



Colorado Department  
of Public Health  
and Environment

# Special Report to the Colorado General Assembly: The History, Status and Long-Term Funding Needs of the Colorado CERCLA Program

Submitted November 1, 2012



# Introduction

This report by the Colorado Department of Public Health and Environment (the department) addresses the 2011-2012 Appropriations Report Request for Information CDPHE #3. This report documents the status of cleanup at Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund) sites, and presents information about current and future funding needs for the Superfund program. Appendix A contains narratives for each of the Superfund sites, including information on the progress of cleanups, future state funding needs for construction and operation and maintenance, and schedules for deleting the sites from the National Priorities List.

## Federal/State Statutory and Other Authority

The Colorado Department of Public Health and Environment possesses authority under the following statutes to participate in the cleanup of Superfund sites in Colorado:

- Comprehensive Environmental Response, Compensation and Liability Act 42 U.S.C. Secs. 9601 to 9675 (1988);
- Colorado Hazardous Waste Management Act, Secs. 25-15-301 to 313 (1998); State Hazardous Waste Sites, Secs. 25-16-101 to 201 (1998); other state and federal public health and environmental statutes.

**The department's mission in this program is to protect public health and the environment by cleaning up sites that are contaminated with hazardous substances in a cost-effective and timely manner. This mission is fulfilled by proper remedy selection and by recovering costs from responsible parties whenever appropriate and possible. The department seeks out and values the opinions of local communities and public officials in the decision-making process, to ensure that selected remedies are acceptable to the affected stakeholders.**



## Colorado Department of Public Health and Environment Hazardous Materials and Waste Management Division Remediation Program

### Special Report to the Colorado General Assembly: The History, Status and Long-Term Funding Needs of the Colorado CERCLA Program

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#### Subject:

The report describes the status of Superfund cleanups, and a detailed accounting of current and future expenditures for these sites. The report also evaluates the Hazardous Substance Response Fund and its ability to meet state Superfund obligations.

**Date:** November 1, 2012

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# Superfund Process

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The Superfund process progresses from site characterization (the remedial investigation phase), to selecting and evaluating appropriate clean-up options (the feasibility study and record of decision), to design of the remedy and, finally, to construction of the remedy. After construction is complete, and the cleanup has achieved the desired goals, the site can be deleted from the National Priorities List. There may be a requirement for continuing operation and maintenance of the remedy after construction has been completed.

State and federal roles vary, depending on the type of site. For sites with viable responsible parties, the state generally acts as a support agency to the U.S. Environmental Protection Agency (EPA), to achieve site cleanup. Clean-up costs are funded by the responsible parties whenever possible. If there is no viable responsible party, the Environmental Protection Agency and the state share clean-up costs under a 90 percent/10 percent arrangement. Sites where the government pays for the cleanup are called “fund-lead,” and portions of sites funded by the government (where the remainder of the cleanup is funded by responsible parties) are called “orphan shares.” The state can take either a lead or support role on these sites.

For sites that the federal government owns, the state acts as support agency to either the Depart-

ment of Energy or the Department of Defense to implement the process and achieve site cleanup. The federal government pays for all of the cleanup and oversight costs. For the Rocky Mountain Arsenal, state oversight costs initially are paid by the state Hazardous Substance Response Fund (HSRF) and then are recovered from the U.S. Army and Shell Oil Company and returned to the fund.

For natural resource damage sites, the state acts as oversight agency to the responsible party. A similar process blueprint is followed. The responsible party pays for all cleanup and oversight costs. Natural resource damage sites may or may not be listed on the National Priorities List of Superfund sites.

## About Superfund

**CERCLA is short for “Comprehensive Environmental Response, Compensation and Liability Act,” also known as the Superfund law. The term “Superfund” refers to the fund accumulated in the U.S. Treasury by a tax on chemical manufacturers. This tax has been discontinued. The Environmental Protection Agency pays for cleanup, with a 10 percent state match requirement, at sites where there is no viable responsible party.**

# Superfund and the Long Bill

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The Hazardous Materials and Waste Management **Division is the state’s implementing agency for the Superfund program within Colorado.** Because of the multifaceted and long-term nature of Superfund cleanups, appropriations for the Superfund program **appear in a variety of ways within the division’s annual appropriations bill.**

Most operating budget expenditures are appropriated, using HSRF cash funds and federal funds, within the Contaminated Site Cleanups line item group. There are also the Rocky Flats Agreement appropriations (non-matched federal funds) for the costs of oversight of the post-closure operations and monitoring at the former Rocky Flats Nuclear Weapons site.

Capital construction appropriations are requested to pay for site cleanup costs when the state must

cost-share. These appropriations are normally financed 10 percent from HSRF cash funds and 90 percent from U.S. EPA grant funds.

Whenever possible, court-approved settlement funds are obtained from responsible parties to finance all, or a portion, of cleanup costs. These custodial funds are accounted for within two separate funds: the Hazardous Substance Settlement Fund (COFRS fund 14X), and the Natural Resource Damage Recovery Fund (COFRS fund 127). Budgetary spending authority for these custodial funds expenditures is obtained from the Office of State Planning and Budgeting (OSP) and the State Controller’s Office. Accordingly, these expenditures are not included within the department’s legislative budget requests. The following Table 1 summarizes the major funding components of the Superfund sites.

Table 1

Superfund Site	Expenditures Included within Legislative Budget Requests			Custodial Fund Expenditures Not Included within Legislative Budget Requests	
	Operating Budgets		Capital Construction Budgets		
	Contaminated Site Cleanups - Long Bill Group	Rocky Flats Cleanup Agreement - Long Bill Group	Superfund Site Cleanups	Hazardous Substance Settlement Fund	Natural Resource Damage Recovery Fund
Broderick	X				
California Gulch	X		X		X
Captain Jack Mill	X		X		
Clear Creek	X		X		
Chemical Sales	X		X		
Cotter (Lincoln Park)				X	X
Denver Radium (Shattuck)	Completed			X	X
Eagle Mine				X	X
Globeville Smelter	X			X	X
Idarado				X	X
Lowry Landfill	X				X
Marshall	X				
Nelson Tunnel	X		X		
PJKS (Martin Marietta)	X				
Rocky Flats		X			
Rocky Mountain Arsenal	X				X
Sand Creek	X				
Smelertown	Completed			X	
Smuggler Mine	Completed				
Standard Mine	X		X	X	X
Summitville	X		X	X	X
Uravan				X	X
Vasquez/I-70	X		X		
Woodbury	Completed				

# Long-Term Funding Requirements

Long-term funding requirements fall into two categories, both of which are funded through the annual revenue and reserves in the Hazardous Substance Response Fund. Table 2 depicts future state obligations for Superfund capital construction and operations and maintenance costs. Detailed expenditure estimates by site, comprising these totals, can be found within Appendix B.

Table 2 does not include any clean-up costs funded by the responsible parties. The figures in the table are based on a state cost-share of 10 percent of actual construction costs at sites for which there is no responsible party to pay all or some of the costs. The federal government is responsible for 90 percent of these costs.

When a remediation is publicly funded, Superfund requires that the state assume responsibility for 100

percent of the ongoing operation and maintenance of the remedy. The Environmental Protection Agency has the ability to continue the 90/10 cost-share for the first 10 years of operation for groundwater restoration remedies, but after that, the state assumes all future responsibility. However, it must be noted that the decision on the part of EPA to cost-share for the first 10 years of operations and maintenance (O&M) on some remedies is discretionary. EPA language in the regulations that implement Superfund (the National Contingency Plan or NCP) **allows for some remedies to be classified as “long-term restoration activities.”** However, there has always been controversy regarding whether the treatment of acid mine drainage qualifies as one of these activities, because the remedy does not provide source control. Therefore, the resource (i.e. the

**Table 2**  
**Summary of Future HSRF-Financed State Match Obligations**

Site	Remedial Action Costs		Operations & Maintenance Costs	
	Future Value	NPV	Future Value	NPV
California Gulch	\$1,300,000	\$1,095,323	\$700,000	\$368,298
Captain Jack Mill	\$565,000	\$496,9468	\$6,700,958	\$2,792,120
Chemical Sales	\$35,000	\$30,280	\$950,453	\$517,214
Clear Creek	\$2,649,586	\$2,254,657	\$44,624,887	\$24,283,788
Denver Radium—All Other	\$0	\$0	\$339,556	\$184,778
Denver Radium—Shattuck	\$0	\$0		
Nelson Tunnel	\$1,673,472	\$1,297,135	\$23,158,272	\$11,767,923
Sand Creek	\$0	\$0	\$211,035	\$83,709
Summitville	\$0	\$0	\$66,670,770	\$27,581,390
Standard Mine	\$744,811	\$622,433	\$4,224,529	\$2,088,709
<b>Totals</b>	<b>\$6,967,869</b>	<b>\$5,769,774</b>	<b>\$147,580,460</b>	<b>\$69,667,910</b>
<b>Grand Totals:</b>				
<b>Future Value</b>	<b>\$154,548,329</b>			
<b>Net Present Value</b>	<b>\$75,437,684</b>			

groundwater) is never “restored.” EPA Region VIII has historically included the treatment of acid mine drainage within the definition of a long-term restoration activity. However, with increasing financial pressures, in 2005 EPA headquarters issued a draft policy that would specifically exclude this activity. If this policy becomes final, EPA would no longer cost-share on the treatment plants operated by the state at Superfund sites (currently two, with up to three additional plants planned). This would have significant consequences regarding solvency of the HSRF. This policy has not been mentioned since 2006, however the question from EPA headquarters about when the state will take over 100 percent of the

O&M continues to be raised from time to time. The state and EPA Region VIII office continue to successfully maintain the 10-year cost share provision.

