INTERIM
RECORD OF DECISION

ROCKWOOL INDUSTRIES, INC.
SUPERFUND SITE

REGION 6

August 2003

156440

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EPA CONCURRENCES

INTERIM RECORD OF DECISION
Rockwool Industries, Inc.
EPA ID# TXD6637964

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DECLARATION
Rockwool Industries, Inc.

INTERIM RECORD OF DECISION

SITE NAME AND LOCATION

Rockwool Industries, Inc. TXD06637964
Belton, Bell County, Texas

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Interim Record of Decision (Interim ROD) for the Rockwool Industries, Inc. Site (the Site) in Belton, Bell County, Texas. The interim remedy is to address human health risk and was chosen in accordance with the Comprehensive Environmental, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601 *et seq*. (CERCLA), and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan, 40 C.F.R. Part 300 (NCP). This Interim ROD is based on the Administrative record file for this Site.

The United States Environmental Protection Agency (EPA) provided the public an opportunity to comment on EPA's Proposed Plan in accordance with the public participation requirements of CERCLA and the NCP. The public comment period began on May 16, 2003 and ended on June 16, 2003. The EPA held a public meeting at the Belton City Hall on June 5, 2003 to provide the community an opportunity to provide verbal and/or written comments on the Proposed Plan. The EPA has reviewed all written and oral comments submitted during the public comment period. Upon review of these comments, the EPA has determined that no changes in the remedy identified in the Proposed Plan are required. The State of Texas concurs with the selected interim remedy.

ASSESSMENT OF SITE

The response action selected in this Interim ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants or contaminants into the environment from this site which may present an imminent and substantial endangerment to public health or welfare.

DESCRIPTION OF SELECTED REMEDY

The selected interim remedy provides that the soil in areas where the concentration of Antimony exceeds the calculated Preliminary Remediation Goals (PRGs), including the Cemetery Shot Pile, North Area, Central Property Area and the sediment along the south bank of the Leon River, will be excavated and treated using an immobilization process. The immobilization process will render the treated waste non-hazardous. The treated material may be taken off-site for use as a road base material.

After the Cemetery Shot Pile and North Area have been excavated and contoured, the interim remedy provides that a clay cover will be installed over the Cemetery Shot Pile and North Area to

prevent further runoff of the waste material to the Leon River and to prevent surface water infiltration and subsequent leaching of contaminants to ground water which enters the Leon River through ground water seeps. A culvert and controlled drainage features will be installed near the Cemetery Shot Pile boundary to control surface drainage and to prevent surface water runoff from contacting and transporting the hazardous substances remaining on Site that are below the PRGs's. The interim remedy will prevent additional contamination from washing into the Leon River and contaminating sediment and aquatic life.

Since the immobilization and recycling remedy is relatively new to EPA, a pilot study will be conducted to define the specifications to be used in the full scale immobilization process, the quantities of additives that will need to be used to meet the specifications, and the cost for each ton of immobilized material processed during remediation. The pilot study will be done during the Remedial Design phase of the project.

Because there is some uncertainty with regard to the immobilization and recycling process, and the related costs, an alternate interim remedy is also being proposed. The alternate interim remedy provides for the excavation of contamination above the PRGs and its placement in an on-site landfill or containment cell which will be constructed on the Central Property.

STATUTORY DETERMINATIONS

This interim action is protective of human health and the environment in the short term and is intended to provide adequate protection until a final ROD is signed; complies with those Federal and State requirements that are applicable or relevant and appropriate for this limited-scope action; and is cost effective. Although this interim action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and thus supports that statutory mandate. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action.

Because the Selected Remedy provides for cleanup suitable for industrial use but will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

Additional information can be found in the Administrative Record file for this site. Information included in the Decision Summary section of this Record of Decision includes, 1)chemicals of concern (COCs) and their respective concentrations, 2) baseline risks represented by the COCs, 3) cleanup levels established for COCs and the basis for the levels, 4) current and future land and ground water use that will be available at the site as a result of the selected remedy, 5) estimated capital, operation and maintenance costs (O&M), as well as total present worth costs; discount rate; and the number of years over which the remedy costs estimates are projected and

6) decisive factor(s) that led to selecting the remedy.

_____

_____

Myron O. Knudson, P.E. Date
Director
Superfund Division

Acronyms and Abbreviations

7Q2- Seven Day Two Year Flow

ACM- Asbestos Containing Material

AOC- Area of Concern

AST- Above Ground Storage Tank

ASWQS- Applicable Surface Water Quality Standards

BP- Brick Plant

CAP- Corrective Action Plan

CEC- Cation exchange Capacity

CERCLA- Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)

CJI- Cook-Joyce Incorporated

CLP- Contract Laboratory program

COC- Chemicals of Concern

COPC- Chemical of Potential Concern

CSM- Conceptual Site Model

CSP- Cemetery Shot Pile

CY- Cubic Yards

DHHS- U.S. Department of Health and Human Services

DO- Dissolved Oxygen

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DQO- Data Quality Objective

DPT- Direct Push Technology

DSP- Danger-field Slag Pile

ELCR- Excess Lifetime Cancer Risk

EPA- U.S. Environmental Protection Agency

EPC- Exposure Point Concentration

ERA- Ecological Risk Assessment

ESD- Explanation of Significant Differences

FOD- Frequency of Detection

FS- Feasibility Study

FSP- Field Sampling Plan

GEMS- Geologic Exposure Modeling System

HEAST- Health Effects Assessment Summary Tables

HHRA- Human Health Risk Assessment

HQ- Hazard Quotient

IRIS- Integrated Risk Information System

LBP- Lead-Based Paint

MB- Maintenance Building

MCL- Maximum Contaminant Level

MSSL- Median Soil Screening Level

NCEA- National Center for Environmental Assessment

NPDES- National Pollution Discharge Elimination System

NSP- North Shot Pile

OU- Operable Unit

ORP- Oxidation Reduction Potential

PCB- Polychlorinated Biphenyl

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PRGs- Preliminary Remediation Goal

PR/VSI- Preliminary Review and Visual Site Inspection

QAPP- Quality Assurance Project Plan

RA- Remedial Action

RD- Remedial Design

RCRA- Resource Conservation and Recovery Act

RFA- RCRA Facility Assessment

RfC- Reference Concentration

RfD- Reference Dose

RFI- RCRA Facility Investigation

RI- Remedial Investigation

RI/FS- Remedial Investigation/Feasibility Study

RME- Reasonable Mean Exposure

ROD- Record of Decision

RWI- Rockwool Industries

SEM- Scanning Electron Microscopic

SF- Slope factor

SPLP- Synthetic Precipitation Leaching Procedure

SSI- Superfund Site Inspection

SSP- South Shot Pile

SVOC- Semi-Volatile Organic Compound

SWMU- Solid Waste Management Unit

TAL- Target Analyte List

TAWP- Technical Activities Work Plan

TCLP- Toxicity Characteristic Leach Procedure

TCEQ- Texas Commission on Environmental Quality

TMV- Toxicity, Mobility, and Volume

TNRCC - Texas Natural Resource Conservation Commission

TOC- Total Organic Carbon

TVR- Taylor's Valley Road

TRW- Technical Review Workgroup

TWC- Texas Water Commission

UCL- Upper Confidence Limit

URF- Unit Risk Factor

USGS - United States Geological Survey

UTL- Upper Tolerance Limit

VOC- Volatile Organic Compound

WBA- Warehouse Building Area

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DECISION SUMMARY

Site Name: Rockwool Industries, Inc.

Site Location: Approximately 100-acre tract of land and industrial area located one quarter mile east of I-35 in Belton, Texas. (see Figure 1).

Site Description: The 100-acre Site is bounded on the north by the Leon River and to the south and south-west by Nolan Creek. The Site is broadly divided into three areas, i.e., the North property, the Central property, and the non-process areas by Taylors Valley Road and FM-93.

Rockwool manufactured household insulation material by melting copper and Antimony slag from metallurgical operations. The "rockwool" insulation was produced by blowing the melted material over rotating drums. Waste by-product called shot material was piled on the north and south sides of the site. The shot material ran into the Leon River from the north shot pile and contaminated the portion of the river adjacent to the site (south bank). The spent shot material is the principal threat waste at RWI Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

SITE HISTORY

The Rockwool Industries Inc.(RWI) facility manufactured mineral wool insulation from the mid-1950s until February 1987. Previous land use is not known. RWI manufactured two types of mineral wool insulation: blow wool and batt wool. Blow wool, which is generally spray blown into attics and other enclosed spaces for thermal insulation, is composed of bulk mineral wool fibers lightly coated with lubricating oil. Batt wool is typically used for wall insulation and consists of mineral wool that is bound with an organic resin (such as tar) and sandwiched into paper.

The mineral wool was manufactured in blast furnaces using raw material such as slags from copper and Antimony smelting, waste from limestone mining, as well as coke and basalt. The raw materials were melted in a coke-fired furnace and then extruded by blowing air over spinning drums to form fibers. The residue left in the furnace from the heating of the slags was a metal "shot" type material. This "spent iron shot" was the main waste type generated as part of the rockwool production process. This material was piled in the North Shot Pile (NSP), the South Shot Pile (SSP), and the Cemetery Shot Pile (CSP).

The NSP area began receiving spent shot material waste in the mid-1950s. By 1982, the NSP covered more than three acres and there was no room for further expansion. The northern edge of the NSP was on the southern bank of the Leon River and waste runoff had been detected going into the River. The NSP was reduced to about two acres after waste was hauled to an off-site disposal area. In 1983, a dirt cover was placed over the NSP to reduce fugitive dust and the infiltration of rain. A french drain system was installed along the northern edge of the shot pile to intercept and collect leachate as it flowed horizontally toward the Leon River. This french drain

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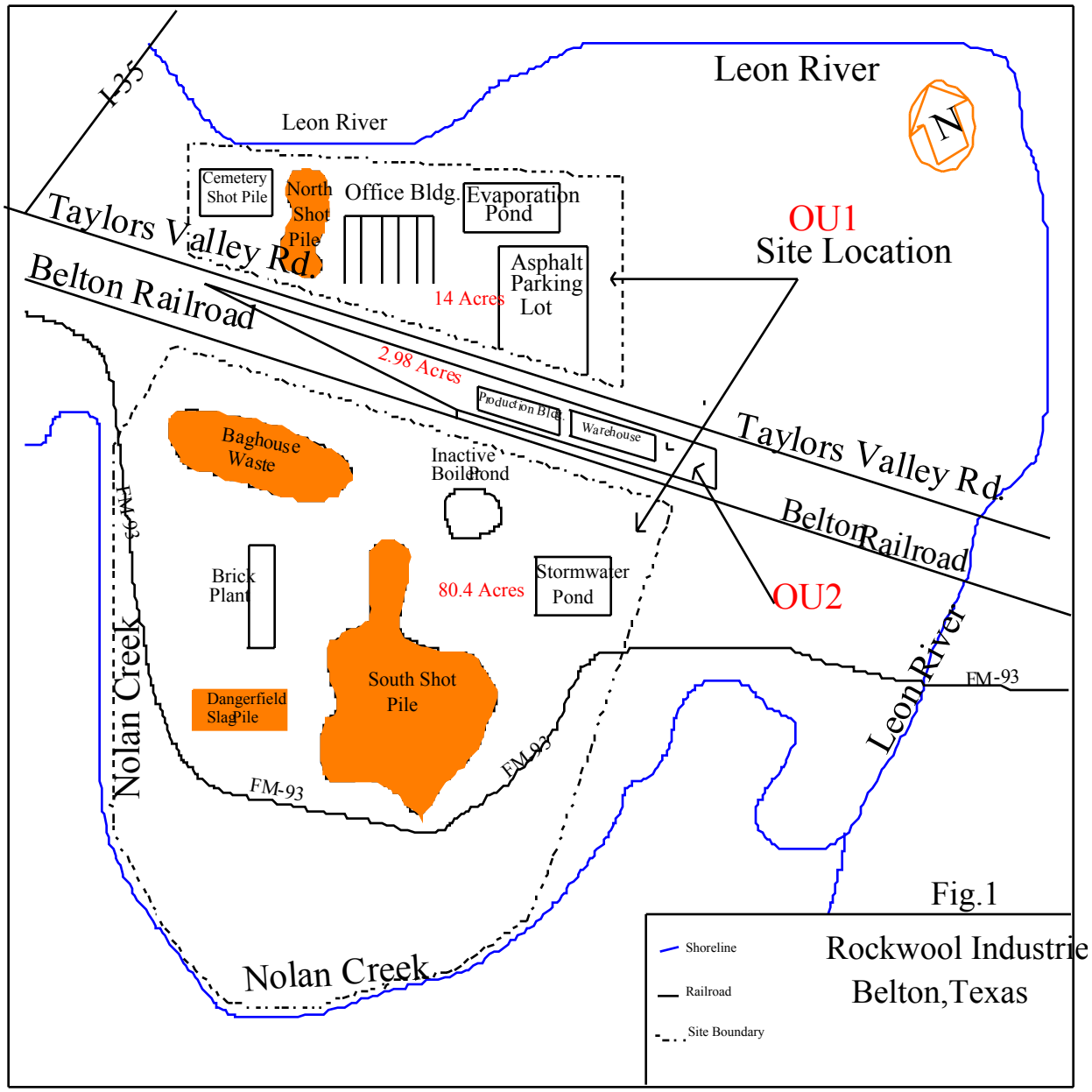
carried the liquid to a concrete sump and the water that collected in the sump was pumped to the lined Evaporation Lagoon.


I-35
Leon River
Leon River
N
Cemetery Shot Pile
North Shot Pile
Office Bldg.
Evaporation Pond
Taylors Valley Rd.
OU1
Site Location
Asphalt Parking Lot
14 Acres
Belton Railroad
2.98 Acres
Production Bldg.
Warehouse
Taylors Valley Rd.
Baghouse Waste
Inactive Boiler
Pond
FM-93
Belton Railroad
Brick Plant
80.4 Acres
Stormwater Pond
OU2
Nolan Creek
South Shot Pile
Leon River
FM-93
Dangerfield Slag Pile
FM-93
FM-93
Fig.1
Nolan Creek
Shoreline
Railroad
Site Boundary
Rockwool Industrie
Belton,Texas

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It is not clear when the SSP began receiving waste; however, beginning in 1984, some of the spent shot material was removed from the SSP and was recycled as an ingredient in brick making. The shot was mixed with cement and Baghouse Dust; it was shaped into bricks and then used as raw material feed for the furnace. An unknown amount of the shot was recycled in this way. It is not known when the CSP began receiving waste.

During site operations, there were numerous solid waste management units that were used to dispose of process wastes. These included a Boiler Blowdown Pond, Stormwater Runoff Pond, Waste Oil Storage Tanks, On-site Landfill, Container Storage Area, Wastewater Blending Tank, West Warehouse Container Storage Area, and the previously mentioned NSP and SSP. A Raw Water Make-up Pond and an Old Brine Pond also were used to dispose of wastes. During the preliminary assessment of the Site, incomplete remediation was evident: 1) the ground water recovery system was abandoned and 2) the main facility building was abandoned but still contained office equipment and supplies.

At one time both the boiler blowdown and baghouse wastes were classified as hazardous. With the adoption of Resource Conservation and Recovery Act (RCRA) regulations in May 1980, only the baghouse dust waste was documented to exhibit hazardous characteristics. In August 1980, RWI submitted a Part-A RCRA permit as a generator/disposal facility for hazardous wastes with regard to the baghouse dust wastes. The regulatory history for the Rockwool Site is listed in Table 1.

Table 1
Regulatory Action Chronology
Rockwool Industries, Inc., Belton, TX.

Year	Event
1955	RWI begins mineral wool manufacturing operation
1976	Baghouse Waste Pond (SWMU #1) constructed
1980	Baghouse dust determined characteristically hazardous due to EP Toxicity Testing for Arsenic. Baghouse Dust Surface Impoundment registered as hazardous SWMU
1985	RWI facility ceases production of baghouse dust (EPA Hazardous Waste D004)
1987	RWI facility ceases production
1987	RCRA Facility Assessment (PR/VSI)
1988	Sampling Visit Report submitted by A.T. Kearney to EPA
1988	Closure Certification Report for Baghouse Waste Impoundment (SWMU #1) submitted to TWC by Waid & Associates
1988	TWC Closure Letter issued to RWI for Baghouse Dust Surface Impoundment

Year	Event
	(SWMU #1)
1988	Corrective Action Plan Hazardous Waste Permit Application submitted to TWC by Waid & Associates
1989	Class II Landfill Closure Certification Report submitted to TWC by Cook-Joyce
1990	TWC letter issued to EPA stating RFI unnecessary at SWMUs 7, 9, 10, 11, 12, 13, 16, 17, and 18, and AOCs 1, 8, 9, and 11
1990	EPA letter to TWC agreeing that RFI unnecessary at SWMUs 7, 9, 10, 11, 12, 13, 16, 17, and 18, and AOCs 1, 8, 9, and 11
1990	Nonhazardous SWMUs Closure Plan submitted to TWC
1990	Closure Plan for Nonhazardous SWMUs submitted to TWC
1990	Baghouse Dust Pocket discovered onsite
1991	Baghouse Dust Pocket Closure Certification Report submitted to TWC
1991	TWC Closure Letter issued to RWI for Class II Landfill
1991	Closure Certification Report for Nonhazardous SWMUs submitted to TWC by Cook-Joyce
1991	Closure Certification Report for Class I Nonhazardous Landfill submitted by Cook-Joyce to TWC
1991	TWC letter issued to RWI acknowledging receipt of Nonhazardous SWMUs Closure Certification Report. Letter states "closure activities involving nonhazardous units do not require formal TWC approval".
1991	TWC letter issued to Cook-Joyce concurs that certain soils at site could be classified as Class III waste
1991	Closure Certification Report for Baghouse Dust Pocket submitted to TWC by Cook-Joyce
1991	TWC Closure Letter issued to RWI for Baghouse Dust Pocket
1991	Hazardous Waste Permit No. HW-50197 & Compliance Plan CP-50197 issued to RWI by TWC authorizing closure & post-closure care and requiring groundwater recovery program
1992	RFI Work Plan submitted to TWC
1993	Offsite Groundwater Investigation Report submitted to TWC by Cook-Joyce
1993	TWC letter issued to RWI concurs with conclusions of Offsite Groundwater Investigation Report
1994	Groundwater monitoring & recovery system shut down by RI due to financial difficulties
1995	TNRCC issued notice of violation letter to RWI

Year	Event
1995	Preliminary Assessment Report submitted to EPA by Fluor Daniel
1996	TNRCC conducted a Superfund Site Inspection to identify the types of contaminants present, assess any releases that have occurred, and identify evidence of actual human and ecological exposures to contaminants
1999	Phase II Environmental Site Assessment, 5.87 Mile Georgetown Railroad Tract, Temple to Belton, Texas, by Raba-Kistner
2000	Technical Activities Workplan submitted to EPA by CH2M HILL
2000	Sampling and Analysis Plan submitted to EPA by CH2M HILL
2001	Remedial Investigation Field Phase completed by CH2M HILL

According to a RCRA Part B permit application, the baghouse dust impoundment had been used since 1970. RWI started using low concentration Antimony slag as feed material for the furnaces in 1977, thus allowing the facility to operate as a "non hazardous" waste generator.

