SECOND FIVE-YEAR REVIEW REPORT

FOR

BLACKWELL ZINC SITE SOIL REMEDIATION UNIT
BLACKWELL, OKLAHOMA
OKD980796023

DRAFTED BY:

BLACKWELL ZINC COMPANY, INC.

ISSUED BY:

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
OKLAHOMA CITY, OKLAHOMA

APRIL 2008

May 7, 2008

Approved By:
Oklahoma Department of Environmental Quality

Date

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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
BCO	Blackwell Community Outreach
BIA	Blackwell Industrial Authority
BIP	Blackwell Industrial Park (Former Smelter Site)
BNSF	BNSF Railway Company
BZC	Blackwell Zinc Company, Inc.
BZS	Blackwell Zinc Site
CAFO	Consent Agreement and Final Order
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 also known as Superfund: Amended in 1986 by the Superfund Amendments and Reauthorization Act
CFR	Code of Federal Regulations
COCs	Contaminant of Concern
CY	Cubic yards
Cyprus	Cyprus Amax Minerals Company
EPA	U.S. Environmental Protection Agency
ERU	Ecological Remediation Unit
FRACR	Final Remedial Action Completion Report
FRDR	Final Remedial Design Report
GRU	Groundwater Remediation Unit
HDAP	House Dust Abatement Program
IC	Institutional Control
ICP	Institutional Control Plan
mg/kg	milligrams per kilogram
MOU	Memorandum of Understanding
µg/dL	micrograms per deciliter
NCP	National Contingency Plan
NPL	National Priorities List
NZS	National Zinc Site
ODEQ	Oklahoma Department of Environmental Quality
OSDH	Oklahoma State Department of Health
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
O&M	Operations and Maintenance
RA	Remedial Action
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SF	Square Feet
SPA	Soil Protection Area
SRU	Soil Remediation Unit
SSP	Supplemental Soil Program
TCLP	Toxicity Characteristic Leaching Procedure

Executive Summary

This report summarizes the results of the Second Five-Year Review for the Soil Remediation Unit (SRU) of the Blackwell Zinc Site (BZS) located in Blackwell, Kay County, Oklahoma. Blackwell Zinc Company, Inc. (BZC) prepared this report at the request of the Oklahoma Department of Environmental Quality (ODEQ).

The primary components of the remedy for the BZS SRU include a combination of removal and capping of soils exceeding ODEQ residential and industrial cleanup levels. Soils exceeding ODEQ residential and industrial cleanup levels were consolidated on-site. The *Final Remedial Action Completion Report, Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma*, EMC², July 19, 2001 (FRACR) documents that the construction of the remedy as prescribed within the *Final Remedial Design Report, Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma*, PTI, May 1999 was substantially complete in 1999 with final completion in 2000. ODEQ approved the FRACR in January 2002.

The trigger for completing a five-year review is the start date for construction, which was April 22, 1998 for the SRU. The First Five-Year Review Report was issued on April 22, 2003 and approved on May 7, 2003.

This Second Five-Year Review found that the remedy for the SRU is currently protective of human health and the environment. Long term maintenance will be needed to maintain the integrity of the remedy. Implementation of planned institutional controls will provide for the long term protectiveness of the remedy. Additionally, the ecological remediation unit (ERU) and groundwater remediation unit (GRU) selected remedies will be protective once construction and implementation are completed.

Currently, BZC has undertaken a second residential soil sampling program (SSP). As with the previous residential sampling program participation by individuals is voluntary. The SSP's outreach program has informed residents of the additional opportunity for sampling and obtained access agreements. Through May 2008, access agreements for over 3,400 properties had been obtained and sampling is in progress. Based on results, some properties will require cleanup. Cleanup will begin in May 2008. The ongoing and planned work in Blackwell is beyond the scope of this Five-Year Review.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Blackwell Zinc Site (BZS) Soil Remediation Unit (SRU)		
EPA ID (*from WasteLAN*): OKD980796023		
Region: 6	**State:** OK	**City/County:** Blackwell/Kay
SITE STATUS		
NPL status: [ ] Final [ ]Deleted [X] Other (specify) The BZS SRU is not an NPL Site		
Remediation status (choose all that apply): [X] Under Construction [ ] Operating [X] Complete		
Multiple OUs?* [X] YES [ ] NO	**Construction completion date**: September, 2000 (Note 1)	
Has site been put into reuse? [X] YES [ ] NO		
REVIEW STATUS		
Lead agency: [ ] EPA [X] State [ ] Tribe [ ] Other Federal Agency		
Author name: Michael Leach		
Author title: Manager, Environmental Remediation	**Author affiliation:** Freeport-McMoRan Copper & Gold, Inc., on behalf of Blackwell Zinc Company, Inc.	
Review period: February 2008 to April 2008		
Date(s) of site inspection: February 29, 2008		
Type of review: [ ] Post-SARA [ ] Pre-SARA [ ] NPL-Removal only [X] Non-NPL Remedial Action Site [ ] NPL State/Tribe-lead [ ] Regional Discretion		
Review number: [ ] 1 (first) [X] 2 (second) [ ] 3 (third) [ ] Other (specify)		
Triggering action: [ ] Actual SRU RA On-Site Construction [ ] Actual RA Start at OU# [ ] Construction Completion [X] Previous Five-Year Review Report [ ] Other (specify)		
Triggering action date (*from WasteLAN*): May 7, 2003		
Due Date (*five years after triggering action date*): May 7, 2008		
* ["OU" refers to operable unit.]		
Note 1: Construction is complete for those properties within the SRU that were identified and addressed prior to ODEQ's approval of the FRACR. Additional properties are currently being evaluated under a supplemental soil sampling program. With respect to those additional properties, the remediation status is "under construction."		

Five-Year Review Summary Form, *cont'd*

Issues:

This Second Five-Year Review addresses those portions of the SRU remedy where the containment element of the remedy was utilized to manage soils with metals concentrations that exceeded specified remediation levels (referred to hereinafter as "Impacted Soils"). This review has identified the following issues that, if not addressed, could potentially prevent the remedy from being protective of human health and environment in the long term:

Issues	Could Affect Protectiveness (Y/N)	
	Current	Future
Operation and maintenance (O&M) of the On-Site Consolidation Area should be performed on a regular basis	N	Y
Management of construction or development activities that could disturb the cap within the On-Site area (i.e., the Blackwell Industrial Park or "BIP") should be improved	N	Y
Maintenance of the Legion Park Sediment Areas and the Blackwell High School Track with a possible enhancement of the engineering design	Y	Y
An institutional controls (IC) program needs to be developed and implemented	N	Y
Remediation of the BNSF Railway Co. (BNSF) properties needs to be completed	Y	Y

Recommendations and Follow-up Actions:

The follow-up actions identified below will be performed to address issues identified within this Five-Year Review.

Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
				Current	Future
Develop and implement an O&M Plan for the Consolidation Area	BZC	ODEQ	5/30/08	N	Y
Develop and implement a soil management plan for the BIP development area	BIA	ODEQ	6/30/08	N	Y

Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
				Current	Future
Perform maintenance at and if necessary develop and construct an enhanced design for the Legion Park Sediment Areas and the Blackwell High School Track	BZC	ODEQ	8/31/08	**Y**	**Y**
Complete development of the IC program and submit to ODEQ for review	BZC and City of Blackwell	ODEQ	9/1/08	**N**	**Y**
Implement applicable components of the IC program	City of Blackwell	ODEQ	1/16/09	**N**	**Y**
Complete remediation of the BNSF properties	BNSF	ODEQ	Finalization of the Consent Decree	**Y**	**Y**
Third Five-Year Review	BZC	ODEQ	4/22/13	**N**	**Y**

Five-Year Reviews will continue as required.

Protectiveness Statement(s):

The remedy at the SRU Operating Unit is currently protective of human health and the environment. Technologies utilized (removal, capping) are effective at maintaining the Remedial Actions Objective (RAOs) to contain materials and prevent direct contact with impacted materials. Implementation of planned institutional controls will provide for the long term protectiveness of the remedy. Additionally, the ERU and GRU selected remedies will be protective once construction and implementation are completed.

Long-Term Protectiveness:

Long-term protectiveness of the remedial action will be verified by conducting Five-Year remedy reviews, maintenance activities, O&M, and implementation of the planned ICs.

1.0 Introduction

BZC owned and operated a zinc smelter facility in Blackwell from approximately 1916 to 1974. When BZC shut down the zinc smelter in 1974, BZC dismantled the buildings, graded the property, and donated the land to the Blackwell Industrial Authority (BIA), a municipal trust of the State of Oklahoma whose sole beneficiary is the City of Blackwell. The BIA developed the former smelter property as an industrial park. The former smelter property, which is currently known as the Blackwell Industrial Park (BIP), consists of approximately 160 acres located one mile west of downtown Blackwell.

In compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP), BZC and the ODEQ conducted a second Five-Year Review of the remedial action implemented at the SRU. A site visit was performed February 29, 2008. This report documents the results of this review. The Five-Year Review was conducted following applicable guidance published by the U.S. Environmental Protection Agency (EPA) and included the activities described in Section 7 of this report. According to EPA guidance, the purpose of the Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of the reviews are documented in Five-Year Review reports to: (1) confirm that RAs, as spelled out in RODs, are operating and functioning as designed and that institutional controls are in place and effective; and (2) evaluated that the ROD cleanup levels remain protective of human health and the environment. In addition, Five-Year Reviews identify deficiencies found during the review, if any, and provide recommendations to mitigate the deficiencies.

CERCLA mandates that Five-Year Reviews be conducted.[1] CERCLA § 121(c) states: "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented." Section 300.430(f)(4)(ii) of Title 40 of the Code of Federal Regulations (CFR) reiterates this Five-Year Review requirement.

ODEQ divided the BZS into three Operable Units (OU) identified as: the SRU; the Ecological Remediation Unit (ERU); and the Groundwater Remediation Unit (GRU). ODEQ has issued a separate Record of Decision (ROD) adopting an individual remedy for each OU. The SRU is the focus of this Five-Year Review. Implementation of the GRU ROD is proceeding. BZC and the City have initiated a well closure program and are developing institutional controls to limit access to groundwater. ODEQ has approved a remedial design report for construction of a groundwater treatment plant, which is expected to commence this year. The ERU has been combined with the GRU and a combined ERU-GRU Five-Year Review will be conducted five years from the appropriate trigger date.

[1] In 1994, ODEQ and EPA entered into a Memorandum of Understanding obligating ODEQ to ensure that a CERCLA-quality cleanup was performed at the BZS.

The SRU remedial action resulted in several areas in Blackwell where Impacted Soils and other materials were capped in place. Therefore, a Five-Year Review is required. Five-Year Reviews for the SRU are to be performed no less often than every five years after the initiation of the SRU remedial action (RA). This is the second Five-Year Review for the SRU. The trigger action for this review is the completion date of the first Five-Year Review, which was May 7, 2003.

