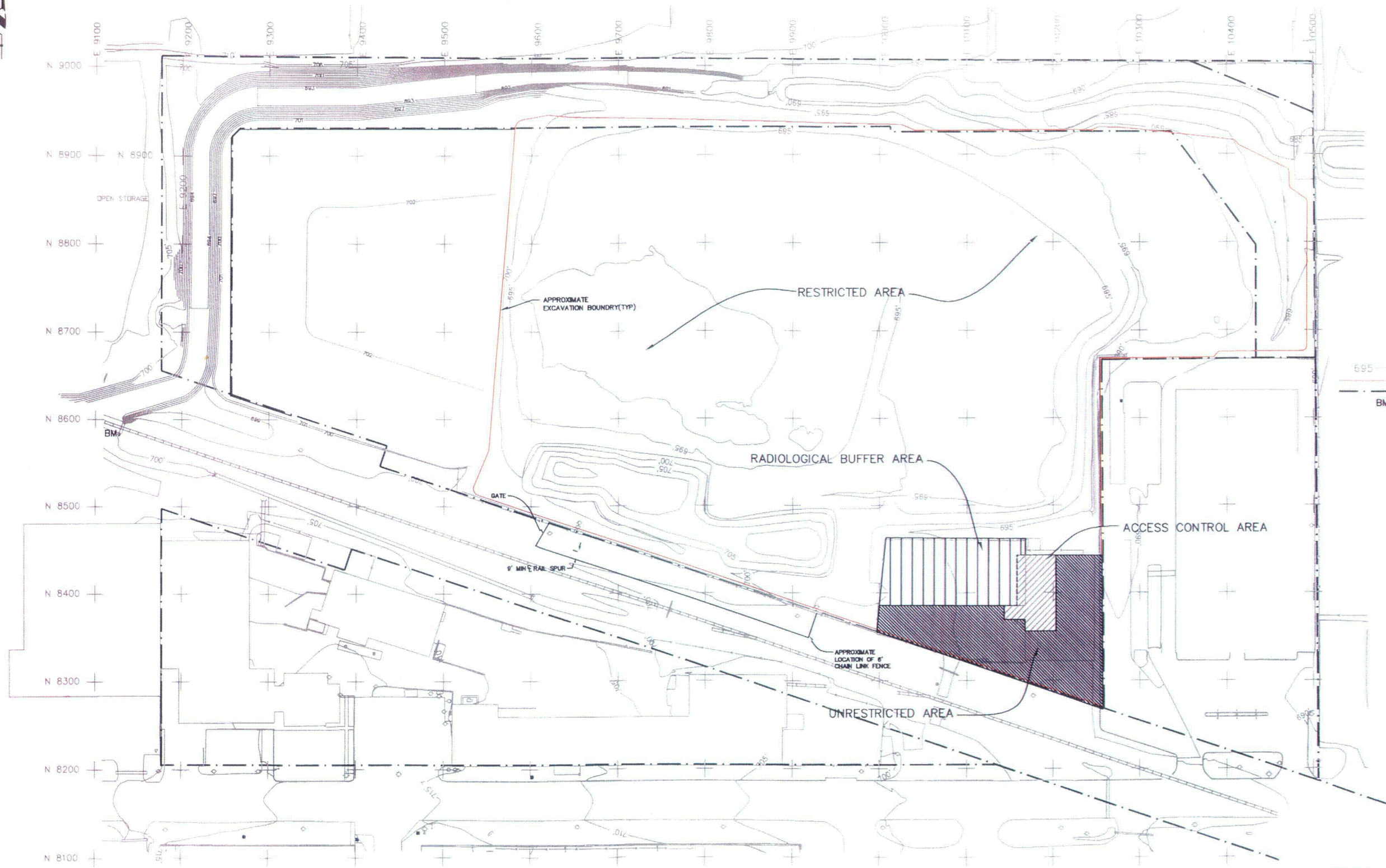
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TITLE
FIGURE WP B 4
EROSION CONTROL DRAWING
KAISER ALUMINUM
Tulsa, Oklahoma