Until 1985, Arsenic-contaminated Baghouse Dust was generated during the manufacturing process (even though hazardous Arsenic content was reduced and non-hazardous Antimony content was increased). This dust was disposed of on-site in a surface impoundment and a landfill. The Baghouse Dust Surface Impoundment (also known as Baghouse Dust Landfill or "The Dust Pocket" - Solid Waste Management Unit 1) was closed as a landfill in 1988. This was discovered at the Site in 1990. RWI proposed a closure plan for this onsite surface impoundment in April of 1990; in 1991, the hazardous wastes were removed.

In October 1991, the TNRCC (now TCEQ) issued a compliance plan and a Hazardous Waste Post-Closure Permit to RWI allowing the company to remove and dispose of contaminated soil, remove and stabilize sludge, and install clay covers where necessary. As part of the remediation effort they installed a ground water recovery system to control and treat ground water in the first saturated interval.

Although numerous on-site solid waste management units (SWMUs) from the RCRA Part A permit were closed by RWI, remediation of the Baghouse Dust Surface Impoundment and the on-site general plant refuse landfill was not completed. The ground water recovery system was abandoned and iron shot piles remained on site. RWI shut down the ground water recovery and treatment system in September of 1994 due to financial problems.

The Preliminary Assessment was completed in December 1995 and the Site Investigation was completed in October of 1996. The RWI Site was proposed to the National Priorities List (NPL) on March 6, 1998. The basis for proposing the Site to the NPL was surface water as the major pathway of concern. Chemical analysis of sediment samples in the Leon River and in Nolan Creek indicated the presence of inorganics in concentrations above the release criteria. The Leon

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River was identified as a fishery and was subject to Level II concentrations of Selenium. The RWI Site was placed on the NPL on September 29, 1998. The combined Remedial Investigation and Feasibility Studies commenced on September 30, 1998.

ENFORCEMENT ACTIVITIES

The Site is currently divided into three parcels of land. RWI formerly owned all three parcels and is the current owner of record of one of the three parcels, consisting of approximately 14 acres. RWI also owned and operated the facility responsible for creating the contamination at the Site. RWI is defunct. Another defunct company, CTMC, Inc. (CMTC), purchased approximately 83 acres of the property in a tax sale in 1997. CMTC submitted documents to the State of Texas seeking reimbursement for various expenditures associated with "post-closure care procedures" and "cleanup of the site." The largest parcel, consisting of just over 80 acres, is currently owned by Nev-Tex Group, Inc. (Nev-Tex), a Nevada corporation. Nev-Tex appears to be a shell created by unidentified persons.

During the RI/FS, EPA obtained access to the southern tract, owned by Nev-Tex, from Mr. Wayne McMiniment, who was president of Nev-Tex at the time. The EPA obtained a court order to collect samples for the RI/FS at the northern 14-acre tract, owned by the defunct RWI. Since there was no bid on the northern tract in the 1997 tax sale, the property reverted back to the defunct RWI, thus necessitating a court order to collect data and samples from the 14-acre tract adjoining the Leon river. The third parcel, about 2.9 acres in size, is currently owned by Jones-Bell, L.L.C. ("Jones-Bell"), a Texas limited liability corporation. Jones-Bell purchased the property from CTMC in March 2000, after the start of the RI/FS.

The EPA issued Notice Letters to PRPs to conduct the Remedial Investigation and Feasibility Studies (RI/FS). No response was received for identified parties as companies had become defunct or the notices were returned as undeliverable. No PRPs came forward to conduct the RI/FS.

COMMUNITY PARTICIPATION

As part of the Community Involvement Plan, EPA community relations staff conducted door-to-door interviews and held meetings with local Belton residents, public officials, community leaders and business people. The community interviews provided interested citizens with opportunities to ask questions about the Site, voice their opinions and concerns about Site activities and issues, and learn more about the Superfund program. These interviews were held in September 1999. The following summarizes the results of these community interviews.

Community Interviews

All interviewees were aware of the existence of the Site and most knew of its location and general background and history. Many, however, were unaware that the Site is a Superfund Site and that it has been placed on the NPL. Interviewees did voice eagerness to see contamination problems at the Site resolved, if EPA determines that Site contaminants pose a risk to public health or the environment.

The Site-related concerns most often expressed by interviewees were:

- The need to restore the Site to tax-generating status. City officials and community members both addressed the need to clean up the Site so that the property may be more beneficial to the community.

- The potential contamination of the fish in the Leon River. The mayor wanted confirmation that the fish in the Leon River were not contaminated as a result of the Site and that the fish caught in these waters are safe and edible .

Many informational meetings were held in Belton during the Site investigations conducted between late 1999 and August 2002. In September 2003, the City of Belton received a $50,000 Superfund Redevelopment study grant.

Public participation activities for the Site have been satisfied, as required in CERCLA Section 113(k), 42 U.S.C. §9613(k), and CERCLA Section 117, 42 U.S.C. § 9617. The Proposed Plan was released to the public on May 16, 2003. The notice of availability of the Proposed Plan and the Administrative Record file for the remedial action was published in the Belton Journal on May 15, 2003. The public comment period was held from May 16, 2003 to June 16, 2003. A public meeting was held at the Belton City Hall on June 5, 2003. A court recorder was present to record oral comments.

The EPA received no written comments during the public comment period, and no adverse comments were made during the public meeting. A summary of the public meeting can be found in Attachment 2.

Documents and information upon which EPA relied in recommending the remedy, is located in the Administrative record. The Administrative Record includes the text and appendices A to R of the RI/FS report, and other documents supporting the remedy. A major part of the Administrative Record is the RI/FS report which includes the data evaluation report, the human health risk assessment report and the feasibility study of the remedial alternatives.

The Administrative Record was made available to the public by placing a copy of all the material at the following repositories:

• Belton City Hall, 333 Water Street, Belton, Texas 76513

• U.S. EPA Region 6, Seventh Floor Reception Area, 1445 Ross Avenue, Ste 12D13, Dallas, Texas 75202-2733

• Texas Commission on Environmental Quality, 12100 Park 35 Circle, Building E, 1st Floor, Austin, Texas 78753.

SCOPE AND ROLE OF OPERABLE UNITS

The inactive RWI National Priorities List (NPL) Site (the Site), at 1741 Taylors Valley Road, includes approximately 100 acres (zoned heavy industrial) and lies one mile east of downtown Belton, Bell County, Texas (see Figure 1). The Site consists of three main areas. The first area is the 14-acre area north of the Taylors Valley Road, denoted as the North Property and adjoining Cemetery. The second area is south of Taylors Valley Road and contains the Rockwool production building. This area is designated as the Central Property and extends to FM 93. The third area is south of FM 93 and is designated as the Non-Process area. Figure 2 presents a layout of these areas and the overall Site. The primary waste types at the Site include spent iron shot and baghouse dust. Secondary waste types include boiler blowdown water, stormwater runoff, recovered ground water, and bricks.

Forty-seven (47) acres were used as an industrial facility; 14-acres included an evaporation lagoon; and 40-acres were used as pasture. The Site is bordered to the north by the Leon River and is twice bisected from east to west by Taylors Valley Road and FM 93 (see Figure 2). These roads divide the Site into three distinct areas that include the 14 acres north of Taylors Valley Road including the CSP and the NSP, the Make-up Water Pond, the water treatment building, and the Evaporation Lagoon. The middle portion of the Site, which consists of 47 acres between Taylors Valley Road and FM 93, is where most of the facility operations took place. This area includes the Baghouse Dust Surface Impoundment, the SSP, the Dangerfield Slag Pile (DSP), the Boiler Blowdown Pond, the maintenance building/garage, and the former Kiln and Brick Plant.

The local taxing district put the Rockwool property up for sale in 1997 due to unpaid taxes. The southern 83 acres (Central Property and the Non Process area) was purchased by CTMC, Inc. There was no bid on the North Property, thus it reverted back to the defunct RWI. In March 2000, Jones- Bell, L.L.C. purchased the 2.9-acre triangular lot containing the RWI main production building and warehouses from CTMC. Currently the 80-acre parcel in the Central Property area is owned by Nev-Tex Group, Inc., a Nevada corporation. Because of this varied ownership, EPA decided to define the triangular 2.9-acre lot as Operating Unit 2 (OU2) (see Figure 1). The rest of the area (the North area, the Geer-Cemetery area and the Central Property and Non-Process area) was defined as Operating Unit 1 (OU1). Operable Unit 2, containing the process building and the warehouse, is likely to require minimal remediation due to contaminated soil. Contaminated soil is the major problem at the site.

Most of the contamination at the Site occurs in the waste material and soil. The remedy addresses essentially the North Property and the Central Property, where Antimony in soil is the primary risk. Results from the Remedial Investigation have shown that the majority of remedial work will consist of excavating soil above PRGs from the Geer-Cemetery property, the North Property and the Central Property. Shot material which has washed into the Leon River from the North Shot Pile will be dredged and treated using the immobilization and recycling process. The

same recycling process will be utilized for treating contaminated soil/waste above PRGs that has been excavated from the Geer Property, the North area and the Central Property. All of the recycled material will be moved off-site for use as road base material.

The excavation of waste material and soil greater than the PRGs and the dredging of the sediments from the Leon River will mitigate risks to human health. Part of the ecological risk assessment has been completed (3 out of 8 steps) at this point. The remaining steps in the ecological risk assessment will be completed after the interim ROD is signed and the project enters the remedial design (RD) phase. A final ROD addressing all the site risks will be completed once the ecological risk assessment is compete.

This interim ROD is being implemented to save time and funding. That is to say, while the remaining ecological risk assessment is being completed (which is a lengthy process), actions to address human health risks will progress. Once the findings from the ecological risk assessment are known, any ecologically specific required remedial actions will be included in the final ROD. There is a cost savings with this approach in that most of the interim ROD (human health remedial action) will have some affect on the ecological risks. For example, placing a clay cover over areas where the Antimony concentration in the waste/soil is below PRGs will prevent infiltration and leaching of contaminants into ground water which may enter the river through seeps in the river banks. This action will prevent Antimony contamination of the Leon River and fish in the river This will also isolate the wastes and soils from the ecological receptors where most of the identified terrestrial risks exist.

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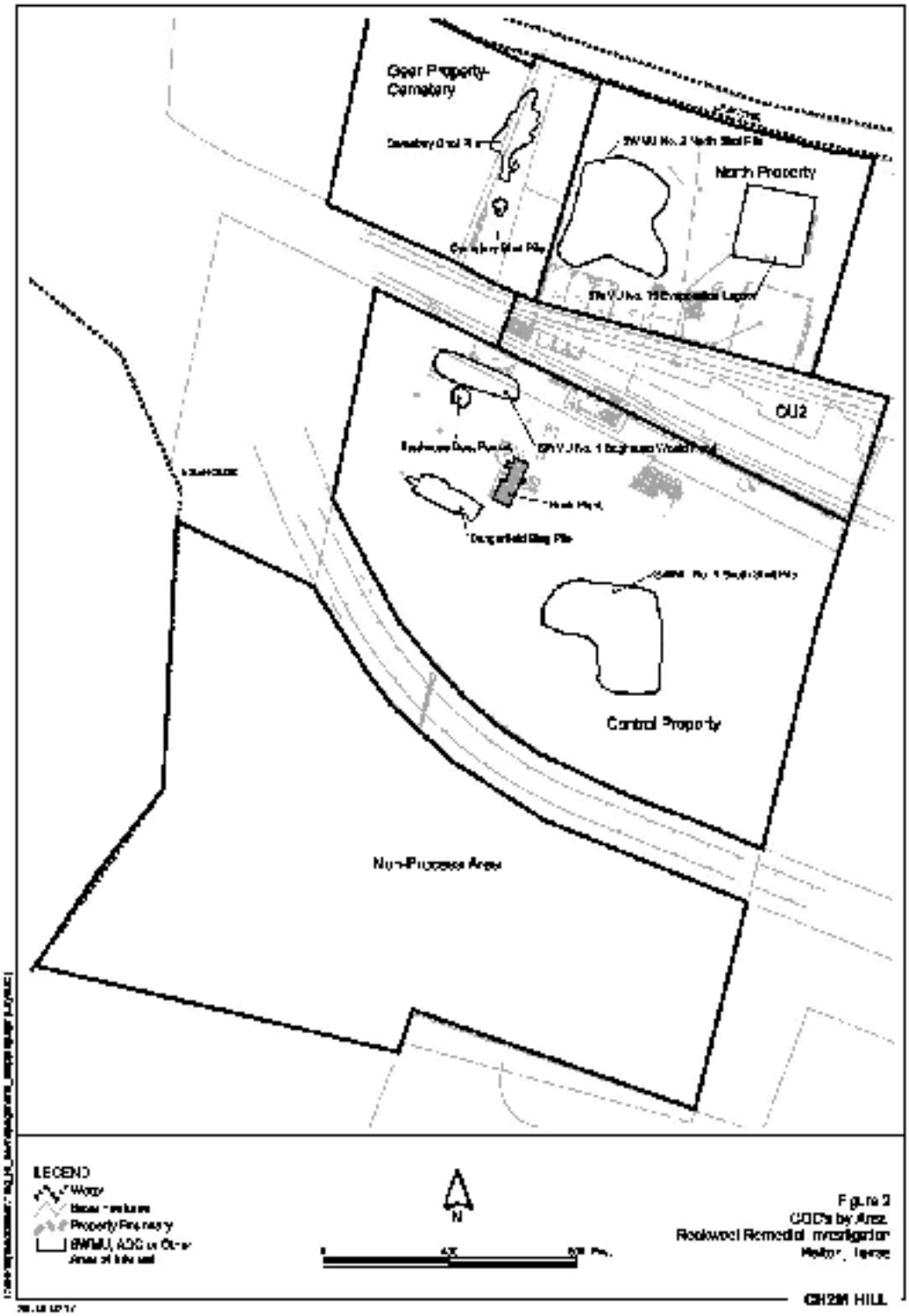

SITE CHARACTERISTICS

The EPA completed its preliminary assessment of the Site in December 1995 and a Site Screening Investigation in October 1996. The Site was proposed to the NPL on March 6, 1998, and was placed on the NPL on September 29, 1998. The EPA sent notice letters to Potentially Responsible Parties (PRPs) to perform the Remedial Investigation and Feasability Studies (RI/FS). On receiving no response from the PRPs, EPA proceeded with the RI/FS as a Fund Lead study. The EPA began its RI/FS in September 1998. The RI field work was essentially completed in August 2001. However a second round of fish sampling was conducted in July 2002 to establish background levels of chemicals of concern (COCs) in fish tissue. In addition to these efforts, the Texas Department of Health (TDH) evaluated the environmental information available for the Site (primarily the Screening Site investigation Report 1996, by TNRCC)

TDH Review

The TDH concluded that potential exposure to contaminants through the food chain is considered to be an indeterminate public health hazard. Although available data do not indicate that people are being, or have been, exposed to levels of contamination that would be expected to cause adverse health effects, data are not available for all environmental media to which people may be exposed. Selenium, which is known to bio-accumulate in fish, was detected at high concentrations in ground water from the NSP and at low concentrations in sediment both from the Leon River and Nolan Creek. Surface water data and fish data from the Leon River were not available. The TDH recommended that fish from the Leon River and Nolan Creek be collected and analyzed.

EPA's RI

The EPA's RI is the most comprehensive investigation conducted to date. It involved collecting and analyzing samples of soil, waste, surface water, sediment and ground water over a four month period (April - August 2001) and again in June-July 2002. The results of this investigation are published in the RI/FS report (CH2M HILL, April 2003) and are summarized below. Unlike the TDH investigation mentioned above, EPA's investigation did not detect Selenium at levels which would dictate Selenium being a chemical of potential concern for human health.

Geology and Hydrogeology

The Site overlies Quaternary alluvium and terrace deposits associated with the Leon River. The terrace deposits generally lie north of FM 93 and consist of limestone gravels, quartz, quartzite, chert, and jasper with varying amounts of clay and sand. The alluvial deposits, which lie south of FM 93, consist of calcareous silts and clays with high organic content, sand, and gravel. Underlying the Quaternary deposits is the Georgetown Formation. The uppermost water-bearing zone occurs at depths between 20 and 35 feet within the coarse grain deposits of the Quaternary alluvium and terrace deposits, and within the weathered limestone. The saturated thickness of the water bearing zone is typically less than three feet, and it is not uncommon for many of the monitor wells to go dry while sampling. Consequently, the water-bearing interval is best

described as a perched zone. Ground water north of Taylors Valley Road generally flows north-northeast discharging through seeps to the Leon River. There is evidence of ground water mounding under the evaporation lagoon, suggesting that seepage from the lagoon is recharging the perched zone. On the south side of Taylors Valley Road ground water flows to the south and southeast, discharging through seeps to Nolan Creek. Ground water flows at an estimated velocity of 0.9 foot per day.