The SRU ROD defines soils as the primary medium of concern within the SRU for protection of human health. Groundwater at the BZS is of concern but is not used for drinking water and is being addressed in the GRU. Metals concentrations in the air were found during the site investigations to not exceed regulatory limits. Media of potential concern for the ERU include soil, surface water and sediments. A portion of the ERU was managed during the SRU RA. This ERU portion included excavation or capping of impacted sediments in the tributary that leads from the BIP through to the end of Legion Park, located in the center of a residential area approximately 0.5 miles northwest of the center of Blackwell.

The properties subject to this Five-Year Review include those where the containment element of the remedy (i.e., capping) was applied to Impacted Soils and other contaminated material having metals concentrations above remediation levels. These include the areas within the BIP (On-Site) where soils were capped in place, the On-Site Consolidation Area, and those properties outside of the BIP (Off-Site) where Impacted Soil was capped in-place. Each of these properties is listed in Table 1 below. All other off-site locations (residential properties) were remediated with all impacted materials removed from the properties and directed to the consolidation area at the BIP for final management. Properties located directly south and southwest of the BIP not covered by this Five-Year Review are those owned by BNSF.

Table 1: List of Properties Covered by this Five-Year Review[2]

PROPERTY NAME	PROPERTY ADDRESS/DESCRIPTION
Blackwell Industrial Park (Former Smelter Site)	West Blackwell Industrial Park, 2nd Addition, Blackwell
First Baptist Church Parking Lot	Bridge and Second Street
Blackwell High School Track	303 East Coolidge Avenue

[2] The First Five Year Review identified one additional location, the Milton Holman Property, that was subject to the review. Subsequent to the First Five Year review, the material that was left in place above residential remediation levels at this property was removed from the property. The removal was documented in the *Remedial Action Completion Report Addendum 1 (May 2003 Construction) Blackwell Zinc Site Soil Remediation Unit Blackwell, Oklahoma,* October 2003, EMC[2]

Table 1: List of Properties Covered by this Five-Year Review[2]	
PROPERTY NAME	**PROPERTY ADDRESS/DESCRIPTION**
Legion Park Sediment Area "S"	A portion of the Legion Park Tributary along West Legion Drive between Florence and Kansas Avenues
Legion Park Sediment Area "L"	A portion of the Legion Park Tributary north of Dewey Avenue and east of 6th Street

2.0 Site Chronology

The following table provides a chronological history of the SRU:

Table 2: Chronology of SRU Events

EVENT	DATE
Horizontal retort zinc and cadmium facility operation	1916 - 1974
Initial discovery of a possible contamination problem resulting from smelter operations	1977
Consent Agreement & Final Order (CAFO) signed between Oklahoma State Department of Health (OSDH), BZC, and BIA	1992
EPA initiated expanded Site Investigations	August 1992
Soil investigations performed by EPA	1992
Washington School and Beatty-Rogers Park remediation performed by EPA	September 1992
ODEQ assumed environmental responsibilities of OSDH	July 1993
Respondent BZC begins Remedial Investigations	September 1993
ODEQ signed a Memorandum of Understanding (MOU) with EPA to conduct a CERCLA-quality cleanup	April 1994
ROD issued for SRU	April 1996
Sediment Remediation Plan issued	November 1996
Legion Park Tributary section remediated by BZC	November 1996
Final Remedial Design Work Plan approved, including Sampling and Analysis Plan	November 1996
Final Remedial Design Report (FRDR) issued	May 1997
Final Remedial Design Report Addendum Number 1 issued	July 1997
Final Remedial Design Report Addendum Number 2 issued	March 1998
ROD issued for ERU	April 1998
SRU RA began	April 1998
SRU RA completed	September 2000
Final Remedial Action Completion Report for the SRU issued	July 2001
First Five-Year Review Report Completed	April 2003
ROD issued for GRU	August 2003
Addendum 1 To The Final Remedial Action Completion Report	October 2003
GRU Remedial Design Report	January 2005
Addendum 2 To The Final Remedial Action Completion Report	September 2006
Supplemental Residential and Commercial Soil Investigation initiated by BZC	Began July 2007 ongoing

Table 2: Chronology of SRU Events	
EVENT	**DATE**
Response action at Washington Center and Middle School	November 2007 to January 2008

3.0 Background

3.1 Physical Characteristics, Land and Resource Use

The former smelter facility was located on 160 acres on what is currently the BIP, located approximately one-half mile west of downtown Blackwell (Figure 1). The BIP has been developed for industrial use and has several commercial and industrial buildings on the property. The former smelter facility is bound to the north, south and west by a mixture of residential and agricultural use properties and residential properties to the east.

3.2 History of Contamination

BZC operated a horizontal retort zinc and cadmium smelting facility from approximately 1916 to 1974. A 48-hour cycle clay retort furnace system was used to recover zinc. Zinc was primarily recovered from zinc concentrates heated in the retorts. Secondary recovery of zinc was obtained from recycled retorts and condensers. The final low value clay residues were stockpiled on the north area of the smelter site. In 1955 zinc concentrates from Africa were obtained which had sufficient cadmium content to justify recovery of that metal.

Historic sources of the metals in the SRU include ore concentrates delivered by rail car, dust from the transport/storage of ore concentrates and solid waste at the facility, emissions from roasting and smelting processes, airborne particulates from smelting and sintering processes, and various solid waste materials (e.g., retort and sinter residues, slag, crushed retorts and condenser sands). Smelter residue also was reportedly used in some locations within the Blackwell area as fill material.

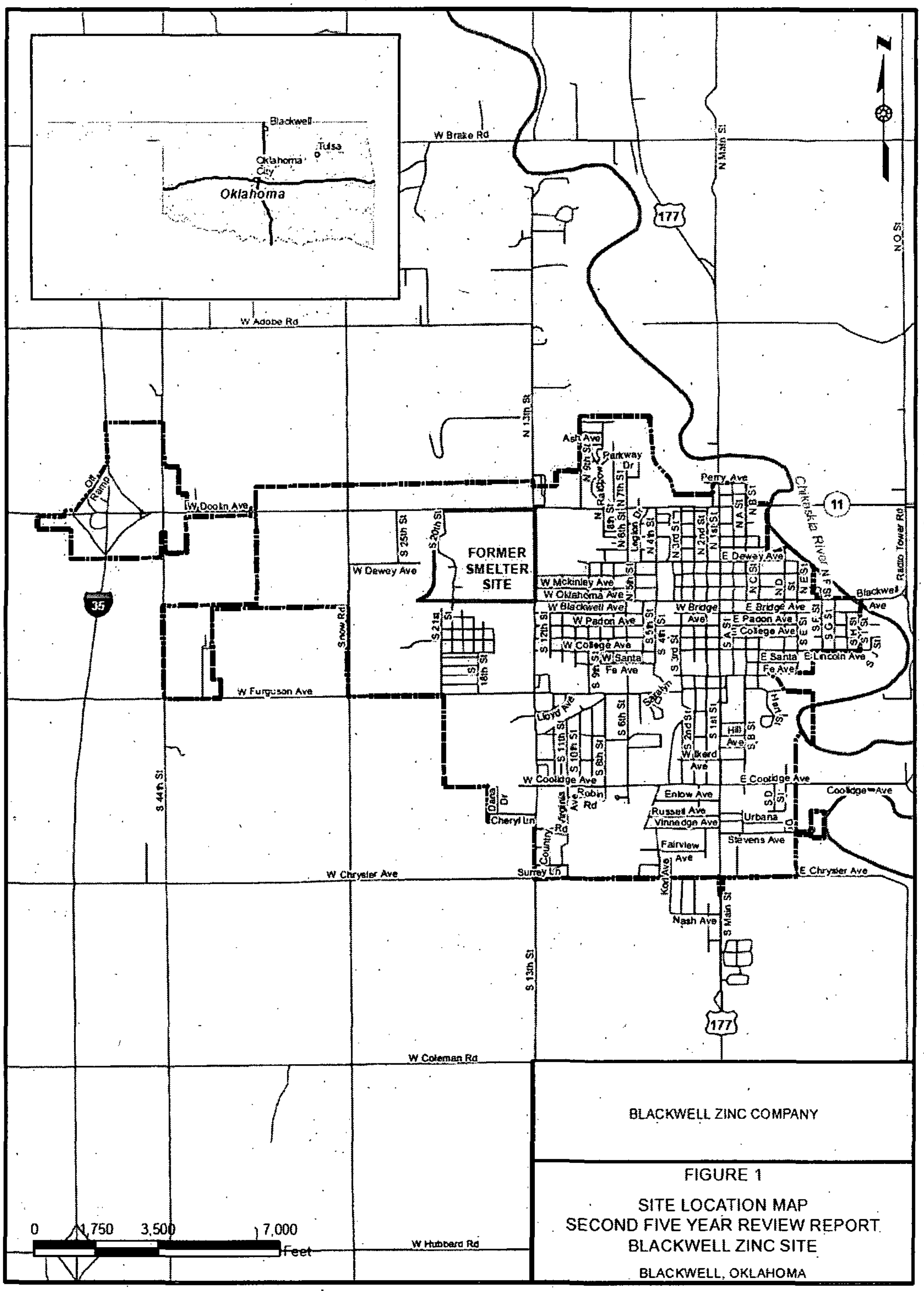
3.3 Initial Response

In 1992, EPA soil sampling investigations indicated that former smelter operations had resulted in the release of lead, cadmium and arsenic

BZC, the OSDH, and the BIA entered into a Consent Agreement and Final Order (CAFO) in 1992. Pursuant to the CAFO, BZC investigated the scope and nature of soil contamination attributable to former smelter operations in Blackwell and evaluated possible remedial action alternatives for the SRU. In April 1996, ODEQ issued a Record of Decision (ROD) selecting a remedy for the SRU.

3.4 Basis for Taking Action

In July 1993, the newly established ODEQ assumed the environmental responsibilities of the OSDH. In April 1994, ODEQ signed a MOU with EPA to ensure that a CERCLA-quality cleanup was conducted at the BZS under ODEQ supervision. Based on this MOU, the BZS was not placed on EPA's National Priorities List, contingent on a timely remediation that achieved CERCLA quality results.