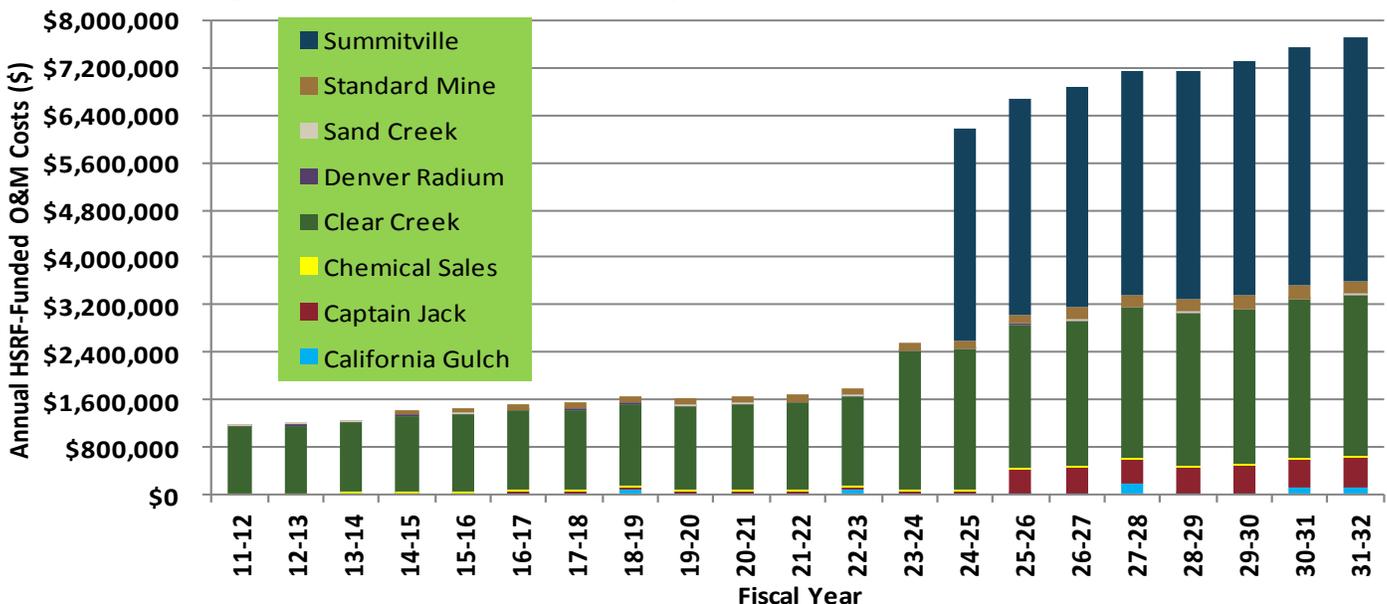
Figure 1 shows the department’s projections of future operation and maintenance estimates, with dramatic increase in 2025 after 10 years of operation and maintenance cost share at Summitville site. The state is currently funding 100 percent of the cost at the Clear Creek Argo treatment plant. As evidenced by this table, the assumption of 100 percent of treatment costs by the state is the most significant action impacting the fund balance. Implementation of the EPA policy mentioned above would accelerate this impact.

## Hazardous Substance Response Fund

Funding for state Superfund expenses comes from the Hazardous Substance Response Fund. This fund, legislatively authorized in 1986, receives income from a tipping fee (the Solid Waste Users Fee) collected at all attended solid waste landfills in the state. The amount of this fee has varied over the years, based on the projected needs of the fund. Over the years, the Colorado Department of Public Health and Environment had a goal of obtaining a fund balance equal to the net present value of all current and future state Superfund obligations.

In 2009 the general assembly reallocated \$32.5 million from the Hazardous Substance Response Fund to balance the budget. The fund transfer did not include any payback provisions. In addition, an unexpected result of the economic recession was that landfill volumes decreased significantly, thus reducing the revenue to the fund. These two factors dramatically changed projections for the fund balance, and changed the projection of when the fund would become insolvent from 2025 to 2014. The legislature in 2010 addressed this issue.

**Figure 1**  
**Long Term HSRF-Funded Operations & Maintenance Costs**

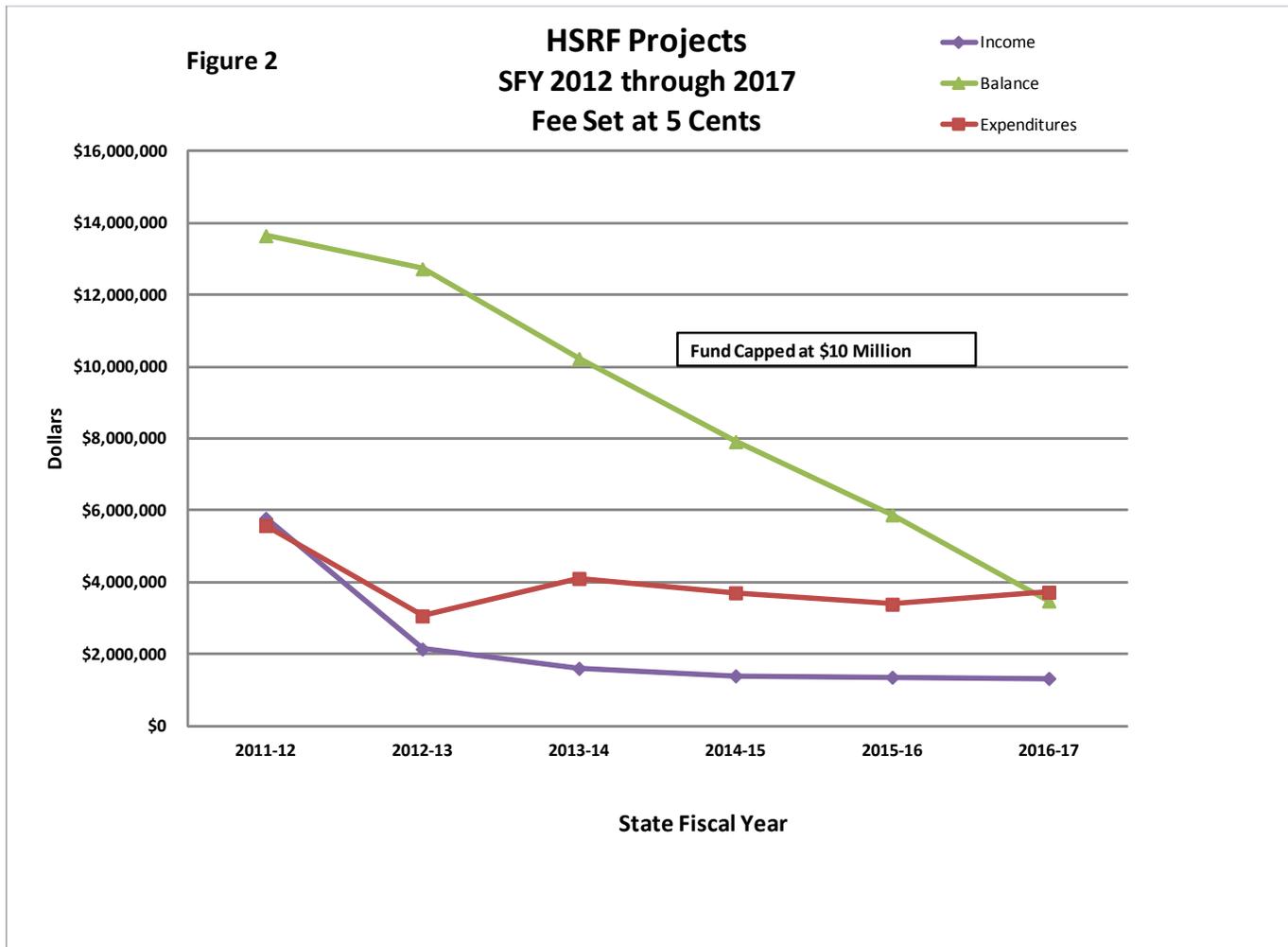


In response to department concerns about fund viability, in 2010 the general assembly extended the Solid Waste User Fee (HB 10-1329) which supports the Solid Waste Program, related Department of Law support and the HSRF/Superfund program. The legislation also transferred fee-setting responsibility to the Hazardous and Solid Waste Commission and capped the Solid Waste User Fee at 50 cents. In addition HB 10-1329 also set a cap on the HSRF fund balance of \$10 million. With this greater flexibility to adjust the tipping fee, and given current estimated expenditures from the HSRF, the fund is expected to remain solvent until approximately 2025. The major driver for when the HSRF will become insolvent is when the state becomes responsible for 100 percent of the operation and maintenance of the Summitville Mine treatment plant, currently estimated to be in FY2022.

The department's current HSRF fund balance projections are graphically depicted in Figure 2 below and summarized in Appendix C. In 2010, the Hazardous and Solid Waste Commission set the HSRF fee at 16 cents. Due to higher than expected reve-

*The major driver for when the HSRF will become insolvent is when the state becomes responsible for 100 percent of the operation and maintenance of the Summitville Mine treatment plant, currently estimated to be in FY2022.*

nues and lower expenses resulting from multiple economic factors, it has become apparent that the current fee must be reduced to maintain the fund below the required cap of \$10 million dollars. In November 2011, the department requested and the commission approved an adjustment to the fee to 5 cents per ton. Figure 2 is based on the revised fee of 5 cents beginning July 1, 2012.



# Appendix A: Site Descriptions

## Introduction

Superfund sites can be described in various ways. Most are on the National Priorities List (NPL), some are Natural Resource Damage sites (state claims under CERCLA brought in 1983, most of which have now been settled) and some are both. The funding for cleanup and oversight costs can be complex. Oversight costs may be funded through grants provided by the Environmental Protection Agency, the Department of Defense and the Department of Energy, or by responsible parties' settlements, the proceeds of which are earmarked

in the Hazardous Substance Response Fund for oversight at the particular site. Clean-up costs are funded by the responsible parties, the EPA, the state or a combination.

The goal at all sites is to require the party responsible for the contamination to clean it up. At many sites, some or all of the responsible parties no longer exist, or are not solvent, requiring full or partial public funding. Superfund requires that when federal dollars are needed, states pay 10 percent of the cost of the remedial action. Once a remedy that requires ongoing operation and maintenance, such as groundwater

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*The goal at all sites is to require the party responsible for the contamination to clean it up.*

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pump-and-treat, is deemed operational, states pay 100 percent of future operation and maintenance costs. State funding comes from a tipping fee at landfills that is deposited into the Hazardous Substance Response Fund.

## Broderick Wood Products

5800 Galapago Street, Adams County

### Description:

Broderick Wood Products, Inc. operated the site as a wood treatment facility from 1946 to 1981. The operation consisted of treating railroad ties, telephone poles and similar products in unlined ponds. This activity resulted in the contamination of soils and groundwater with creosote, pentachlorophenol and related compounds.

### Funding and Management:

This site is managed by the Environmental Protection Agency, with the responsible parties paying for site cleanup. State oversight is funded through an Environmental Protection Agency grant and by settlement funds provided by Union Pacific. Currently, the site is managed by

Broderick Investment Company (BIC).

### Cleanup Status:

Wood treatment sludge was excavated and incinerated off-site. Ongoing treatment of groundwater from the shallow aquifer, biological treatment of contaminated soils and bioventing of soils in the former impoundment and process areas is occurring. The soils remediation was completed in 2010; however groundwater treatment is expected to continue for some time. BIC expressed to EPA that lack of revenue leading to funding issues for remedial actions at the site has delayed progress.

Brannon Sand and Gravel Company purchased a portion of the former Broderick Wood

Products property in June 2012. This transaction infused BIC with funding to re-start the groundwater pump-and-treat system. Brannon has informed BIC that it may expand its operations on the property and may purchase additional acreage for the expansion.

### Estimated State-Funded Costs:

All remediation costs are funded by the responsible parties, including any future operation and maintenance. Union Pacific provided funding for the CDPHE to review the changes to the clean-up plan that were required as a result of the realignment of the rail line.

### Schedule for Deletion:

The site cannot be deleted until remedial activities are completed.