There are seven domestic, five industrial, and three general use (irrigation), wells within one mile of the Site. The nearest well in the perched zone is a domestic well, located approximately 0.5 miles to the west at 104 Elm Street. This well was sampled during past investigative activities and did not reveal any evidence of contamination (TCEQ, 1996b). Several of these wells are screened in the perched zone and several are screened in the deeper zone. Page 4-4 of the Rockwool RI/FS Report presents additional details concerning these wells. All evidence indicates that a ground water bearing perched zone located at the Site does not appear to be hydraulically connected to any off-site water bearing units. In 1990, RWI drilled a deep well to the deeper water bearing formation in a shaley limestone which is part of the Georgetown Formation. The water analysis showed no resemblance to the shallow perched ground water, proving no vertical communication between the two water bearing units. In addition, the potable aquifer in the area is located in the Travis Peak formation at about1000 feet below the perched aquifer, with positive evidence of no communication. The industrial area around the Site is connected to city water from Lake Belton.

Poor and unreliable yields make the perched water zone an unlikely future drinking, irrigation or industrial water source. Additionally, given the industrial/commercial land use designation for the general vicinity and availability of water from the City of Belton, future ground water development in the areas down-gradient of the Site is unlikely.

Surface Water Hydrology

The primary surface water features in the vicinity of the Site are the Leon River and Nolan Creek. The Leon River discharge volume, downstream in Belton, is recorded continuously by the USGS with mean flows ranging from 20 to 600 cubic feet per second (cfs). Peak flows of 3,000 cfs were observed in late March 2001. The designated water uses of the river are contact recreation, high-quality aquatic habitat, and public water supply. Recreational fishing is known to occur but swimming is unlikely because of unsafe conditions such as high flow rates, unclear water, presence of high brush along the river banks, and steep banks limiting access.

Surface water flow volumes in Nolan Creek are not currently monitored. A harmonic mean discharge of 29 cfs has been reported. The TNRCC (now TCEQ) has designated the creek's uses as non-contact recreation, high-quality aquatic habitat, and public water supply.

Ground water

Antimony, Arsenic, and lead in residual waste remaining in the former baghouse dust

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impoundment represents the primary ground water contaminant sources. Analytical results for samples collected in the vicinity of the NSP, SSP and evaporation lagoon area also indicate waste materials as probable Antimony and Arsenic sources. This conclusion is also supported by the Arsenic results from the Toxicity Characteristic Leaching Procedure (TCLP) and Antimony results from the Synthetic Precipitation Leaching Procedure (SPLP) tests. The TCLP results exhibited Arsenic leachate concentrations up to 1.02 mg/L from fine waste material in the SSP. The SPLP results revealed Antimony leachate concentrations up to 3.1 mg/L from the NSP samples. The absence of TCLP-Arsenic in the NSP samples and the relatively low Antimony concentration in the SPLP samples from the SSP are most likely the result of waste material variations not captured by the samples.

The ground water seep results show that Arsenic and Antimony contaminated ground water is currently seeping into the Leon River and Nolan Creek at concentrations greater than surface water quality standards. However, based on the ground water seepage rates and surface water flow volumes observed, Antimony and Arsenic concentrations attain equilibrium river concentrations within 10 to 100 feet from the point of entry into the Leon River. This has been verified by mass balance calculations.

Surface Water and Sediment

Leon River- Surface water samples collected from 24 locations in the Leon River adjacent to and downstream of the seep sites revealed Arsenic and lead concentrations above background levels. Analysis of sediment samples collected from the same 24 locations also revealed elevated levels of Antimony, Arsenic, and lead. However, sediments in the Leon River are rare and are limited to the south bank of the river. The majority of the channel bed consists of limestone bedrock. The location of the sediments close to the south bank is most likely the result of NSP waste material either being placed in the river during the facility's operating life or erosion of waste material from the Site itself. The south bank of the river, north of the NSP, is also known to contain significant amounts of waste material that is presently entering the river.

Nolan Creek- Surface water samples collected from 20 locations in Nolan Creek adjacent to and downstream of the seep sites did not detect many of the metals observed in on-site soil or ground water above the laboratory detection limit or above background levels. It should be noted that sediments are sparsely located in Nolan Creek and the majority of the stream channel flows on the limestone bedrock. Also being farther away from the Central Processing (CP) area, there is very little shot material present in the creek. Analysis of sediment samples collected from these same 20 locations revealed the presence of many of the same metals detected in on-site soil and ground water, however these same metals (which occur naturally in the environment) were also observed at comparable levels in the upstream sediment samples. Sediment concentration profiles graphs developed for Antimony, Arsenic, and lead show no increase in those areas downstream of the ground water seep sites.

Waste Material Characteristics and Volumes

The NSP, SSP and DSP represent the three primary non-hazardous SWMUs remaining at the Site. A third shot pile, identified as the CSP straddles the property line between the adjacent cemetery and adjoining private property and within a drainage easement. This pile, and waste material near the evaporation lagoon, were not identified in historical Site documents and may represent overflow from the NSP, or material removed when the NSP was reduced in size in 1987. The estimated waste area and volumes are summarized in Table 2 below.

Analysis of samples collected from the primary waste material piles did not reveal the presence of RCRA hazardous characteristics. The analyses indicate that, in its current condition, Arsenic and lead in the waste (shot, slag, and brick) have very low leachability. However, the leachability will significantly increase if the waste is broken into fine particles and if the pH of the aqueous solutions interacting with the waste is either highly acidic or highly alkaline. Analysis of samples collected from the CSP, NSP, SSP and the DSP reveals that Antimony in the waste materials has higher leachability than Arsenic and lead.

Table 2
Waste Impact Area and Volume Estimates
Rockwool Industries, Inc., Belton, TX.

Waste Unit	Surface Impacted Area (acres)	Estimated Waste Impacted Area (acres)	Max. Waste Thickness Observed (feet)	Estimated Waste Volume (cubic yards)
Cemetery Shot Pile	0.4	5	17.5	30,000
North Shot Pile	2	4	22	25,000
Evap. Lagoon Waste	0	2	10.5	6,000
South Shot Pile	4.6	15	14	25,000
Dangerfield Slag Pile	0.3	0.3	8	2,500
Brick	0.3	0.3	3	150 to 200

Biota

Leon River- Analysis of the 61 fish samples (26 top feeders and 35 bottom feeders) collected from the Leon River at locations adjacent to and down gradient of the Site revealed the presence of many of the same metals detected in on-site soil and ground water (see Figure 3 and Figure 4). Adverse impact associated with the Site can be concluded for fish because Antimony was detected at a high frequency of detection (80.3%) at concentrations significantly higher than background.

Nolan Creek- Analysis of 10 fish samples (5 top feeders and 5 bottom feeders) collected from Nolan Creek at locations adjacent to the Site did not reveal the presence of soil COCs. Adverse

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impacts associated with the Site are not likely because elevated soil COCs were not identified in the fish samples.

On-site Buildings

The on-site buildings are generally in poor condition. Any building constructed of cinder block/brick is likely a structural liability. The large cracks and differentiated foundations/slabs do not allow for timely/cost effective restoration. Steel beam constructed buildings can be restored and they appear to be structurally sound. This will be addressed when the Site is redeveloped for industrial use.

Figure 3- Distribution of Antimony in Leon River Bottom Feeder Fish

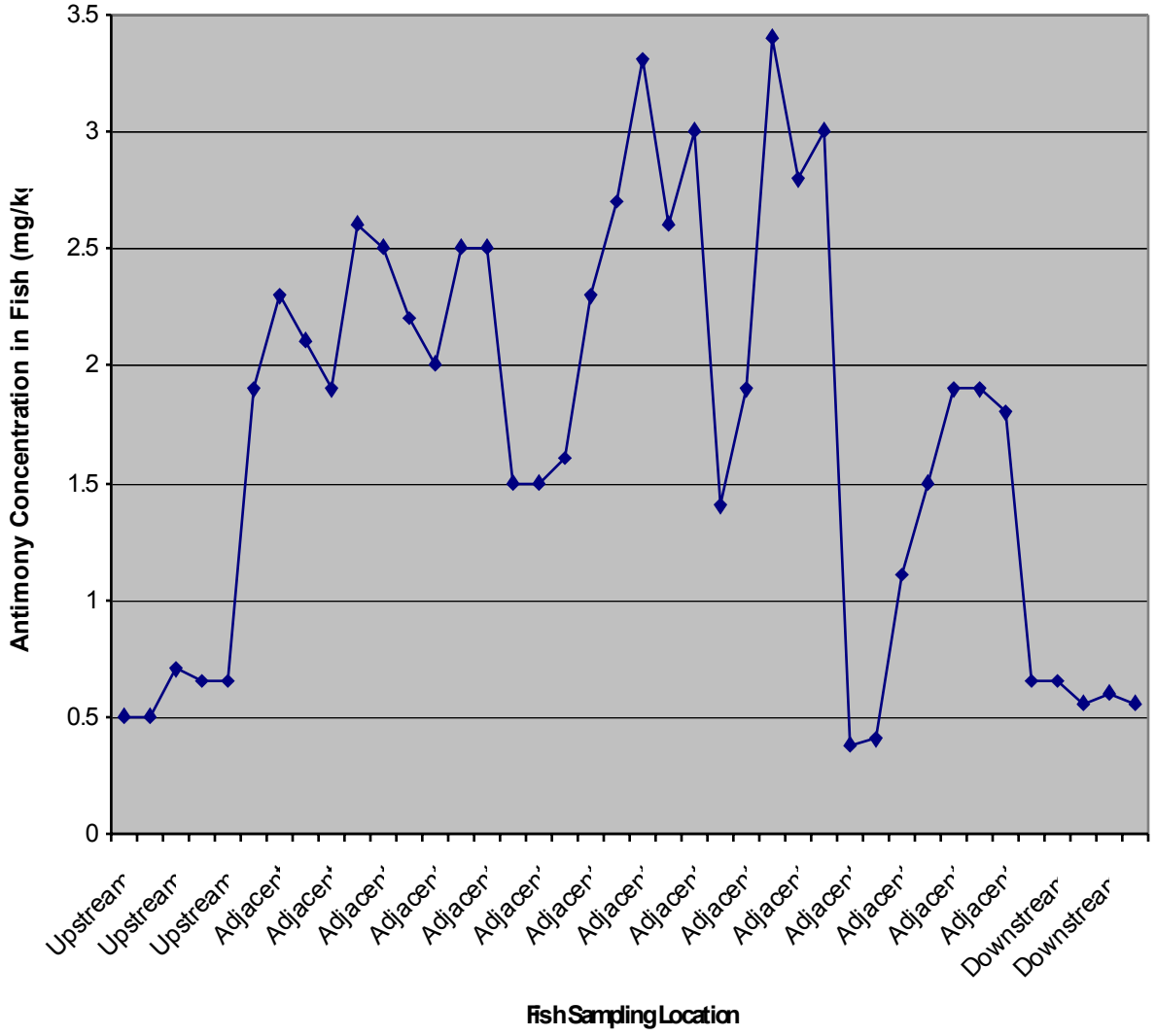
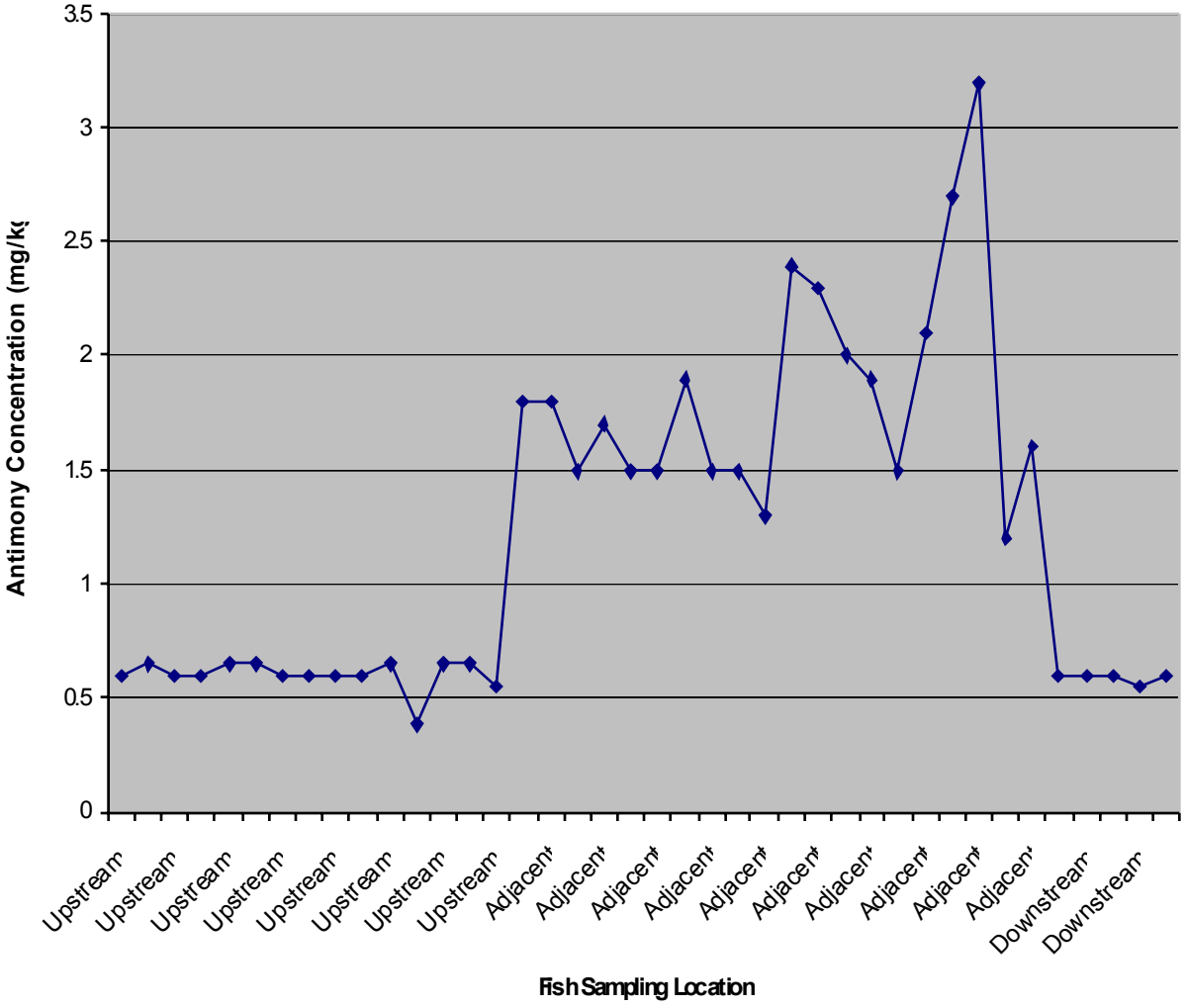


Figure 4- Distribution of Antimony in Leon River Top Feeder Fish



CURRENT AND FUTURE SITE RESOURCE USES

Most of the Site is abandoned. The 3-acre processing building area called OU2 is currently occupied and used for light industrial manufacturing. The reasonable future land use is industrial/commercial. The Site is zoned for heavy industrial use. It is located in an area with projected low growth, and is situated between two major roadways. Future residential use of the Site is unlikely, and the City of Belton plans to restore the Site into an industrial area.

The uppermost water bearing zone (see Figure 5) underlying the area occurs at a depth of 20 to 35 feet within the Quaternary alluvium. The water bearing zone occurs in the top 3 feet of the underlying Georgetown formation(fractured limestone at the top). This water bearing zone has very low saturation, and it is not uncommon for monitor wells in this interval to go dry while sampling.

While sampling for the RI/FS in 2001, four out of the nine hydro punch samples failed to extract water from this saturated zone in the alluvium. Because of the low and unreliable yield, this interval in the alluvium can best be described as perched water bearing zone. Thus, it is unlikely that the perched zone will be the source of future drinking, irrigation or industrial use water. Locally, the drinking water aquifer is in the Hosston Member of Travis Peak Formation about 1000 feet below the Site. Thus, it not likely that the contaminated perched aquifer can contaminate the drinking water aquifer. From a review of about 15 shallow wells surrounding the Site, there is no evidence that the perched water bearing zone is connected hydraulically to any off-site water bearing units. The EPA has awarded a Superfund Redevelopment grant to the City of Belton to rehabilitate the area to locate industrial/commercial entities.

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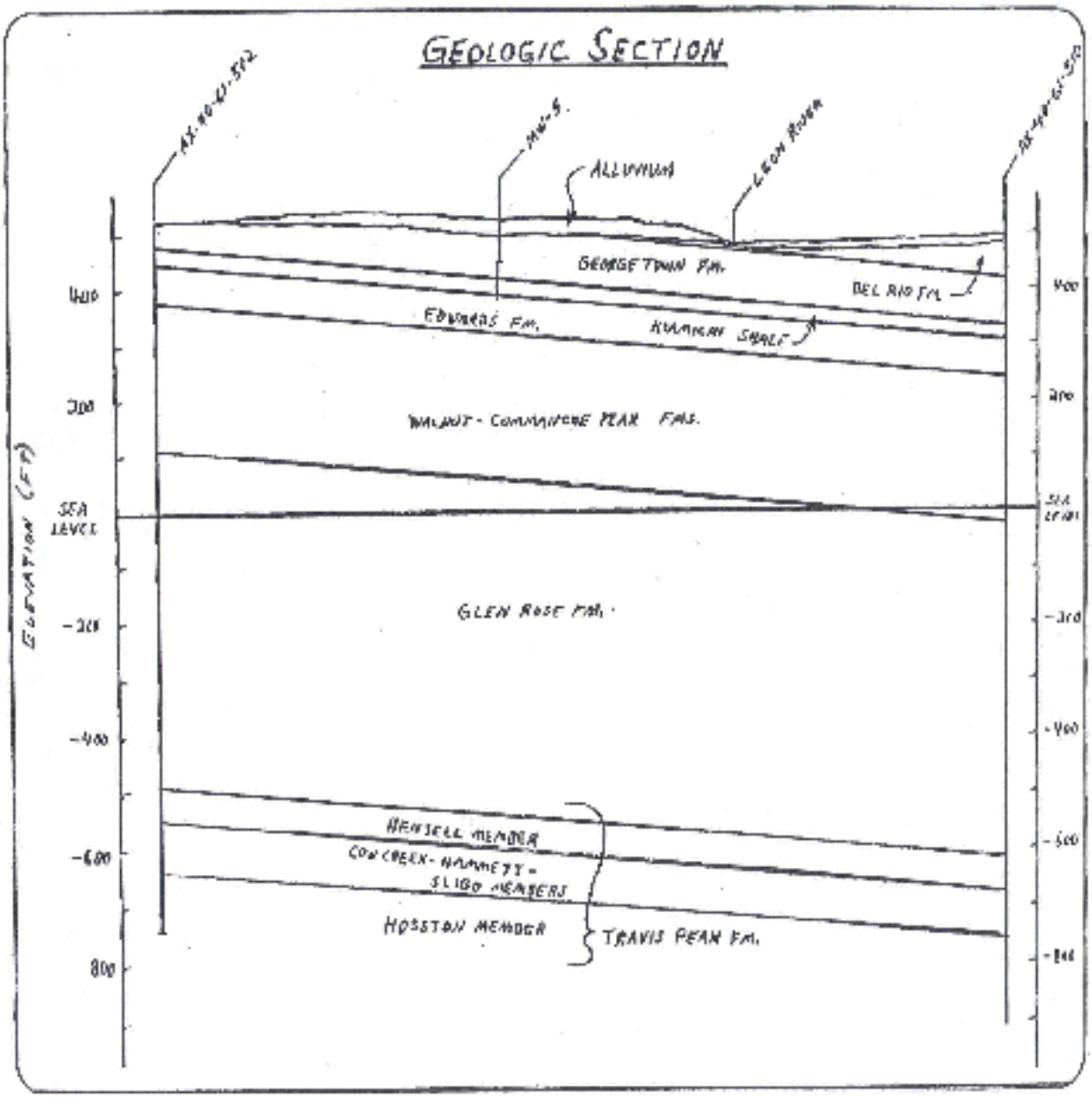
Figure 5
Geologic Cross-Section
Rockwool Industries, Inc., Belton, TX.



