



**COLORADO**  
Department of Public  
Health & Environment

#  
Dedicated to protecting and improving the health and environment of the people of Colorado

**Covenant Information:**

**Covenant Date** 5/16/2016  
**Last Modified** 5/16/2016  
**Self Reporting**

**Media of Concern:**

**Surface Water:**   
**Ground Water:**   
**Air:**   
**Soil:**   
**Other:**

**Contaminants of Concern:**

Arsenic, Lead

**Institutional Control ID: RSNOT00021**

**Site Contact Information:**

**Owner Corp:** Colorado Dept of Public Hlth and Env  
**Contact Name:** Hazardous Materials Corrective Unit Mgr.  
**Contact Address:** 4300 Cherry Creek Dr. S.  
**Contact City:** Denver  
**Contact State:** CO  
**Contact Zip:** 80246  
**Contact Phone:** 303-692-3362

**Property Restrictions:**

- 1: Access to property prohibited.
- 2: Structures are not allowed on cover.
- 3: No activities allowed that will damage landfill cover.
- 4: Extractiion of groundwater is prohibited except for environmental samples.
- 5: Owner shall comply with Department approved closure plan and monitoring plan.

**Site Information:**

**ID:** COD073405961  
**Name:** Rockwool Industries  
**Address:** 600 Old Smelter Rd.  
**City:** Pueblo  
**State:** CO  
**Zip:** 80217

**Legal Description:**

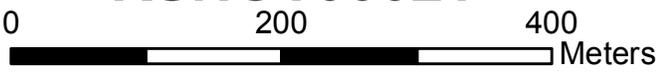
See Institutional Control

# ROCKWOOL INDUSTRIES



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

## RSNOT00021





52

**This property is subject to a  
Notice of Environmental Use Restrictions  
imposed by the  
Colorado Department of Public Health and Environment  
pursuant to section 25-15-321.5, Colorado Revised Statutes**

**Notice of Environmental Use Restrictions**

WHEREAS, Rock Wool Insulating Company and Rockwool Industries, Inc. ("OWNERS") are the OWNERS of certain property commonly referred to as the Rockwool Landfill, located at **600 Old Smelter Road, Pueblo, Colorado**, more particularly described in **Attachment A**, attached hereto and incorporated herein by reference as though fully set forth (hereinafter referred to as "the Property");

WHEREAS, the Hazardous Materials and Waste Management Division of the Colorado Department of Public Health and the Environment ("the Department"), which is located at 4300 Cherry Creek Drive South, Denver, Colorado 80246-1530, is authorized to issue Notices of Environmental Use Restrictions (a/k/a "Restrictive Notices") pursuant to C.R.S. § 25-15-320(4)(a) of the Colorado Hazardous Waste Act, C.R.S. §§ 25-15-101, *et seq.* ("CHWA");

WHEREAS, for purposes of indexing in the County Clerk and Recorder's office Grantor-Grantee index only, Rock Wool Insulating Company and Rockwool Industries shall be considered the **Grantors**, and the Colorado Department of Public Health and Environment shall be considered the **Grantee**. Nothing in the preceding sentence shall be construed to create or transfer any right, title or interest in the Property;

WHEREAS, from the 1880's until 1920, smelting operations were conducted on the eastern portion of the Property. The waste material from the smelting operations was a slag high in arsenic and lead. In 1957, Rockwool Industries, Inc. began using the slag as raw material for the manufacturing of mineral wool insulation;

WHEREAS, mineral fiber insulation was produced from the above-referenced blended composite of smelter slag at the industrial plant site. Slag and coke were melted in cupolas and extruded to form the fiber insulation. Both batt and loose fiber insulation was produced. The prominent feature of the site was a shot pile, which encompasses 12 of the 39 acres of the site. The shot consisted of spherical grains of sand size, metallic material that resulted from the extrusion of the fiber insulation from the molten slag. The shot pile received solid waste including shot, waste slag, and mineral fiber insulation from the manufacturing process, which were deposited on native soils;

WHEREAS, based on maps from a site characterization report in Department records, this shot pile is located along the western portion of the site, adjacent to the current I-25 alignment. The maximum depth of the shot pile was approximately 30 feet and contained approximately 400,000 cubic yards of waste material;



WHEREAS, pursuant to the Department-approved Closure Plan dated December 1992, attached hereto as **Attachment B** and incorporated herein by reference as though fully set forth (hereinafter referred to as the "Closure Plan"), the shot pile was closed in the early 1990's by re-grading the material and installing a cover system comprised of a layer of fill overlain by a layer of compacted clay, a geotextile drainage layer and rock mulch. A boiler evaporation pond was located adjacent to the shot pile and received wastewater from the boiler and bag house dust control facilities. The pond was approximately 80 feet square and 6 feet deep with a liner and embankments constructed from native shale and clay existing at the site. The site also contained areas where slag, coke, and damaged rockwool insulation were disposed and/or stored;

WHEREAS, the Property is the subject of enforcement and remedial action pursuant to the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6926, *et seq.* ("RCRA") and the Colorado Solid Waste Disposal Sites and Facilities Act, C.R.S. §§ 30-20-100.5, *et seq.*;

WHEREAS, contaminants including heavy metals, specifically lead and arsenic, remain on the Property above levels that are protective of unrestricted use of the Property;

WHEREAS, the U.S. Environmental Protection Agency ("EPA") and the Department have determined that activity and use restrictions within the Rockwool Landfill are necessary to assure the long-term integrity of the landfill and that it operates as intended in the future;

WHEREAS, the purpose of this Restrictive Notice is to ensure protection of human health and the environment by restricting access to waste, soil and groundwater from the Property which remain on the Property above state standards; and

WHEREAS, the Department is imposing this Restrictive Notice to subject the Property to certain covenants and restrictions as provided in Article 15 of Title 25, Colorado Revised Statutes. These covenants and restrictions shall burden the Property and bind OWNERS and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein, for the benefit of the Department and OWNERS.