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# California Gulch (Leadville)

County Road 2 and Vicinity, Leadville, Lake County



*A new repository under construction will be used to dispose of contaminated residential soil from Leadville.*

## **Description:**

The California Gulch Superfund site encompasses the city of Leadville, significant areas of the mining district east of town, and adjacent areas affected by the spread of contamination. Contamination of residential soils, groundwater and local surface waters has resulted from decades of historic mining activities. Contaminants of concern include arsenic, cadmium, lead, zinc and other heavy metals. Past and continuing releases of these contami-

nants pose threats to local residents, and to fish and other biota in the Arkansas River.

**Due to the site's size and complexity,** a 1994 consent decree divided it into 12 segments or operable units (OUs). Each of the OUs addresses a type or source of contamination and is managed and funded uniquely.

Superfund activities at the site are managed by the Environmental Protection Agency with oversight provided by the CDPHE. CDPHE oversight is

funded through an Environmental Protection Agency grant. A large percentage of site clean-up costs have been funded by two responsible parties, Resurrection/Newmont and ASARCO. These and other responsible parties have been conducting and funding work in OUs 1, 2, 3, 4, 5, 7, 8, 9 and 10. Costs for Operable Unit 6 will be shared by the Environmental Protection Agency and the state.

In 2008, Resurrection/Newmont negotiated a new con-



*The Pyrenees Waste Pile is located in Operable Unit 6 of the California Gulch Superfund site. When rain or snowmelt percolates through mine waste piles heavy metals cause acid rock drainage that can get into waterways where it harms fish and other aquatic life. The Environmental Protection Agency is currently developing the design for this operable unit.*

sent decree with EPA and the state. Under the 2008 consent decree, Resurrection/Newmont will be responsible for long-term operation and maintenance of OUs 1, 4, 8 and 10, and will contribute to future response actions in OUs 11 and 12, as well as future natural resource damage restoration activities. The 2008 consent decree, along with the settlement of the ASARCO bankruptcy has responsible parties paying for most of OU11 and a portion of OU12. Responsible parties paid approximately 60 percent of OU11 costs while EPA paid 30 percent. The state also contributed to this “orphan share.” Although settlement funds have been set aside for OU12, final costs have not been determined.

### **Cleanup Status:**

The responsible parties have completed a significant amount of work. The Yak Tunnel water treatment plant (OU1) became operational in February 1992, and remedial action work in Operable Units 2, 3, 4, 5, 7, 8, 9, 10 and 11 has also been completed.

The EPA and CDPHE have revised the Operable Unit 6 Record of Decision. The EPA currently is

preparing to develop a revised remedial design.

Operable Unit 12, the final operable unit, is intended to address site-wide water quality issues remaining after work at other operable units had been completed. In September 2009 EPA selected a “no action” remedy. EPA and CDPHE will monitor the Arkansas River to see if the trend of improving water quality will meet state standards. If not, additional work may be required in the future.

### **Estimated State-Funded Costs:**

Although substantial work has been completed at the site, work remains for OU6. The ASARCO bankruptcy settlement included \$1.7 million for the state to perform operation and maintenance on OUs 3, 5 and 7. The change in the OU6 remedy may cost on the order of \$10 million, which would include a state share of \$1 million, plus operation and maintenance costs.

The state also could be responsible for a portion of the remedy costs for OU12. Remedy costs for Operable Unit 12 are

unknown at this time, because we will not know whether state standards are met in the Arkansas River until the next five-year review is performed in FY2013. However, the ASARCO settlement calls for Newmont to contribute \$2.5 million towards any remedy chosen.

### **Schedule for Deletion:**

Operable Units 2, 8, 9 and 10 have been deleted, and EPA and the state are working to delete OU3. The remedial action work required for OUs 1, 3, 4, 5 and 7, is complete, but implementation of institutional controls or completion of other administrative tasks is needed before these operable units can be deleted. Although OU11 remedy construction was completed in 2011, two to three years of monitoring is expected before the remedy is considered operational and functional. Institutional controls also will need to be established for OU11. Deletion of OU6 depends on construction completion and implementation of institutional controls, while deletion of OU12 will be considered after completion of construction in OU6 and several years of additional water quality monitoring.

# Captain Jack Mill Site

**1.5 Miles Southeast of Ward, Lefthand Creek Watershed,  
Boulder County**

## **Description:**

This mining site is located at the headwaters of the Left Hand Creek Watershed in a narrow valley approximately 1.5 miles southeast of Ward in the mountains west of Boulder. Mining for gold and silver in the region began about 1860. The site consists of a horizontal mine entrance (known as an adit) to the Big Five Tunnel, which drains acidic mine water and several large waste rock piles including the Big Five, Cornucopia, Philadelphia and White Raven piles. In addition, there are two tailings ponds created during operations of the Captain Jack Mill. Heavy metals from mine waste piles and acid mine drainage impact the fishery of Left Hand Creek. In addition, the Left Hand Water District, which provides drinking water to about 15,000 people, has an intake approximately 15 miles below these abandoned mines and contaminant sources. Contaminants from historic mining also affect wetlands downstream of Captain Jack along Left Hand Creek. The site was listed on the National Priorities List on Sept. 29, 2003.

## **Management and Funding:**

The state has implemented investigations and evaluations as the lead agency under a grant from the Environmental Protection Agency (100 percent federal funding), and a Record of Decision was issued in September 2008. Cleanup costs will be borne by the United States Environmental Protection Agency and the state in a 90/10 percent cost share because the mining impacts are from companies that no longer exist and no viable re-

sponsible parties have been identified for this site at this time.

## **Cleanup Status:**

The remedy calls for plugging of the tunnel and treatment of the Big Five mine pool, as well as consolidation and capping of mine waste piles. To facilitate design and construction, the two components of the remedy are being handled separately. Design for the Big Five tunnel component of the remedy began in May 2011 and is approximately 60 percent complete. The start of Big Five tunnel construction will depend on receiving funding from EPA, which will be requested in spring 2013.

Colorado Cleanup Company (CCC) was awarded the contract to implement the first phase of the Captain Jack remedy, consolidation and capping of mining-related wastes. Implementation began in June 2012. By the middle of September 2012 at least 80 percent of the remedy elements had been completed with removal of four waste rock piles and a mill tailings impoundment to an on-site engineered mine waste repository. In addition, the Big Five Mine waste rock pile was consolidated, re-graded and capped in-place. The goal is to complete the surface remedy by mid-October 2012.

## **Estimated State-Funded Costs:**

The estimated cost for construction of the waste pile portion of the remedy is about \$2.8 million. The engineering

cost estimate for the construction of the Big Five tunnel remedy is approximately \$8 million. The state will be responsible for 10 percent of the cleanup construction cost and 100 percent of any operation and maintenance required for the site.

## **Schedule for Deletion:**

At this time, no schedule has been developed for construction completion and deletion of the site. Estimates for construction schedules will be developed as part of the remedial design process. Based upon the following assumptions, the project will not be completed until at least 2018:

- two construction seasons (years) to implement the selected remedy; and
- two years of monitoring remedy performance.

If water quality standards are not met after construction of the bulkhead in the Big Five tunnel (Phase I), a biochemical reactor will be designed and constructed outside of the adit (Phase II). Phase II will require one year for design, one year for construction and another year to develop the deletion package. Therefore, the earliest the site could be considered for deletion would be roughly 2018.



*Discharge from the Big Five Mine impacts Left Hand Creek.*

# Central City/Clear Creek

## Central City and Idaho Springs Mining District, Clear Creek and Gilpin Counties

The Central City/Clear Creek Superfund study area covers the 400-square mile drainage basin of Clear Creek, which has been affected by inactive precious metal mines. The Superfund investigation has focused on six priority mine drainage tunnels and more than 40 priority mine waste piles. The most significant environmental impacts are on the Clear Creek stream system, including a reduced fishery and impacts to other aquatic life and habitat. Acidic water draining from many mines contains heavy metals, and mine wastes contribute to the non-point source impacts to the basin. Clear Creek is a drinking water source for more than 250,000 people in the northern Denver metropolitan area, and is used for kayaking, rafting, fishing, wildlife watching and gold panning. Human health hazards from this site involve the potential for exposure to heavy metals — primarily lead, arsenic

and cadmium — in surface water and soils.

### Management and Funding:

The state implements investigations and cleanup as the lead agency under several grants from the Environmental Protection Agency (both 100 percent federal and 90/10 percent federal/state funding). Most of the cleanup costs are borne by the EPA and the state, in a 90/10 percent cost share, because the mining impacts in this basin are from companies that no longer exist. For operations and maintenance at the Argo Tunnel Water Treatment Plant, 100 percent of the costs are borne by the state.

### Clean-up Status:

Clean-up accomplishments include capping or removal of more than 40 waste rock piles, construction of an on-site mine waste repository, closing mine

openings, conducting domestic well sampling, building a constructed wetlands to filter metals and constructing sediment retention dams. The CDPHE continues to operate a water treatment facility to treat the Argo and Big Five tunnel discharges and Virginia Canyon groundwater. The facility prevents approximately 900 pounds of metals per day from entering Clear Creek, thereby treating the single largest point source of metals in the basin. Modifications are under way at the Argo facility to improve efficiency. Planned work includes construction of a flow control device to be installed in the Argo Tunnel and capping the Quartz Hill Waste Pile.

Construction of a mine water treatment plant for the Gregory Incline and National Tunnel discharges and Gregory Gulch surface water is expected to begin in 2014, pending EPA funding approval. The department recently completed construction of a pipeline to convey the discharges to the new plant site. Related ongoing work includes construction of a retaining wall to prepare the water treatment plant site and North Fork Clear Creek mill tailings removal and stream stabilization.

### Estimated State-Funded Costs:

The site cleanup decision documents are complete and therefore projected costs for completion of Superfund remedial action can be estimated. In addition to the significant remediation projects already completed, constructing the North Fork water treatment plant, tunnel bulkhead installation, Argo Tunnel Water Treatment Plant improvements, North



*CDOT crews constructed the pad for the future North Fork water treatment plant as part of a curve straightening project.*

Fork mill tailings removal and stream stabilization measures, and Quartz Hill capping is estimated at \$33,657,480. The state 10 percent cost share for these construction activities is estimated at \$3,739,720, some of which has already been spent (see Appendix C).

Currently, the major operation and maintenance component is operation of the Argo Tunnel Water Treatment Plant. The plant began full operation in April 1998, with an approximate annual operating cost of **\$1,000,000**. The state's share of these costs was \$100,000 per year through September 2009. As of October 2009, the state is responsible for the full annual operating cost in perpetuity.

The state also will be responsible for the treatment of the Gregory Incline and National Tunnel discharges. Initial engineering estimates of construction cost are in the \$16 million dollar range. The state will be responsible for 10 percent of the construction cost. The current cost estimate for operations and maintenance



*Paving in May 2012 marked completion of the pipeline that will convey contaminated water to the site of the new North Fork water treatment plant below the town of Black Hawk.*

is \$926,000 per year. The state will be responsible for 10 percent of the annual costs, or approximately \$95,000 per year, for the first 10 years of operation, and the full annual cost beginning in 2024 and continuing in perpetuity.