DECISION SUMMARY SITE RISKS

This section provides information regarding risks addressed by the interim action and provides the rationale for the limited scope of the action.

1. Risks Addressed by the Interim Action

The Site contains shot material, waste and contaminated soil resulting from previous industrial processes. There are several large shot piles, and shot is scattered over the surface soil. In its current condition, Arsenic and lead in the waste (shot, slag, and brick) have very low leachability. However, the leachability will significantly increase if the waste is broken into fine particles, and if the pH of aqueous solutions interacting with the waste is either highly acidic or highly alkaline. Analysis of samples collected from the major shot piles (CSP, NSP, SSP and Dangerfield) reveal that Antimony in the waste materials has higher leachability than Arsenic and lead. The EPA's RI has shown that metals from the shot have leached into shallow ground water over the years. Additionally, shot material has visibly entered the Leon River via erosion, and the metals associated with the shot (primarily Antimony) were detected in fish tissue. These detected metals correlate with the boundaries of the Site.

Based on the current and future Site land use, four types of populations were identified and evaluated in the human health risk assessment (HHRA): industrial workers, swimmers and fishers in Nolan Creek, and fishers in the Leon River. No receptor scenarios that were evaluated for the Site exceeded the upper end of the carcinogenic risk range($1x10^{-4}$), so risks due to carcinogenic contaminants do not need to be addressed; however, the industrial worker's non-cancer hazard from direct contact with Antimony in soil/waste from OU2 and the Central Property are 2.1 and 5.1, respectively, which exceed unity. Unity is defined as 1. Also, the adult fisher's non-carcinogenic hazard resulting from ingestion of Antimony in fish tissue from the Leon River is 3.7. These numbers suggest that current fishers in the Leon River and future workers on the Site could have non-carcinogenic health hazards from exposure to Antimony. The interim action, therefore, will address several issues:

- Visible waste material (shot) on the Site will be excavated and removed.
- The impact of shot/waste and contaminated soil on shallow ground water and surface water will be abated.
- The movement of shot into the Leon River through erosion will be halted.
- The effects of leachate and shot on fish in the Leon River will be abated.

As a result, non-carcinogenic health hazards to the current fisher and the future industrial worker from Antimony will be reduced.

Table 3 presents a summary of the Site associated risks.

Table 3
Summary of Estimated Health Risks (RME Scenario)
Rockwool Industries, Inc., Belton, TX.

Exposure Scenario	Cancer Risk		Non-carcinogenic Risk	
	Risk Level	**Chemical**[1]	Target Organ HI>1	Chemical [2]
Industrial Worker (OU2)				
Soil	2×10^{-5}	Arsenic	*2 (*Circulatory*)*	Antimony
Industrial Worker (Geer Property*)*				
Soil	3×10^{-5}	Arsenic	--	None
Industrial Worker (North Property)				
Soil	1×10^{-5}	Arsenic	--	None
Industrial Worker (Central Property*)*				
Soil	5×10^{-5}	Arsenic	5 (Circulatory)	Antimony
Industrial Worker (Non-Process Area)				
Soil	2×10^{-6}	Arsenic	--	None
Adult Fisher (Leon River*)*				
Surface Water	--	None	--	None
Fish	6×10^{-5}	Arsenic	4 (Circulatory)	Antimony
			2 (Immune)	***Mercury***
			5 (Circulatory)	***Thallium***
Adult Fisher (Nolan Creek*)*				
Fish	--	None	14 (Kidney)	***Cadmium***
			8 (Circulatory)	***Thallium***
Adult Swimmer (Nolan Creek)	–	None	-----	None

1-Chemical contributes to exposure pathway risk >1x10-6

2-Chemical with Hazard Quotient >1

Bold/Italicized chemicals are within background concentrations

2. Rationale for the Limited Scope of the Action

The ecological risk assessment (ERA) for the Site is in progress. At this time, the first three steps in an eight step process, as outlined in *Ecological Risk Assessment Guidance for Superfund (EPA,1997*), have been completed. The EPA has decided to complete the remaining ERA steps after the Interim ROD is signed, which will address human health risks only. This is being done, in part, because most of the identified terrestrial ecological risks will coincide with human health risks, which will be resolved in the final ROD and resulting Remedial Action (RA). The remaining ecological risks, not addressed by the remedial action for human health, will be further quantified during the Remedial Design (RD) phase and appropriate RA's presented in the final ROD.

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A screening level ecological assessment was completed using historic data from the 1996 Site Screening Investigation Report (TCEQ, 1996b). This assessment was presented in the Technical Activities Work Plan (CH2M HILL, 2001a). The ERA screening assessment (Step 1 and Step 2 of the EPA ERA process) identified complete pathways and potential adverse effects from Site-related source materials to potential ecological receptors. Further assessment of risks from metals and organic compounds was recommended. These recommendations were included in the project's RI Field Sampling Plan and Quality Assurance Project Plan (CH2M HILL, 2001b) for the June 2001 RI. Discussions were held among EPA, TCEQ and CH2M HILL in the Spring of 2002 to develop a strategy for using a modified ERA process to complete the ERA and to facilitate conducting and completing the RI/FS simultaneously. Based on the identified path forward, an interim ERA report was generated which contained the major elements of Step 3 of the ERA process; the major elements of the baseline problem formulation (BPF), including an exposure and effects evaluation; and recommendations for conducting Site-specific ecological sampling in Step 4. The BPF is presented in Appendix N of the RI/FS Report (CH2M HILL, 2003). The BPF show that:

- Risk to lower trophic level organisms in soil do exist for several metals (Hazard Quotients [HQs] between 1 and 5) based on comparing measured soil concentrations to screening benchmarks. These risks need to be addressed through further investigation or by eliminating the pathway of exposure to these organisms (i.e., remove or cover the waste).
- There are risks from metals to aquatic and benthic organisms in the Leon River and Nolan Creek at some locations, based on comparison of measured concentrations to screening benchmark values.

Further investigation was recommended to substantiate or refute these risks.

REMEDIAL ACTION OBJECTIVES AND GOALS

The Remedial Action Objectives (RAOs) specify the chemicals of concern (COCs), exposure routes, receptors, and Preliminary Remediation Goals (PRGs) for each affected media and are presented in this section as well as Table 4 and Table 5.

Soil RAOs and PRGs

Arsenic, Antimony, and lead are the COCs in surface soil. No COCs were identified for direct contact in subsurface soils (below two feet) because an exposure pathway is not present. The soil PRGs for the direct human health exposure pathway are **200 mg/kg** for Arsenic, **310 mg/kg** for Antimony, and **1,754 mg/kg** for lead.

The Arsenic PRG is commonly used at Commercial/Industrial sites in EPA Region 6 and is equivalent to a carcinogenic risk level of $1x10^{-4}$. The Antimony PRG is equivalent to a non-carcinogenic hazard quotient (HQ) of 1. The lead PRG is based on the assumption that an

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unborn child which was exposed to the Site wastes and contaminated soil will have less than a 5% chance to exceed the blood lead level of 10 ug/dL, based on EPA's Adult Lead Model (ALM). The lead PRG, while not necessary to achieve an average acceptable soil lead concentration, is to be used for addressing hot spots in the Central Property.

The RI revealed that sediments in the Leon River contained elevated concentrations of Antimony, Arsenic, and lead compared to the background. This media does not cause a directly unacceptable risk or hazard to human health, but it could be contributing to risks present from consumption of fish from the Leon River. Also, there is a potential for continuing impacts to sediments from the Site, under current conditions.

While direct contact was not considered for the subsurface soil pathway, soil to ground water PRGs for Arsenic, Antimony, and lead were developed for subsurface soil in order to reduce impacts from ground water seep running into surface water and to sediment in the Leon River. The purpose is to ensure that leaching of these metals from subsurface soil/waste into ground water does not lead to the exceedance of subsequent ground water PRGs designed to protect surface water. The first step, therefore, was to develop soil-to-ground-water protection values (GWP PRGs), based on the final result of not exceeding applicable surface water quality standards. The GWP PRGs for Arsenic and lead were based on achieving the Texas Surface Water Quality Standards (TSWQS) for protection of both human health and ecological receptors (50 ug/L for Arsenic, 5 ug/L for lead), while the GWP PRGs for Antimony was calculated from the EPA drinking water MCL (6 ug/L).

GWP PRGs were developed separately for the North and Central Properties to reflect the difference in each area's ground water flow conditions. For the North Property soil, the GWP PRGs are **1,322 mg/kg** for Antimony, **7,111 mg/kg** for Arsenic, and **5,721 mg/kg** for lead. For the Central Property soil, the GWP PRGs are **630 mg/kg** for Antimony, **3,385 mg/kg** for Arsenic, and **2,722 mg/kg** for lead. Table 5 presents these values.

Table 4
Summary of Soil Direct Contact PRGs and GWP PRGs
Rockwool Industries, Inc., Belton, TX.

COCs	Soil Direct Contact PRGs (mg/kg)	North Area Soil GWP PRGs (mg/kg)	Central Property Soil GWP PRGs (mg/kg)
Antimony	310	1,322	630
Arsenic	200	7,111	3,385
Lead	1,754	5,721	2,722

Groundwater RAOs and PRGs

No COCs were identified in the HHRA for shallow ground water. The exposure pathway is not complete because the shallow ground water does not have sufficient yield or quality to be considered a potable source; however, Arsenic, Antimony, and lead can impact surface water (e.g. Leon River and Nolan Creek) through ground water seeps. Because of this, ground water PRGs were developed to protect the quality of surface water.

The ground water PRGs were calculated to ensure that the transport of metals through ground water seeps into surface water would not result in surface water exceeding applicable surface water quality standards. Essentially, this completes the pathway of contamination moving from subsurface soil through ground water to surface water. The PRGs for ground water in the North Property are **2,932 ug/L** for Antimony; **24,441 ug/L** for Arsenic; and **2,444 ug/L** for lead. The PRGs for ground water in the Central Property are **1,396 ug/L** for Antimony; **11,633 ug/L** for Arsenic; and **1,163 ug/L** for lead.

Table 5 presents the ground water PRGs.

Table 5
Groundwater PRGs
Rockwool Industries, Inc., Belton, TX.

COCs	Max. GW Conc. (ug/L)	Max. Seep Conc. (ug/L)	GW Flow (gpm)	7Q2 SW Flow (gpm)	Dilution Factor	SW Quality Criteria[a]	GW to SW PRG[c]	GW PRG[d]
Leon River (North Areas)								
Antimony	2,770	1,250	2.3	1,122	0.002046	6[b]	2,932	2,932
Arsenic	5,870	49.4	2.3	1,122	0.002046	50	24,441	24,441
Lead	4	ND	2.3	1,122	0.002046	5	2,444	2,444
Nolan Creek (Central Property)								
Antimony	4,350	34.2	4.8	1,112	0.004298	6	1,396	1,396
Arsenic	2,120	ND	4.8	1,112	0.004298	50	11,633	11,633
Lead	3,800	1.4	4.8	1,112	0.004298	5	1,163	1,163

Table Notes:
a: The SW quality criteria are the lower values of the aquatic life protection/human health criteria.
b: A TCEQ SW quality criteria is not available for Antimony; so EPA Region 6 tap water MCL is selected.
c: The GW to SW PRGs are the protective concentration levels for ground water to protect surface water.
d: The GW to SW PRGs are selected as the ground water PRGs.
e. Surface Water 7Q2: 7-day 2-year low flow

Therefore, the following RAOs for surface/subsurface soils and ground water were developed:

- RAO No. 1 - Prevent direct human contact (site workers) with surface soil/waste

containing Arsenic at concentrations above 200 mg/kg.

- RAO No. 2 - Prevent direct human contact (site workers) with surface soil/waste containing Antimony at concentrations above 310 mg/kg.
- RAO No. 3 - Prevent direct human contact (site workers) with surface soil/waste containing lead at concentrations above 1,754 mg/kg.
- RAO No. 4 - Prevent leaching and migration of Arsenic from surface/subsurface soils/waste into ground water and surface water resulting in Arsenic concentrations exceeding 50 ug/L.
- RAO No. 5 - Prevent leaching and migration of Antimony from surface/subsurface soils/waste into ground water and surface water resulting in Antimony concentrations exceeding 6 ug/L.
- RAO No. 6 - Prevent leaching and migration of lead from surface/subsurface soils/waste into ground water and surface water resulting in lead concentrations exceeding 5 ug/L.
- RAO No. 7 - Prevent the migration of contaminated soil/waste into the Leon River through surface runoff and erosion.
- RAO No. 8- Remove sediment containing COCs at concentrations exceeding sediment PRGs.

DESCRIPTION OF ALTERNATIVES

The remedial alternatives were developed separately for Geer-Cemetery area, North Property area, and Central Property/OU2 area. The alternatives are organized by area and briefly described below.

Geer Property and Cemetery Area

Alternative GC-1: No Further Action

Alternative GC-1 constitutes the absence of any remedial actions. Under this alternative, no action would be conducted to protect human health, or to control the potential transport of the surface waste and contaminated soil into the Leon River, and no provisions would be included for institutional controls to restrict Site access and future land use. Although this alternative does not meet any of the RAOs, it is considered in the evaluation as a baseline for comparison to other remedial alternatives, as required by the NCP. Under this alternative, 5-year reviews would be performed following finalization of the Record of Decision (ROD).

The key ARARs associated with this interim remedy are the Texas Surface Water Quality Standards (TSWQSs) (30 TAC 307) and the Federal Water Quality Criteria (FWQC) (40 CFR Part 131). The TSWQSs establish limits for constituents for the protection of surface water quality in Texas and the FWQC apply to water classified as a fisheries resource.

Alternative GC-2: Capping

Alternative GC-2 would include implementation of a clay cap for soil/waste containing COCs exceeding direct contact PRGs and the waste on the ground surface, coupled with institutional control and environmental monitoring program. The RAOs 1 through 7 are met with this alternative by cutting off the human health exposure pathway and preventing the surface runoff of the waste material and contaminated soil into the Leon River. This alternative would also decrease the water infiltration through the waste and reduce the transport of the waste leachate into the river. The main components of this alternative include the following:

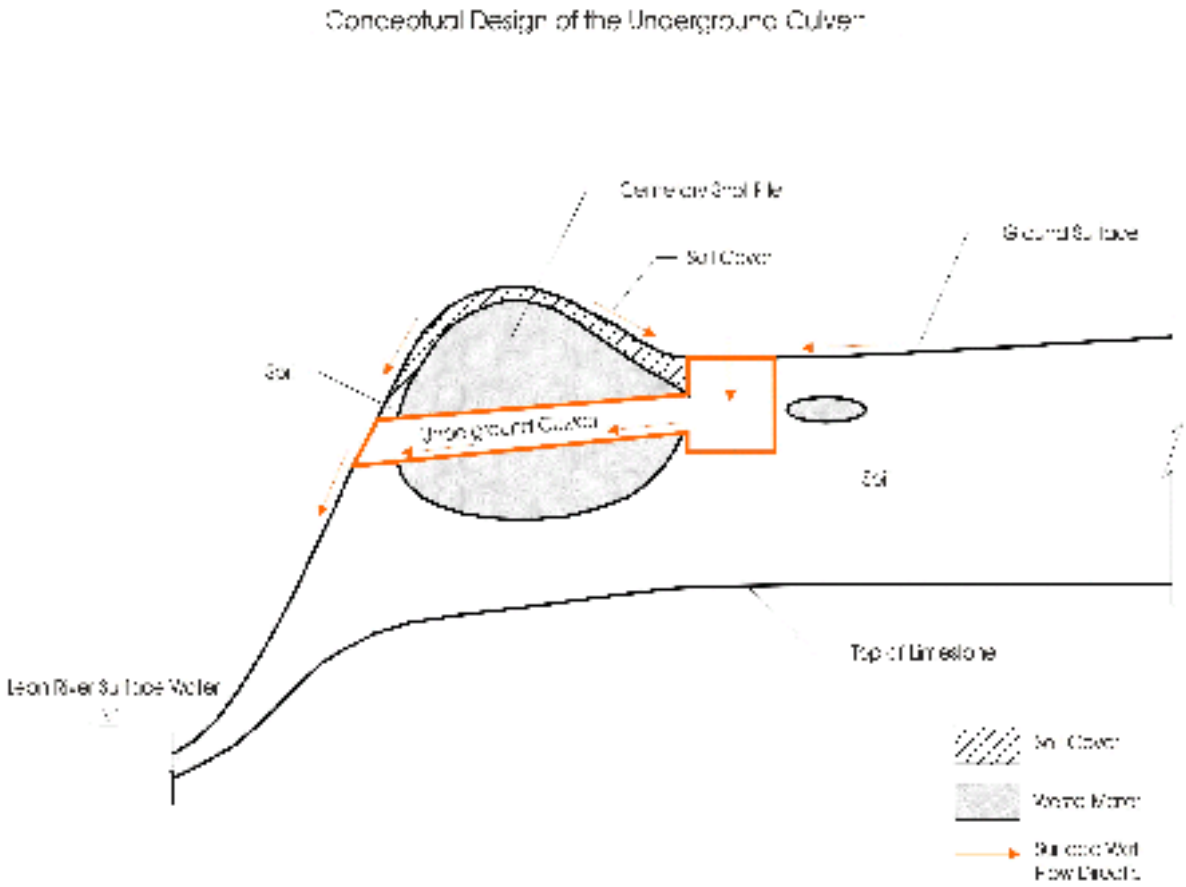
- Draining
- Capping
- Vegetating
- Institutional Control
- Environmental Monitoring

Draining

Under this alternative, an underground culvert would be constructed along the existing drainage

ditch to prevent the runoff of the waste within and near the drainage ditch into the Leon River and to reduce the potential erosion of the clay cap by the storm water. The conceptual design of the underground culvert is shown in Figure 6.