NOW, THEREFORE, the Department issues this Restrictive Notice pursuant to C.R.S. § 25-15-321.5, with EPA as a third party beneficiary. The Property described in Attachment A shall hereinafter be subject to the following requirements set forth in paragraphs 1 through 13 below, which shall be binding on OWNERS and all persons now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein. As used in this Restrictive Notice, the term OWNERS means the then current record OWNERS of the Property and, if any, any other person or entity otherwise legally authorized to make decisions regarding the transfer of the Property or placement of encumbrances on the Property, other than by the exercise of eminent domain.

- 1) Use restrictions. The following uses are prohibited on the Property:
  - a. Access to the property is prohibited, except for authorized remedial activities.



- b. OWNERS shall maintain the existing security fence surrounding the property. Gates in the fence must be locked at all times except to allow authorized ingress or egress.
- c. OWNERS shall post signs legible from at least 20 feet at 1,000 foot intervals, stating "No trespassing."
- d. OWNERS shall inspect the fence and signs bi-annually, and complete any necessary repairs within two weeks of the inspection.
- e. OWNERS shall report in writing to the Department any evidence that the restrictions on access have been violated (e.g., fences or locks cut, signs of vandalism, etc.) within one week of discovery.
- f. Inspection results and any necessary repairs must be documented in the annual Restrictive Notice Certification Forms.
- g. No excavation, drilling, grading, digging, tilling or any other soil-disturbing activity is allowed on the Property, except as authorized in a remedial decision document or environmental sampling plan.
- h. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document approved by the Department or an environmental sampling plan.
- i. Nothing in the preceding shall prohibit the installation or use of monitoring or remedial wells, as authorized in a remedial decision document or environmental sampling plan approved by the Department.
- j. Actions that may damage or impair the proper functioning of any authorized remedial wells are prohibited.
- k. Construction or maintenance of any standing body of water on the Property, including any pond or storm water retention basin, is prohibited.
- l. Activities that may damage the landfill cover are prohibited. Such activities include, but are not limited to, grazing, digging, drilling, tilling, grading, excavation, construction of any sort, use as an athletic field, placing of any objects or structures on the cover, and vehicular traffic. Nothing in the preceding sentence shall prohibit the use of vehicles needed to perform any authorized maintenance or repairs on the cover.
- m. No enclosed structures may be built or placed on the landfill cover.
- n. Non-enclosed structures may be placed on the landfill cover in accordance with the approved Closure Plan.



- o. Irrigation of the landfill cover is prohibited, except as approved by the Department in the Closure Plan, a post-closure plan, or a remedial decision document to establish and maintain vegetation.
  - p. Any action that may damage or interfere with the proper operation or maintenance of any engineered component of the remedy on the Property, including the landfill cover, is prohibited.
  - q. OWNERS shall comply with all provisions of the attached Closure Plan for the Property. The Closure Plan and any amendments are also on file at the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, Records Center.
- 2) Modifications. This Restrictive Notice shall remain and continue in full force and effect unless modified or terminated in accordance with this paragraph and pursuant to C.R.S. § 25-15-321.5 or any successor statute. OWNERS may request that the Department approve a modification or termination of the Restrictive Notice. The request shall contain information showing that the proposed modification or termination shall, if implemented, ensure protection of human health and the environment. The Department shall review any submitted information, and may request additional information. If the Department determines that the proposal to modify or terminate the Restrictive Notice will ensure protection of human health and the environment, it shall approve the proposal. No modification or termination of this Restrictive Notice shall be effective unless the Department has approved such modification or termination in writing. Information to support a request for modification or termination may include one or more of the following:
- a. a proposal to perform additional remedial work;
  - b. new information regarding the risks posed by the residual contamination;
  - c. information demonstrating that residual contamination has diminished;
  - d. information demonstrating that the proposed modification would not adversely impact the remedy and is protective of human health and the environment; and
  - e. other appropriate supporting information.
- 3) Conveyances. OWNERS shall notify the Department at least fifteen (15) days prior to any conveyance of any interest in any or all of the Property. Thirty (30) days after any conveyance, OWNERS shall provide the Department with a copy of the recorded deed transferring any interest in any or all of the Property and provide the name, mailing address and telephone number of the new OWNER(S). If the entire interest is not conveyed, OWNERS shall provide an improvement survey plat that shows the property being conveyed.
- 4) Notice to Lessees. OWNERS agree to incorporate either in full or by reference the restrictions of this Restrictive Notice in any leases, licenses, or other instruments granting a right to use the Property.
- 5) Notification for proposed construction and land use. OWNERS shall notify the Department simultaneously when submitting any application to a local government for a building permit or change in land use.



6) Inspections. The Department, including its authorized employees, agents, representatives and independent contractors, shall have the right of entry to the Property at reasonable times with prior notice for the purpose of determining compliance with the terms of this Restrictive Notice. Nothing in this Restrictive Notice shall impair any other authority the Department may otherwise have to enter and inspect the Property.