Blackwell
Tulsa
Oklahoma City
Oklahoma
W Brake Rd
W Adobe Rd
N Main St
177
N O St
N 13th St
Ash Ave
Parkway Dr
Perry Ave
Chikaskia River
11
W Doolin Ave
S 25th St
S 20th St
FORMER SMELTER SITE
W Dewey Ave
E Dewey Ave
W Mckinley Ave
W Oklahoma Ave
W Blackwell Ave
W Padon Ave
W Bridge Ave
E Bridge Ave
E Padon Ave
College Ave
W College Ave
E Santa Fe Ave
E Lincoln Ave
W Santa Fe Ave
Blackwell Ave
Radio Tower Rd
35
Snow Rd
S 21st St
S 18th St
W Furguson Ave
Lloyd Ave
S 6th St
S 44th St
W Coolidge Ave
E Coolidge Ave
Coolidge Ave
Enlow Ave
Russell Ave
Vinnedge Ave
Urbana
Stevens Ave
Fairview Ave
Dana Dr
Cheryl Ln
Robin Rd
Country Rd
Surrey Ln
W Chrysler Ave
E Chrysler Ave
Kori Ave
Nash Ave
S Main St
S 13th St
W Coleman Rd
W Hubbard Rd
0
1,750
3,500
7,000
Feet
BLACKWELL ZINC COMPANY
FIGURE 1
SITE LOCATION MAP
SECOND FIVE YEAR REVIEW REPORT
BLACKWELL ZINC SITE
BLACKWELL, OKLAHOMA

4.0 Remedial Actions

4.1 Remedy Selection

In April 1996, ODEQ signed the SRU ROD. The ROD defines soils as the primary medium of concern for protection of human health. The SRU includes areas subject to human health risk-based goals for remediation of Impacted Soils in residential, recreational and commercial/industrial areas.

SRU RAOs

The SRU's RAOs are intended to:

- Prevent ingestion of soil/dust lead originating from historical smelting operations at the BZS that would result in a greater than five percent probability of an individual child or pregnant female having a blood lead concentration greater than 10 micrograms per deciliter (μg/dL);
- Prevent ingestion/direct contact with cadmium soils or dust originating from historical smelting operations at the BZS in excess of the reference dose, which accounts for typical daily intake from food and other background sources; and
- Prevent ingestion of arsenic in soil or dust originating from historical smelting operations at the BZS in amounts that pose an unacceptable cancer risk.

SRU ROD Requirements

ODEQ's selected remedy for the SRU establishes two land use category types. Category 1 includes Off-Site residential and recreational areas. Category 2 includes commercial and industrial areas. Specific remedies and soil remediation levels were set in milligrams per kilogram (mg/kg) for the SRU contaminants of concern (COCs) as follows:

Table 3: Remediation Levels

Constituent	Category 1 Areas	Category 2 Areas
Lead	750 mg/kg	2,000 mg/kg
Cadmium	75 mg/kg	200 mg/kg
Arsenic	50 mg/kg	200 mg/kg

For residential and recreational lands (Category 1), the major components of the selected remedy consist of:

- Removal of soils with concentrations of arsenic, cadmium, or lead above the Category 1 remediation levels to a maximum depth of two feet;
- Consolidation of excavated On-site and Off-site soils at a designated location on the BIP property;
- Stabilization of Off-site soils that that fail the criteria of the toxicity characteristic leachate procedure (TCLP);
- House dust abatement;
- Containment (capping) of areas such as driveways in residential areas with asphalt or some other suitable material with specific approval by DEQ; and
- Institutional controls to insure continued maintenance of the selected remedy and insure that activities such as utility repair on the site will be conducted in a manner protective of the remediated areas.

For Commercial and Industrial Lands (Category 2), the major components of the selected remedy consist of:

- Consolidation and containment of the Impacted Soils from residential properties and other areas at the BIP; and
- Capping (i.e., containment) of portions of the BIP.

The ROD also requires the development and implementation of an ICP. The following institutional controls are required as part of the ICP:

- Install security fences and post signs around commercial or industrial properties, as appropriate, to limit access;
- In conjunction with the City of Blackwell and if appropriate Kay County, develop a system for establishing zoning or other restrictions for non-residential properties that exceed the residential remediation levels;
- Develop a system for the City to use its authority to require protective soil management and dust control procedures during construction activities, as well as develop a system which addresses continued maintenance of capped areas; and
- Establish a public education program to inform and educate the public, particularly parents and children, on ways to reduce potential exposure to lead, cadmium, and arsenic.

The ROD also indicates that, as the Remedial Design and Remedial Action progress, areas where smelter residues were transported and remain exposed or have insufficient cover will be identified. The ROD requires that the Remedial Design include specific steps to be taken to identify such smelter residues, including solicitation of information from the public. Once areas are identified as containing smelter waste they are to be evaluated to determine whether they continue to pose a significant hazard and then addressed as part of the SRU in a manner that will eliminate or reduce the potential for exposure to a reasonable level.

4.2 Remedy Implementation

The FRDR was submitted to ODEQ in May 1997. Subsequent FRDR addenda were developed by the BZC and approved by ODEQ. The SRU response actions can be categorized into two main areas: On-Site and Off-Site.

On-Site Remedial Actions

Construction activities performed On-Site at the BIP were performed in accordance with the FRDR's *Blackwell Industrial Park Remediation Technical Specifications and Construction Drawings.* The BIP work was identified as either Remediation Area or Non-Remediation Area work. Remediation Area work was that work required by the ROD to mitigate human contact with visually distinct smelter waste materials and impacted materials that exceeded the Category 2 RA levels. Non-Remediation Area work was not required by the ROD and consisted of work that BZC agreed to perform to enhance the redevelopment of the BIP and provide enhanced protection (e.g., armoring of BIP storm water channels) to minimize future maintenance of RA areas.

BIP work was initiated in April 1998 and was substantially completed in November 1999. Approximately 46,752 cubic yards (CY) were excavated from various areas of the BIP and placed in the Consolidation Area below the final 18-inch soil cover. Approximately 25,099 CY of clean borrow soil was imported to backfill RA excavation areas; approximately 611,453 square feet (SF) of geotextile fabric was placed under gravel and riprap; approximately 10,186 SF of erosion control matting was placed to stabilize problem erosion areas; and approximately 46,960 tons of 1.5-inch crusher run gravel, 2-inch riprap, gabion fill rock, railroad spur ballast rock and pea gravel chips were imported to backfill and cap Remediation and Non-Remediation areas. In addition, approximately 1,045,962 SF of the BIP was hydroseeded to revegetate all areas disturbed by construction.

Off-Site Remedial Actions

The remediation of residential properties between 1997 and 2000 was determined based on the results of soil sampling performed in accordance with the BZS Sampling and Analysis Plan (November 1996). Based on those soil sampling results, residential property RAs required excavation of impacted materials in a front yard, back yard, or entire property. In some cases, a portion of a property received a RA based on discrete sample results identifying a "hot spot". In other cases, the RA

consisted of removing residue based on visual observation without conducting sampling. Off-site Areas receiving a RA can be categorized into the following locations and their resulting RA quantities:

1. Historical Placement Properties which were Off-site properties within the SRU where smelter waste materials had been used as backfill and were identified either through actual knowledge (based on input from the public) or visual inspection:
   - 34 properties required RA resulting in approximately 2,253 CY excavated.
2. East Residential Area properties located just east of the BIP:
   - 13 properties required RA resulting in approximately 2,571 CY excavated.
3. Blackwell Heights Area properties located just south of the BIP:
   - 18 blocks required RA resulting in approximately 17,578 CY excavated.
4. Legion Park Tributary Areas:
   - 465 CY of sediments excavated along a 455-foot linear reach, 740 tons of gravel backfill.

RA activities for Off-Site work noted in 1 through 4 proceeded concurrently with On-Site activities. With the exception of the Legion Park Tributary Area the RA for these off-site properties consisted of removal of the Impacted Soil and replacement with clean materials. The response actions summarized above did not result in any known materials being left in place above residential remediation levels thus these sites do not require further consideration under the five year review.

ODEQ approved a capping alternative as the RA for a limited number of Off-site properties. These included the:

1. First Baptist Church parking lot with a surface area was approximately 10,238 SF.
   - Approximately 28 CY of 1.5 inch crusher run gravel material was placed as subgrade and approximately 126 CY of Class B base-course and leveling-course asphalt was placed to a four-inch cap thickness;
2. Blackwell High School track with a surface area was approximately 29,322 SF.
   - Approximately 272 CY of 1.5-inch crusher run gravel material was placed over geotextile and covered by approximately 272 CY of 'Red Dog' clay surface cinders. The Red Dog clay cinders were a special order cinder material specifically manufactured for tracks; and
3. Tonkawa High School track with a surface area was approximately 44,199 SF.
   - Approximately 546 CY of Class B base-course and leveling-course asphalt was placed to a four-inch cap thickness.

In addition to the above RAs performed by BZC, EPA performed a removal action at two properties in 1992 (i.e., Washington Center and Beatty-Rogers Park) resulting in the following quantities:

- 555 CY excavated and replaced with clean backfill soil.

Additionally, a house dust abatement program (HDAP) was implemented by providing High Efficiency Particulate Air (HEPA) vacuums, along with clear instructional information, on loan to City residents who performed the work on a voluntary basis. House dust abatement services were also provided to citizens requesting and unable to perform the service. Consistent with the requirements of the FRDR, the HDAP was maintained through the RA duration and made available to any and all City residents. A request for house dust abatement was made by only one residential property.

Since the First Five-Year Review, additional response actions were performed at both On-site and Off-site properties in 2003, 2006, and 2007. BZC also performed several response actions in 2007 in connection with a supplemental residential soil sampling program (SSP) initiated by BZC that year. These additional response actions include:

1. Remediation of four properties in 2003 that was documented in Addendum 1 to the RACR resulting in:

   - 1,270 CY of soil being excavated and moved to the Consolidation Area.

2. Remediation of the On-Site Weldex property that was documented in Addendum 2 to the RACR resulting in:

   - 278 CY of On-Site soil being excavated and moved to the Consolidation Area.

3. Remediation of portions of the Washington Center and Blackwell Middle Schools properties between November 2007 and January 2008 resulting in:

   - 944 CY of soil being excavated and moved to the Consolidation Area (this work was performed under the Remedial Action Plan for Two Blackwell Schools (November 2007) and the Soil Management Plan (November 2007) approved by ODEQ).

The response actions described above did not result in any known materials being left in place above residential remediation levels.

4.3 System Operations/Operation and Maintenance (O&M)

The objectives of the required institutional controls will be to maintain long term protection of property owners, future owners and/or local citizens. The City of Blackwell and BZC are jointly developing the remaining aspects of the ICP for subsequent adoption by the City. The different components of the ICP under consideration include the establishment of a Soil Protection Area (SPA) that would include restrictions for non-residential properties that exceed the residential remediation levels, require protective soil management and dust control procedures during construction activities, and address continued maintenance of engineering controls and capped areas. The SPA includes the entire BIP and Off-site areas

within the Blackwell City limits where material was capped in place (the current list of these properties are identified in Table 1.)

The specific regulations governing land use and soil handling within the SPA and for areas which have engineering controls or smelter residuals are also being developed but have not yet been completed. The regulations governing land use and soil handling within the SPA are intended to prevent contamination and/or recontamination of remediated and /or non-remediated areas, protect the health and safety of workers, and to track soil movement and soil quality data. Under the ICP, existing and future property owners of property located in the SPA will be required to meet development guidelines that are consistent with the ICP and to manage future activities in a manner that will maintain the RA that has been implemented.