Revisions	Date
1	
2	
3	
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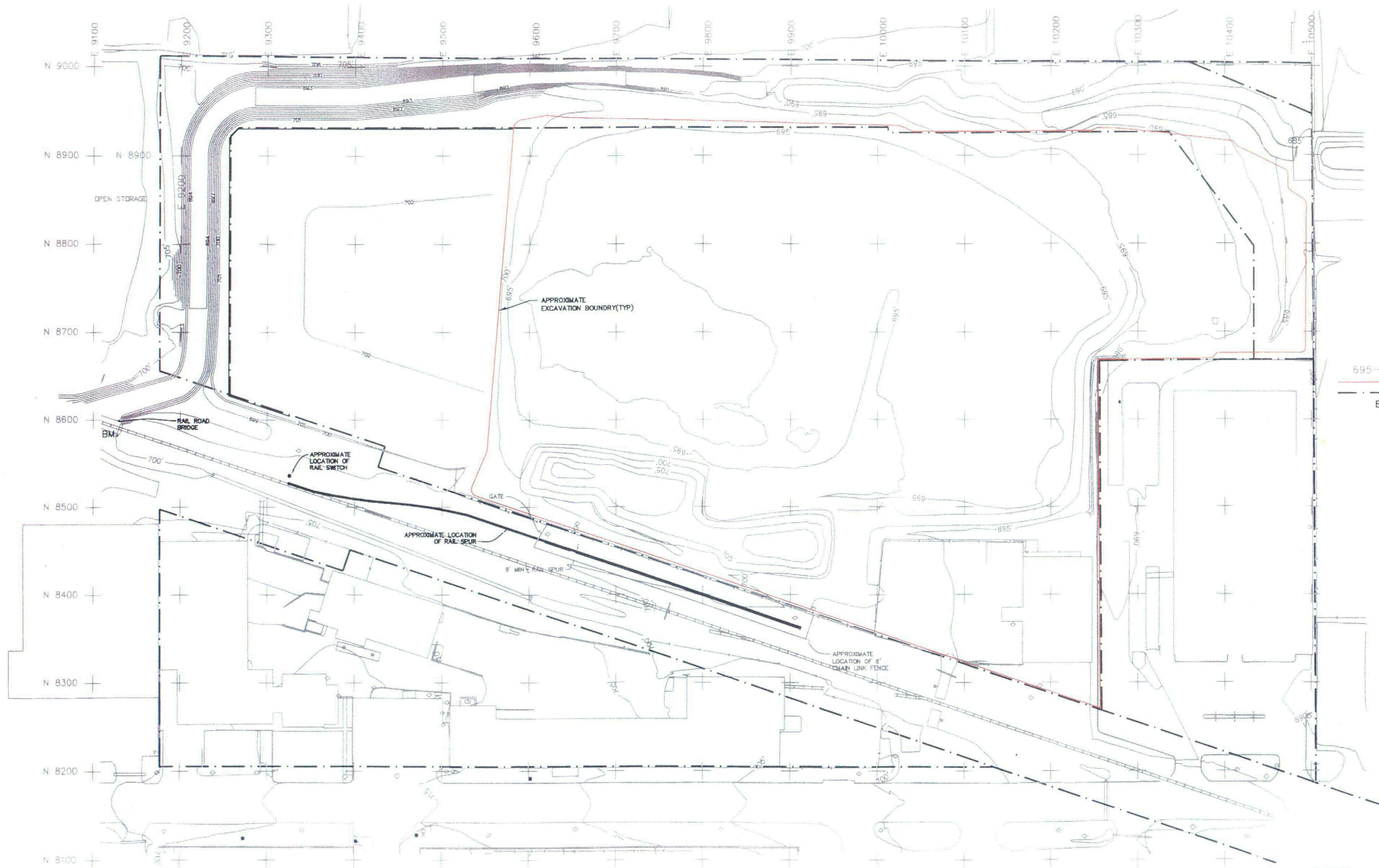
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TITLE