7) Third Party Beneficiary. The OWNERS of the Property and EPA are third party beneficiaries with the right to enforce the provisions of this Restrictive Notice as provided in C.R.S. § 25-15-322.

8) No Liability. The Department does not acquire any liability under State law by virtue of issuing this Restrictive Notice.

9) Enforcement. The Department may enforce the terms of this Restrictive Notice pursuant to C.R.S. § 25-15-322. OWNERS and EPA may file suit in district court to enjoin actual or threatened violations of this Restrictive Notice.

10) OWNERS' Compliance Certification. OWNERS shall execute and return a certification form provided by the Department, on an annual basis, detailing OWNERS's compliance, and any lack of compliance, with the terms of this Restrictive Notice.

11) Severability. If any part of this Restrictive Notice shall be decreed to be invalid by any court of competent jurisdiction, all of the other provisions hereof shall not be affected thereby and shall remain in full force and effect.

12) Recording. Grantee shall cause this Restrictive Notice to be duly recorded in the real property records for Pueblo County.

13) Notices. Any document or communication required under this Restrictive Notice shall be sent or directed to:

**FOR THE DEPARTMENT:**

Robert Dean Beierle  
Hazardous Materials and Waste Management Division  
Colorado Department of Public Health and the Environment  
4300 Cherry Creek Drive South  
Denver, Colorado 80246-1530

And to:

Jason E. King  
Natural Resources and Environment Section  
Colorado Department of Law  
1300 Broadway, 7th Floor  
Denver, CO 80203



**FOR OWNERS:**

Rock Wool Insulating Company  
c/o Jean Carpentier  
1727 Sardis Rd., Suite 168  
Charlotte, NC 28270

**FOR EPA:**

On-Scene Coordinator (8EPR-ER)  
Rockwool Landfill  
U.S. Environmental Protection Agency  
1595 Wynkoop Street  
Denver, CO 80202-1129

And to:

Regional Institutional Control Coordinator, EPR-SR  
U.S. Environmental Protection Agency  
1595 Wynkoop Street  
Denver, CO 80202

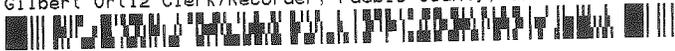


**ATTACHMENT A**  
**Property Description**

Pueblo County Assessor's Parcel #431323001

LOT 1 WHEELSTAR SUB CONTG 13.16A FORMERLY 04-313-00-012 + 019  
County of Pueblo, State of Colorado

2038432 NOTICE 06/01/2016 03:41:39 PM  
Page: 8 of 24 R 126.00 D 0.00 T 126.00  
Gilbert Ortiz Clerk/Recorder, Pueblo County, Co





**ATTACHMENT B**  
**Closure Plan**

2038432 NOTICE 06/01/2016 03:41:39 PM  
Page: 10 of 24 R 126.00 D 0.00 T 126.00  
Gilbert Ortiz Clerk/Recorder, Pueblo County, Co



RWI/LA/VOL. 2

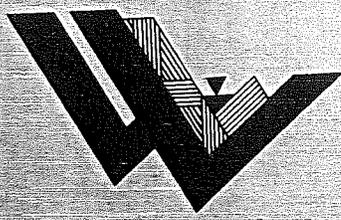
2038432 NOTICE 06/01/2016 03:41:39 PM  
Page: 11 of 24 R 126.00 D 0.00 T 126.00  
Gilbert Ortiz Clerk/Recorder, Pueblo County, Co

SHOT PILE CLOSURE PLAN  
ROCKWOOL FACILITY  
Pueblo, Colorado

PREPARED FOR:  
ROCKWOOL INDUSTRIES, INC.

PREPARED BY:  
WATER, WASTE & LAND, INC.

DECEMBER 7, 1992



**WATER**  
**WASTE**  
**& LAND**  
INC.

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION .....	1
2.0 CURRENT SITE CONDITIONS .....	3
2.1 GENERAL SITE LAYOUT .....	3
2.2 GEOLOGIC SETTING .....	3
2.3 HYDROLOGIC SETTING .....	4
2.3.1 Climate .....	4
2.3.2 Ground Water .....	4
2.3.3 Surface Water .....	5
2.4 WASTE PILE CHARACTERIZATION .....	6
3.0 CLOSURE PLAN .....	7
3.1 GENERAL DESCRIPTION .....	7
3.2 IDENTIFICATION AND REMOVAL OF ARSENIC BEARING MATERIAL .....	7
3.3 GRADING OF THE SHOT PILE .....	9
3.4 COVER SYSTEM .....	11
3.4.1 Cover Description .....	11
3.4.1.1 <u>Low Permeable Layer</u> .....	13
3.4.1.2 <u>Flexible Membrane Cover</u> .....	14
3.4.1.3 <u>Lateral Drainage Layer</u> .....	14
3.4.1.4 <u>Geotextile Filter</u> .....	14
3.4.1.5 <u>Plant Growth Media</u> .....	15
3.4.1.6 <u>Rock Mulch</u> .....	15
3.4.2 Cover Evaluation .....	15
3.4.2.1 <u>Water Balance Modeling</u> .....	16
3.4.2.2 <u>Stability Evaluation of the Cover</u> .....	16
3.5 HYDRAULIC ANALYSIS .....	17
3.5.1 Runoff Hydrograph Modeling .....	18
3.5.2 Diversion Channel Design .....	18
3.5.3 Rock Protection Design .....	20
3.5.4 Existing 1921 Arkansas River Channel .....	21
3.6 VEGETATION AND EROSION PROTECTION .....	22
3.6.1 Vegetation .....	22
3.6.2 Surface Erosion Stability .....	22
4.0 SUMMARY OF CLOSURE CONSTRUCTION ACTIVITIES .....	30
4.1 CLOSURE SCHEDULE .....	30
4.2 CONSTRUCTION EQUIPMENT .....	31
4.3 CONSTRUCTION PROCEDURES AND MATERIAL SPECIFICATIONS .....	31
4.3.1 Regrading the Shot Pile .....	31
4.3.2 Borrow Excavation and Material Handling .....	33
4.3.3 Cover Construction Tolerance .....	33
4.3.4 Material Specifications .....	34
4.3.5 Construction Quality Assurance and Quality Control Plan .....	34
4.3.6 Diversion Channel Location .....	34
4.3.7 Soil Amendments and Native Plant Seeding .....	34
4.3.8 Construction Phase Water and Dust Management Plan .....	35