Figure 6
Underground Culvert Cross Section
Rockwool Industries, Inc.



Capping

To cut off the direct exposure pathway and to prevent surface runoff of waste material into the Leon River, the CSP would be regraded to a slope between 2% to 6% and the area containing COCs exceeding soil PRGs, as well as the area with waste material on the ground surface, would be capped with a minimum of two feet of clay. The estimated area to be capped is approximately 5,000 square yards.

Vegetating

To prevent water and wind erosion of the clay cap, and to minimize the maintenance efforts, the capped area would be covered with six inches of topsoil which would be seeded with grass chosen for long term erosion control capabilities.

Institutional Control

Because the soil/waste containing COCs above direct contact PRGs and the low threat waste would be left on-site, institutional controls, such as enforceable land use restrictions, would be required to prevent breaching of the cap.

Environmental Monitoring

Following the remediation, the conditions of the capped area would be visually monitored annually as part of the post closure care plan. Wind and water erosion or other defects at the area would be repaired. Ground water monitoring would not necessary because seasonal monitoring indicates there is no ground water in this area. Because the soil/waste containing COCs will remain on the area, EPA will conduct a review of the remedial action no less often than every five years after initiation of the remedial action in order to assure that the remedy is protected.

Key ARARs

In addition to the ARARs previously identified under Alternative GC-1, the key ARARs associated with Alternative GC-2 also include the Texas Pollutant Discharge Elimination System (TPDES) Construction Stormwater Permit (30 TAC 205). While a permit is not required for on-site response actions, the TPDES requirement that a stormwater pollution prevention plan or stormwater best management plan be developed and implemented will be met.

Alternative GC-3: Excavation of PRG Exceedances and Containment On-site

Alternative GC-3 would include excavation of soil/waste containing COCs exceeding direct contact PRGs; disposal of the excavated soil/waste into an on-site containment cell; covering the remaining visible waste on the ground surface with one foot of clay; institutional controls; and, an environmental monitoring program. The RAOs No. 1 through No. 7 are met with this alternative by removing the soil/waste containing COCs exceeding direct contact PRGs and

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preventing the surface runoff of the remaining waste material into the Leon River by covering the waste on the ground surface. Not only would this alternative permanently remove the direct contact PRG exceedances, but it would also decrease the water infiltration through the waste and reduce the transport of the waste leachate into the river. The main components of this alternative include the following:

- Excavating and On-site Disposal
- Draining
- Soil Cover
- Vegetating
- Institutional Control
- Environmental Monitoring

Excavating and On-site Disposal

Under this alternative, the PRG exceedances identified at the area would be removed and disposed of in an on-site containment cell. The on-site containment cell would be located in the southeast corner of the Central Property area. Construction of the on-site containment cell is discussed in Alternative CP-4. The estimated area to be excavated and disposed of in the on-site containment cell is about 1,800 square yards, and the estimated soil/waste volume to be excavated is approximately 3,000 cubic yards. Confirmatory samples would be required to ensure the complete removal of the soil/waste containing COCs above the direct contact PRGs.

Draining

Following removal of the PRG exceedances, an underground culvert would be constructed along the existing drainage ditch to prevent the surface runoff of the waste near the drainage ditch into the Leon River, and to reduce the potential erosion of the soil cover by the storm water. The conceptual design of the underground culvert is shown in Figure 6**.**

Soil Cover

To prevent the surface runoff of the remaining waste material into the Leon River, the CSP area would be regraded to a slope between 2% to 6% and the area having visible waste material on the ground surface would be covered with a minimum of one foot of clay. The estimated area to be covered is approximately 5,000 square yards.

Vegetating

To prevent the water and wind erosion of the soil cover and to minimize the maintenance cost, the soil cover area would be placed with a 6-inch topsoil layer, which would be seeded with grass chosen for long term erosion control capabilities.

Institutional Control

Because the low threat waste would be left on site, institutional controls, such as enforceable land use restrictions, would be required to prevent breaching of the soil cover and thereby minimizing the transport of the waste into the Leon River.

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Environmental Monitoring

Following the remediation, the conditions of the soil cover will be visually monitored annually as part of the post closure care plan. Wind and water erosion features, or other defects of the cover, will be repaired. Ground water monitoring is not necessary because seasonal monitoring indicates there is no ground water in this area. Since the waste containing COCs will remain in the area, EPA will conduct a review of the remedial action no less often than every five years after initiation of the remedial action.

Key ARARs

In addition to the ARARs previously identified under Alternative GC-2, the key ARARs associated with Alternative GC-3 also include Standards for Waste Piles and Landfills (40 CFR Part 264 Subparts L and N), Texas Industrial Solid Waste and Municipal Solid Waste Regulations (30 TAC 335), and Control of Air Pollution from Visible Emissions and Particulate Matter (30 TAC 111). The **Standards for Waste Piles and Landfills Subpart L set design and operating requirements for the storage or treatment of wastes in piles. If waste piles are closed with wastes left in place, Subpart N requirements must be met.** The Texas Industrial Solid Waste regulations and Municipal Solid Waste Regulations are to determine if a solid waste is a hazardous waste and if adherence to storage, treatment, and disposal requirements is required. **The Control of Air Pollution from Visible Emissions and Particulate Matter ARAR requires that all reasonable precautions be taken to prevent particulate matter from becoming airborne, including use of water or chemicals for control of dust in the demolition of existing structures, construction operations, clearing of land, and on dirt roads or stockpiles.**

Alternative GC-4: Excavation of PRG Exceedances and Off-site Disposal

Alternative GC-4 is the same as Alternative GC-3 with the exception that the excavated soil/waste containing COCs exceeding PRGs would be disposed of in an off-site landfill instead of an on-site containment cell. It is assumed that a Class I landfill will be used for disposal.

Alternative GC-5: Excavation of PRG Exceedances and Ex-situ Immobilization/Recycling

Alternative GC-5 is the same as Alternative GC-3 with the exception that the excavated material would be immobilized/recycled on site.

North Property Area

Alternative NP-1: No Further Action

Alternative NP-1 constitutes the absence of any remedial actions. Under this alternative, no action would be conducted at North Property Area to protect human health, to prevent the surface runoff of the waste into the Leon River, or to control the potential release and leaching of the COCs into ground water and the nearby surface water (Leon River). No provisions would be included for institutional controls to restrict site access and future land use. Although this alternative does not meet any of the RAOs, it is considered as a baseline for comparison to other remedial alternatives, as required by the NCP. Under this alternative, 5-year reviews would be

performed following finalization of the ROD.

The key ARARs associated with this interim remedy are Texas Surface Water Quality Standards (TSWQSs) (30 TAC 307) and Federal Water Quality Criteria (FWQC) (40 CFR Part 131). The TSWQSs establish limits for constituents for the protection of surface water quality in Texas and the FWQC apply to water classified as a fisheries resource.

Alternative NP-2: Capping

Alternative NP-2 would include removing wastewater from the Evaporation Lagoon and excavating the top one foot of soil from the Leon River south bank all the way from the top to the toe; implementation of a clay cap for soil/waste containing COCs exceeding direct contact PRGs and waste on the ground surface; institutional controls; and, environmental monitoring. The RAOs No.1 through No. 8 would be met with this alternative by cutting off the human health exposure pathway, preventing the surface runoff of the waste material and contaminated soil into the Leon River, reducing the leaching of the COCs into the ground water, and removing the submerged waste/sediment along the Leon River bank toe. The main components of this alternative include the following:

- Surface Water Removal and Treatment
- Excavating Leon River Bank
- Backfilling Evaporation Lagoon
- Capping
- Vegetating and Site Cleanup
- Institutional Control
- Environmental Monitoring

Surface Water Removal and Treatment

Under this alternative, the surface water in the Evaporation Lagoon would be completely removed and disposed of in a local wastewater treatment facility for treatment. The estimated total water volume to be removed is approximately 800,000 gallons.

Excavating Leon River Bank

To prevent future runoff of waste material on the Leon River bank into the river and to address the elevated Antimony concentrations in the Leon River fish, the top one foot of soil would be removed from the Leon River bank, all the way from the top edge of the bank to the bank toe. The estimated area to be excavated is approximately 900 feet x 120 feet (12,000 square yards) and the estimated total volume to be removed is approximately 4,000 cubic yards. To prevent the erosion of the slope and prevent waste material from sloughing into the river, it will be necessary to protect the riverbank and the exposed waste material after removal of the top one foot of material. There was no sediment identified in the central portion of the river during the field sampling. Most of the sediment was found to be located at the bank toe, and some of the

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sediment samples were even collected from the submerged bank due to the lack of sediment. Therefore, all the sediment containing COCs above the PRGs would be removed during the excavation of the Leon River bank. It is estimated that about 1,000 cubic yards of the excavated bank material contain COCs exceeding soil direct contact PRGs.

Backfilling Evaporation Lagoon

Upon complete removal of the water from the Evaporation Lagoon, the lagoon would be backfilled with the bank excavation material containing COCs not exceeding the direct contact PRGs and the low leachable slag and brick material from the DSP and the Brick Plant in the Central Property area. It is assumed that additional backfill material can be obtained from on-site locations. The required total backfill volume is estimated to be approximately 6,500 cubic yards.

Capping

To cut off the direct exposure pathway and to prevent the surface runoff of waste material into the Leon River, the NSP and the Evaporation Lagoon area would be regraded to a slope between 2% to 6% and the area containing COCs exceeding soil PRGs. The area with the waste material on the ground surface would be capped with a minimum of two feet of clay. The estimated area to be capped is approximately 35,000 square yards.

Vegetating and Site Cleanup

The capped area would be covered with six inches of top soil which would be seeded with grass chosen for long term erosion control. The excavated Leon River bank (about 12,000 square yards) would also be seeded. The construction debris and the uncontrolled isolated wastes identified at the area would be removed and disposed of in accordance with applicable federal, state, and local regulations.

Institutional Control

Because the soil/waste containing COCs above direct contact PRGs would be left on-site, institutional controls, such as enforceable land use restrictions, would be required to prevent breaching of the clay cap.

Environmental Monitoring

Following the remediation, the conditions of the capped area would be visually monitored annually as part of the post closure care plan. Wind and water erosion features, or other defects in the area will be repaired. Ground water monitoring would be necessary to evaluate the effectiveness of the remedial action and to define the remedies effectiveness. The ground water monitoring program would include collecting ground water samples from four existing monitoring wells semiannually for five years and analyzing for Antimony, Arsenic, and lead.

Key ARARs

In addition to the ARARs previously identified under Alternative NP-1, the key ARARs associated with Alternative NP-2 include the Texas Pollutant Discharge Elimination System

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(TPDES) Construction Stormwater Permit (30 TAC 205) and Fish and Wildlife Coordination Act (16 USC § 661, 16 USC § 742a and 16 USC § 2901). While a permit is not required for on-site response actions, the TPDES requirement that a stormwater pollution prevention plan or a stormwater best management plan be developed and implemented will be met. The Fish and Wildlife Coordination Act requires consultation when a modification of a stream or other water body is proposed or authorized and requires provision for protection of fish and wildlife.

Alternative NP-3: Excavation of PRG Exceedances and Containment On-site

Alternative NP-3 would include removing the wastewater from the evaporation lagoon, excavating the top one foot of soil from the Leon River south bank all the way from the top edge to the toe; excavating soil/waste containing COCs exceeding direct contact PRGs and disposal in an on-site containment cell; covering the visible waste on the ground surface with one foot of clay; institutional controls; and environmental monitoring. The RAOs No. 1 through No. 8 are met with this alternative by removing the soil/waste containing COCs exceeding direct contact PRGs, removing contaminated soil and sediment along the Leon River bank, and preventing the surface runoff of the remaining waste material into the Leon River. Not only would this alternative permanently remove the direct contact PRG exceedances from this area, but it also would decrease the water infiltration through the waste and reduce the transport of COCs into the river through ground water seeps. The main components of this alternative include the following:

- Surface Water Removal and Treatment
- Excavating Leon River Bank
- Excavating Soil/Waste PRG Exceedances and Containing On-site
- Backfilling Evaporation Lagoon
- Soil Cover
- Vegetating and Site Cleanup
- Institutional Control
- Environmental Monitoring

Surface Water Removal and Treatment

This component would be the same as that described in Alternative NP-2.

Excavating Leon River Bank

This component would be the same as that described in Alternative NP-2.

Backfilling Evaporation Lagoon

This component would be the same as that described in Alternative NP-2.

Excavating Soil/Waste PRG Exceedances and Containing On-site

To permanently prevent direct human exposure to soil/waste containing COCs above PRGs in this area, the PRG exceedances would be removed and disposed of in an on-site containment cell.

The cell would be located in the southeast corner of the Central Property area. Construction of the on-site containment cell is discussed in Alternative CP-4. Under this alternative, the surface soil/waste direct contact PRG exceedances at the NSP area and the surface and subsurface soil/waste direct contact PRG exceedances near the Evaporation Lagoon area would be completely removed. The estimated total volume to be excavated is about 13,500 cubic yards. The total soil direct contact PRG exceedances to be contained on-site is about 14,500 cubic yards.

Soil Cover

After excavation, the NSP and the Evaporation Lagoon areas would be regraded to a slope between 2% to 6% and covered with a minimum of one foot of clay. The estimated area to be covered is approximately 35,000 square yards.

Vegetating and Site Cleanup

This component would be the same as that described in Alternative NP-2.

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Institutional Control

Because low threat waste material would be left on site, institutional controls, such as enforceable land use restrictions, would be required to prevent breaching of the soil cover.

Environmental Monitoring

This component would be the same as that described in Alternative NP-2.

Key ARARs:

In addition to the ARARs previously identified under Alternative NP-2, the key ARARs associated with Alternative NP-3 would also include Standards for Waste Piles and Landfills (40 CFR Part 264 Subparts L and N), Texas Industrial Solid Waste and Municipal Solid Waste Regulations (30 TAC 335), and Control of Air Pollution from Visible Emissions and Particulate Matter (30 TAC 111). **The Standards for Waste Piles and Landfills Subparts L set design and operating requirements for the storage or treatment of wastes in piles. If the waste piles are closed with wastes left in place, Subpart N requirements must be met.** The Texas Industrial Solid Waste regulations and the Municipal Solid Waste Regulations guidelines for waste generators to determine if a solid waste is a hazardous waste and requires adherence to storage, treatment, and disposal requirements. **The Control of Air Pollution from Visible Emissions and Particulate Matter ARAR requires that all reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including use of water or chemicals for control of dust in the demolition of existing structures, construction operations, clearing of land, and on dirt roads or stockpiles.**

Alternative NP-4: Excavation of PRG Exceedances and Offsite Disposal

Alternative NP-4 is the same as the Alternative NP-3 with the exception that the excavated soil/waste containing COCs exceeding PRGs would be disposed of in an offsite landfill instead of an onsite containment cell. As a conservative estimate, and to provide for more reliable disposal, it is assumed that the soil/waste will be disposed of in a Class I landfill.

Alternative NP-5: Excavation of PRG Exceedances and Ex-situ Immobilization/Recycling

Alternative NP-5 is the same as the Alternative NP-3 with the following two exceptions:

- The excavated soil/waste containing COCs exceeding PRGs would be immobilized/recycled on site, but not disposed of in an onsite containment cell.
- The slag and brick materials from Central Property Area will not be used to backfill the Evaporation Lagoon. Instead of the slag and brick materials, on-site uncontaminated soils, and the bank materials containing COCs not exceeding soil direct contact PRGs, will be used to backfill the Evaporation Lagoon.

Alternative NP-6: Excavation of Soil/Waste and Ex-situ Immobilization/Recycling

Alternative NP-6 would include removing wastewater from the evaporation lagoon, excavating the top one foot of soil from the Leon River south bank all the way from the top to the toe;

excavating soil/waste containing COCs exceeding direct contact PRGs and all the other waste material identified in the area; and, immobilization/recycling of the excavated soil/waste. The RAOs No. 1 through No. 8 would be met with this alternative by removing the contaminant source (soil/waste) from the area and along the Leon River bank, and immobilization/recycling the excavated soil/waste. Because the contaminant source will be completely removed from the area, institutional controls and environment monitoring would not be required. The main components of this alternative include:

- Surface Water Removal and Treatment
- Excavating Leon River Bank
- Excavating Soil/Waste PRG Exceedances and the Remaining Waste Onsite
- Ex-situ Immobilization/Recycling
- Backfilling Evaporation Lagoon and Excavation Pits
- Vegetating and Site Cleanup

Surface Water Removal and Treatment

This component would be the same as that described in Alternative NP-2.

Excavating Leon River Bank

This component would be the same as that described in Alternative NP-2.

Excavating Soil/Waste PRG Exceedances and the Remaining Waste Onsite

To permanently prevent direct human exposure to the soil/waste containing COCs above PRGs in the area and the transport of the waste into the Leon River, the PRG exceedances and the remaining wastes in the area would be removed. The estimated total volume to be removed from the NSP and the Evaporation Lagoon is about 33,000 CY.

Ex-situ Immobilization/Recycling

The soil/waste removed from the Leon River bank, the NSP area, and the evaporation lagoon area would be immobilized/recycled onsite. The estimated total volume to be immobilized/recycled is approximately 37,000 cubic yards.