The state will also be responsible for 100 percent of the operations and maintenance costs

associated with maintaining covers and sediment control structures at several mine reclamation sites throughout the Clear Creek basin.

#### **Schedule for Deletion:**

Construction completion for the entire site is currently estimated to occur by July 2015, with deletion to follow.

## **Chemical Sales Company**

**4661 Monaco Parkway, Denver, Denver County**

#### **Description:**

The Chemical Sales Company Superfund site extends from the facility at 4661 Monaco Street, Denver, approximately five miles to the north. The site covers portions of the city and county of Denver, south Adams County and Commerce City. Soil and shallow groundwater at the facility are contaminated with chlorinated volatile organic compounds.

#### **Funding and Management:**

The Chemical Sales Company performed the study phase of the

project for Operable Unit 1 (OU1). The Environmental Protection Agency managed the study phase of OU1 and funded the study phase of Operable Units 2, 3 and 4. The EPA and the state jointly funded (90/10 percent) remedial actions at Operable Units 2 and 3. No action was taken for OU4. After the company declared bankruptcy, the Environmental Protection Agency performed most of the remedial design for OU1, and then turned management of the remainder of design and con-

struction over to the state. State oversight and management costs are funded through EPA grants requiring state matching funds (90 percent federal, 10 percent state). Clean-up costs are shared between the EPA and the state (90/10 percent). A portion of the clean-up costs was recovered through settlement consent decrees with the Chemical Sales Company and Interstate Distribution Center Associates, and a prospective purchaser agreement with G.L. Bryan Investments, Inc.

#### **Cleanup Status:**

The air sparging and soil vapor extraction treatment system was

stopped in January 2007 because it was no longer cost effectively extracting contaminants from the groundwater. In-situ chemical oxidation was determined to be more cost effective. Operable Unit 1 groundwater was treated by chemical oxidation and additional wells were added to treat a persistent source area. In fall 2011, CDPHE's contractor performed additional chemical oxidation to treat persistent source areas of groundwater contamination. A baseline groundwater sampling event was conducted prior to the initial treatment injection. The first injection phase

was conducted the week of Sept. 12, 2011. The second phase of injection was completed in October 2011.

Performance groundwater sampling was conducted in August 2012. Results indicate a significant reduction in the mass of contaminants at this site. The environmental contractor will present EPA and CDPHE with a report on the success of the injections related to mass reduction and will recommend where to focus additional injections in 2012. The 2012 injections may reduce the

mass of contaminants enough to meet site standards.

**Estimated State-Funded Remaining Clean-up Costs:**

In-situ treatment of the groundwater costs \$180,000 per year, with the state share being \$18,000. The state also incurs groundwater monitoring costs associated with OU2 of approximately \$19,000 per year.

**Schedule for Deletion:**

Chemical oxidation is anticipated to continue for at least two more years. Deletion is not expected before 2013.

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## Denver Radium

### Various sites, Denver, Denver County

**Description:**

The site includes 65 properties contaminated with radioactive soils and debris, which are organized into 11 operable units. Denver was the site of various radium processing operations during the early 1900s. When radium processing ended in the 1920s the site locations were forgotten. In 1979, the Environmental Protection Agency discovered the situation, and the state of Colorado, with help from numerous agencies, conducted studies to locate the properties. Soils at these sites were contaminated with radium, thorium and uranium. The radioactive decay of these elements produces radon gas. At some sites, groundwater was impacted.

**Management and Funding:**

The EPA was the lead agency for managing the Denver Radium sites, although the state managed portions of the Shattuck project. All but one, Shattuck Chemical, were considered orphan shares, for which clean-up costs were

funded by the EPA and the state in a 90/10 cost share. The responsible parties paid for the original cleanup of the Shattuck site. However, with the revised decision to move the Shattuck waste, the state and EPA were responsible for most of the additional cost.

**Cleanup Status:**

Cleanup of all sites (except Shattuck) consisted of excavation of contaminated materials and disposal at a licensed facility in eastern Idaho or eastern Colorado, and is complete. Some residual contamination was left under streets in accordance with EPA standards, but those contaminants have since been removed. A five-year review, completed in September 2008, requires additional groundwater monitoring for at least five more years. The next five-year review is scheduled to be completed by September 2013. CDPHE monitors Shattuck groundwater twice per year

and at other locations as necessary.

**Estimated State-Funded Costs:**

Due to increased contaminant volumes at the site, costs for the Shattuck site cleanup totaled \$58 million. The required state cost share was \$5.28 million. Government costs were offset by recovery of \$5.2 million of the total cost from the responsible party. The state completed payments of its 10 percent cost share in 2006. The state also estimates that it may incur approximately \$15,000 per year for monitoring contaminated groundwater. It should be noted that the city and county of Denver has spent several million dollars over the past five years to remove contamination under city streets. Denver obtained funding for these activities by withholding HSRF tipping fees collected at county landfills.

**Schedule for Deletion:**

Except for Shattuck groundwater (OU8), the site was deleted on Nov. 5, 2010. Groundwater at Shattuck cannot be deleted until it meets state standards.

# Eagle Mine

SH 24 between Redcliff and Minturn, Eagle County

## Description:

The Eagle Mine and associated mining wastes are located approximately eight miles southwest of Vail. Heavy metals, such as lead, zinc, cadmium, arsenic and manganese impact surface soils and local streams, including the Eagle River.

## Management and Funding:

The state is the lead agency under the consent decree between Colorado and the responsible party. The responsible party bears the cost of site cleanup. State oversight is funded by the responsible party through the Hazardous Substance Response Fund Eagle Mine accounts.

## Cleanup Status:

In September 2001, the EPA determined clean-up activities at the site to be complete. There has been a dramatic improvement in water quality in the Eagle River and a rebound in aquatic life populations as a result of the cleanup. A biologically based standard for the Eagle River was proposed to the Colorado Water Quality Control Commission (WQCC) in December 2005. However, this standard was not adopted because local residents wanted additional cleanup. In June 2008 the WQCC adopted new underlying standards for metals in the Eagle River. These standards cannot be attained with the current remedy; therefore, the responsible party will be required to conduct a feasibility study to determine what additional work can be performed to meet the new standards. A five-year review was completed in September 2008 and determined that the remedy is not fully protective because it does not meet the new water

quality standards. The responsible party continues work on the feasibility study that includes additional groundwater treatment. The next five-year review will be conducted in 2013.

## Estimated State-Funded Costs:

All cleanup, operation and maintenance; state oversight; and state legal costs are borne by the responsible party.

## Schedule for Deletion:

A review of the site will be performed every five years to ensure that the waste repositories are still performing as expected. Deletion will be tied to completion of the additional work that is yet to be determined.



*Miners entered the works in the now-abandoned town of Gilman.*



*The Eagle Mine Superfund site features various historic features, including a trestle that conveyed mine wastes. The structure now conveys contaminated water from the mine pool to the treatment plant.*

# Globeville Smelter

495 East 51st. Avenue, Denver, Adams and Denver Counties

## Description:

The site consists of the plant, along with properties in the surrounding communities in North Denver and South Adams counties. The Globeville Plant has operated as a lead smelter, refined arsenic and cadmium, and produced gold and silver. There are no operations currently ongoing at the plant. ASARCO is required to clean up all contaminated media in and around the Globeville Plant site, which includes the former neutralization pond, groundwater and surface water, community soil and air emissions. Cadmium, arsenic and lead are present in the surrounding soils and in localized groundwater east of the plant.

## Funding and Management:

The state is the lead agency. **Through settlement of the state's claims, the responsible party funded cleanup and oversight costs up until the time that the company declared bankruptcy. To settle the state's bankruptcy claim, ASARCO paid \$16 million into a settlement trust to complete the remediation work on the plant site and to fund the state's oversight.** This settlement is also funding ongoing water treatment. In addition the state received \$1.1 million from a national trust account to complete the cleanup of contaminated soils from commercial/industrial properties surrounding the Globeville Plant site.

## Cleanup Status:

Construction activities have been completed at all off-site residential properties. Cleanup of the former sedimentation pond has been completed and the groundwater extraction and

treatment system is constructed and operating. During 2011, sampling and removal of off-site contaminated soils was completed. Uncompleted work includes closure of the Former Neutralization Pond and capping of on-site contaminated soils. On-site cleanup work was ongoing until ASARCO filed for bankruptcy in 2005. The ASARCO bankruptcy case was settled in 2009. As a result of the court-ordered settlement, a multi-state custodial trust was established to fund cleanup at ASARCO sites across the country. Remaining cleanup at the Globeville site will be funded from this trust. Remediation of the on-site soils and groundwater began in March 2012. The smelter stack and all buildings have been demolished. Materials that were found to be hazardous were sent off-site to the appropriate landfill, and most of the concrete has been pulverized for reuse on the prop-

erty. The first phase of the project is expected to be complete by December 2012.

## Estimated State-Funded Costs:

The ASARCO bankruptcy settlement resulted in \$16 million for the cleanup of the site, to be placed in a multi-state custodial trust. The department is working with the trustee and Globeville Inc., LLC to complete cleanup of the property. The cost of site cleanup, including CDPHE's oversight cost, will be funded by the trust.

## Schedule for Deletion:

This site was proposed for listing on the National Priorities List (NPL), but Environmental Protection Agency deferred final listing of the site because the state was actively working with the responsible party to complete cleanup. **Once cleanup activities are completed, the site will be "de-proposed" from the NPL.**

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# Idarado Mine

SH145 and US 550, San Miguel and Ouray counties

## Description:

The Idarado mine extends beneath a mountain ridge between the towns of Telluride and Ouray. In the Telluride District, there are seven infiltration lagoons and six tailings ponds. The western portal of the mine in the Telluride District is located three miles east of the town of Telluride. In the Red Mountain District, there are five tailings ponds. The eastern portal of the mine in the Red Mountain District is located about 11 miles south of Ouray.

The major human health concern is possible exposure to heavy metals in the tailings, specifically lead and cadmium. High zinc concentrations adversely affect aquatic life in nearby rivers and creeks. Farmers and ranchers downstream of the Red Mountain District also have concerns about contaminated irrigation water.

## Management and Funding:

The site is managed by the Colorado Department of Public Health and Environment through the natural resource damage set-

tlement. Cleanup costs and state oversight costs are funded by the responsible party.

**Cleanup Status:**

A majority of the clean-up activities have been completed on the site, and compliance monitoring in Red Mountain Creek and the San Miguel River is ongoing. Remediation of Society Turn Tailings Pile Number 1, in the Telluride District, remains. The results of compliance monitoring indicate that the current remedy will meet the standards agreed upon in the settlement between the state and Newmont Mining in the Telluride District. The department is in discussions with Newmont to identify additional reme-



*Preservation of historic structures, such as the American Girl Mill, above, was crucial to the successful implementation of the remedy.*

dial measures that may be necessary to meet standards in the Red Mountain District.

Final remedy completion has been delayed by negotiations

between the mining company and the town of Telluride, which owns property where contamination remains. The town of Telluride, the state and Newmont have entered discussions on site access and identifying clean-up activities needed to address the remaining contamination.