4.3.9 Decontamination Plan ..... 36

5.0 COST ESTIMATES ..... 37

6.0 POST CLOSURE ACTIVITIES ..... 39

    6.1 POST CLOSURE SECURITY AND INSPECTION PLANS ..... 39

    6.2 POST CLOSURE GROUND WATER MONITORING ..... 39

7.0 REFERENCES ..... 41

LIST OF TABLES

TABLE 3.1 -- HYDRAULIC CHARACTERISTICS USED IN HEC-1 ANALYSIS ..... 24

TABLE 5.1 -- SHOT PILE CLOSURE COST ESTIMATES ..... 38

LIST OF FIGURES

FIGURE 3.1 -- LOCATION OF ONSITE LANDFILL ..... 25

FIGURE 3.2 -- TYPICAL SIDE SLOPE CROSS-SECTION ..... 26

FIGURE 3.3 -- 2:1 SIDE SLOPE ..... 27

FIGURE 3.4 -- HEC-1 WATERSHEDS ..... 28

FIGURE 3.5 -- TYPICAL EAST DIVERSION CHANNEL CROSS-SECTION ..... 29

LIST OF PLATES

PLATE 1 -- CURRENT SITE LOCATION MAP

PLATE 2 -- PROPOSED SHOT PILE REGRADING PLAN

LIST OF APPENDICES

A -- BORROW MATERIAL INVESTIGATIONS

B -- STABILITY ANALYSIS

C -- HYDROLOGIC MODELING

D -- GROUND WATER MONITORING

E -- COVER EVALUATION WITH THE HELP MODEL

F -- EROSIONAL STABILITY - ROCK PROTECTION

G -- ARSENIC BEARING MATERIAL SAMPLING AND ANALYSIS PLAN

H -- PROCESS AND MATERIAL SPECIFICATIONS AND CONSTRUCTION DRAWINGS

I -- CONSTRUCTION QA/QC PLAN

J -- CONSTRUCTION PHASE WATER AND DUST MANAGEMENT PLAN

K -- DECONTAMINATION PLAN

L -- POST CLOSURE SECURITY AND INSPECTION PLANS

M -- MONITORING WELL ABANDONMENT AND COMPLETION PROCEDURES



## 6.0 POST CLOSURE ACTIVITIES

Following closure construction, a post closure plan will be implemented to provide ongoing security, inspection and maintenance programs, monitoring of ground water quality, and monitoring of surface stability.

### 6.1 POST CLOSURE SECURITY AND INSPECTION PLANS

Post closure security and inspection plans are provided in Appendix L. These plans specify the inspection frequency, inspection items and reporting mechanisms. Post closure security monitoring and site inspections will be performed quarterly. The visual site inspections will be performed to evaluate the conditions of the cover system and diversion channels. Any signs of erosion or cover degradation will be noted in order to identify any maintenance activities required to maintain the integrity of the cover or diversions. In addition, the integrity of the monitoring wells and benchmarks will be inspected.

Settlement benchmarks will be established on the cover surface at locations shown in Appendix L and on the construction drawings in Appendix H. The benchmarks will be surveyed quarterly during the first year following closure to identify any settlement of the cover system or underlying pile. If evidence of damage or disturbance to the benchmarks is observed during the quarterly site inspections, the disturbed benchmarks will be surveyed within one month of the inspection. Data from the initial year of surveying of the benchmarks will be submitted in a report to the Division. Upon approval of the Division, the benchmarks will be surveyed at least annually after the first year. Further reduction in the frequency of surveying of the benchmarks will be based on the survey data and approval of the Division.

### 6.2 POST CLOSURE GROUND WATER MONITORING

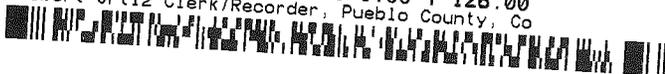
Quarterly ground water monitoring at the site will be conducted until closure construction work begins. All existing monitoring wells are completed within the boundaries of the shot pile. Due to the significant pile regrading required, it will be impossible to maintain the integrity of the wells. Therefore, prior to construction all existing monitoring wells and piezometers completed within the current boundary of the pile will be abandoned. Appendix M provides detailed procedures for abandonment of the existing monitoring wells and piezometers.