Backfilling

Upon completing removal of the wastewater from the Evaporation Lagoon and excavating soil/waste from the SSP and the Evaporation Lagoon areas, the lagoon and the excavation pits would be backfilled with uncontaminated soil. The required backfill volume is estimated to be approximately 20,000 cubic yards.

Vegetating and Site Cleanup

The excavation/backfill area would be graded to a slope between 2% to 6% and seeded. The estimated area to be seeded is approximately 35,000 square yards. The excavated Leon River bank (about 12,000 square yards) would also be seeded. Upon completion of the construction

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work, the construction debris and the uncontrolled isolated wastes including the waste on the concrete bays, used resin outside the Fresh Water Process Building, and the debris in the Office Building would be removed and disposed of in accordance with all applicable federal, state, and local regulations.

Central Property and Adjoining OU2 Areas

Alternative CP-1: No Further Action

Alternative CP-1 constitutes the absence of any remedial actions. Under this alternative, no action would be conducted at Central Property and OU2 areas to protect human health, or to control the potential release and leaching of the COCs into ground water. No provisions would be included for institutional controls to restrict site access and future land use. Although this alternative does not meet any of the RAOs, it is considered as a baseline for comparison to other remedial alternatives, as required by the NCP. Under this remedial alternative, 5-year reviews would be performed following finalization of the ROD.

The key ARARs associated with this interim remedy are Texas Surface Water Quality Standards (TSWQSs) (30 TAC 307) and Federal Water Quality Criteria (FWQC) (40 CFR Part 131). The TSWQSs establish limits for constituents for the protection of surface water quality in Texas and the FWQC apply to water classified as a fisheries resource.

Alternative CP-2: Capping

Alternative CP-2 would include implementation of a clay cap for soil/waste containing COCs exceeding direct contact PRGs, surface waste at the SSP coupled with institutional control and an environmental monitoring program. RAOs No. 1 through No. 7 would be met with this alternative by cutting off the human health exposure pathway and preventing the wind and water erosion of waste material on the ground surface. This alternative would also decrease the water infiltration through the waste and reduce the transport of the COCs into the ground water, and thereby Nolan Creek. The main components of this alternative include:

- Capping
- Vegetating and Site Cleanup
- Institutional Control
- Environmental Monitoring

Capping

To cut off the direct exposure pathway and to prevent wind and water erosion of waste material on the ground surface, the SSP and other areas containing COCs exceeding soil PRGs would be capped with a minimum of two feet of clay. The estimated area to be capped is approximately 64,000 square yards. The capped area would be contoured to minimize wind and water erosion. The low leachable slag material and bricks in the Dangerfield Slag and the Brick Plant would be removed and the materials used to backfill the Evaporation Lagoon.

Vegetating and Site Cleanup

To prevent water and wind erosion of the clay cap and to minimize the maintenance costs, the capped area would be covered with a 6-inch topsoil layer, which would be seeded. Upon completion of the construction work, the construction debris and the uncontrolled isolated wastes identified at the area would be removed and disposed of in accordance with applicable federal, state, and local regulations.

Institutional Control

Because soil/waste containing COCs above the direct contact PRGs would be left onsite, institutional controls, such as enforceable land use restrictions, would be required to prevent breaching of the clay cap.

Environmental Monitoring

Following the remediation, the conditions of the capped area would be visually monitored and repaired, as needed annually as part of the post closure care plan. A ground water monitoring program would be implemented to evaluate the effectiveness of the alternative and to predict the potential impacts on the environment. The ground water monitoring program would include collecting ground water samples from eight existing monitoring wells semiannually for five years, and analyzing them for Antimony, Arsenic, and lead.

Key ARARs

In addition to the ARARs previously identified under Alternative CP-1, the key ARARs associated with Alternative CP-2 also include the Texas Pollutant Discharge Elimination System (TPDES) Construction Stormwater Permit (30 TAC 205). While a permit is not required for on-site response actions, the TPDES requirement that a stormwater pollution prevention plan or a stormwater best management plan be developed and implemented will be met.

Alternative CP-3: Excavation of PRG Exceedances and Capping the SSP

Alternative CP-3 would include excavating the surface soil/waste exceeding direct contact PRGs and disposal of on the SSP, implementation of a clay cap to cover the SSP, coupled with institutional controls and an environmental monitoring program. RAOs No. 1 through No. 7 would be met with this alternative by cutting off the human health exposure pathway and preventing wind and water erosion of the waste material on the ground surface. This alternative would also decrease water infiltration through the waste and reduce transport of the COCs into the ground water, and thereby Nolan Creek. The main components of this alternative include:

- Excavating
- Capping
- Vegetating and Site Cleanup
- Institutional Control
- Environmental Monitoring

Excavating

Under this alternative, the top one to two feet of surface soil/waste containing COCs exceeding direct contact PRGs would be excavated and disposed of in the SSP. The area to be excavated is about 38,000 square yards and the estimated total volume to be excavated is approximately 13,000 cubic yards. The low leachable slag material and bricks in the Dangerfield Slag and the Brick Plant would be removed and the materials used to backfill the Evaporation Lagoon.

Capping

To cut off the direct exposure pathway and to minimize erosion of the waste and transport of the COCs into the ground water, the SSP area would be regraded to a slope between 2% to 6% and capped with a minimum of two feet of clay. The estimated area to be capped is approximately 25,000 square yards.

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Vegetating and Site Cleanup

This component would be the same as that described in Alternative CP-2.

Institutional Control

This component would be the same as that described in Alternative CP-2.

Environmental Monitoring

This component would be the same as that described in Alternative CP-2.

Key ARARs

In addition to the ARARs previously identified under Alternative CP-2, the key ARARs associated with Alternative CP-3 would also include Standards for Waste Piles and Landfills (40 CFR Part 264 Subparts L and N), Texas Industrial Solid Waste and Municipal Solid Waste Regulations (30 TAC 335), and Control of Air Pollution from Visible Emissions and Particulate Matter (30 TAC 111). The Standards for Waste Piles and Landfills Subparts L set design and operating requirements for the storage or treatment of wastes in piles. If the waste piles are closed with wastes left in place, Subpart N requirements must be met. **The Texas Industrial Solid Waste regulations and the Municipal Solid Waste Regulations guidelines for waste generators to determine if a solid waste is a hazardous waste and requires adherence to storage, treatment, and disposal requirements. The Control of Air Pollution from Visible Emissions and Particulate Matter ARAR requires that all reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including use of water or chemicals for control of dust in the demolition of existing structures, construction operations, clearing of land, and on dirt roads or stockpiles.**

Alternative CP-4: Excavation of Soil/Waste and Containment Onsite

Alternative CP-4 would include excavating the soil/waste containing COCs exceeding direct contact PRGs and waste above ground at the SSP, and disposal of the excavated soil/waste into an onsite containment cell, coupled with institutional control and environmental monitoring. RAOs No. 1 through No. 7 would be met with this alternative by removing the soil/waste containing COCs exceeding direct contact PRGs and waste in the SSP, and minimizing the leaching of the COCs into the ground water by immobilizing the soil/waste in an onsite containment cell. The main components of this alternative include:

- Constructing an Onsite Containment Cell
- Excavation and Onsite Disposal
- Site Cleanup
- Institutional Control
- Environmental Monitoring

Constructing an On-site Containment Cell

Under this alternative, an onsite containment cell would be constructed at the southeast corner of the Central Property area to contain all of the soil/waste excavated in Alternatives GC-3, NP-3, and CP-4. The containment cell would be designed to have a capacity of approximately 55,000 cubic yards. The containment cell would also be designed to prevent infiltration of water into the cell and to prevent migration of COCs out of the cell.

Excavating Soil/Waste and Disposing Onsite

To prevent the direct exposure of site workers to the soil/waste containing COCs above PRGs and to prevent the future wind/water erosion above ground waste in the SSP, the PRG exceedances and waste material in the SSP would be removed and disposed of in the onsite containment cell. The estimated total volume to be removed and disposed of in the onsite containment cell is approximately 38,000 cubic yards. This alternative would also include removing the low leachable slag material and bricks from the Dangerfield Slag and the Brick Plant and using the slag and brick to backfill the Evaporation Lagoon.

Site Cleanup

This component would be the same as that described in Alternative CP-2.

Institutional Control

Because the soil/waste containing COCs above PRGs would be left on site, institutional controls, such as enforceable land use restrictions, would be required to prevent breaching of the onsite containment cell.

Environmental Monitoring

Following the remediation, the conditions of the containment cell would be visually monitored annually as part of the post closure care plan. Settlement resulting in ponding, wind and water erosion or other defects would be repaired. A ground water monitoring program would also be implemented. The ground water monitoring program would include installation of three new ground water monitoring wells downgradient of the containment cell to a total depth of 35 feet, collecting ground water samples from the new wells and five existing monitoring wells semiannually for five years, and analyzing them for Antimony, Arsenic, and lead.

Key ARARs

The key ARARs for Alternative NP-4 are the same as those identified under Alternative NP-3.

Alternative CP-5: Excavation of Soil/Waste and Offsite Disposal

Alternative CP-5 is the same as the Alternative CP-4 with the exception that the excavated material would be disposed of in an offsite landfill instead of an onsite containment cell. The onsite containment cell and institutional controls would not be necessary because the contaminant source would be completely removed. Ground water monitoring would be required because ground water PRG exceedances currently exist. The ground water monitoring program would include collecting ground water samples from eight existing monitoring wells semiannually for five years, and analyzing them for Antimony, Arsenic, and lead. As a conservative estimate,

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and to provide for more reliable disposal, it is assumed that the soil/waste will be disposed of in a Class I landfill.

Alternative CP-6: Excavation of Soil/Waste and Ex-situ Immobilization/Recycling

Alternative CP-6 is the same as the Alternative CP-5 with the exception that the excavated material would be immobilized/recycled onsite and the slag and brick materials in the DSP and the Brick Plant would also be immobilized/recycled. The total volume to be immobilized/recycled is about 40,500 cubic yards.

COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives described in the previous section were compared based on seven of the nine evaluation criteria required and defined by the NCP. This approach is intended to provide sufficient information to adequately compare the alternatives and to select the most appropriate alternative for implementation at the site. The nine evaluation criteria are:

1) Overall protection of human health and the environment
2) Compliance with ARARs
3) Long-term effectiveness and permanence
4) Reduction of toxicity, mobility, and volume (TMV) through treatment
5) Short-term effectiveness
6) Implementability
7) Cost
8) Community acceptance
9) State acceptance

The first two of the nine criteria are minimum, or "threshold," criteria that must be met by all alternatives. The next five criteria are considered "balancing" criteria and are the primary criteria upon which the detailed analysis is based. The last two criteria, considered to be "modifying" criteria, were deferred until the public comment process. Since neither the State nor the community had any written or oral objection of the Proposed remedy, the community and state acceptance criteria have been satisfied.

Geer Property and Cemetery Area

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The following five alternatives developed for the Geer-Cemetery area are compared and evaluated against the seven evaluation criteria.

- Alternative GC-1: No Further Action
- Alternative GC-2: Capping
- Alternative GC-3: Excavation of PRG Exceedances and Containment Onsite
- Alternative GC-4: Excavation of PRG Exceedances and Offsite Disposal
- Alternative GC-5: Excavation of PRG Exceedances and Ex-Situ Immobilization/Recycling

Overall Protection of Human Health and the Environment

Alternatives GC-2 and GC-3, which allow the soil/waste posing the greatest risks to stay onsite, are less certain in their ability to protect human health and the environment in the long term. Alternative GC-3 is considered more protective than Alternative GC-2 because removal of the soil/waste posing the greatest risks from its current location would significantly reduce the leaching of COCs into the ground water and thereby the Leon River. Alternative GC-1 provides the least protection because the waste is left in place in its current condition.

Compliance with ARARs

All alternatives, with the exception of Alternative GC-1, are in compliance with the ARARs.

Long-term Effectiveness and Permanence

Alternatives GC-5 and GC-4 are the most effective and permanent, and they would significantly reduce the residual risks remain onsite. Some uncertainty in risk for Alternative GC-4 is introduced in the long-term containment of the COCs in the disposal facility. Alternative GC-3 is considered to have greater long-term effectiveness and permanence than GC-2 because the soil/waste posing the greatest risks would be removed from its current location (near the Leon River) to the less permeable containment cell located in the Central Property area (away from the surface water). The effectiveness and permanence of GC-2 and GC-3 rely on the appropriate operation and maintenance of the clay cap, containment cell, and soil cover. Alternative GC-1 provides no long-term effectiveness or permanence because all risks remain in place.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative GC-5 offers the best reduction in TMV for the Geer Property and Cemetery area. About 3,000 cubic yards of soil/waste posing the greatest risks will be removed and converted to a road construction material through the immobilization/recycling process. Alternatives GC-1 through GC-4 do not offer any TMV reduction because there is no treatment associated with these alternatives.

Short Term Effectiveness

Alternative GC-1 has no short-term impacts because it does not involve remedial construction.

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Alternative GC-2 would provide the least short-term effectiveness as compared with the other alternatives. GC-3 through GC-5 includes excavation the soil/waste posing the greatest risks, and disposal of or immobilization/recycling of the excavated soil/waste. There is a slight increase of short-term impacts for GC-3 through GC-5 because GC-4 will require off-site transport and GC-5 will also require onsite immobilization/recycling processing.

The short-term effectiveness with respect to the time until the RAOs are achieved is shortest for Alternative GC-2 because it does not include excavation of soil/waste posing the greatest risk. The next shortest time is GC-3 and GC-4. The slowest is GC-5, which would take a few months for processing. All the alternatives would be completed within a year.

Implementability

Only Alternative GC-1 presents no technical or administrative constraints for implementation. Because of the presence of the cemetery, any movement of material (as indicated by all other alternatives) or modification of the Cemetery Property could potentially require administrative permit or permission. Additionally, deed restrictions may not be easily enforced in the Cemetery Property, which is no longer maintained by a civic or private entity. Alternative GC-2 provides the most straightforward implementation action since no excavation is required. Alternatives GC-3 through GC-5 would be more difficult to implement than GC-2 because of the uncertainties associated with excavating in the waste pile. GC-3 would require construction of an onsite containment cell. The available and facility-specific requirements of potential disposal facilities would need to be confirmed for Alternative GC-4. GC-5 would be the most difficult to implement because the feasibility of immobilization/recycling techniques would need to be confirmed through implementation of a pilot study.

Costs

The estimated costs for each of the remedial alternatives developed for the Geer Property and Cemetery area are presented in Table 6. The table breaks down the estimated capital cost, O&M cost, periodic cost, and net present value. The order of magnitude cost estimates have an intended accuracy range of +50 percent to -30 percent.

Table 6
Estimated Costs for the Geer Property and Cemetery Property Remedial Alternatives Rockwool Industries, Inc., Belton, TX.

Cost Type	Alternative GC-1	Alternative GC-2	Alternative GC-3	Alternative GC-4	Alternative GC-5
Total Capital Cost	$0	$198K	$187K	$354K	$297K
O&M Cost (PV)	$0	$30K	$30K	$30K	$30K
Periodic Cost (PV)	$22K	$22K	$22K	$22K	$22K
Total Present Value	$22K	$250K	$238K	$405K	$348K

North Property Area

The following six alternatives developed for the North Property area are compared and evaluated against the seven evaluation criteria. These are:

- Alternative NP-1: No Action
- Alternative NP-2: Capping
- Alternative NP-3: Excavation of PRG Exceedances and Containment Onsite
- Alternative NP-4: Excavation of PRG Exceedances and Offsite Disposal
- Alternative NP-5: Excavation of PRG Exceedances and Ex-situ Immobilization/Recycling
- Alternative NP-6: Excavation of Soil/Waste and Ex-situ Immobilization/Recycling

Overall Protection of Human Health and the Environment

All alternatives, with the exception of NP-1, are protective of human health and the environment. Alternative NP-6 provides the best protection to human health and the environment. Alternatives NP-4 and NP-5 provide less protection than NP-6, but a better protection than NP-2 and NP-3 because the soil/waste posing the greatest risks would be physically removed from the site. The removal of the soil/waste posing the greatest risks would also significantly reduce the leaching of COCs into ground water and thereby the Leon River surface water. Alternative NP-5 is considered to provide much better long-term effectiveness then NP-4 as the soil/waste posing the greatest risks is converted, through the immobilization/recycling, to a road construction material. Alternatives NP-2 and NP-3, which allow the soil/waste posing the greatest risks, are less certain in their ability to protect human health and the environment in the long term. NP-3 is considered more protective than NP-2 because removal of the soil/waste posing the greatest risks from its current location would significantly reduce the leaching of COCs into the ground water and thereby the Leon River surface water.

Compliance with ARARs

All alternatives with the exception of Alternative NP-1 comply with the ARARs.

Long-term Effectiveness and Permanence

Alternative NP-6 is the most effective and permanent remedy. Alternative NP-5 is the second most effective and permanent remedy because it physically removes the soil/waste posing the greatest risks from the area and converts the soil/waste to a road construction material. The third most effective and permanent remedy is NP-4. Although Alternative NP-4 physically removes the soil/waste posing the greatest risks and disposes of the soil/waste in an offsite disposal facility, some uncertainty in risk for NP-4 is introduced in the long-term containment of the soil/waste COCs in the disposal facility.

Alternatives NP-2 and NP-3 are less effective and permanent because they allow the soil/waste posing the greatest risks to remain on site. However, there is a significant reduction in the magnitude of residual risk for NP-2 and NP-3 as compared with NP-1. Alternative NP-3 is considered to have greater long-term effectiveness and permanence than NP-2 because the soil/waste posing the greatest risks would be removed from its current location near surface water) to the less permeable containment cell located in the Central Property area (away from the surface water). The effectiveness and permanence of NP-2 and NP-3 rely on the appropriate operation and maintenance of the clay cap and the containment cell. Alternative NP-1 provides the least protection because the contaminant source is left in place.

Reduction of TMV Through Treatment

Alternative NP-6 offers the best reduction in TMV for the North Property area. About 37,000 cubic yards of source material will be removed from the NSP, Evaporation Lagoon, and the river bank areas, and converted to a road construction material. Alternative NP-5 offers the second best reduction in TMV for the North Property area. About 13,500 cubic yards of soil/waste posing the greatest risks to human health and the environment will be removed and converted to a road construction material. Alternatives NP-1 through NP-4 do not offer any TMV reduction as treatment is not involved in the alternatives.