Various procedures including annual reminders of restrictions on the property sent with tax bills or required excavation permits are being evaluated as part of the ICP to facilitate the appropriate handling of soil within the SPA.

On-Site O&M costs for the period from April 2003 through April 2008 were incurred for mowing the vegetative cover, installing a 14,000 linear foot security fence, and improving drainage controls in late 2007. Off-Site O&M costs were limited over this time period. Potential future On-Site O&M costs may include mowing, periodic maintenance, and minor repairs to soil cover and drainage control areas.

5.0 Progress since the Last Five-Year Review

The First Five-Year Review found that the implemented SRU RAs were functioning as designed, did not require maintenance, and remained protective of human health and the environment. No issues were identified as needing attention, and progress has been made on the BNSF properties and the ICP for the City of Blackwell.

As of this Second Five-Year Review, the BNSF properties have not yet been remediated, and the ICP has not yet been fully developed and implemented. Implementation of the ICP is expected in the first half of 2009. Maintenance activities consisting of the installation of a fence surrounding the consolidation area has been performed. Repair of minor erosion at the consolidation area is in progress.

Since the First Five-Year Review, additional response actions were performed at both On-site and Off-site properties in 2003, 2006, and 2007. BZC also performed several response actions in 2007 in connection with a supplemental residential soil sampling program (SSP) initiated by BZC that year. These additional response actions include:

1. Remediation of four properties in 2003 that was documented in Addendum 1 to the RACR resulting in:
    - 1,270 CY of soil being excavated and moved to the Consolidation Area.
2. Remediation of the On-Site Weldex property that was documented in Addendum 2 to the RACR resulting in:
    - 278 CY of On-Site soil being excavated and moved to the Consolidation Area.
3. Remediation of portions of the Washington Center and Blackwell Middle Schools properties between November 2007 and January 2008 resulting in:
    - 944 CY of soil being excavated and moved to the Consolidation Area (this work was performed under the Remedial Action Plan for Two Blackwell Schools (November 2007) and the Soil Management Plan (November 2007) approved by ODEQ).

The response actions described above did not result in any known materials being left in place above residential remediation levels.

A component of the SRU remedy included solicitation of information from property owners to identify properties where historical placement of smelter residue as backfill may have occurred. During the 1996-2001 SRU response action, such solicitation successfully identified a number of residential properties for remediation. Resident's participation in activities was voluntary. In 2007, BZC initiated the SSP to provide Blackwell property owners with an additional opportunity to have their residential or commercial properties sampled. As with the previous residential sampling program participation by individuals is voluntary. The SSP has included: an outreach program to inform residents of the opportunity and to

obtain access agreements. Through May 2008, access agreements for over 3,400 properties had been obtained and sampling is in progress. Any additional required remediation identified by the sampling will begin in May 2008. The SSP and any necessary response actions undertaken as a result of the SSP will be performed pursuant to work plans approved by ODEQ that are designed to meet the remedial action objectives of the SRU ROD and will be further evaluated under the next five-year review, as appropriate.

Additionally, work on the GRU should begin at the end of the year. Characterization of the historic railroad properties located immediately south and southwest of the BIP and the right-of-way area have been undertaken by the BNSF Railway Company (BNSF). Currently, BNSF has an approved work plan to perform remediation on these properties.

6.0 Five-Year Review Process

6.1 Administrative Components

BZC and ODEQ initiated the Second Five-Year Review process in January 2008. The SRU Five-Year Review team consisted of the following stakeholders from BZC, the State, BIA, and the City of Blackwell:

- Sara Downard, Dennis Datin – ODEQ
- Mike Leach, Catherine Castaneda, Mike Cooper – BZC
- Jim Willis, Mike Jeffers – City of Blackwell
- Shane Frye – BIA

The tasks for the SRU, ERU, and GRU Second Five-Year Review included:

1. Evaluation of site documentation (e.g., the ROD, CAFO, FRADR) identified in Attachment 1 and the draft ICP by ODEQ (to determine whether the remedy selected in the ROD is still valid and functioning and protective of human health and the environment);

2. An inspection of properties identified in Table 1 where the RA resulted in Impacted Soils and other material being capped and left in-place (to determine whether the SRU OU1 remedy at the site is still functioning and protective of human heath and the environment);

3. Preparation of the Second Five-Year Review Report.

6.2 Community Involvement

Community involvement activities specific to the Five-Year Review consisted of the following:

- On February 1, 2008 a notice was sent to the local newspaper that a five-year review was to be conducted (Attachment 1); and
- A notice will be sent to the same local newspapers once the Five-Year Review is completed and approved. The notice will announce that the Five-Year Review report for the BZC SRU is complete (Attachment 2), and that the results of the review and the report will be available to the public at the ODEQ's Central Records and the City of Blackwell.

Although not specifically related to the Second Five-Year Review, BZC is currently performing an extensive community outreach program in support of the SSP. This outreach program has included extensive communication efforts to inform residents of Blackwell of the opportunity to have their property sampled. This outreach program has provided an opportunity for the residents to become

informed about the SRU remedy. The communication efforts have included:

- The opening and full-time staffing of a community outreach office;
- A public availability meeting;
- Periodic newsletters and other direct mailings;
- Establishing a web site;
- Ongoing newspaper and radio advertisements; and
- Numerous meetings with local civic organizations.

6.3 Document and Data Review

EPA guidance suggests that five-year reviews include a review of "sampling and monitoring plans and results from monitoring activities, [O&M] reports or other documentation of remedy performance, including previous Five-Year Review reports." Because the SRU remedy does not require the collection of monitoring data after the completion of the RA, monitoring records were not reviewed. The documents listed in Attachment 3, however, were reviewed as documentation of remedy performance.

6.4 Site Inspection

An inspection at the site was conducted on February 29, 2008 by the following Inspection Team:

Person	Representing
Sara Downard and Dennis Datin	Oklahoma Department of Environmental Quality
Jim Willis, Mike Jeffers	City of Blackwell
Mike Leach, Catherine Castaneda, Mike Cooper	Blackwell Zinc Company
Shane Frye	Blackwell Industrial Authority

The results of the inspection are recorded in the Site Inspection Checklist (Attachment 4). The purpose of the inspection was to assess the protectiveness of the remedy, including visual inspection of the BIP and Off-Site properties identified on Table 1. The BIP Site inspection included the Consolidation Area soil cover, drainage structures and the condition of the approved engineering structures (e.g., gravel caps, soil caps, etc.) approved for the On-Site capped areas.

Inspection of the On-Site Consolidation Area soil cover and the drainage structures revealed relatively minor erosion in some areas of the cover and limited ponding. Oklahoma experienced unusually harsh weather conditions during 2007 which likely contributed to the erosion. This erosion and mitigation of future erosion will be addressed by a future maintenance plan.

The inspection also indicated that the soil cover was well vegetated.

The inspection of the Legion Park Sediment areas indicated that maintenance of these areas was required and a possible enhancement of the design of the cap for those impacted sediments that are left in place. As with the consolidation area cap, the cap within the Legion Park Sediment area could have also been affected by the exceedingly wet year that preceded the inspection.

The inspection of the asphalt cap at the First Baptist Church Parking Lot found no deficiencies relative to isolation of the underlying material.

The inspection of the Blackwell High School track found that the track itself, which serves as the capped remedy remains protective, but requires maintenance. However, a visual inspection combined with sampling that has been performed as part of the SSP has identified areas around the perimeter of the track area that indicated the need for soil cleanup.

6.5 Interviews

In addition to interviews (Attachment 5) the following activities occurred:

- The BZC community outreach program referenced in Section 6.2 has provided an ongoing opportunity for Blackwell residents to express concerns pertaining to the SRU remedy;
- ODEQ had maintained a presence in Blackwell and addresses residents as they arise; and.
- Responsible parties took place in the site inspection and comments and concerns were documented in the field (see Attachment 6 Site Inspection Minutes and Photographs).

7.0 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The Second Five-Year Review determined that the containment element of the remedy within the SRU ROD for management of Impacted Soils or other contaminated materials is functioning as intended. Long term maintenance will be needed to maintain the integrity of the remedy. This conclusion is based on the following:

1. An inspection of the properties identified in Table 1 indicated that, although there is a need for a more systematic O&M program, the containment remedy for these areas continues to provide for a barrier to direct contact or ingestion of Impacted Soils;

2. There have been no zoning or land use changes within the SPA since the previous Five-Year Review that have affected the remedy and the ICP will ensure that future land use of these areas will be consistent with the remedy; and

3. The SSP is being conducted in accordance with the requirements of the SRU ROD and ODEQ-approved work plans and will be protective upon implementation.

4. Implementation of the remedy for the GRU continues to move forward.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?

The Second Five-Year Review determined that the selected remedy remediation levels remain protective of human health and the environment. This conclusion is based on the following:

1. No changes in the BZS conditions that affect exposure pathways were identified; and

2. Modifications in risk assessment methodologies have occurred since the ROD was executed; however, these modifications alone do not indicate a change in the protectiveness of the remedy/remediation levels.

No applicable changes have been made on the Federal or State level for chemical or action specific Applicable or Relevant and Appropriate Requirements (ARARs) since the ROD was executed. ARARs for air, hazardous waste, solid waste disposal, and safety and health were reviewed for any changes that may affect the criteria basis for the SRU RA levels.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no other information that calls into question the protectiveness of the remedy. The SRU remedy is protective of human health and the environment and the technologies used (e.g., removal, in-place capping) are effective at maintaining the RAOs to contain and prevent direct contact with the Impacted Soils and other contaminated materials for which the containment remedy was applied. The GRU will be protective once the implementation and construction are completed.

Close collaboration between the City, BIA, ODEQ and BZC to develop, finalize and implement the City's ICP will result in an ICP that is comprehensive in effectively protecting the remedy. Under the ICP, Soil Protection Areas will: define established locations and boundaries of impacted materials (e.g., where in-place containment was the remedy); define safe practices for working in areas where impacted materials may be encountered; establish rules for maintaining engineering controls installed as part of the remedy; and specify procedures for management of Impacted Soils that may be identified in the future.

Technical Assessment Summary

According to the documents reviewed and the site inspection, the remedy is currently functioning as intended by the ROD. There have been no fundamental changes in the physical conditions of the site that would affect the protectiveness of the remedy provided the deficiencies identified below are addressed. There have been no changes in the exposure pathways or assessment methodologies that, in and of themselves, dictate a need for a change in the remedial action levels. There is no other information that calls into question the protectiveness of the remedy. The technologies used (capping, removal, and ICs) are effective at containing and preventing direct contact with those Impacted Soils or other contaminated materials for which these technologies were applied.