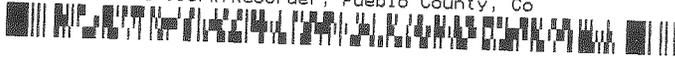
Following closure construction, six monitoring wells will be completed at the edge of the shot pile boundary. Procedures for completion of the monitoring wells are provided in Appendix M. The locations of the well are provided in Appendix D. Four of the new monitoring wells will be located downgradient of the pile, and two of the new monitoring wells will be located upgradient of the pile. One upgradient well will be located between the pile and 1921 Arkansas river channel. The other upgradient well will be completed northeast of the pile. Three of the four downgradient wells will be completed in the alluvial aquifer downgradient of the western pile boundary, each well being located west of existing wells GW-7, P-3 and GW-5. An additional downgradient well will be completed at the southeast edge of the pile boundary approximately 150 feet southeast of existing well GW-3.

Ground water samples will be collected from the monitoring wells on a quarterly basis for the first year following closure. The quarterly ground water monitoring data will be submitted to the Division within 30 days of receipt of the analytical data from the laboratory. Upon Division approval, ground water monitoring will be performed at least semi-annually following the initial year. Modification of the frequency of the long-term ground water monitoring program will be based on an evaluation of the monitoring data and approval of the Division. Details of the post closure ground water monitoring plan including a sampling and analyses plan are provided in Appendix D.

2038432 NOTICE 06/01/2016 03:41:39 PM  
Page: 15 of 24 R 126.00 D 0.00 T 126.00  
Gilbert Ortiz Clerk/Recorder, Pueblo County, Co



2038432 NOTICE 06/01/2016 03:41:39 PM  
Page: 16 of 24 R 126.00 D 0.00 T 126.00  
Gilbert Ortiz Clerk/Recorder, Pueblo County, Co



## APPENDIX D

### GROUND WATER MONITORING

APPENDIX D

POST CLOSURE GROUND WATER MONITORING PLAN

Information contained in this appendix provides details concerning implementation of the ground water monitoring plan following closure of the shot pile. As specified in the Closure Plan, the ground water monitoring system will consist of six monitoring wells in the alluvium underlying the shot pile. The wells will be completed on the perimeter of the shot pile. Two wells will be installed upgradient of the pile and four of the wells will be installed hydraulically downgradient of the shot pile. Proposed locations of the monitoring wells are provided on Figure D.1. Anticipated completion data for the wells are provided in Table D.1. The wells will be completed with 10-foot screen intervals as specified in Appendix M.

The purpose of the ground water monitoring system is to collect samples representative of the background water quality of the alluvial aquifer and to detect potential migration of constituents from the shot pile to the alluvial aquifer at the downgradient boundary of the pile. The following sections provide details concerning the collection and analyses of samples collected from the monitoring wells, and recordkeeping and reporting procedures.

Table D.1

Proposed Monitoring Well Details				
Well ID	Location	Casing Dia. (inches)	Approximate Total Depth (ft)	Approximate Screened Interval (ft)
MW-1	Upgradient	2	15	5-15
MW-2	Upgradient	2	36	26-36
MW-3	Downgradient	2	31	21-31
MW-4	Downgradient	2	22	12-22
MW-5	Downgradient	2	18	8-18
MW-6	Downgradient	2	12	4-12

D.1 SAMPLE COLLECTION AND ANALYSES PROCEDURES

Ground water samples will be collected from the monitoring wells on a quarterly basis for the first year following closure. The quarterly ground water monitoring data will be submitted to the Division within 30 days of receipt of the analytical data from the laboratory. Upon Division approval, ground water monitoring will be performed at least semi-annually following the initial year. Modification of the frequency of the long-term ground water monitoring program will be based on an evaluation of the monitoring data and approval of the Division.

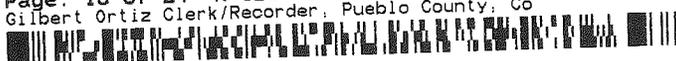
### D.1.1 Sample Collection Procedures

The sample collection procedures include decontamination of equipment, static water level measurement, evacuation of stagnant water from the well, sample collection, sample preservation, and recordkeeping. Prior to evacuation or sampling of each well, all external and internal portions of sampling equipment will be decontaminated unless dedicated pumps and equipment are permanently installed in the wells. Equipment that will contact water in the well will be decontaminated between wells by a three step procedure: wash with a non-phosphate detergent, rinse with dilute nitric acid, and rinse with deionized water. If equipment will be damaged by exposure to dilute nitric acid, the nitric acid rinse will be omitted. Sampling equipment and supplies that will be disposed between wells, such as filters and tubing that are decontaminated by the manufacturer and remained sealed in plastic or other enclosure until use, will not require field decontamination. Sample containers will be provided and appropriately prepared by the laboratory, prior to use in the field.

Spent decontamination solutions will be containerized. Containerized decontamination liquids will be disposed in the sanitary sewer connected to the City of Pueblo Sewage Treatment facility or other appropriate methods at the termination of each sampling event or more frequently if necessary. Disposal of decontamination liquids to the sanitary sewer system is being discussed with the City of Pueblo. Disposable sampling equipment will be disposed at the termination of each sampling event at a landfill authorized to manage the material.