**Estimated State-Funded Costs:**

All clean-up, operation and maintenance, and state oversight costs are borne by the responsible party.

**Schedule for Deletion:**

This site is not on the National Priorities List and will not require deletion.

## **Lincoln Park (Cotter)**

**0502 Fremont County Road 68, Cañon City, Fremont County**

**Description:**

The site consists of a uranium processing mill and tailings disposal cells located adjacent to the community of Lincoln Park; approximately 1.5 miles south of Cañon City. Operation of the mill since 1958 led to contamination of soils and groundwater on the site, and groundwater contamination in the adjacent community of Lincoln Park. The contaminants of concern are molybdenum and uranium.

**Funding and Management:**

This site is managed by the state through the radioactive materials license held by the operator, and a consent decree and court order issued in 1988. Most clean-up and oversight costs are borne by the responsible party. Cotter receives some monies from the U.S. Department of Energy for pre-1972 tailings disposal.

**Cleanup Status:**

Soils in the Lincoln Park area have been remediated. Groundwater contamination still exists in the Lincoln Park area and is monitored for quality and use. Cotter has committed to performing additional water investigations, water clean-up studies, and capital cost expenditures in the Lincoln Park area during the next year. The EPA five-year review was performed in 2012.

Site closure continues for the mill and impoundments. Soil and groundwater contamination still exist on the Cotter property. Major on-site soil remediation occurred in 2008. New activities have been paused while the Community Advisory Group is re-organized and a roadmap process is instituted for integrating license, consent decree and CERCLA

requirements. Water and air monitoring continues. Most of the mill buildings have been dismantled and disposed in the primary impoundment. A new evaporation pond is being considered. Additional soil and groundwater characterization is expected in 2013.

**Estimated State-Funded Costs:**

All clean-up, operation and maintenance, and state oversight costs are borne by the responsible party.

**Estimated State-Funded Remaining Operations and Maintenance Costs:**

None.

**Schedule for Deletion:**

Deleting the Lincoln Park Operable Unit site from the National Priorities List cannot occur until groundwater in the area meets standards and has met the CERCLA process requirements. The timeframe for achieving these standards is unknown at this time.

# Lowry Landfill

3500 South Gun Club Road, Arapahoe County

## Description:

The site is located 15 miles southeast of the city and county of Denver and less than a mile east of Aurora at the intersection of East Quincy Avenue and Gun Club Road. The Lowry site consists of 480 acres, and is a portion of the Denver Arapahoe Disposal Site, owned by the city and county of Denver (Denver) and operated by Waste Management of Colorado, Inc.

From 1966 through 1980, Denver operated a municipal solid waste landfill, accepting liquid and solid municipal refuse and industrial wastes, including sewage sludge. Approximately 138 million gallons of liquid industrial wastes were co-disposed with solid industrial and municipal wastes in approximately 78 unlined pits over 400 acres. In addition, six million to 10 million tires were disposed of on-site. Over time, the liquids seeped from the pits and mixed with surrounding refuse, contaminating groundwater and surface water with volatile and semi-volatile organic compounds.

## Funding and Management:

Clean-up and oversight costs are borne by the responsible par-

ties. The Environmental Protection Agency manages the site. State oversight is funded through an EPA grant to the Colorado Department of Public Health and Environment.

## Cleanup Status:

In 2005, EPA and the responsible parties entered a consent decree with the court settling remaining issues regarding clean-up components. All clean-up work required by the decree has been completed. However, contamination in groundwater was subsequently discovered more than two miles beyond the site boundary. The EPA considers the associated investigation and remediation part of the site operations and maintenance. On-site and off-site remedial measures are currently under way.

## Estimated State-Funded Costs:

All clean-up, operation and maintenance, and state oversight costs are borne by the responsible parties.

## Schedule for Deletion:

Construction completion was achieved in 2006. Once site



*Groundwater monitoring is an ongoing activity at the Lowry Landfill.*

completion is achieved and all clean-up goals are met, the site will be eligible for deletion. It is unknown how the discovery of off-site contamination will affect the deletion schedule.

cleanup and oversight costs are borne by the responsible party.

## Cleanup Status:

All clean-up work has been completed. The treatment plant has been shut down and groundwater is being monitored to assure that further treatment is not required.

## Estimated State-Funded Costs:

None.

# Marshall Landfill

66th Street and SH 170 Boulder County

## Description:

The site covers 160 acres in southeast Boulder County. The inactive landfill has contaminated the Cowdrey Drainage and Community Ditch, which conveys raw drinking water for Louisville. The main chemicals found in the groundwater and surface water at the site include the volatile or-

ganic compounds benzene, trichloroethylene and tetrachloroethylene; heavy metals; and major ions such as chloride, nitrate and sulfate.

## Funding and Management:

This site is managed by the EPA and state oversight is funded by an EPA grant. All

**Schedule for Deletion:**

The responsible party stopped groundwater treatment in 2004, and was required to monitor for three years to assure that con-

taminant levels do not increase. This data indicates there are slightly elevated levels of arsenic in the on-site groundwater. A five-year review was com-

pleted last summer. Although there is a slight elevation for 1,4-Dioxane in the groundwater, EPA is starting the process to determine if delisting can proceed.

## Nelson Tunnel/Commodore Waste Pile

One mile north of Creede, Mineral County



*The Commodore Mine features historic structures, including ore bins.*

**Description:**

The Nelson Tunnel/Commodore Waste Pile is located outside of Creede. The site consists of a large mine waste pile that impacts Willow Creek and a discharging tunnel. Approximately 70 percent of the zinc load delivered to the Rio Grande River via Willow Creek is attributed to the Nelson Tunnel discharge.

**Management and Funding:**

This site is managed by the Environmental Protection Agency. State oversight is funded by an EPA grant (100 percent federal). It is anticipated that a 10 percent state cost share will be required to implement the remedy.

**Cleanup Status:**

Stabilization of the Commodore Waste Pile was completed in 2009 as an EPA emergency response. Remedial investigation of the draining adit (Nelson Tunnel) is under way. Contractors continue to study the mine hydrology to determine if the flow into the tunnel can be reduced and if a passive treatment system can be used. Remedial options will be developed once the hydrology study is completed. A draft feasibility study for water treatment has been completed; however, EPA is waiting for the results of the hydrologic studies before issuing the final feasibility study.

There is a high likelihood that water treatment will be needed as part of the final remedy.

**Estimated State-Funded Costs:**

The state will be responsible for cost sharing on the cleanup. Estimated clean-up costs assume active water treatment will be necessary; however, this conclusion is highly speculative because the feasibility study has not been completed. The costs are based on recent estimates developed for the Central City/Clear Creek Superfund Site (see Table 2).

**Schedule for Deletion:**

Unknown at this time.



*EPA performed a removal project on West Willow Creek*

# Rocky Flats Environmental Technology Site

SH 93, Jefferson County

## Description:

The Rocky Flats Environmental Technology Site (Rocky Flats) consists of 6,262 acres plus property beyond the boundaries that has become contaminated from the site. Rocky Flats is located approximately 16 miles northwest of downtown Denver and is almost equidistant from the cities of Boulder, Golden, Westminster and Arvada. Major plant structures were located within an industrialized area of 384 acres. Rocky Flats produced components for nuclear weapons for more than 50 years. Radionuclides such as plutonium and americium, metals, solvents and other organic compounds are present in soils, buildings, surface water and groundwater. Potential exposure routes to the public include releases off-site via surface water or airborne releases, as well as contaminated groundwater discharges to site surface water.

## Management and Funding:

The state and EPA jointly oversaw cleanup of the site, which is managed by the U.S. Department

of Energy. EPA and the state had divided lead responsibilities to avoid duplication. State oversight costs are funded through a grant from the Department of Energy (100 percent federal). The Colorado Department of Public Health and Environment currently conducts environmental monitoring and data reporting as part of oversight activities. The Department of Energy pays for all clean-up costs.

## Cleanup Status:

Physical clean-up work was completed in October 2005. The record of decision was signed on Sept. 29, 2006. Remedial actions have been conducted and completed for contaminated soil hot spots, including source removal from several old disposal trenches, removal of plutonium-contaminated soil from the infamous 903 Pad, and containment or treatment of three groundwater plumes. All buildings and structures have now

been appropriately remediated by either being decontaminated and removed or demolished with remaining below-grade structures covered by more than three feet of clean fill. The shipment of all weapons grade plutonium from Rocky Flats was completed in July 2003. The record of decision is for no further remedial action. Much of the Rocky Flats land will be transferred to the U.S. Fish and Wildlife Service to become a national wildlife refuge. The post-closure care agreement was signed in March 2007. Due to the presence of residual contamination and the continued operation of groundwater treatment systems after site closure, the state will continue to have a regulatory oversight role at Rocky Flats, although at much reduced levels.

## Estimated State-Funded Costs:

None

## Schedule for Deletion:

The site was delisted in 2007.

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# Rocky Mountain Arsenal

Commerce City, Adams County

## Description:

The Rocky Mountain Arsenal was originally a 27-square mile U.S. Army facility located approximately 10 miles northeast of downtown Denver, directly north of the former Stapleton International Airport and west of Denver International Airport. The arsenal was used between 1942 and 1982 as a chemical agent/incendiary munitions plant. In addition, the property was the site of one of Shell Oil Company's pesticide

manufacturing facilities. Soils, structures, surface water, and groundwater became severely contaminated with pesticides, heavy metals, organic solvents and chemical-agent breakdown products. Unexploded ordnance, some containing nerve agent, also has been found. During the 1950s, groundwater contamination was discovered to have moved off-site. Groundwater pump-and-treatment sys-

tems were installed during the late 1970s to contain the groundwater to the site interior, and those systems have been operating ever since. The construction



*A lysimeter (above) measures moisture infiltration to ensure that landfilled waste stays dry.*

of the other remedy structures (caps, covers and all groundwater pump-and-treat/containment systems) is now completed. The intention of this remedy is to contain and encapsulate the contamination on-site, underground in soils and groundwater and in landfills, with all pathways to the surface cut off. Most of the site is now a national wildlife refuge, with the exception of approximately 1,000 acres where the caps, covers and landfills are located. Those areas have been retained as Army property and will likely remain so in perpetuity. The contaminated groundwater off-site remains on the NPL and is expected to slowly attenuate over time. The Army maps these plumes annually and funds a sampling program through Tri-County Health Department to monitor the contaminant levels in private wells that still exist in the area.

### **Funding and Management:**

The Army is the lead agency and manages the cleanup directly, with oversight by the Colorado Department of Public Health and Environment. The Environmental Protection Agency and Tri-County Health Department also are involved with oversight of the cleanup effort. The Army and Shell are both responsible for cleanup costs.