Deficiencies

While the remedy is functioning as intended, those properties where the containment remedy was applied will require more systematic, ongoing maintenance and management to ensure that they remain protective. The ICP element of the remedy also requires further definition and implementation. The BNSF properties require remediation. The deficiencies are not currently affecting the protectiveness.

8.0 Issues

The Five-Year Review addresses those portions of the remedy where the containment element of the remedy was utilized to manage Impacted Soils having metals concentrations above remediation levels applicable to unrestricted use have been left within the BZC SRU. This review has identified the following issues that, if not addressed, could potentially prevent the remedy from being protective of human health and environment:

Issues	Could Affect Protectiveness (Y/N)	
	Current	Future
Operation and maintenance (O&M) of the On-Site Consolidation Area should be performed on a regular basis	N	Y
Management of construction or development activities that could disturb the cap within the On-Site (BIP) area should be improved	N	Y
Maintenance of the Legion Park Sediment Areas and the Blackwell High School Track with a possible enhancement of the engineering design	Y	Y
Although the cap installed at the Blackwell High School track is functioning as intended, a visual inspection combined with sampling that has been performed as part of the SSP has indicated the need for soil cleanup around the perimeter of the track area and maintenance of the portion of the track that serves as a cap	Y	Y
An IC program needs to be developed and implemented	N	Y
Remediation of the BNSF properties needs to be completed.	Y	Y

9.0 Recommendations and Follow-Up Actions

The follow-up actions identified below will be performed to address issues identified within this Five-Year Review.

Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
				Current	Future
Develop and implement an O&M Plan for the Consolidation Area	BZC	ODEQ	4/15/08	N	Y
Develop and implement a soil management plan for the BIP development area	BIA	ODEQ	5/16/08	N	Y
Perform maintenance at and if necessary develop and construct an enhanced design for the Legion Park Sediment Areas	BZC	ODEQ	6/30/08	Y	Y
Complete development of the IC program and submittal for ODEQ review	BZC and City of Blackwell	ODEQ	9/1/08	N	Y
Adopt and implement applicable components of the IC program	City of Blackwell	ODEQ	1/15/09	N	Y
Implement supplemental remediation adjacent to the capped Blackwell High School Track	BZC	ODEQ	6/30/08	Y	Y
Complete remediation of the BNSF properties	BNSF	ODEQ	Finalization of the Consent Decree	Y	Y

Currently, the ICP is being revised in preparation for adoption by the City of Blackwell. Revision to the ICP, before adoption, was needed to adequately address areas. Characterization of the historic railroad properties located immediately south and southwest of the BIP and the right-of-way area have been undertaken by BNSF. Currently, BNSF has an approved work plan to perform remediation on there properties.

Five-Year Reviews will continue as required.

10.0 Protectiveness Statement

The remedy at the SRU Operating Unit is currently protective of human health and the environment. Long term maintenance will be needed to maintain the integrity of the remedy. Implementation of planned institutional controls will provide for the long term protectiveness of the remedy. Additionally, the ERU and GRU selected remedies will be protective once construction and implementation are completed.

11.0 Next Review

The next Five-Year Review for the SRU will be performed April 2013, five years from the date of this review.

ATTACHMENT 1

Notice of Second Five-Year Review for the Blackwell Zinc Site Blackwell, Oklahoma

The Oklahoma Department of Environmental Quality (DEQ) will begin conducting a five-year review of the remedy for the Blackwell Zinc Site (BZS) (EPA ID OKD980796023) in Blackwell, Oklahoma this month. The purpose of this review is to determine whether BZS Soil Remediation Unit (SRU) Remedial Action (RA) remedies are functioning as designed, whether or not maintenance is required, and remain protective of human health and the environment. Five-Year Reviews are required at sites when waste materials are left in place. A report documenting DEQ's five-year review will be available to the public in May 2008. This will be the second Five-Year Review for the BZS.

This BZS Five-Year Review focuses on areas where impacted soil remains contained or capped on-site and/or off-site. The Blackwell Zinc Company's (BZC) responsibility for conducting remedial actions in the SRU arose from its ownership and operation of a zinc smelter facility which operated between 1916 and 1974. In 1974, after closing and salvaging the facility, BZC donated the smelter site to the Blackwell Industrial Authority (BIA), a public trust of the City of Blackwell. Since that time, the BIA has been developing the former smelter site as an industrial park.

The Environmental Protection Agency (EPA) began an investigation at the site in 1992. Sampling was conducted in a grid pattern to evaluate potential onsite and offsite impacts from the historical smelter and focused on high access areas where children may have lived or played. The results of the samples led the EPA to perform two early removal actions, the first located at Washington School and the second at Beatty-Rogers Park.

In 1993, BZC began a comprehensive site investigation, pursuant to a 1992 consent order with DEQ. This included obtaining access from property owners to allow sampling and to identify areas where smelter waste was located. Following the investigation, an evaluation of possible remedial action alternatives for the SRU was done. DEQ selected a remedy for the SRU and memorialized its decision in the Record of Decision (ROD) in April 1996. The ROD for the soils targeted removal of impacted soils from residential and former zinc smelter facility areas, and consolidating and containing them in a repository on the former zinc smelter property.

Other work is ongoing and planned in Blackwell. This work includes both soil and groundwater. However, this work is beyond the scope of this Five-Year Review. For further information about this Five-Year Review, please contact Sara Downard with DEQ at (405) 702-5126.

ATTACHMENT 2

Notice of Second Five-Year Review Completion for the Blackwell Zinc Site Blackwell, Oklahoma

The Oklahoma Department of Environmental Quality (DEQ) has completed the second Five-Year Review of the remedy for the Blackwell Zinc Site (BZS) (EPA ID OKD980796023) in Blackwell, Oklahoma this month. The purpose of this review was to determine whether BZS Soil Remediation Unit (SRU) Remedial Action (RA) remedy is functioning as designed, whether or not maintenance is required, and remain protective of human health and the environment. Five-Year Reviews are required at sites when waste materials are left in place. A report documenting DEQ's second Five-Year Review will be available to the public in May 2008.

This BZS Five-Year Review focused on areas where impacted soil remains contained or capped on-site and/or off-site. The results of the second Five-Year Review indicate that the site remedy is protective of human health and the environment and long term maintenance will be needed to maintain the integrity of the remedy. Additionally, implementation of planned institutional controls will provide for the long term protectiveness of the remedy.

The second Five-Year Review will be available to the public at the following repositories:

Oklahoma Department of Environmental Quality
Central Records
707 North Robinson
Oklahoma City, OK

City of Blackwell
221 West Blackwell Avenue
Blackwell, OK 74631

Other work is ongoing and planned in Blackwell. This work includes both soil and groundwater. For more information about the site please contact Sara Downard with DEQ at (405) 702-5126.

ATTACHMENT 3

LIST OF DOCUMENTS REVIEWED

Blackwell Technical Report 93-05, Mintech, Inc., April 1993.

Blackwell Technical Report 93-06, Mintech, Inc., May 1993.

Blackwell Technical Report 93-09, Mintech, Inc., December 1993. Blackwell Technical Report 94-10, Mintech, Inc., April 1994.

Blackwell Zinc Site Soil Remediation Unit Field Notes, Schafer & Associates, Inc., February 1998.

Blackwell Zinc Site Soil Remediation Unit Sampling Locations and Analytical Results, Schafer & Associates, Inc., February 1998.

Expanded Site Investigation Report for Blackwell Zinc Site, US EPA Site Assessment Section, Region VI, October 9, 1992.

Final Remedial Design Calculations Blackwell Zinc Site Soil Remediation Unit, Titan Environmental Corporation, May 1997.

Final Remedial Action Completion Report, Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma, EMC², July 19, 2001.

Final Remedial Design Report, Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma, PTI, May 1999.

Final Remedial Design Report Addendum 1, Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma, PTI, July 22, 1997.

Final Remedial Design Report Addendum 2, Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma, PTI, March 18, 1998.

Letter Agreement: Railroad Spur Remediation Work for Blackwell Zinc Site Soil Remediation Unit, Schafer & Associates, Inc., December 22, 1995.

Preliminary Remedial Design Report Blackwell Zinc Site Soil Remediation Unit, PTI, November 1, 1996.

Record of Decision for Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma, Oklahoma Department of Environmental Quality, April 4, 1996.

Record of Decision for Blackwell Zinc Site Ecological Remediation Unit, Blackwell, Oklahoma, Oklahoma Department of Environmental Quality, April 24, 1998.

Record of Decision for Blackwell Zinc Site Groundwater Remediation Unit, Blackwell, Oklahoma, Oklahoma Department of Environmental Quality, August 15, 2003.

First Five-Year Review for the Blackwell Zinc Site Soil Remediation Unit, Blackwell, Oklahoma, EMC², April 22, 2003.

Addendum 1 To The Final Remedial Action Completion Report (RACR) Blackwell Zinc Site (BZS) Soil Remediation Unit (SRU) – Blackwell, Oklahoma, EMC², October 2003.

Addendum 2 To The Final Remedial Action Completion Report (RACR) Blackwell Zinc Site (BZS) Soil Remediation Unit (SRU) – Blackwell, Oklahoma Sampling and Analysis Plan Phase II, EMC², September 2006.

Sampling and Analysis Plan, Phase II Environmental Assessment of a 20-Acre Site, Blackwell, Oklahoma, Shaw, April 2007.

Final Supplemental Soil Sampling and Analysis Plan, Property Sampling, Shaw, June 2007.

Remedial Action Plan for Two Blackwell Public Schools, Shaw, November 2007.

Memorandum documenting ODEQ consolidation area inspection and sampling event, Oklahoma Department of Environmental Quality (ODEQ), August 15, 2007.

Letter from ODEQ to Don Shandy documenting ODEQ consolidation area inspection and sampling event, Oklahoma Department of Environmental Quality (ODEQ), August 21, 2007. (letter based on above memorandum).

ATTACHMENT 4
FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION	
Site name: Blackwell Zinc Site	**Date of inspection: February 29, 2008**
Location and Region: Blackwell, OK, Region 6	**EPA ID: OKD980796023**
Agency, office, or company leading the five-year review: ODEQ	**Weather/temperature:**

Remedy Includes: (Check all that apply)

[X]Landfill cover/containment
[X]Access controls
[X]Institutional controls
[ ]Groundwater pump and treatment
[ ]Surface water collection and treatment
[ ]Monitored natural attenuation
[ ]Groundwater containment
[ ]Vertical barrier walls
[X]Other: Soil Remediation Unit Remedies including Soil Removal/Backfill, Asphalt/Concrete/Gravel/Riprap Capping of Impacted Materials left in place and the GRU and the construction of the treatment plant.