Field parameters consisting of pH, temperature and conductivity will be measured using portable meters during evacuation and sampling. These meters will be calibrated at least daily or more frequently as needed. Meters which may need more than daily calibration include the pH and conductivity meters. In addition to daily calibration, these meters will be checked at least once during the day of use, by measuring values of known standards. Acceptable tolerances of the standard check measurements are:  $\pm 0.1$  pH units and 10 percent of the conductivity standard. The pH meter and electrode will compensate automatically for temperature and will be calibrated using manufacturer's procedures for two-point standard pH buffers. Two standard pH buffers, that bracket the expected pH of the sample water, will be used to calibrate the pH meter to a precision of at least  $\pm 0.1$  pH unit. The conductivity meter and cell will also compensate automatically for temperature and will be calibrated with a standard conductivity solution that has a concentration of the same order of magnitude as the water to be sampled. The calibration data will be recorded in the field notebook.

Prior to evacuation of water from the well, the initial water level in the well will be measured with an electronic water level probe and recorded. Typically, sample water will be removed from the well using a submersible pump. During sampling, the pump will be set at the bottom of the screened interval, regardless of well yield. If sample water is removed using a bailer, the bailer will be lowered to the bottom of the screened interval during sampling. Before sample collection, a minimum of three casing volumes of water will be removed from the well, but not until field parameters (pH, temperature and specific conductance) have stabilized. The evacuation procedure is performed to remove stagnant water from the well casing and to ensure that a sample representative of the aquifer is obtained. Water from the wells will be purged on the same day that samples are collected. If the well can be pumped or bailed dry during evacuation, it can be assumed that the purpose of removing three well volumes has been satisfied, and samples can be collected as soon as sufficient water is available. Water from the well will be evacuated using a stainless steel



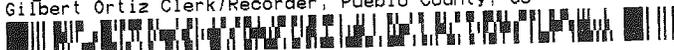
pump, or stainless steel, Teflon or PVC bailer. If a positive gas-drive bladder pump is used, a decontaminated or dedicated Teflon bladder will be used in the pump. The same pump or bailer used to evacuate water from the well will be used for collection of the sample from the well. The materials used in the construction of the pump or bailer shall not affect, to the extent possible, the quality of the sample. The bailing rate or discharge rate of the pump will be controlled to avoid surging and aeration of the ground water.

Samples will be collected immediately following well purging. To the extent possible, water samples should be dispensed from the sample collection device (pump discharge or bailer) directly into the sample containers provided by the laboratory. Any required preservative will be added to the sample bottle in the laboratory. Sample filtration will be performed in the field during or immediately following sample collection using a disposable filter apparatus with a 0.45 micron, membrane filter. If the sample is collected with a pump, the filter apparatus should be attached directly to the pump discharge tubing with the filtered water being dispensed directly into the sample bottles provided by the laboratory. Alternatively, a portion of the sample can be dispensed into a decontaminated polyethylene container for filtering.

Purge water will be collected during sampling in containers that can be sealed. The containers will be temporarily stored in a locked, enclosed area at the site. Containers will be labeled with attached documentation that lists: amount of stored water, date of sampling, well from which the water was removed, sample ID of corresponding water submitted for laboratory analyses, and date and method of water disposal. Purge water will be disposed in an appropriate manner depending on the results of the laboratory analyses of the sample collected from the monitoring well. If the quality of the ground water does not exceed maximum contaminant levels (MCL) for the parameters to be analyzed, then the purged ground water will be disposed onsite in such a way that it does not cause sheet flow, flow into the diversion ditches or discharge to the river. If the ground water quality exceeds MCL values but is non-hazardous, the purge water will be disposed in the Pueblo Sewage Treatment facility or at a non-hazardous waste disposal site. If the purged ground water is determined to be hazardous, it will be disposed at a hazardous waste disposal facility. If offsite shipment of water is necessary, disposal will be performed by authorized waste handling personnel according to DOT regulations.

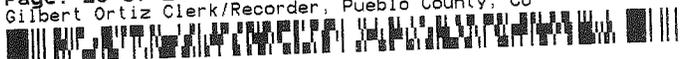
Step by step procedures for evacuation and sampling of water from each well are:

- 1) Note the condition of the outer well casing, well label, lock, pad and any other unusual conditions in the immediate area around the well. Unlock the well and note any unusual conditions of the well casing or cap.
- 2) Measure and record the depth to static water in the well to the nearest 0.01 foot referenced from the point marked on the well casing. Measure and record the total depth of the well from the same reference point. Confirm that the measured total depth corresponds to the depth of the well provided by the well completion form. If silt has accumulated in the well casing to the level where more than 10 percent of the screen length is blocked, the silt will be removed by additional well development until 90 percent of the screen is unobstructed by silt prior to initiation of sampling.



- 3) Calculate the volume stored in the well casing based on the feet of water in the well (including the sump) and the casing diameter. Calculate the three casing volumes of water to be removed.
- 4) Decontaminate and place the pump or bailer in the well. Obtain initial sample for field measurements.
- 5) Continue to evacuate water from the well. Record visual observations of the water and measure field parameters after purging of each well volume or more frequently.
- 6) Prior to collecting ground-water samples, a minimum of three well casing volumes shall be purged from the well, but not until field measurements of pH, temperature and specific conductance have stabilized or the water removed is as clear as possible. Stable pH and conductivity values should be within  $\pm 0.2$  pH units and 10 percent, respectively. However, in the case of low yield wells, if the well is pumped or bailed dry during evacuation, it can be assumed that the purpose of removing three well volumes has been satisfied, and samples can be collected as soon as sufficient water is available.
- 7) Assemble filter apparatus and label sample bottles.
- 8) If a bailer is used to collect the sample, lower the bailer slowly and gently into contact with the water in the well. Lower the bailer to the bottom of the screened interval of the well and to the same depth each time. Retrieve the bailer and carefully dispense the water into the sample containers for samples that do not require field filtering. Cap containers. For filtering, dispense the sample from the bailer into a decontaminated container. Filter from the container into the laboratory sample containers. If a pump is used to collect the sample, fill the sample container directly from the pump discharge tubing. For filtering, attach the filter directly to the pump tubing and dispense the filtered water into the sample container.
- 9) Sample preservation, extraction and analytical techniques will comply with the second edition of SW-846 or Division approved methods according to Table D.2. Samples will be filtered in the field and will be analyzed in the laboratory for dissolved constituents.
- 10) Withdraw sampling equipment from well and lock well.
- 11) Complete field documentation including chain of custody forms.