### **Cleanup Status:**

Active remediation was initiated in 1997 and is by and large complete save for some remaining re-negotiation efforts, and a late-stage project involving the recent discovery of some previously unknown groundwater contamination in the site's interior. Interim response actions were implemented beginning in 1975 to control some of the contamination. The cleanup strategy was primar-

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*In 2010, the Army, U.S. Fish and Wildlife Service, and Shell Oil approached the regulatory agencies with a proposal to re-evaluate the need for the institutional controls at the site.*

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ily containment-oriented and consisted of soil excavation, building demolition, and on-site landfilling of 5.5 million cubic yards of contaminated soil and debris. The remedy also requires ongoing treatment and containment of contaminated groundwater. Permanent monitoring of the integrity of the containment structures will continue in perpetuity. Institutional controls, including prohibitions against residential development, consumption of fish and game, and agricultural use are an integral component of the cleanup. In 2010, the Army, U.S. Fish and Wildlife Service, and Shell Oil approached the regulatory agencies with a proposal to re-evaluate the need for the institutional controls at the site. A risk assessment was attempted in 2011 to support this effort, but there was not enough underlying site data to provide a clear and meaningful result about current risks that could be associated with unrestricted use of the site.

### **Estimated State-Funded Costs:**

All clean-up, operation and maintenance, and state oversight costs are borne by the responsible parties.

### **Schedule for Deletion:**

In 2003, the EPA deleted 940 acres along the western boundary of the arsenal. In accordance with the Refuge Act, this property was sold to Commerce

City for commercial and recreational development. In 2004, an additional 5,053 acres along the perimeter of the site was deleted to establish the national wildlife refuge. Also, 126 acres along 96<sup>th</sup> and 56<sup>th</sup> avenues and Highway 2 were transferred to local and state governments for road improvements. In 2006 an area of approximately 7,795 acres (12 square miles) was deleted, and will be added to the refuge property.

By Sept. 30 2010, an additional (approximately) 2,800 acres of cleaned-up property was deleted from the NPL and added to the Wildlife Refuge land. It is important to note that the NPL deletions on the western half of the arsenal pertain to the surface only, not the underlying contaminated groundwater. It is not known when the underlying groundwater on the western half of the arsenal and in the off-site plumes migrating north and north-west of the arsenal, will meet cleanup standards and permit groundwater deletion, but it is generally expected to take a century. Most of the arsenal surface property has now been deleted from the NPL with the caveat that the current institutional/land use controls must still remain in place. In addition to the approximately 1,000 acres that will be retained by the Army, there is a minor amount of surface land that could be eligible for further deletion in the future, but it is unclear when that effort will be undertaken.

# Sand Creek Industrial

**East 52nd Avenue and  
Dahlia Street  
Commerce City,  
Adams County**

## **Description:**

The 350-acre site is located south of Sand Creek, north of 48th Avenue, east of Colorado Boulevard and west of Ivy Street, and includes a closed landfill, a former pesticide manufacturer, a closed acid storage impoundment and a former oil refinery. The 48th and Holly landfill accepted residential, commercial, agricultural and industrial solid waste from 1968 to 1975. The Colorado Organic Chemical Company, located at East 52<sup>nd</sup> Avenue and Dahlia Street, manufactured pesticides from the 1960s until 1984. **The LC Corporation's acid neutralization** impoundments operated from 1968 to 1972 for brines from the Shell Chemical Company production of herbicides at the Rocky Mountain Arsenal. The Oriental Refinery operated at East 52<sup>nd</sup> Avenue and Dahlia Street until it was destroyed by fire in 1965, releasing up to 48,000 gallons of refined petroleum products. Volatile and semi-volatile organic compounds, petroleum products, pesticides, herbicides and metals contaminate



*The Sand Creek site includes a number of former industrial facilities.*



*The state is responsible for site-wide groundwater monitoring.*

soil, surface water and groundwater at the site.

## **Funding and Management:**

The Sand Creek site was managed by the Environmental Protection Agency. State oversight was funded through Environmental Protection Agency grants (100 percent federal). Funding of clean-up activities was a combination of responsi-

ble party, the Environmental Protection Agency and state funding. The state share of clean-up funding was approximately \$740,000.

## **Cleanup Status:**

Remedial action at all operable units was completed by late 1995.

## **Estimated State-Funded**

## **Costs:**

The state is responsible for continued site-wide groundwater

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*The Oriental Refinery operated at East 52<sup>nd</sup> Avenue and Dahlia Street until it was destroyed by fire in 1965, releasing up to 48,000 gallons of refined petroleum products.*

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monitoring, which costs approximately \$10,000 per year. The responsible parties are continuing to operate and maintain the landfill gas extraction system and flare at the 48<sup>m</sup> and Holly Landfill at their cost.

**Schedule for Deletion:**

The site was deleted in December 1996.

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## **Smelertown**

**9000 County Road 152, Salida, Chaffee County**

**Description:**

The site, located one mile northwest of Salida on the eastern bank of the Arkansas River, was proposed for inclusion on the NPL in February 1992, but has not been listed. Past operations on the 125-acre site included metals smelting (gold, silver, copper and lead) from 1902 to 1920, and creosote treatment of railroad ties from 1926 to 1946. Contamination includes heavy metals in mining waste, soils and groundwater and creosote-contaminated soils and groundwater.

**Funding and Management:**

This site is managed by the EPA. Cleanup costs were funded by the responsible parties and the EPA in a removal action. The state did not share costs on this removal action. The state oversees operations and maintenance, funded by the responsible parties.

**Cleanup Status:**

Consolidation and capping of smelter wastes was completed in October 2003. Cleanup of the former wood-treating operation was completed in 2000, comprising the installation of groundwater monitoring wells, fencing, and establishing restrictions to ensure gravel operations do not disturb contaminated soils.

**Estimated State-Funded Costs:**

All clean-up, operation and maintenance, and state oversight costs are borne by the responsible party. The state currently incurs expenditures for oversight of Operable Units 1

and 2 and bills the responsible parties annually under the terms of consent decrees for each operable unit.

**Schedule for Deletion:**

This site was never listed on the National Priorities List.

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## **Smuggler Mine**

**Gibson Avenue, Aspen, Pitkin County**

**Description:**

This 116-acre site represents an area of inactive silver and lead mining. The site is located in the northeastern section of the city of Aspen. Housing units and recreational facilities have been constructed on the mine waste, including two trailer parks, condominiums, private homes and a tennis club. The health hazard from the Smuggler Mine site involves potential exposure from heavy metals in soils, primarily lead, arsenic and cadmium.

**Management and Funding:**

The site was managed by the Environmental Protection Agency. State oversight was funded by an EPA grant (100 percent federal). The responsible parties funded site cleanup.

**Cleanup Status:**

All work has been completed. Ongoing materials management is overseen by the county.

**Estimated State-Funded Costs:**

Pitkin County manages the remaining contaminated materials at the site, including supervising excavation and disposal at the county landfill by private owners. County costs are derived from the Hazardous Substance Response Fund fees, and therefore decrease the fund revenue by about \$50,000 per year.

**Schedule for Deletion:**

The Smuggler site was deleted from the National Priorities List in November 1999. The last five-year review was completed in June 2012.

## Standard Mine

### Gunnison County

#### Description:

The Standard Mine is a 20-acre site outside of Crested Butte. The mine consists of several waste piles, a mill tailings impoundment and a discharging tunnel.

#### Management and Funding:

This site is managed by the Environmental Protection Agency. State oversight is funded by an EPA grant (100 percent federal). Implementation of the remedy will require a 10 percent state cost share, and these funds will come from the Hazardous Substance Response Fund.

#### Cleanup Status:

The remedial investigation and feasibility study has been completed. The record of decision was finalized in September 2011.

The EPA Removal Program was mobilized to the site in 2007 to address concerns involving the tailings impoundment located at the site. The concern was the failure of the impoundment and subsequent transport of the tailings to adjacent Elk Creek and further transport to Coal Creek, the

drinking water supply for Crested Butte. The Removal Program removed the impoundment as well as mine waste rock piles to an on-site mine waste repository.

The EPA Removal Program was mobilized to the site in July 2012 to start the removal of a collapse within the drainage tunnel. The Removal Program is responsible for the containment and treatment of the mine drainage as the removal of the collapse moves forward. The Removal Program contracted Environmental Restoration, an EPA remedial action contractor, to oversee the treatment, disposition of a bioreactor and removal and disposition of the **collapse material at the site's** engineered repository. The Removal Program also contracted Harrison Western to rehabilitate the draining adit to address safety issues and to remove the collapse. Harrison Western will continue assessing the adit to determine a potential location to construct a flow-through bulkhead to control mine drainage discharges.

A second phase of the overall remedy will include the in-situ

filling of the upper level adit where water enters the mine workings and flows to the second level of the workings and then out the bottom drainage level. By filling the top adit, the recharge to the workings will cease and the residual water potentially will drain, addressing the metals loading related to the mine drainage.

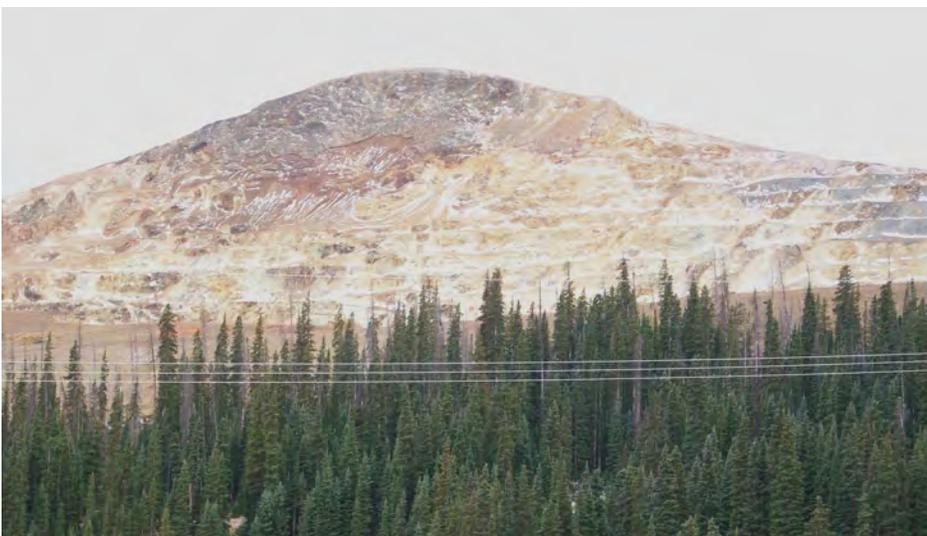
If this approach is not successful, EPA may decide to construct another bioreactor at the site to provide water treatment.

#### Estimated State-Funded Costs:

The state will be responsible for cost sharing on the cleanup (10 percent). State cost estimates are based on the feasibility study. The remedy is structured to be two-phased. If the first phase is unsuccessful in reaching clean-up goals, passive treatment of the draining adit will be implemented. The state cost share for remedy construction is estimated to be \$597,060, assuming both phases are conducted.

#### Schedule for Deletion:

Unknown at this time.



The "highwall" shows signs of historic mining impacts.