Attachments: [X] Inspection team roster attached [X] Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____Not applicable_____
_____ _____
Name Title Date
Interviewed [ ] at site [ ] at office [ ]by phone Phone no. _____
Problems, suggestions; [ ]Report attached
_____
_____

2. **O&M staff** _____Not applicable_____ _____
_____
Name Title Date
Interviewed [ ]at site [ ]at office [ ]by phone Phone no. _____
Problems, suggestions; [ ]Report attached
_____
_____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency Oklahoma Department of Environmental Quality (ODEQ)
Contact Sara Downard Project Manager _____ _____
Name Title Date Phone no.
Problems; suggestions; [ ]Report attached

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; [ ]Report attached

4. **Other interviews** (optional) [X] Report attached.

Interview Forms are available in a separate attachment. See Section 6.5 of the text and Attachment 5.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
[ ]O&M manual [ ]Readily available [ ]Up to date [X]N/A
[ ]As-built drawings [ ]Readily available [ ]Up to date [X]N/A
[ ]Maintenance logs [ ]Readily available [ ]Up to date [X]N/A
Remarks: A structured O&M plan for future maintenance activities will be prepared and implemented.

2. **Site-Specific Health and Safety Plan** [ ]Readily available [ ]Up to date [X]N/A
[ ]Contingency plan/emergency response plan [ ]Readily available [ ]Up to date [ ]N/A
Remarks_____

3. **O&M and OSHA Training Records** [ ]Readily available [ ]Up to date [X]N/A
Remarks: See Item 1 above

4. **Permits and Service Agreements**
None

5.	**Gas Generation Records** None
6.	**Settlement Monument Records** None
7.	**Groundwater Monitoring Records** None
8.	**Leachate Extraction Records** None
9.	**Discharge Compliance Records** None
10.	**Daily Access/Security Logs** [ ]Readily available [ ]Up to date [X]N/A Remarks_____

IV. O&M COSTS

1. **O&M Organization**
   [ ]State in-house [ ]Contractor for State
   [ ]PRP in-house [ ]Contractor for PRP
   [ ]Federal Facility in-house [ ]Contractor for Federal Facility
   [X]Other: Each property owner is currently responsible for the O&M on their individual property.

2. **O&M Cost Records**
   [ ]Readily available [ ]Up to date
   [ ]Funding mechanism/agreement in place
   Original O&M cost estimate N/A [ ]Breakdown attached

   Total annual cost by year for review period if available

From Apr 2003 (Date)	To Apr 2004 (Date)	_____ (Total cost)	[ ]Breakdown attached
From Apr 2004 (Date)	To Apr 2005 (Date)	_____ (Total cost)	[ ]Breakdown attached
From Apr 2005 (Date)	To Apr 2006 (Date)	_____ (Total cost)	[ ]Breakdown attached
From Apr 2006 (Date)	To Apr 2007 (Date)	_____ (Total cost)	[ ]Breakdown attached
From Apr 2007 (Date)	To Apr 2008 (Date)	125,000 (Total cost)	[ ]Breakdown attached

   Fencing and minor erosion repairs conducted in 2007 and 2008

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons:

_____

_____

V. ACCESS AND INSTITUTIONAL CONTROLS [ ]Applicable [ ]N/A

A. Fencing

1. **Fencing damaged**

Previously fencing was not determined to be necessary; fencing has recently been installed as part of a more structured O&M program.

B. Other Access Restrictions

1. **Signs and other security measures** [ ]Location shown on site map [X]N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented [ ]Yes [X]No [ ]N/A
Site conditions imply ICs not being fully enforced [ ]Yes [X]No [ ]N/A

Type of monitoring (*e.g.*, self-reporting, drive by)
_____
Frequency
_____
Responsible party/agency City of Blackwell
Contact _____ _____ _____
_____
Name Title Date Phone no.

Reporting is up-to-date [ ]Yes [ ]No [X]N/A
Reports are verified by the lead agency [ ]Yes [ ]No [X]N/A
Specific requirements in deed or decision documents have been met [ ]Yes [ ]No [X]N/A
Violations have been reported [ ]Yes [ ]No [X]N/A
Other problems or suggestions: [ ]Report attached

The ICP has not yet been finalized by the parties.

2. **Adequacy** [ ]ICs are adequate [ ]ICs are inadequate [X]N/A
Remarks: The ICP has not yet been finalized by the parties.

D. General

1. **Vandalism/trespassing** [ ]Location shown on site map [X]No vandalism evident
Remarks_____ _____

2. **Land use changes on site** [X]N/A
Remarks_____

3. **Land use changes off site** [X]N/A
Remarks_____

VI. GENERAL SITE CONDITIONS

A. Roads [X]Applicable [ ]N/A

1. **Roads damaged** [ ]Location shown on site map [X]Roads adequate [ ]N/A
Remarks_____

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS [X]Applicable [ ]N/A

A. Landfill Surface

1. **Settlement** (Low spots) [ ]Location shown on site map [ ]Settlement not evident
Areal extent: Minor ponding over less than 10% of area Depth < 6 inches.
Remarks:_____

2. **Cracks** [ ]Location shown on site map [X]Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** [ ]Location shown on site map [ ]Erosion not evident
Areal extent: Minor erosion rills – no exposure of underlying material Depth < 12 inches
Remarks: 2007 had atypical rainfall and other precipitation

4. **Holes** [ ]Location shown on site map [X]Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** [X]Grass [X]Cover properly established [X]No signs of stress
[ ]Trees/Shrubs (indicate size and locations on a diagram)
Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** [ ]N/A
Remarks: Riprap armoring in surface water channel.
Gravel over Geotextile on top of Former Smelter Cellars.

7. **Bulges** [ ]Location shown on site map [X]Bulges not evident
Areal extent_____ Height_____
Remarks_____

8. **Wet Areas/Water Damage** [ ]Wet areas/water damage not evident
[ ]Wet areas [ ]Location shown on site map Areal extent_____
[X]Ponding [ ]Location shown on site map Areal extent_____
[ ]Seeps [ ]Location shown on site map Areal extent_____
[ ]Soft subgrade [ ]Location shown on site map Areal extent_____
Remarks: See above

9. **Slope Instability** [ ]Slides [ ]Location shown on site map [X]No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches [ ]Applicable [X]N/A
(Horizontally constructed mounds of earth placed across a steep side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** [ ]Location shown on site map [X]N/A or okay
Remarks None

2. **Bench Breached** [ ]Location shown on site map [X]N/A or okay
Remarks None

3. **Bench Overtopped** [ ]Location shown on site map [X]N/A or okay
Remarks None

C. Letdown Channels [X]Applicable [ ]N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the cover without creating erosion gullies.)

1.	**Settlement** [ ]Location shown on site map [ ]No evidence of settlement Areal extent_____ Depth_____ Remarks_____
2.	**Material Degradation** [ ]Location shown on site map [ ]No evidence of degradation Material type_____ Areal extent_____ Remarks_____
3.	**Erosion** [ ]Location shown on site map [ ]No evidence of erosion Areal extent_____ Depth_____ Remarks_____
4.	**Undercutting** [ ]Location shown on site map [X]No evidence of undercutting Areal extent_____ Depth_____ Remarks_____
5.	**Obstructions** Type_____ [X]No obstructions [ ]Location shown on site map Areal extent_____ Size_____ Remarks_____
6.	**Excessive Vegetative Growth** Type_____ [X]No evidence of excessive growth [X]Vegetation in channels does not obstruct flow [ ]Location shown on site map Areal extent_____ Remarks_____
D. Cover Penetrations	[ ]Applicable [X]N/A
E. Gas Collection and Treatment	[ ]Applicable [X]N/A
F. Cover Drainage Layer	[ ]Applicable [X]N/A
G. Detention/Sedimentation Ponds	[ ]Applicable [X]N/A
H. Retaining Walls	[ ]Applicable [X]N/A
I. Perimeter Ditches/Off-Site Discharge	[X]Applicable [ ]N/A

1.	**Siltation** [ ]Location shown on site map [X]Siltation not evident Areal extent_____ Depth_____ Remarks_____
2.	**Vegetative Growth** [ ]Location shown on site map [ ]N/A [X]Vegetation does not impede flow Areal extent_____ Type_____ Remarks_____
3.	**Erosion** [ ]Location shown on site map [X]Erosion not evident Areal extent_____ Depth_____ Remarks_____
4.	**Discharge Structure** [ ]Functioning [X]N/A Remarks_____
	VIII. VERTICAL BARRIER WALLS [ ]Applicable [X]N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES [X]Applicable [ ]N/A
X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.
XI. OVERALL OBSERVATIONS
A. Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). A treatment plant will be constructed as part of the GRU, groundwater is not used as a drinking water source, and there is coordination with residents to close remaining wells in the groundwater protection zone.
B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

See Section 8.0 of text.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Identified need for a formal long-term maintenance program at the consolidation area.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

ATTACHMENT 5

INTERVIEWS

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Blackwell Zinc	**EPA ID No.:** OKD980769023	
Location: Blackwell, Oklahoma	**Date:** 4/7/2008	
Contact Made By:		
Name: Sara Downard	**Title:** Project Manager	**Organization:** ODEQ
Telephone No.: (405) 702-5126 **E-Mail:** sara.downard@deq.state.ok.us	**Street Address:** 707 North Robinson **City, State, Zip:** Oklahoma City, Oklahoma 73101	
Individual Contacted:		
Name: Bart Canellas	**Title:** RPM	**Organization:** EPA
Telephone No.: (214) 665-6662 **E-Mail Address:** Canellas.Bart@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Survey Questions		
The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the second five-year review for the Blackwell Zinc Site. The period covered by this five-year review is from the completion of the first five-year review in April 2003 to the current completion of this review. Should you choose to respond, please return your interview form to Sara Downard at the Department of Environmental Quality via e-mail or postal service by April 14, 2008.		
1. What is your overall impression of the work conducted at the site since initiation of the Remedial Action? Response: Quality work has been conducted by the responsible parties under the oversight of the State, the Oklahoma Department of Environmental Quality (ODEQ). The U.S. EPA has provided oversight that the State (ODEQ) implements a CERCLA-Quality Cleanup following the Memorandum of Understanding signed in 1994.		
2. From your perspective, what effect has the remedial action at the site had on the surrounding community? Are you aware of any ongoing community health concerns regarding the site or its operation and maintenance? Response: The effect is a very prompt response that benefits the community. Where immediate action was needed, it was taken with removal actions, and where no time critical actions were required, action has been taken or are being taken through the remedial process (for example, the ground water remediation unit).		

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.

Response: There is routine communication and the U.S. EPA keeps oversight of actions implemented by ODEQ.

4. Have there been any complaints or other comments related to the site that required a response by your office? If so, please summarize the events and result.

Response: There have been no complaints presented directly to our office. Some concerned citizens, and/or their attorneys have brought concerns to the attention of the State, the ODEQ, and they have been, or are currently being addressed by the State.

5. Do you feel well-informed about the site's activities and progress?

Response: Yes, well-informed and prompt response to any questions from the EPA.