Short-Term Effectiveness

Alternative NP-1 has no short-term impacts because it does not involve remedial construction. Alternatives NP-2 through NP-6 include excavating the Leon River bank and sediment, and NP-2 through NP-5 also include hauling large quantities of soil for capping. During excavation of the Leon River bank and sediment, the downstream surface water quality would be impacted, but the impacts can be minimized through implementation of engineering controls. During the cap construction, impacts on workers are expected to be limited to normal construction related accidents because the COCs will not be disturbed. Impacts on the community during the cap construction will be related to nuisance noise and dust and the potential for accidents related to the large amount of truck traffic. In addition to the Leon River bank and sediment excavation and clay cover, Alternatives NP-3 through NP-6 also includes excavation of the soil/waste posing the greatest risks, and disposal of or immobilization/recycling of the excavated soil/waste. There is a slight increase in the short-term impacts for the NP-3 through NP-6.

The short-term effectiveness with respect to the time until the RAOs are achieved is shortest for NP-2 because it does not include excavation of soil/waste posing the greatest risk. The next shortest time is NP-3 and NP-4. The slowest is NP-5 and NP-6, which would take a few months for processing. All the remedial alternatives would be completed within a year.

Implementability

No significant technical or administrative Implementability problems are expected for Alternative NP-2. NP-3 through NP-6 would be more difficult to implement than NP-2 because of the uncertainties associated with excavating in the waste pile (NSP) and the buried waste near the Evaporation Lagoon. There are only small differences in Implementability between Alternatives

NP-3 through NP-6. NP-3 would require construction of an onsite containment cell. The available and facility-specific requirements of potential disposal facilities would need to be confirmed for NP-4. Alternatives NP-5 and NP-6 would be the most difficult to implement because the feasibility of immobilization/recycling techniques would need to be confirmed through implementation of a pilot study.

Cost

The estimated costs for each of the remedial alternatives developed for the North Property area are presented in Table 7. The table breaks down the estimated capital cost, O&M cost, periodic cost, and net present value. The order of magnitude cost estimates have an intended accuracy range of +50 percent to -30 percent.

Table 7
Estimated Costs for the North Property Area Remedial Alternatives
Rockwool Industries, Inc., Belton, TX.

Cost Type	Alternative NP-1	Alternative NP-2	Alternative NP-3	Alternative NP-4	Alternative NP-5	Alternative NP-6
Total Capital Cost	$0	$1,668K	$1,404K	$2,248K	$1,976K	$2,645K
O&M Cost (PV)	$0	$64K	$64K	$64K	$30K	$0
Periodic Cost (PV)	$43K	$43K	$43K	$43K	$43K	$0
Total Present Value	$43K	$1,775K	$1,511K	$2,356K	$2,082K	$2,645K

Central Property and adjoining OU2 Area

The following six alternatives developed for the Central Property and OU2 area are compared and evaluated against the seven evaluation criteria.

- Alternative CP-1: No Action
- Alternative CP-2: Capping
- Alternative CP-3: Excavation of PRG Exceedances and Capping the SSP
- Alternative CP-4: Excavation of Soil/Waste and Containment Onsite
- Alternative CP-5: Excavation of Soil/Waste and Offsite Disposal
- Alternative CP-6: Excavation of Soil/Waste and Immobilization/Recycling

Overall Protection of Human Health and the Environment

All remedial alternatives, with the exception of CP-1, are protective of human health and the environment. CP-5 and CP-6 are most protective because the soil/waste posing the greatest risks and the remaining waste at the SSP are physically removed from the site. CP-6 is considered to provide much better long-term effectiveness as the contaminated soil and waste are completely converted, through the immobilization/recycling process, to a road construction material. CP-2 through CP-4, which allow the soil/waste posing the greatest risks to stay onsite are less certain in their ability to protect human health and the environment in the long term. CP-3 offers better protection than CP-2 as a smaller capped area would be easier for operation and maintenance. CP-4 is considered more protective than CP-2 and CP-3 because removal of the soil/waste from the wide spread area and compaction of the soil/waste into the onsite impermeable containment cell would reduce the mobility of the COCs and minimize the transport of the COCs through the ground water into the Nolan Creek surface water.

Compliance with ARARs

All alternatives with the exception of Alternative CP-1 comply with the ARARs.

Long-term Effectiveness and Permanence

Alternative CP-6 is the most effective and permanent remedy because it physically removes the soil/waste posing the greatest risks and the remaining waste at the SSP from the site, and converts the soil/waste to a road construction material. The second most effective and permanent alternative is CP-5. This alternative physically removes the soil/waste posing the greatest risks and the remaining waste at the SSP and disposes of in an offsite disposal facility. Both CP-5 and CP-6 would eliminate the land use restrictions and provide the maximum land for future industrial use.

There is a significant reduction in the magnitude of residual risk for CP-2 through CP-4 as compared with CP-1. Although the contaminated soil and waste are left on site, the physical barriers between the contaminated soil/waste would significantly reduce the potential risks. CP-3 offers better long-term effectiveness and permanence than CP-2 as a smaller capped area would be easier to maintain and would have less limitations on the future land use. CP-4 is considered to have greater long-term effectiveness and permanence than CP-2 and CP-3 because the COCs are immobilized in a much less permeable containment cell and the area occupied by the containment cell is smaller than the capped areas in CP-2 and CP-3. The effectiveness and permanence of CP-

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2 through CP-4 rely on the appropriate operation and maintenance of the clap caps and the containment cell.

Reduction of TMV Through Treatment

Alternative CP-6 offers the best reduction in TMV for the Central Property area. About 40,500 cubic yards of soil/waste posing the greatest risks and the remaining waste at the SSP, DSP, and Brick Plant would be removed and converted to a road construction material. Alternatives CP-1 through CP-5 do not offer any TMV reduction as treatment is not involved in the alternatives.

Short-Term Effectiveness

Alternative CP-1 has no short-term impacts because it does not involve remedial construction. Alternatives CP-2 through CP-4 include hauling large quantities of soil for capping and/or construction of the onsite containment cell. During the cap and containment cell construction, impacts on workers are expected to be limited to normal construction related accidents because the COCs will not be disturbed. Impacts on the community during the cap and containment cell construction will be related to nuisance noise and dust, and the potential for accidents related to the large amount of truck traffic. In addition to the clay cap and containment cell construction, CP-3 through CP-6 also includes excavation of the soil/waste posing the greatest risks and the remaining waste in the SSP, and disposal of or immobilization/recycling of the excavated soil/waste. There is a slight increase in the short-term impacts for the CP-3 through CP-6.

The short-term effectiveness with respect to the time until the RAOs are achieved is shortest for CP-2 and CP-3 because they do not include construction of an onsite containment cell or transport of the soil/waste to an off site disposal facility. The next shortest time is CP-4 and CP-5. The slowest is CP-6, which would take several months for the immobilization/recycling process. All the remedial alternatives would be completed within one year.

Implementability

No significant technical or administrative Implementability problems are expected for CP-2 and CP-3. Alternatives CP-4 through CP-6 would be more difficult to implement than Alternatives CP-2 and CP-3 because of the uncertainties associated with excavating in the waste pile. There are only small differences in Implementability between Alternatives CP-4 through CP-6. Alternative CP-4 would require construction of an onsite containment cell to contain all the waste material including the waste from Geer Property Cemetery area and the North Property area. The available and facility-specific requirements of potential disposal facilities would need to be confirmed for CP-5. Alternative CP-6 would be the most difficult to implement because the feasibility of immobilization/recycling techniques would need to be confirmed through implementation of a pilot study.

Cost

The estimated costs for each of the remedial alternatives developed for the Central Property area are presented in Table 8. The table breaks down the estimated capital cost, O&M cost, periodic cost, and net present value. The order of magnitude cost estimates have an intended accuracy range of +50 percent to -30 percent.

Table 8
Estimated Costs for the Central Property Area Remedial Alternatives
Rockwool Industries, Inc., Belton, TX.

Cost Type	Alternative CP-1	Alternative CP2	Alternative CP-3	Alternative CP-4	Alternative CP-5	Alternative CP-6
Total Capital Cost	$0	$2,245K	$1,057K	$2,110K	$2,530K	$2,288K
O&M Cost (PV)	$0	$80K	$80K	$80K	$33K	$32K
Periodic Cost (PV)	$43K	$43K	$43K	$43K	$43K	$43K
Total Present Value	$43K	$2,369K	$1,180K	$2,233K	$2,605K	$2,363K

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SELECTED REMEDIAL ALTERNATIVE

The preferred remedial alternatives defined herein are the alternatives (presented by study area) being proposed by EPA and are believed to be the most appropriate for the Site.

Geer Property and Cemetery Area

Alternative GC-5: Excavation of PRG Exceedances and Immobilization/Recycling Onsite

Alternative GC-5 includes excavation of the soil/waste containing COCs exceeding direct contact PRGs (estimated 3,000 cubic yards) and processing the soil/waste in an onsite immobilization process and covering the remaining visible general waste on the ground surface with one foot of clay (estimated 5,000 square yards), coupled with institutional controls and environmental monitoring. This alternative would also reduce water infiltration and minimize the potential transport of waste leachate into the river.

An underground culvert would be constructed along the existing drainage ditch and the area would be regraded. The covered area would have six inches of top soil added, with institutional controls implemented. Following the remediation, the conditions of the covered area would be visually monitored annually, and EPA would conduct 5-year reviews.

This alternative is the most protective of public health and the environment. It removes 3,000 cubic yards of soil/waste containing COCs exceeding direct contact PRGs and places a clay cover over the residual soil/waste left onsite (5,000 square yards). This would significantly reduce the leaching of COCs into ground water and the Leon River. GC-5 would provide much better long-term effectiveness than other alternatives as the soil/waste posing the greatest risks would be converted through the immobilization/recycling process to a useful uncontaminated construction material.

Alternative GC-5 is designed to achieve the contaminant-specific, location-specific, and action-specific ARARs and is the most effective and permanent because it physically removes the soil/waste PRG exceedances and converts it. It would offer the best reduction in TMV. During the remedial action, short-term, health-related risks would be minimized through air monitoring and use of emission control techniques, such as dust suppressants. Short-term nuisance noise impacts and safety-related risks to the community would be minimized by not using haul routes through residential areas.

The short-term effectiveness, with respect to the time until the RAOs are achieved, is the longest for GC-5 which would take several months to process the waste. This alternative presents some technical constraints for implementation because of the cemetery. Any movement of material or modification of the cemetery could require a permit. Additionally, deed notices and restrictions may not be easily enforced because the area is no longer maintained by a civic or private entity. GC-5 would be the most difficult to implement because the feasibility of

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immobilization/recycling needs to be confirmed through implementation of a pilot study. GC-5 is estimated to cost $348,000 (present value) based on $297,000 capital costs, $30,000 O&M, and $22,000 periodic costs.

North Property Area

Alternative NP-5: Excavation of Soil/Waste and Immobilization/Recycle Onsite

Alternative NP-5 would include removing the wastewater from the Evaporation Lagoon, excavating the top one foot of soil from the Leon River south bank, excavating soil/waste containing COCs exceeding direct contact PRGs, and processing the estimated 13,500 cubic yards of material in an onsite immobilization process. It would also include implementation of a clay cover (estimated 35,000 square yards) to cover any remaining visible waste on the ground surface, coupled with institutional controls and environmental monitoring. Under this alternative, the surface water in the lagoon would be removed and disposed of in a local wastewater treatment facility and the top one foot of soil would be removed from the river bank (see Figure 7).

After removing the wastewater from the lagoon, it would be backfilled with any bank excavation material containing COCs below the soil direct contact PRGs. The surface soil/waste direct contact PRG exceedances at the NSP area and the surface and subsurface soil/waste direct contact PRG exceedances near the lagoon area would be removed. After excavation, the NSP and the lagoon areas would be regraded to a slope between 2% to 6% and covered with a minimum of one foot of clay. The area would have a 6-inch topsoil layer placed on it, which would be seeded. The remaining river bank material would also be seeded. Institutional controls would be required and the condition of the covered area monitored annually. A ground water monitoring program would be required and would include collecting ground water samples from four existing monitoring wells semiannually for the first five years, and analyzing them for Antimony, Arsenic, and Lead. The EPA would also conduct a review no less than every five years.

Alternative NP-5 provides reasonable protection of human health and the environment as the soil/waste containing COCs at concentrations exceeding PRGs would be removed (estimated 13,500 cubic yards) and converted to a useful construction material. This alternative could be designed and implemented to achieve the contaminant-specific, location-specific, and action-specific ARARs. NP-5 is an effective and permanent remedy because it would physically remove the source material causing the human health risks. Residual risks would still exist in the area, however, due to waste remaining in place. NP-5 offers a reduction in TMV in that the source material would be removed from the NSP, Evaporation Lagoon, and the river bank and converted to a useful construction material.

The short-term effectiveness is measured with respect to the time until the RAOs are achieved. NP-5 would take only a few months for processing the waste onsite. NP-5 would be more difficult to implement because of the uncertainties associated with excavating in the waste pile (NSP) and the buried waste near the Evaporation Lagoon. As mentioned above, NP-5 would be somewhat difficult to implement because the feasibility of immobilization/recycling would need to be confirmed through a pilot study.

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NP-5 is estimated to cost $2,082,000 (present value) based on $1,976,000 capital costs, $64,000 O&M costs, and $43,000 periodic costs.

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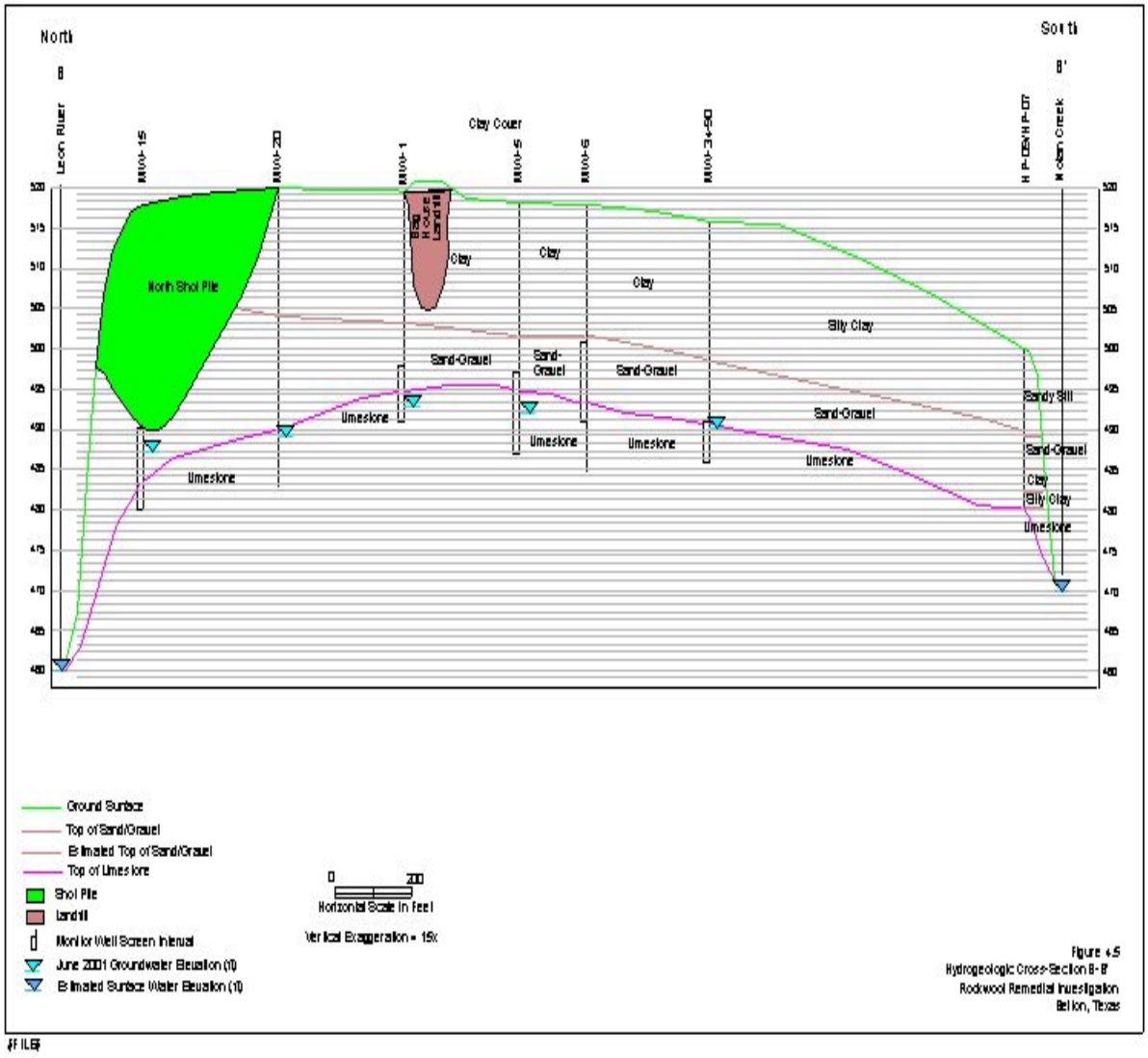
Figure 7
Alternative NP-5 Cross-Section
Rockwool Industries, Inc.



Central Property and adjoining OU2 Area

Alternative CP-6: Excavation Soil/Waste and Immobilization/Recycle Onsite

Alternative CP-6 includes excavating the soil/waste containing COCs exceeding direct contact PRGs and all above ground waste at the SSP (estimated 38,000 cubic yards), and processing the excavated soil/waste in an onsite immobilization process, coupled with institutional controls and monitoring.

Alternative CP-6 is the most protective because the soil/waste posing the greatest risks and the remaining waste at the SSP (estimated 40,500 cubic yards) would be physically removed. The

removal of the contaminant source would also significantly reduce the leaching of COCs into ground water and Nolan Creek. CP-6 is considered to provide the best long-term effectiveness as the contaminated soil and waste would be completely converted, through the immobilization process, to a useful construction material.

CP-6 could be designed and implemented to achieve the contaminant-specific, location-specific, and action-specific ARARs. It would be the most effective and permanent remedy because it would physically remove and convert the soil/wastes in the SSP. CP-6 would offer the best reduction in TMV in that all the soil/waste at the SSP, DSP, and brick plant would be removed and converted. Short-term risks to workers, the community, or the environment would be related to impacts from the construction and implementation. During the remedial action, short-term, health-related risks would be minimized through air monitoring and use of emission control techniques.