## Summitville Mine

### Rio Grande County

#### Description:

This 1,231-acre site is in the San Juan Mountains, surrounded by the Rio Grande National Forest at an elevation of 11,500 feet. The Wightman Fork flows from the site, then joins with the Alamosa River, which continues through forest and agricultural land in Rio Grande and Conejos counties and past the San Luis Valley towns of Capulin and La Jara. The Terrace Reservoir, 18 miles downstream

of the site on the Alamosa River, is used for irrigation. All of these surface water bodies and uses are impacted by heavy metals, primarily copper, aluminum and acid mine drainage, that emanate from the mine and surrounding mineralized areas.

**Management and Funding:**

The Environmental Protection Agency initiated lead management responsibilities at the site with its emergency response action in 1992. EPA performed several interim clean-up actions, which included the interim water treatment plant, heap leach pad and mine pits closure, and installation of adit bulkheads. The state has lead responsibility for the site-wide reclamation project, remedial investigation and feasibility study, site-wide record of decision (ROD) and all projects associated with the 2001 ROD, which includes the design and construction of a new water treatment plant. State costs for these activities are funded through an Environmental Protection Agency grant. The funding is 100 percent federal in the characterization and design phase, 90/10 federal-

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*The major cost associated with the site is water treatment plant operation and maintenance of engineered structures within the abandoned mine property, which included revegetated slopes and erosion repair.*

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state for construction, and 90/10 federal for the first 10 years of water treatment plant (WTP) operation and maintenance. One hundred percent of the operation and maintenance associated with other con-

structed site features (exclusive of the new water treatment plant) are borne by the state as soon as the construction phase for that element is complete. The state cost share is partially funded through settlements with respon-



*The old water treatment plant removed metals from contaminated water until it was replaced by a new facility in September 2011.*



*The new water treatment plant treats 1.600 gallons per minute. A micro-hydroelectric plant generates supplemental electricity, with annual cost savings between \$9,000 and \$15,000.*

sible parties, which are held in custodial accounts.

### **Cleanup Status:**

Site-wide reclamation of the surface disturbance was completed in 2002. Redesign of a new treatment plant occurred in 2009. Construction of the treatment plant began in September 2009, with the receipt of government stimulus (ARRA) funding, and was completed in September 2011. Additional projects — including increased contaminated storage impoundment capacity, improved surface water and groundwater collection systems, and rehabilitation of abandoned adits — were completed between 2002 and 2012.

### **Estimated State-Funded Costs:**

In FY2001, the state and the Environmental Protection Agency settled with Robert M. Friedland, the principal responsible party. The settlement provides \$10 million for future response costs. The state also settled with five other responsible parties, and received an additional \$1,335,000 from those parties. In addition, the state has recovered \$1.8 million from the Galactic Resources Ltd. bankruptcy. Settlement funds are used to pay for remedy implementation and to defray future operation and maintenance costs.

The major cost associated with the site is water treatment plant operation and maintenance of engineered structures within the abandoned mine property, which included revegetated slopes and erosion repair. The state share of these costs is estimated at \$38 million for 100 years. These costs continue essentially in perpetuity, and are detailed in Appendix B.

### **Schedule for Deletion:**

Construction completion for all structures and improvements identified in the Summitville Record of Decision 2001 are complete as of Sep-

tember 2012. EPA will cost share at 90/10 federal/state until the year 2021. In year 2022, the state will assume 100 percent responsibility for the new water treatment plant.



*A remote location, high altitude and difficult weather conditions made constructing the new plant a real challenge. Hundreds of trade and professional workers were employed by the project, which was funded by the American Recovery and Reinvestment Act (ARRA).*



# PJKS Air Force Base

12500 South SH 75, Jefferson County

## Description:

The site is a 460-acre facility near Waterton Canyon, 20 miles southwest of Denver. The facility was used for missile/rocket manufacturing, research and development and rocket fuels development. Contaminants in soil and groundwater include volatile organic compounds, hydrocarbons, rocket fuel, organic and inorganic compounds and some radionuclides. Some contaminant plumes have migrated off-site, and perhaps merged with plumes from the surrounding Lockheed Martin Astronautics Facility, which is not on the National Priorities List.

## Funding and Management:

The Colorado Department of Public Health and Environment is the lead regulator at the site in accordance with an agreement with the Environmental Protection Agency. The department is handling the site through its Resource Conservation and Recovery Act program. The Department of Defense (Air Force) reimburses Colorado for state time and expenditures via the Defense and State Memorandum of Agreement (DSMOA).

## Clean-up Status:

The Air Force completed the voluntary removal of seven underground storage tanks used to manage heating oil and the bioremediation of one hydrocarbon plume. The minor volume of thorium-contaminated soil has been excavated and disposed off-site. Clean closure was achieved for four of the five RCRA interim status units. Residential/unrestricted use cleanup levels have been achieved at 32 of the RCRA corrective action Solid Waste Management Units

(SWMUs) with soil contamination. The final remedies have been constructed for all 15 of the remaining SWMUs with soil contamination. The remedies consisted of asphalt covers and/or enforceable land-use controls to protect human health. The implementation of the environmental covenant to control future land use will be complete by the end of 2012. Groundwater investigations are complete at the site and interim remedial measures are ongoing in all seven of the contaminant source areas using in-situ enhanced biological treatment to help reduce contaminant mass in the source areas. Additional interim remedial measures were initiated in April 2009 to treat the dissolved-phase contaminant plumes at the site boundary and beyond. The feasibility study/corrective measures study report describing the proposed final remedies for all contaminated groundwater at the PJKS site was approved by Colorado and the EPA in December 2010. The proposed

plan for the site-wide groundwater remedy went through public comment from Jan. 15, 2012 to Feb. 25, 2012 and no public comments were received that impacted the proposed final remedy. Negotiation of the language of the record of decision (ROD) was conducted in the summer of 2012 and the ROD should be signed by the end of calendar year 2012. The ultimate remediation of the groundwater may take considerably longer.

## Estimated State-Funded Costs:

None.

## Schedule for Deletion:

In March 2001, the United States completed the sale of the U.S. Air Force Plant — PJKS to the Lockheed Martin Corporation. Lockheed Martin also owns the surrounding Lockheed Martin Astronautics Facility. Lockheed Martin has expressed a desire to have PJKS deleted from the National Priorities List. However, neither Lockheed Martin nor the U.S. Air Force has formally approached the department or the EPA regarding deletion.



*Research involving this rocket test stand resulted in soil and water contamination including volatile organic compounds, hydrocarbons, rocket fuel, organic and inorganic compounds and radionuclides.*

# Uravan Mill

## SH 141, Uravan, Montrose County

### Description:

The Uravan Mill site is located above the San Miguel River between the Uncompahgre Plateau and the Paradox Valley. Radium, uranium and vanadium ores located throughout the Colorado Plateau were processed at the site from the late 1800s until 1984.

Soils, mill residues and mill structures contaminated from uranium mill tailings and other processing residues are disposed of in secure repositories away from the San Miguel River. Contaminated groundwater was

pumped from the ground and evaporated in a series of lined impoundments.

### Funding and Management:

The state is the lead management agency. All clean-up, operation and maintenance, and state oversight costs are funded by the responsible party, Umetco Minerals.

### Cleanup Status:

Soils cleanup and repository construction are complete. Groundwater pumping and

evaporation in lined ponds is complete, and the ponds have been decommissioned. EPA declared construction complete in September 2008. Alternate concentration limits for the groundwater are in place. EPA is preparing the record of decision.

### Estimated State-Funded Costs:

None

### Schedule for Deletion:

Site deletion is anticipated to occur in 2013.

### Uravan through the years

*The Uravan site dates to the dawn of the Atomic Age. In 1921 Mme. Marie Curie was presented with a gram of radium from the Joe Jr. Camp, which later became Uravan. Throughout the 1930s, the mill processed vanadium, leaving uranium as a by-product in the tailings. During World War II, production shifted to uranium recovery for the Manhattan Project and the first atomic bomb. Following the war, the mill produced uranium for national defense and for the growing nuclear power industry. The mill closed in 1984 and Uravan became a Superfund site in 1986. A 1987 remedial action plan (RAP) called for soil cleanup of radionuclides and heavy metals, the isolation of more than 13.5 million cubic yards of radioactive materials in repositories, groundwater restoration and cleanup of the San Miguel River. More than 50 mill structures and buildings were removed, along with 260 buildings from the town of Uravan. Total cost of the project was more than \$140 million dollars. Today nothing remains of the mill or the former town.*



## Vasquez Boulevard and I-70 (VB I-70)

### SH 141, Uravan, Montrose County

#### **Description:**

The Vasquez Boulevard/I-70 site is in northeast Denver. Two smelters, Omaha & Grant and Argo, operated at various times from the 1870s through the 1900s, refining gold, silver, copper, lead, zinc, arsenic and cadmium. The site consists of three operable units (OUs). OU1 includes residential soils in the Swansea, Elyria, Clayton, Cole and West Globeville neighborhoods. OU2 includes the site of the former Omaha & Grant Smelter. OU3 includes the area in and around the site of the former Argo Smelter. The contaminants of concern are heavy metals, particularly arsenic and lead. Exposure can occur through ingestion of contaminated soil particles and inhalation of contaminated dust.

#### **Cleanup Status:**

Residential cleanup (OU1) began in FY2004 and was com-

pleted in 2006, with 761 homes remediated. Based upon the last five-year review, EPA determined it must try to get access to the 190 property owners who denied access for either sampling or remediation. EPA will give all the owners one more chance at remediation. Homes whose owners grant access will be sampled and, if necessary, will be remediated in the 2013 construction season.

The remedial investigation of the Omaha & Grant Smelter site (OU2) is under review. EPA officials want four quarters of groundwater samples for volatile organic compounds from the site.

The record of decision for the Argo Smelter site (OU3) was produced in 2009, but is under revision because EPA attorneys felt it did not properly explain why groundwater was not going to be treated.

#### **Estimated State-Funded Costs:**

The state's 10-percent cost share on OU1 was \$2.6 million. Payment was completed in 2006.

As a result of the five-year review recommendations, the state may incur approximately \$350,000 in matching funds to cover the costs of future remediation. Costs for OU2 are unknown at this time. The feasibility study has been completed; however a record of decision has not been filed. Any further costs will be borne by the city and county of Denver, which will withhold payments to the HSRF and fund this work directly. State costs for OU3 are also unknown because no decision has been made as to the need to remediate groundwater.

#### **Schedule for Deletion:**

As a result of all the properties that will be remediated in 2012, OU1 is not eligible for deletion at this time. Timing of deletion of the other operable units is uncertain.

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## Woodbury Chemical

### Garfield Street and 54th Avenue, Commerce City, Adams County

#### **Description:**

The Woodbury Chemical site consists of 11 acres located north of 54th Avenue between Harrison and Adams streets in Commerce City. Organochlorine pesticides were manufactured at the site in the 1950s until 1971. McKesson Corporation operated a chemical distributorship at the site from 1971 to 1986.