6. Do you have any comments, suggestions, or recommendations regarding the site?

Response: The State, continues to coordinate removal and remedial actions as needed, and in the process, continues to conduct five-year remedy reviews of actions implemented to ensure the short-term and long-term protectiveness of the selected remedies.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Blackwell Zinc	**EPA ID No.:** OKD980769023	
Location: Blackwell, Oklahoma	**Date:** 4/7/2008	
Contact Made By:		
Name: Sara Downard	**Title:** Project Manager	**Organization:** ODEQ
Telephone No.: (405) 702-5126 **E-Mail:** sara.downard@deq.state.ok.us	**Street Address:** 707 North Robinson **City, State, Zip:** Oklahoma City, Oklahoma 73101	
Individual Contacted:		
Name: Sara Downard	**Title:** Project Manager	**Organization:** ODEQ
Telephone No.: (405) 702-5126 **E-Mail Address:** sara.downard@deq.state.ok.us	**Street Address:** 707 North Robinson **City, State, Zip:** Oklahoma City, Oklahoma 73101	
Survey Questions		

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the second five-year review for the Blackwell Zinc Site. The period covered by this five-year review is from the completion of the first five-year review in April 2003 to the current completion of this review. Should you choose to respond, please return your interview form to Sara Downard at the Department of Environmental Quality via e-mail or postal service by April 14, 2008.

1. What is your overall impression of the work conducted at the site since initiation of the Remedial Action?

Response: Currently, the work remains protective of human health and the environment. However, there is a need for long term maintenance of some areas.

2. From your perspective, what effect has the remedial action at the site had on the surrounding community? Are you aware of any ongoing community health concerns regarding the site or its operation and maintenance?

Response: Currently, there is a Supplemental Soil Sampling program taking place in Blackwell to address off-site concerns. The Supplemental Soil Sampling program allows residents an opportunity to have their yards sampled if they did not participate in the previous sampling event.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.

Response: Yes, the ODEQ makes regular site visits and is regularly engaged with the City, PRP, and local residents.

4. Have there been any complaints or other comments related to the site that required a response by your office? If so, please summarize the events and result.

Response: Currently, ODEQ in providing oversight of the Supplemental Soil Sampling being conducted by the PRP. The Supplemental Soil Sampling Program gives Blackwell residents an additional opportunity to have their yards sampled if they did not have them sampled in the previous sampling event.

5. Do you feel well-informed about the site's activities and progress?

Response: Yes, ODEQ maintains a continuous presence in Blackwell and continues to answer questions and receive information from the City, PRP, and the community.

6. Do you have any comments, suggestions, or recommendations regarding the site?

Response: Long term maintenance is needed. The City and PRP are currently planning for this in consultation with ODEQ.

ATTACHMENT 6
SECOND FIVE-YEAR REVIEW REPORT
SITE INSPECTION MINUTES

Date: February 29, 2008

Five Year Review Site Inspection Participants:

Sara Downard, Oklahoma Department of Environmental Quality
Dennis Datin, Oklahoma Department of Environmental Quality
Michael Leach, Freeport McMoran/Phelps Dodge
Candy Thomas, Freeport McMoran/Phelps Dodge
Mike Jeffers, City of Blackwell
Jim Willis, City of Blackwell
Shane Frye, Blackwell Industrial Authority
Mike Cooper, Shaw Environmental, Inc.
Catherine Castañeda, Shaw Environmental, Inc.

Blackwell Zinc Site Soil Remediation Unit, Five Year Review Site Inspection

These minutes summarize comments noted during the site inspection conducted on February 29, 2008 as part of the second Five Year Review for the Blackwell Zinc Site (BZS) Soil Remediation Unit (SRU). The site inspection team visited those properties identified in Table 1 of the Second Five-Year review report where material was capped in place: the consolidation area located at the Blackwell Industrial Park (BIP), the First Baptist Church parking lot, two areas along the Legion Park Tributary, and the Blackwell High School track.

Weather: Sunny, dry, light wind from northwest.

9:00 AM – Group assembled at the Blackwell Community Outreach Office
Group assembled and traveled by car to the Consolidation Area at the Blackwell Industrial Park (BIP).

9:20 AM - Consolidation Area at the Blackwell Industrial Park
The site inspection team was shown the existing cell constructed at the BIP, which consolidated soil and smelter materials removed from both On-site (BIP) and Off-site properties between 1997 and 2005. Changes to the consolidation area since the first Five-Year Review in 2003 were described by Shaw representatives, and include the following:

- A new security fence installed around the northern, western, and southern boundaries of cell. The eastern fence line was extended approximately 800 feet to allow for future expansion of the

consolidation area. The security fence consists of a 6-foot tall chain link topped with 3-strand barbed wire, and two locking gates;

- An improved access road for vehicle traffic in and out of the consolidation area;
- Silt fence and rip rap were installed in a low area previously intended to drain the property and control runoff of silt materials from the consolidation area into the Legion Park Tributary channel that flows west to east between the southern boundary of the fence and Blackwell Avenue.
- Soil piles not part of the existing consolidation cell include:
  - One soil pile (approximately 2,000 cy) placed November 2007 through January 2008 from the remedial actions performed at the Blackwell Middle School and the Washington Center Elementary School;
  - One soil pile (approximately 1,000 cy) consisting of what appeared to be smelter residue that had been consolidated from smaller piles placed adjacent to the existing consolidation area by others
  - Both of the soil piles described above are covered with geonetting and erosion matting. Additional storm water control features include a soil berm around the perimeter of the piles to prevent run on and contain runoff.
  - Soil piles located inside and to the southeast of the consolidation area main gate were deposited by City of Blackwell employees or subcontractors at various times. These soil piles were sampled in February 2008 by Shaw to assess presence of arsenic, cadmium, and lead;
  - Soil piles with concrete rubble located inside and to the southwest of the consolidation area main gate were deposited by the City of Blackwell during the 2007 sidewalk improvement project. These soil piles were sampled in February 2008 by Shaw to assess presence of arsenic, cadmium, and lead.
- It was noted by Shaw representatives and the City representatives that the northeast side of the existing consolidation cell was temporarily opened up in 2005 to receive soil removed from the Holman property (500 13th Street).

Comments on the condition of the consolidation cell included:
Shaw representatives noted that the cap and surface of the cell appears to have been affected by minor settling and erosion as indicated by some localized ponding of water on the top of the consolidation cell, gullies/rivulets on the side slopes, and a minor amount of exposed geofabric in various areas along the top and sides.

The City representatives noted that the clay used to cap the consolidation area doesn't allow infiltration of

water into the cell and causes water to pond in low areas until evaporation occurs.

Shaw representatives noted that while the remedy as designed appears to remain protective of human health, but that routine maintenance of the consolidation cell is necessary. The maintenance of site drainage is a component of the new Operations and Maintenance Work Plan being prepared for the expanded consolidation area and will address control of both site run on and runoff for the final footprint.

ODEQ representatives noted that controlled drainage should be considered part of the existing consolidation cell's operation and maintenance.

The BIA representative noted the channel west of the consolidation cell was covered with rip-rap and the channel to the south was not, and that rip-rap makes it easier to control vegetation in the channel where even tree seedlings have had to be removed periodically. The City engineer commented that during the design of the consolidation cell it was noted that the flow of water in the west channel was high so required control, while the flow in the south channel is consistently low as evidenced by no obvious bank erosion. The City engineer also noted that the decision to use rip rap was made before more modern and efficient erosion control materials became available, like the geomat fabric used on the two new dirt mounds.

10:10 AM – First Baptist Church Parking Lot

At the church parking lot, it was noted by the City, ODEQ, Freeport, and Shaw representatives that the asphalt-cover remedy remains intact and protective.

10:20 AM – Legion Park Tributary

Along the Legion Park Tributary two areas subject to remedies were inspected.

- The first area inspected was the 455 foot length of the tributary channel immediately south of the West Florence Avenue Bridge. A gravel slope was excavated in 1999 to allow 9 inch depth replacement gabion stone below the original grade in this area (BZC Completion Report, 2001).
- The second area inspected was a 50 foot length of tributary channel immediately north of West Dewey Avenue and east of North 6th Street where a concrete channel lining was constructed (BZC Completion Report, 2001).

Comments on the condition of the two areas included:

- No visible evidence of gabion stone was observed on the slope of the first area. However, stones were observed within the streambed and Shaw noted that the remedy requires rework and maintenance.

- The concrete channel lining in the second area is intact, but Shaw noted that this remedy requires maintenance due to the condition of slopes affected by seasonal flooding.

11:10 AM - Eastern Residential Area properties and Blackwell Heights properties

A drive-by inspection of these neighborhoods was performed by the team at ODEQ's request. No comments were noted.

11:25 AM – Blackwell High School Track

The Blackwell High School track was previously constructed with smelter material and the footprint of the former track was subject to a remedy involving a layer of crusher-run gravel overlain with a layer of geotextile fabric and topped with 3 inches of Red Dog cinders (BZC Completion Report, 2001). Shaw identified two locations where soil samples collected in 2007 under the Supplemental Soil Program indicated the presence of lead above ODEQ cleanup criteria: one location adjacent to the track, and one location southwest of the track – and noted that emergency vehicles historically parked at the southwest location during sports events.

The second Five Year Review site inspection team requested the presence of Mr. Larry Cochenour, the Blackwell School District's Maintenance Director, to describe his recollection of how the track has been maintained before and after the remedy was placed. Mr. Cochenour indicated that the track was periodically maintained with a 'drag" to help evenly distribute track surface materials.

Comments on the condition of the track included:

Shaw observed evidence of what appeared to be smelter material along portions of the edge of the track.

Mr. Cochenour indicated that the practice of using the 'drag' to maintain the track prior to placement of the remedy could have caused some smelter material to relocate from the track itself to areas adjacent to the track. He also indicated wind and water has contributed to relocation/erosion and therefore current track conditions.

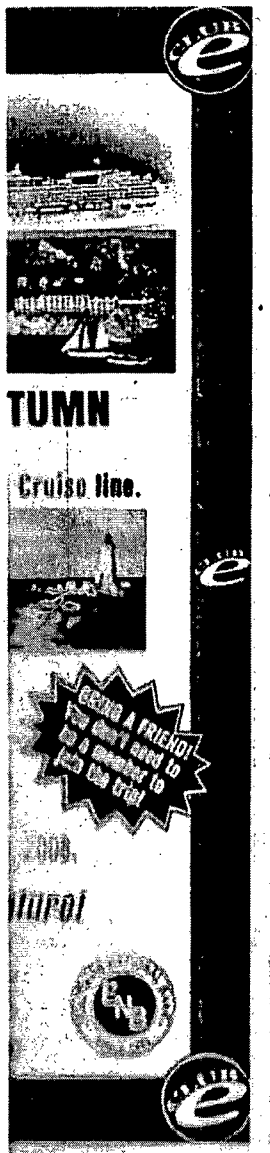
The City representatives noted that evidence of smelter residue was apparent, that there was room for improvement, and expressed concern over the public's perception of the track area used by students. The City representatives questioned the selection of this remedy. In response, Phelps Dodge representatives was under the impression that the Red Dog cinders was preferred by the school at the time but took an action item to review the documents associated with this remedy was selected.