FIGURE WP B 6
ACCESS CONTROL DRAWING

KAISER ALUMINUM
Tulsa, Oklahoma

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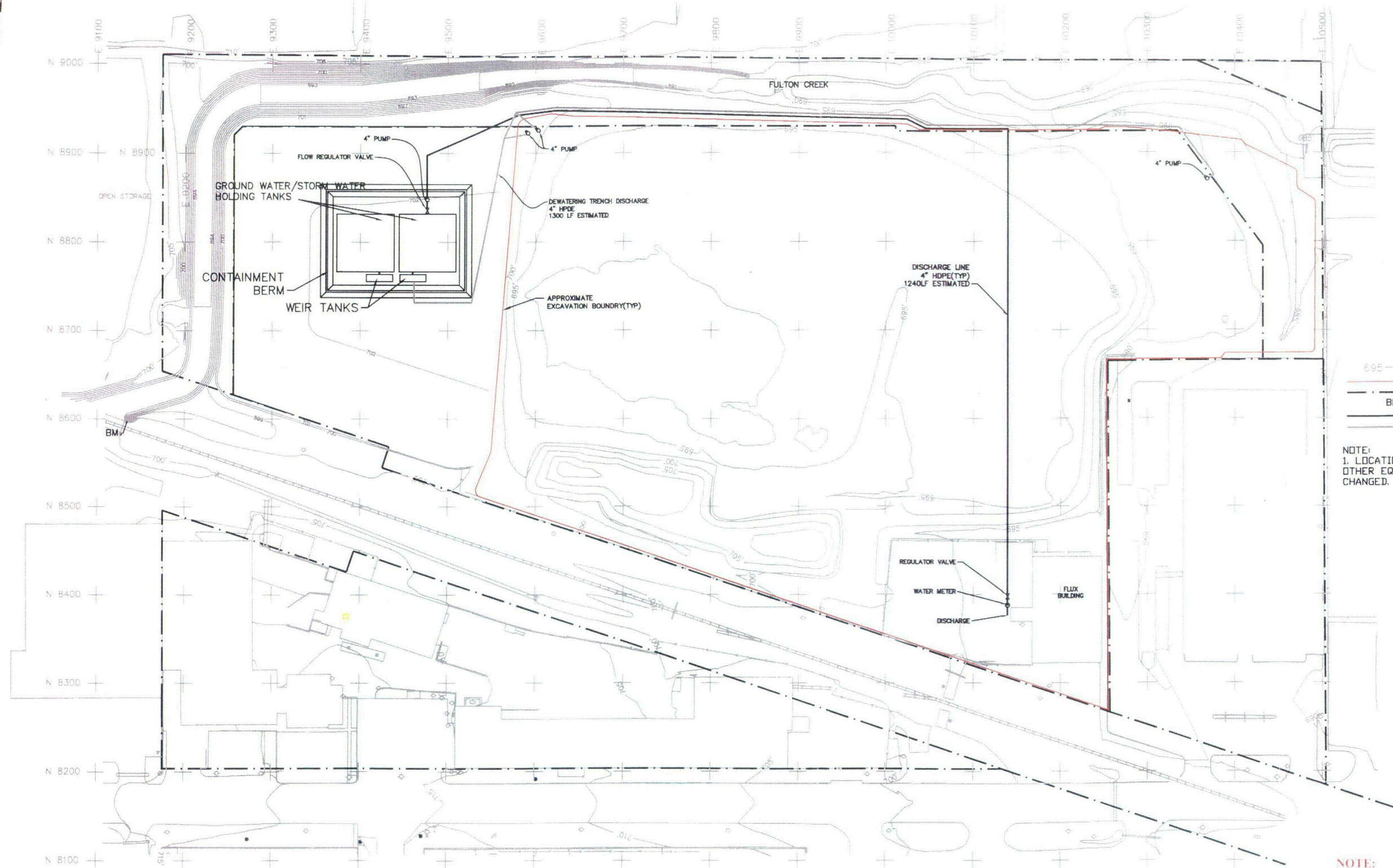
TITLE
FIGURE WP B 7
RAIL SPUR LOCATION DRAWING
KAISER ALUMINUM
Tulsa, Oklahoma

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Phone: (281) 955-2442 Fax: (281) 890-5172
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TITLE
FIGURE WP B 8
HOLDING TANK LOCATION DRAWING
KAISER ALUMINUM
Tulsa, Oklahoma

Revisions	Description	Date

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DATE: 5-24-04
BY: J. J. [Signature]

RECON Work Plan & Procedures Manual

RECON Work Plan

Tables

May, 2004
Job No. 2-1719

Table 1
City of Tulsa Maximum Allowable Discharge Concentrations

Pollutant	Limitation	Pollutant	Limitation
Arsenic (Total)	1.0 mg/l	Nickel (Total)	3.25 mg/l
Cadmium (Total)	0.60 mg/l	Zinc (Total)	3.00 mg/l
Chromium (Total)	4.0 mg/l	Cyanide (Total)	0.75 mg/l
Copper (Total)	2.0 mg/l	Silver (Total)	1.20 mg/l
Lead (Total)	0.70 mg/l	Oil & Grease	100 mg/l
Mercury (Total)	0.04 mg/l	PH	6.0 to 10.5 S.U.

Table 2
NRC Allowable Thorium and Radium Concentrations to Sewers

Radiological Analyte	10 CFR , 20 Appendix B, Table 3 - Avg. Monthly Concentrations- Sewage Disposal (pCi/l)
Ra-226	600
Ra-228	600
Th-228	2,000
Th-230	1,000
Th-232	300