Quality assurance/quality control (QA/QC) samples consisting of equipment rinsate and duplicate samples will be collected during each sampling event. Rinsate and duplicate QA/QC samples will be collected for every ten ground water samples collected with at least one rinsate and duplicate collected for each sampling event. For the equipment rinsate sample, deionized water will be contacted with the sampling equipment in a manner similar to the collection of the ground water sample and transferred into identical sample containers as the ground water sample. The equipment rinsate sample will be handled and analyzed in the



laboratory for the same parameters as the ground water samples. The duplicate sample will be collected from a well at the same time as the primary sample is collected. The duplicate QA/QC sample(s) will be collected from known contaminated ground water monitoring wells after the existence of any such wells has been established. The duplicate ground water sample will be handled and analyzed in the same manner as the primary sample.

Chain of custody procedures include labeling of sample containers, recording information in the field notebook, preparing the Chain of Custody form, and submitting a sample analyses request form to the laboratory. Labels will be affixed to each sample container. The label will be used to record at least the following information: sample identification number, name of collector, date and time of collection, place of collection, and sample preservation methods.

A field logbook will be maintained to record information in a systematic manner that is collected during the ground water sampling program. Information recorded in the field book will include: name(s) of samplers, well identification, well depth, depth to water and measurement method, purge volume and pumping rate, time of well purging, field measurements during well purging, well purging procedure and equipment, sample withdrawal procedure and equipment, date and time of sample collection, sample containers used, preservative(s) used, climatic conditions, and any other field observations.

Information concerning the custody, transfer, handling and shipping of samples will be recorded on the Chain of Custody (COC) form. The sampling individual will be responsible for initial preparation of the COC. A COC form will be completed for each set of samples at the time of collection during a sampling event. The COC will document the following: the sampler's name and affiliation; the project number; date and time of sample collection; sample identification; sample type; analyses requested; number of containers; signatures of persons relinquishing and accepting custody, dates and times; and method of shipment. The COC will accompany the samples at all times from collection of the samples until disposal of the samples. The COC will be signed (date and time will also be recorded on the COC) by the individual relinquishing the samples and the individual receiving the samples whenever the samples are transferred. If the samples are to be shipped by a third party carrier, the shipment method will be recorded on the COC, the COC will be signed and the COC will be sealed in the cooler containing the samples. If the samples leave the sampler's immediate control, a seal will be provided on the shipping container to ensure that the samples have not been disturbed. Upon receipt of the samples by the laboratory, the individual receiving the samples will sign and record the date and time on the COC form. The original COC form will be maintained at the laboratory until the samples are disposed. A copy of the COC form will be included by the laboratory as part of the analytical report.

A sample analyses request form will be submitted with the COC form to the laboratory to identify the parameters to be analyzed.

#### D.1.2 Sample Analyses Parameters

Water quality samples collected from the monitoring wells will be submitted under chain of custody procedures to the laboratory. The samples will be analyzed for the parameters listed in Table D.2. Major cations, anions and metal parameters will be analyzed as dissolved constituents. Based on the parameters to be analyzed, two sample containers are required:

- 1) One polyethylene bottle, filtered and unpreserved, for determination of major anions, and
- 2) One polyethylene bottle, filtered and preserved with ultra-pure grade nitric acid, for determination of metals and major cations.

## D.2 DOCUMENTATION AND REPORTING

### D.2.1 Documentation

Data recorded in the field during sampling will be recorded on a field data sampling form for each well. Additional information will be recorded in the field notebook. All data, field notes, sample results and reports associated with post closure care will be maintained during the post-closure care period at the office of Rockwool Industries, Inc. or the contractor selected to perform the post closure monitoring activities.

### D.2.2 Reporting

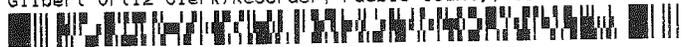
During the first year of ground water monitoring data will be submitted to the Division within thirty (30) days of receipt of the analytical data from the laboratory. Any parameter listed in Table D.2 for which maximum contaminant levels (MCL) have been established will be separately identified if the concentration or value has been found to exceed the MCL.