ODEQ representatives noted the visible smelter waste material, and indicated maintenance issues involving the condition of the track and its immediate surroundings.

Shaw commented that the application of the remedy in 2001 did not address soils adjacent to the track. Shaw concurred with the ODEQ representatives regarding maintenance, adding that in one area the surface material had thinned since placement of the remedy and observed an area of the track on the southwest corner where geotextile fabric had become exposed.

In summary, some areas need maintenance to continue to be protective in the future.

Marland Mansion as Rolf Clements)



Notice of Second Five-Year Review for the Blackwell Zinc Site Blackwell, Oklahoma

The Oklahoma Department of Environmental Quality (DEQ) will begin conducting a five-year review of the remedy for the Blackwell Zinc Site (BZS) (EPA ID OKD980796023) in Blackwell, Oklahoma this month. The purpose of this review is to determine whether BZS Soil Remediation Unit (SRU) Remedial Action (RA) remedies are functioning as designed, whether or not maintenance is required, and remain protective of human health and the environment. Five-Year Reviews are required at sites when waste materials are left in place. A report documenting DEQ's five-year review will be available to the public in May 2008. This will be the second Five-Year Review for the BZS.

This BZS Five-Year Review focuses on areas where impacted soil remains contained or capped on-site and/or off-site. The Blackwell Zinc Company's (BZC) responsibility for conducting remedial actions in the SRU arose from its ownership and operation of a zinc smelter facility which operated between 1916 and 1974. In 1974, after closing and salvaging the facility, BZC donated the smelter site to the Blackwell Industrial Authority (BIA), a public trust of the City of Blackwell. Since that time, the BIA has been developing the former smelter site as an industrial park.

The Environmental Protection Agency (EPA) began an investigation at the site in 1992. Sampling was conducted in a grid pattern to evaluate potential onsite and offsite impacts from the historical smelter and focused on high access areas where children may have lived or played. The results of the samples led the EPA to perform two early removal actions, the first located at Washington School and the second at Beatty-Rogers Park.

In 1993, BZC began a comprehensive site investigation, pursuant to a 1992 consent order with DEQ. This included obtaining access from property owners to allow sampling and to identify areas where smelter waste was located. Following the investigation, an evaluation of possible remedial action alternatives for the SRU was done. DEQ selected a remedy for the SRU and memorialized its decision in the Record of Decision (ROD) in April 1996. The ROD for the soils targeted removal of impacted soils from residential and former zinc smelter facility areas, and consolidating and containing them in a repository on the former zinc smelter property.

Other work is ongoing and planned in Blackwell. This work includes both soil and groundwater. However, this work is beyond the scope of this Five-Year Review. For further information about this Five-Year Review, please contact Sara Downard with DEQ at (405) 702-5126.

pd. adv.

PROOF OF PUBLICATION

State of Oklahoma } ss:
County of Kay

Everett Lockwood

of lawful age, being duly sworn and authorized,

says that he is Advertising Manager

of **THE PONCA CITY NEWS,** a daily newspaper printed in the City of Ponca City, Kay County, Oklahoma, having paid a general subscription circulation in said County, with entrance into the United States mails as second class mail matter in Kay County, and published and printed in said County where delivered to the United States mail, and said newspaper has been continuously and uninterruptedly published in said County during a period of one hundred four (104) consecutive weeks immediately prior to the first publication of the attached notice, advertisement or publication; and that said newspaper comes within the requirements of Chapter 4 of Title 25, Oklahoma Statutes 1951, as amended, and complies with all other requirements of the laws of Oklahoma with reference to legal publications.

That said notice, a true copy of which is attached hereto, was published in the regular edition of said newspaper during the period and time of publication and not in a supplement, on the following dates:

May 11, 2008

Everett Lockwood

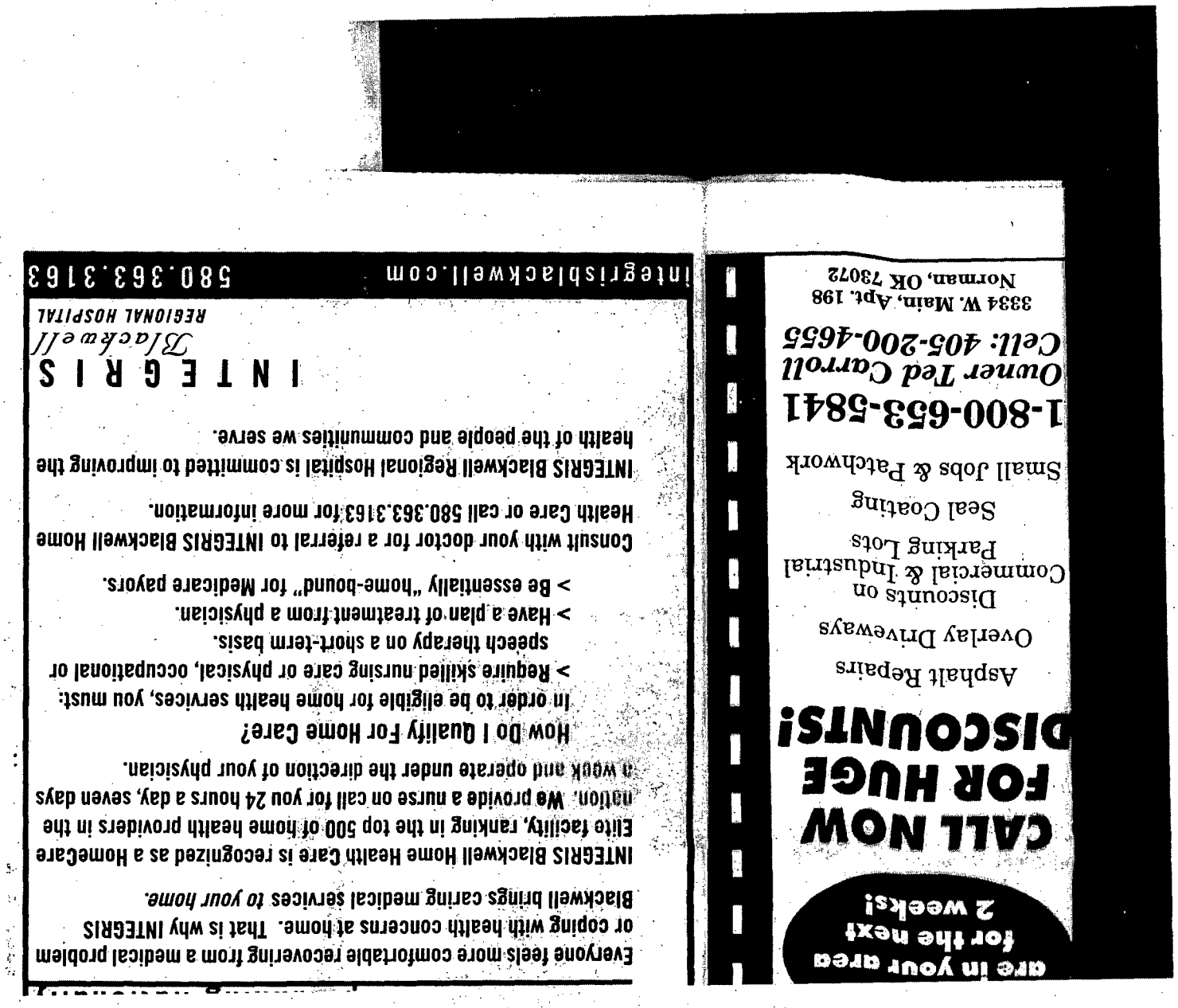
Subscribed and sworn to before me this 13th

day of May, 2008

Notary Public

My Commission Expires 5-1-2009

B-51-5-64



Notice of Second Five-Year Review Completion for the Blackwell Zinc Site Blackwell, Oklahoma

The Oklahoma Department of Environmental Quality (DEQ) has completed the second Five-Year Review of the remedy for the Blackwell Zinc Site (BZS) (EPA ID OKD980796023) in Blackwell, Oklahoma this month. The purpose of this review was to determine whether BZS Soil Remediation Unit (SRU) Remedial Action (RA) remedy is functioning as designed, whether or not maintenance is required, and remain protective of human health and the environment. Five-Year Reviews are required at sites when waste materials are left in place. A report documenting DEQ's second Five-Year Review will be available to the public in May 2008.

This BZS Five-Year Review focused on areas where impacted soil remains contained or capped on-site and/or off-site. The results of the second Five-Year Review indicate that the site remedy is protective of human health and the environment and long term maintenance will be needed to maintain the integrity of the remedy. Additionally, implementation of planned institutional controls will provide for the long term protectiveness of the remedy.

The second Five-Year Review will be available to the public at the following repositories:

Oklahoma Department of Environmental Quality
Central Records
707 North Robinson
Oklahoma City, OK

City of Blackwell
221 West Blackwell Avenue
Blackwell, OK 74631

Other work is ongoing and planned in Blackwell. This work includes both soil and groundwater. For more information about the site, please contact Sara Downard with DEQ at (405) 702-5126.

pd. adv.

PROOF OF PUBLICATION

State of Oklahoma } ss:
County of Kay

Everett Lockwood

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of **THE PONCA CITY NEWS,** a daily newspaper printed in the City of Ponca City, Kay County, Oklahoma, having paid a general subscription circulation in said County, with entrance into the United States mails as second class mail matter in Kay County, and published and printed in said County where delivered to the United States mail, and said newspaper has been continuously and uninterruptedly published in said County during a period of one hundred four (104) consecutive weeks immediately prior to the first publication of the attached notice, advertisement or publication; and that said newspaper comes within the requirements of Chapter 4 of Title 25, Oklahoma Statutes 1951, as amended, and complies with all other requirements of the laws of Oklahoma with reference to legal publications.

That said notice, a true copy of which is attached hereto, was published in the regular edition of said newspaper during the period and time of publication and not in a supplement, on the following dates:

February 10, 2008

Everett Lockwood

Subscribed and sworn to before me this 13th day of May, 2008

Notary Public

My Commission Expires 5-1-2009

B-51-5-64

Main Street Goes

Ponca City Main Street 2008 Awards Banquet is entitled Ponca City Main Street ... That's Amore!

Gondoliers and Main Street board members will greet guests upon arrival. The local PCMS Awards Banquet is to receive a Crowning Achievement Award from the OK State Main Street organization in the spring for its cleverness and creativity.

"Our awards banquet is unlike any other in the state," said Christina Rich-Splawn, banquet committee chair. "We try and make it fun

MAIN STREET BANQUET guests seated, [illegible] special treats handed out by PCMS board [illegible] dressed as a grease monkey from an auto [illegible]