Short-term nuisance noise impacts and safety-related risks to the community caused by truck traffic would be minimized. The short-term effectiveness with respect to the time until the RAOs are achieved would be the longest for CP-6, which would take several months for processing. CP-6 would be more difficult to implement because of the uncertainties associated with excavating in the waste pile and the feasibility of immobilization/recycling. CP-6 is estimated to cost $2,363,000 (present value) based on $2,288,000 capital costs, $32,000 O&M costs, and $43,000 periodic costs.

Cost Estimates

The estimated costs for the preferred alternatives developed for each area are presented in Table 9. The table breaks down the estimated capital cost, O&M cost, periodic cost, and net present value. The order of magnitude cost estimates have an intended accuracy range of +50 percent to -30 percent. The detailed cost analysis is presented in Attachment 1.

Table 9
Estimated Costs for the Preferred Alternative
Rockwool Industries, Inc., Belton, TX.

Cost Type	Alternative GC-5	Alternative NP-5	Alternative CP-6
Total Capital Cost	$297,000	$1,976,000	$2,288,000
O&M Cost (PV)	$30,000	$30,000	$32,000
Periodic Cost (PV)	$22,000	$43,000	$43,000
Total Present Value	$348,000	$2,082,000	$2,363,000

ALTERNATE SELECTED REMEDIAL ALTERNATIVE

The selected remedy will require a pilot study to confirm the technical feasibility of the immobilization/recycling process, as well as the final costs of the process. There is a possibility that the process would not be cost effective. In case the pilot study indicates recycling technology is not cost effective, the following alternate Remedial Alternative has been selected by EPA to replace the Selected Remedy.

- *Geer Property and Cemetery Area*: Alternative GC-3, Excavation of PRG Exceedances and Containment Onsite
- *North Property Area*: Alternative NP-3, Excavation of PRG Exceedances and Containment Onsite
- *Central Property and OU2 Area*: Alternative CP-4, Excavation Soil/Waste and Containment Onsite
- Cost of the On-Site Containment Remedy: $3,982,000

As compared with the capping alternatives, the onsite containment alternatives would provide much better protection to human health and the environment, and would minimize the effort required for future monitoring and O&M of the site. Although the cost is higher than the capping alternatives ($3,205K for capping and 3,982K for onsite containment), the onsite containment alternatives would significantly reduce the human health and environmental risks and minimize the future O&M effort by removing the soil/waste containing COCs exceeding PRGs from their current locations and placing them in a much less permeable containment cell located away from the surface water (Leon River).

Cost Estimates

Table 10 presents the costs for the secondary remedial alternative. The order of magnitude cost estimates have an intended accuracy range of +50 percent to -30 percent. The detailed cost analysis is presented in Attachment 1.

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Table 10
Estimated Costs for the Secondary Preferred Alternative
Rockwool Industries, Inc., Belton, TX.

Cost Type	Alternative GC-3	Alternative NP-3	Alternative NP-4
Total Capital Cost	$187,000	$1,404,000	$2,110,000
O&M Cost (PV)	$30,000	$64,000	$80,000
Periodic Cost (PV)	$22,000	$43,000	$43,000
Total Present Value	$238,000	$1,511,000	$2,233,000

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STATUTORY DETERMINATION

The selected remedy for the site will excavate soil in which the Antimony concentration exceed PRGs to prevent direct human contact (surface soil/waste) and apply an immobilization/recycling treatment technology to the excavated material. The immobilization/recycling technology will render the waste non-hazardous, allowing it to be used as offsite road base material. The remedy will also dredge wastes which have washed into the Leon River from the river's south bank. This is likely the cause of the higher than background Antimony concentration in fish tissue. The dredged material will be treated using the same technology as the onsite soil /waste. Waste in the North Property and Geer-Cemetery Area that is below the PRGs, will be covered with one foot of clay to prevent rainfall infiltration and further leaching of contaminants into ground water, which unloads into the Leon River through seeps. Thus, the selected remedy will remove the source of contamination, as well as prevent wastes from washing into the river in the future. As stated earlier, the primary focus in the Interim ROD is protection of human health. However, the conclusions of the base line ecological risk assessment work conducted to date is that the terrestrial ecological risks will coincide with the human health risk. Therefore, remedial measures to mitigate human health risks may partially address ecological risks.

The selected remedy and alternate remedy are protective of human health and the environment in the short term and are intended to provide adequate protection until a final ROD is signed; comply with those Federal and State requirements that are applicable or relevant and appropriate for this limited-scope action; and are cost effective. Although this interim action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and thus supports that statutory mandate. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action.

Because the selected remedy and the selected alternate remedy provide for cleanup suitable for industrial use but will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ATTACHMENT 1

Cost Assumptions and Estimates

COST ASSUMPTIONS

This document presents the assumptions used for estimating costs for the primary and secondary preferred alternatives selected for the Rockwool site. The description of the alternatives is presented in the Interim ROD.

General Cost Estimate Assumptions

- The site will be operated for a total of 30 years.
- The annual discount rate is 7%.
- Allowance for Miscellaneous Items is assumed to be 5% of the total construction cost. The "Allowance for Miscellaneous Items" will cover items that can be identified, but cannot be quantified at this level of alternative development.
- Allowance for Unscoped Items is assumed to be 5% of the total construction cost. The cost will cover items that cannot be quantified at this level of alternative development.
- General Condition is assumed to be 5% of the total construction cost. The general condition cost covers the contractor's mobilization, demobilization, insurance and bonds.
- Contingency is assumed to be 20% of the total construction cost, per EPA guidance. The contingency covers unknown, unforeseen circumstances, or unanticipated conditions that are not possible to evaluate during the RI/FS. The 20% contingency is selected because of the uncertainties associated with the waste piles, the amount and nature of river bank material, and remedial processes to be used.
- Permitting & legal is assumed to be 5% of the total construction cost. This includes legal fees and fees for technical personnel necessary to obtain licenses and permits, as appropriate.
- Services During Construction is assumed to be 9% of the total construction cost. The cost includes supervision and administration during construction which includes bidding and contract administration, construction management and onsite observation, change order negotiations, pre-purchase of equipment, expedition of deliveries, submittal review, office services, and record drawings. The cost also includes engineering and design during construction which includes additional design work and preparation of O&M manuals.
- Engineering & Design is assumed to be 8% of the total construction cost.

Geer Property and Cemetery Area

Alternative GC-3:

- The underground culvert will consist of a 3'x3'x3' sump and a 200 feet long concrete pipe with a diameter of two feet.
- The total PRG exceedances to be excavated and disposed in the on-site containment cell is about 3,000 cubic yards.
- A total of eight confirmatory samples will be required during implementation of the alternative.
- The estimated graded cover area is 5,000 square feet.
- The clay covered area will require annual inspection for 30 years
- The area will require five-year reviews for 30 years.

Alternative GC-5:

- The underground culvert will consist of a 3'x3'x3' sump and a 200 feet long concrete pipe with a diameter of two feet.
- The total PRG exceedances to be excavated is about 3,000 cubic yards.
- The excavated PRG exceedances will be stabilized/recycled onsite.
- A total of eight confirmatory samples will be required during implementation of the alternative.
- The estimated graded cover area is 5,000 square yards.
- The clay covered area will require annual inspection for 30 years
- The area will require five-year reviews for 30 years.

North Property Area

Alternative NP-3:

- The wastewater to be removed from the Evaporation Lagoon is about 800,000 gallons and it can be disposed into the local WWTP for treatment.

- A total of 4,000 cubic yards of soil/waste/sediment will be removed from the Leon River bank and about 1,000 cubic yards of the excavated bank material contains COCs exceeding soil direct contact PRGs.
- The excavated bank material not containing COCs exceeding soil direct contact PRGs, the slag material from DSP, and the brick material from the Brick Plant will be used as the backfill materials to fill the Evaporation Lagoon. Onsite soil will be available to fulfill the additional backfill needs (about 1,000 cubic yards).
- A total of 14,500 cubic yards direct contact PRG exceedances (13,500 cubic yards + 1,000 cubic yards) will be removed and disposed in an onsite containment cell.
- The total area (including NSP and Evaporation Lagoon area) to be graded and covered is approximately 35,000 square yards.
- The clay covered area will require annual inspection for 30 years.
- Ground water samples will be collected from four existing monitoring wells and analyzed for the COCs semiannually for five years.
- The area will require five-year reviews for 30 years.

Alternative NP-5:

- The wastewater to be removed from the Evaporation Lagoon is about 800,000 gallons gals and it can be disposed into the local WWTP for treatment.
- A total of 4,000 cubic yards of soil/waste/sediment will be removed from the Leon River bank and about 1,000 cubic yards of the excavated bank material contains COCs exceeding soil direct contact PRGs.
- The excavated bank material (about 3,000 cubic yards) that contains COCs not exceeding soil direct contact PRGs will be used to backfill the Evaporation Lagoon. Onsite soil will be available to fulfill the additional backfill needs (about 3,500 cubic yards).
- A total of 13,500 cubic yards direct contact PRG exceedances will be removed from the site.
- The PRG exceedances (13,500 cubic yards + 1,000 cubic yards) will be stabilized/recycled onsite.
- A total of 20 confirmatory samples will be collected during implementation of the remedial alternative
- The total area (including NSP and Evaporation Lagoon) to be graded and covered is approximately 35,000 square yards.

- The clay covered area will require annual inspection for 30 years.
- Ground water samples will be collected from four existing monitoring wells and analyzed for the COCs semiannually for five years.
- The area will require five-year reviews for 30 years.

Central Property and OU2 Area

Alternative CP-4:

A total of 38,000 cubic yards soil/waste (including all PRG exceedances and the remaining waste in the SSP) will be excavated and disposed in an onsite containment cell .

- The slag material in the DSP and the brick material in the Brick Plant will be used to backfill the Evaporation Lagoon.
- An onsite containment cell will be constructed at the south east corner of the Central Property. The containment cell will be designed to have a capacity of 55,000 cubic yards. It will be constructed using the local clay and will be lined by impermeable HDPE liner in all directions. The dimension of the containment cell will be 340'x340'x12' with a 1 to 2 degree slope, assuming 8 feet underground and 4 feet above ground.
- Three monitoring wells will be installed down-gradient of the containment cell at a total depth of 35 feet.
- Ground water samples will be collected from the three new monitoring wells and five existing wells and analyzed for the COCs semiannually for five years.
- The containment cell will require annual inspection for 30 years.
- The area will require five-year reviews for 30 years.

Alternative CP-6:

- A total of 40,500 cubic yards soil/waste (including all PRG exceedances, the remaining waste in the SSP, the slag material in the DSP, and the brick material in the Brick Plant) will be removed from the site.
- The excavated soil/waste (40,500 cubic yards) will be stabilized/recycled on site.
- Ground water samples will be collected from the eight existing monitoring wells and analyzed for the COCs semiannually for five years.

- The area will require five-year reviews for 30 years.

NOTE: See attached Excel file for detailed Cost Estimates.

ATTACHMENT 2

Responsiveness Summary

RESPONSIVENESS SUMMARY

SUMMARY OF PUBLIC MEETING

HELD JUNE 5, 2003

The Environmental Protection Agency ("EPA") held a public meeting to present information and receive comments regarding the proposed plan for the Rockwool Industries, Inc., Superfund Site ("Site") at 6:00 p.m., Thursday, June 5, 2003, at City Hall, Belton, Texas. EPA staff began the meeting with a slide presentation about the history of the site, site characteristics, details of the RI/FS, alternatives evaluated to address site contamination, and EPA's preferred alternative.

EPA staff accepted comments from meeting attendees upon conclusion of the presentation. Members of the public who spoke at the meeting mostly asked questions about the Site and the preferred alternative, and they made no adverse comments concerning EPA's proposed interim remedy for the Site. Questions focused on technical details of the preferred remedy, redevelopment efforts, funding and budget issues, and the schedule for design and implementation of the remedy. A complete transcript of the public meeting is available for review in the Administrative Record. A summary of comments and responses is set forth below:

COMMENT: Will the Site be returned to a condition suitable for redevelopment whether the implemented remedy includes a cap or not?

RESPONSE: Yes.

COMMENT: You will be able to put a foundation on it and build on it?

RESPONSE: A foundation is the best cap.

COMMENT: The city of Belton desires to move the cleanup along so that the Site can be redeveloped.

RESPONSE: EPA is aware of that.

COMMENT: How big the clay cap will need to be?

RESPONSE: Maximum of two feet deep.

COMMENT: What if it's necessary to excavate for some type of utility extensions or road or something like that, and you have to cut through the cap?

RESPONSE: There would be institutional controls that would require that if the utility cuts through the cap it would have to replace the clay.

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COMMENT: You are going to scoop up the bad stuff and take it out?

RESPONSE: We are going to treat it on Site, and then it can be taken off Site and used as road base material.

COMMENT: Will there be fill brought back into the area?

RESPONSE: No, but we will not leave a gouged-out place. We will reconstitute the whole area with a 6 percent slope. We will look at what exactly will be done in this regard during the remedial design. We will have an open house to discuss that in more detail at that time.

COMMENT: How much of the funding for this is going to be from the Superfund, and how much is going to come from tax dollars?

RESPONSE: All of the funding will be federal money, except that when we get to actual construction of the remedy the State, by law, has to pay ten percent.

COMMENT: Will the ecological risk assessment proceed? How are you going to work that in?

RESPONSE: We are going to complete the ecological risk assessment during the remedial design phase. If we determine that some additional work needs to be done, we will incorporate that into a final remedy. That is why we are only calling this an interim remedy. From our experience, we expect that the measures that we are taking to protect human health will also protect the eco-system.

COMMENT: All the water quality standards are being met in the Leon River. Yet, as you pointed out, antimony levels in fish tissue are elevated. Have you worked out what is going on there particularly?

RESPONSE: No, but we speculate that since the antimony levels in the water are the same everywhere else but high adjacent to the Site that fish are consuming contamination coming from the Site.

COMMENT: Is antimony bio-cumulative?

RESPONSE: No. In humans it primarily affects the circulatory system.

COMMENT: How long will the monitoring of the fish and all this stuff continue in the long term?

RESPONSE: We are removing the source of contamination for the fish. We will be doing five-year reviews to check on the remedy. We could take some fish samples.

COMMENT: I think that would be real important because you are not real certain of the pathway. It seems that you would want to keep monitoring the fish.

RESPONSE: Thirty years is the answer to your question.

COMMENT: So there is an ongoing commitment that the EPA will monitor the Site?

RESPONSE: Yes, we have to do it because we are not cleaning up to a residential standard.

COMMENT: Is O & M related to the question about when do you come back?

RESPONSE: No. EPA does O & M for the first ten years, and after that the State takes over. We negotiate with them and make sure everything is the way it should be. In some instances, they just have to mow over the cap or whatever and keep the fences up.

COMMENT: What is your time-frame to the next step, assuming funding is available?

RESPONSE: The next step is doing the remedial design and the ecological risk assessment. We are estimating it will be about October or November. After that, we do the remedial action. When that will start is a little hazy.

COMMENT: Is the remedial design funded?

RESPONSE: Yes.

COMMENT: And then the cleanup itself?

RESPONSE: It will depend upon when we get funding. Once we start the cleanup, we should be able to finish the whole process in about five months. We need a market for the stabilized waste.

COMMENT: Texas Department of Transportation has a project on I-35.

RESPONSE: We are hoping to be able to be part of that.

COMMENT: Have you done anything on your pilot?

RESPONSE: No. We do the pilot during the remedial design phase.

COMMENT: Is EPA going to do that?

RESPONSE: In this case, EPA is going to do the pilot. It should start any time after the internal review is done, maybe in the July through October time-frame. It's very hard to project exactly.

COMMENT: You have to do the ecological risk assessment and the final ROD.

RESPONSE: Yes, if we have to do anything else. What we are hoping is that the remedy we have come up with will suffice for the ecological risk.

COMMENT: But steps five through eight still need to be carried out to some degree?

RESPONSE: Procedurally, that ecological risk assessment is going to get done. What happens after that is left to the science. If there has to be a change because the ecological risk assessment found a complete pathway, then the final ROD will have to incorporate that. It is a possibility that the final ROD will say no further action is required.

COMMENT: How much remediation on the Greer property? How far are you going to encroach on that?

RESPONSE: Only the shot pile that extends to the Greer property, we will excavate that.

COMMENT: And put the culvert along the easement?

RESPONSE: Right now we are thinking of the easement area, but that will be fine-tuned.

COMMENT: I see in your report that you found contamination all the way to the western edge of the Greer property.

RESPONSE: Right now we are concerned about the big shot pile.

COMMENT: How much material did you find west of that?

RESPONSE: We did not investigate enough to estimate that. It is below grade, covered. The intent of this cleanup is to address uncontrolled surface waste that had a complete risk pathway. That material on the Greer property is already covered and not leaching to the river, so we do not have a real reason to remove it.

COMMENT: What if we excavate to build something there?

RESPONSE: There is going to be waste there. That will be deed-recorded. You will know where it is. We will know where it is. We will tell you how many yards are

out there. So you will know what you are getting into and can do it in an informed way, protect yourself, and then put the material back in a safe way.

COMMENT: That can be done safely?

RESPONSE: Absolutely. That is an institutional control. This is not a clean closure, so it is going to be controlled property. The good news is it is controlled under an industrial scenario, and exposure in industrial scenarios is different than in a residential scenario. It would not preclude you from putting a building there, but you would have to do it in a safe way. If you put a building there, that itself is a cover. It would be a far better cover than the clay. The only cautions would be in preparing the Site for the foundation or excavation. If you do that, it should be with an understanding of the condition of the property.

COMMENT: Would this Site, after remediation, be a concern to an industry coming in to build a plant?

RESPONSE: No. We do not think so. Many sites have been redeveloped across the country.

COMMENT: In terms of contamination, it does not sound very severe.

RESPONSE: No, it is not.

COMMENT: From the experiences that you have had in cleaning up sites and coming up with a five million dollar budget, is that a very significant superfund site in comparison to what you have seen at other locations?

RESPONSE: In terms of cost level, it is very ordinary. In terms of threat level, many are much worse.

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