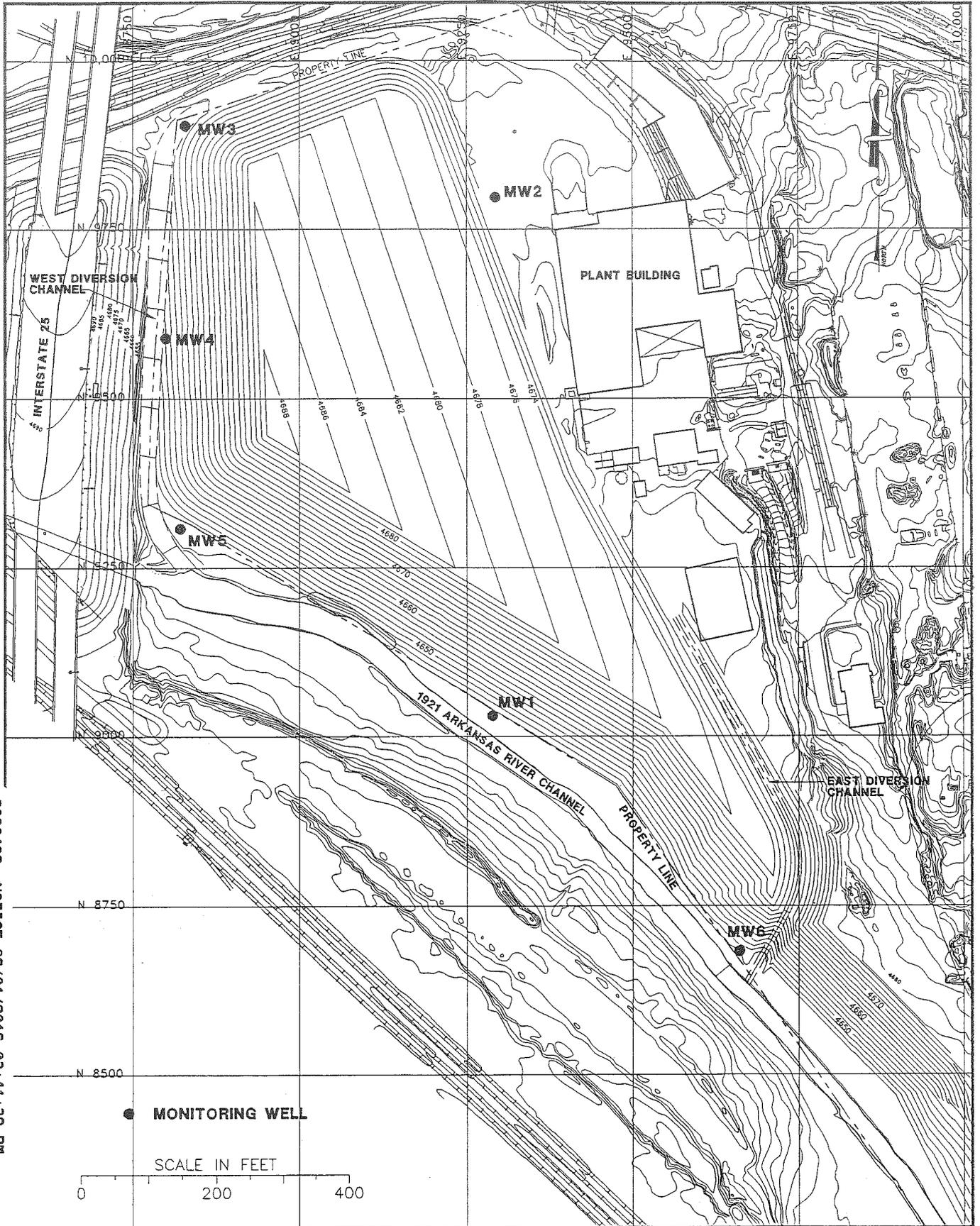
During the second and subsequent years of ground water monitoring the following four items will be submitted to the Colorado Department of Health no later than March 1 of the following calendar year:

1. Concentrations or values of the parameters listed in Table D.2 for each ground water monitoring well.
2. Any parameter listed in Table D.2 for which MCL's have been established will be separately identified if the concentration or value has been found to exceed the ground water standards.
3. Any significant difference or trends in concentrations or values of constituents monitored annually from concentrations or values of constituents monitored during the initial year or subsequent years. Ground water quality data for constituents for which a maximum contaminant level (MCL) has been established will be evaluated using a parametric analysis of variance (ANOVA), provided that this method is appropriate for the distribution of the constituents. If the distribution of the constituents is shown to be inappropriate for the parametric analysis, the data will be transformed or a distribution-free theory test will be used. If the distributions for constituents differ, more than one statistical method may be used. If necessary, the statistical method will include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.
4. An evaluation of the ground water surface elevations.

TABLE D.2

WATER QUALITY PARAMETERS TO BE ANALYZED	
Parameter	EPA Method
pH	SW-846, 9040
Conductivity	SW-846, 9050
Bicarbonate	310.1
Calcium	SW-846, 6010
Chloride	325.2
Fluoride	340.2
Magnesium	SW-846, 6010
Potassium	SW-846, 6010
Sodium	SW-846, 6010
Arsenic	SW-846, 7060
Barium	SW-846, 6010
Cadmium	SW-846, 6010
Chromium	SW-846, 6010
Iron	SW-846, 6010
Lead	SW-846, 7421
Manganese	SW-846, 6010
Mercury	SW-846, 7040
Selenium	SW-846, 7741
Silver	SW-846, 6010
Sulfate	SW-846, 9035





2038432 NOTICE 06/01/2016 03:41:39 PM  
 Page: 24 of 24 R 126.00 D 0.00 T 126.00  
 Gilbert Ortiz Clerk/Recorder, Pueblo County, Co



FIGURE D.1  
 PROPOSED LOCATION OF  
 MONITORING WELLS

Date:	DEC 1992
Project:	2351