Contamination at the site included construction rubble and debris from a 1965 fire, as well as bags of pesticides and contaminated soil at the facility and on an

adjacent lot. The chemicals of concern at the site fall into three categories: metals including arsenic and zinc; organochlorine pesticides including aldrin, chlordane, DDT, dieldrin and toxaphene; and volatile organic chemicals including tetrachloroethylene and trichloroethylene. Contamination at the site was restricted to the surface soils.

#### **Management and Funding:**

The site was managed by the Environmental Protection Agency, with funding for state

oversight through an EPA grant (100 percent federal). Clean-up costs were borne by the responsible party.

#### **Cleanup Status:**

Cleanup of the site was completed in June 1992.

#### **Estimated State-Funded Remaining Costs:**

None

#### **Schedule for Deletion:**

The site was deleted from the National Priorities List on March 22, 1993.

## Appendix B

### SUPERFUND SITES - EST. STATE MATCH LIABILITIES THROUGH FY 2039-40

CONTRACT/ ESTIMATE	SUPERFUND SITE	STATE MATCH BY OP UNIT	TOTAL FUTURE STATE MATCH OBLIGATIONS	NET PRESENT VALUE OF STATE MATCH OBLIGATIONS
	<b>BRODERICK</b>		\$1,069,554	
SSC-C878489	OU #1 Sludges		\$399,634	
SSC-HAZ930973	OU #2 Phase 1		\$669,920	
NA	OU #2 Phase 2	NO STATE MATCH		
	<b>DENVER RADIUM</b>		\$6,683,832	\$0
	Operation & Maintenance		\$184,778	\$339,556
	<b>CALIFORNIA GULCH</b>		\$1,510,000	\$1,300,000
ESTIMATE	OU 6 - StrayHorse Gulch		\$1,300,000	\$1,095,323
	OU 9 - Residential Soils			
SSC09FEA0009	OU 11 - Arkansas River Floodplain		\$420,000	
	OU 12 - Sitewide Ground & Surface Water -No Action ROD			
	OU 11 - Arkansas River O&M		\$300,181	\$530,165
	OU 12 - Sitewide Ground & Surface Water O&M			\$83,200
estimate	OU 6 - Stray Horse Gulch O&M		\$368,298	\$700,000
	<b>CLEAR CREEK</b>		\$4,185,207	\$2,649,586
	Lyon Ck		\$53,861	\$2,254,657
SSC-C378406	OU 2 - Argo Tailings (RA Complete)		\$129,914	
Coop. Agreement	OU 2 - Big 5 Waste Rock (RA Complete)		\$185,540	
Coop. Agreement	OU 3 - Argo Tunnel		\$532,685	
	Flow Control Bulkhead		\$60,000	
Coop. Agreement	OU 3 - Virginia Canyon GW/Big Five (RA Complete)		\$141,000	
Coop. Agreement	OU 3 - Chase Gulch #2 Tailings (RA Complete)		\$7,508	
Coop. Agreement	OU 3 - Argo Tunnel WTP Improvements (HDS) - contracted		\$244,748	
Coop. Agreement	OU 4 - Mine Waste Repository (Const. compl/RA cont)		\$28,980	
Coop. Agreement	OU 4 - Quartz Hill Mine Waste Pile (95% design)		\$150,000	
Coop. Agreement	OU 4 - Golden Gilpin Mill (RA Complete)		\$14,629	
Coop. Agreement	OU4- Mine Drainage Pipeline (RA Complete)		\$177,835	
Coop. Agreement	OU 4 - New Active Treatment Plant (based on 90% design)		\$1,673,472	
Coop. Agreement	OU 4 - Mine Waste and Sediment Control-RA Compl.		\$450,644	
Coop. Agreement	OU 4 - CDOT IAG (Site Prep & NCC Stab.), BHCCSD wet.		\$334,391	
estimate	O & M - New Water Treatment Plant		\$9,077,270	\$20,542,363
estimate	O & M - Repository and waste piles (w/o sludge disp.)		\$462,237	\$800,757
estimate	O & M - Argo Tunnel Water Treatment Plant		\$24,283,788	\$44,624,887
	<b>SAND CREEK</b>		\$713,550	\$0
estimate	O & M		\$83,709	\$211,035
SSC-C379562	<b>SMUGGLER</b>		\$44,000	\$0
	<b>CHEMICAL SALES</b>		\$933,689	\$35,000
Coop. Agreement	OU 1		\$890,527	\$30,280
SSC-920947	OU 2&3		\$43,162	
estimate	O and M		\$517,214	\$950,453
	<b>SUMMITVILLE</b>		\$7,271,220	\$1,400,000
Reclam. Bond	OU 2 - Cap Cropsy (SSC)		\$0	\$1,322,115
Coop. Agreement	OU 4 - Reclamation/Reveg.		\$2,013,529	
Coop. Agreement	OU 4 - Exploration Benches		\$51,214	
SSC-9705364	OU 1 - Heap		\$496,477	
estimate	OU 5- Water Treatment Plant		\$1,700,000	
	O&M - Water Treatment match & Reclamation		\$3,473,703	\$4,329,443
	O&M - Water Treatment 100% State		\$50,706,630	\$73,615,530
SSC-	old water treatment contract w/EPA		\$3,010,000	\$0
	O&M Totals		\$35,144,915	\$77,944,972
	<b>VASQUEZ BLVD/I-70</b>		\$2,600,000	\$0
estimate	OU 1 - Residential Soils		\$2,600,000	\$0
	<b>Denver Rad - SHATTUCK</b>		\$5,389,381	\$0
	credit for settlement		\$0	\$0
estimate	Removal		\$5,389,381	\$0
	<b>CAPTAIN JACK MILL</b>		\$2,227,888	\$7,265,958
estimate	capping mine waste/tunnel plug			\$565,000
	In-situ Treatment		\$2,227,888	\$6,700,958
	<b>STANDARD MINE</b>		\$744,811	\$0
ESTIMATE	Based on ROD (pg. 43). Assume Ph 2 is built.		\$744,811	\$744,811
estimate	O&M		\$2,088,709	\$240,644
	<b>NELSON TUNNEL</b>			\$1,673,472
ESTIMATE	Assume Active Plant - no remedy decisions made yet			\$1,297,135
ESTIMATE	O&M			\$1,902,363
	<b>TOTAL CONSTRUCTION COST</b>		\$33,373,133	\$12,650,544
	Less: Summitville settlements (Fund 14X)		(\$1,700,000)	(\$1,322,115)
	<b>NET CONSTRUCTION COST</b>		\$31,673,133	\$11,250,544
	<b>TOTAL OPERATION AND MAINTENANCE COST</b>		\$183,966,617	\$180,811,147
	Less: Summitville settlements (Fund 14X)		(\$12,837,919)	(\$11,274,203)
	<b>NET OPERATIONS AND MAINTENANCE COST</b>		\$171,128,699	\$169,536,945
	<b>Net Summitville HSRF-Funded O&amp;M Costs</b>		\$66,670,770	\$66,670,770
				\$27,581,371

Appendix C

HAZARDOUS SUBSTANCE RESPONSE FUND: PROJECTED BALANCES

Base HSRF fee \$0.05/cubic yard effective 7/01/12

Fund 116	SFY	BEGINNING FUND BAL.	Non-NPL Landfills			Landfill Fees										General Fund, SW & or AGO	TOTAL EXPENDITURES	ENDING FUND BAL.		
			Cubic Yards	Fee	HSRF %	Interfund Transfers	Damage Awards	Other Income	RMA Cost Recoveries	Interest	TOTAL REVENUES	O&M COSTS	HB00-1306	HMMMD OPER EXP	CERCLA GF				Cost Recoverable Contracts	Capital Construction
2003		\$8,046,260	--	--	100%	\$2,082,010		\$0	\$338,929	\$2,439,256	\$119,530	\$123,832	\$732,691	\$479,078	\$415,000	\$1,134,563	\$3,004,694	\$7,480,822		
2003-04		\$7,480,822		\$0.1390	100%	\$0		\$980,253	\$194,230	\$3,940,332	\$118,492	\$176,813	\$726,906	\$460,108	\$415,000	\$423,829	\$2,790,029	\$8,631,125		
2004-05		\$8,631,125		\$0.1390	100%	\$0		\$977,049	\$222,863	\$4,314,393	\$140,691	\$60,702	\$636,766	\$439,243	\$415,000	\$2,325,012	\$4,470,413	\$8,475,104		
2005-06		\$8,475,104	18,557,447	\$0.1390	100%	\$2,514,998		\$30,504,743	\$821,788	\$34,003,616	\$136,902	\$496,851	\$951,551	\$447,274	\$425,000	\$4,024,099	\$6,948,608	\$35,530,112		
2006-07		\$35,530,112	18,928,595	\$0.1190	100%	\$2,196,190		\$997,137	\$1,705,452	\$4,898,779	\$102,674	\$289,222	\$699,318	\$520,877	\$425,000	\$293,060	\$2,330,150	\$38,098,741		
2007-08		\$37,755,224	19,307,167	\$0.1190	100%	\$2,470,043		\$1,201,322	\$1,676,967	\$5,348,332	\$117,516	\$93,778	\$949,037	\$872,392	\$425,000	\$10,351	\$2,468,074	\$40,635,482		
2008-09		\$40,635,482	16,147,520	\$0.1190	100%	\$1,562,980		\$1,589,337	\$1,155,860	\$4,308,176	\$152,984	\$141,837	\$1,266,779	\$68,185	\$425,000	\$419,017	\$32,442,319	\$12,501,339		
2009-10		\$12,501,339	15,794,311	\$0.1190	100%	\$1,804,521		\$513,212	\$266,959	\$3,618,513	\$834,871	\$202,649	\$371,387	\$366,698	\$473,000	\$110,993	\$4,859,598	\$11,260,254		
2010-11		\$11,260,254	16,020,811	\$0.1190	100%	\$2,029,008		\$1,372,006	\$250,542	\$4,753,874	\$972,910	\$29,820	\$338,435	\$302,812	\$876,959	\$47,282	\$2,568,217	\$13,445,911		
2011-12		\$13,445,911	16,020,811	\$0.1600	100%	\$3,002,049		\$0	\$187,996	\$5,786,175	\$1,191,752	\$268,545	\$339,563	\$312,063	\$715,819	\$2,753,879	\$5,581,622	\$13,650,465		
2012-13		\$13,650,465	16,100,915	\$0.0500	100%	\$784,920		\$965,264	\$246,841	\$2,147,025	\$1,182,935	\$250,000	\$348,052	\$280,857	\$180,000	\$825,961	\$3,067,806	\$12,729,684		
2013-14		\$12,729,684	16,261,924	\$0.0500	100%	\$792,769		\$446,814	\$214,607	\$1,609,190	\$1,221,594	\$250,000	\$356,753	\$252,771	\$26,000	\$2,001,613	\$4,108,732	\$10,230,142		
2014-15		\$10,230,142	16,505,853	\$0.0500	100%	\$804,660		\$266,133	\$169,276	\$1,400,069	\$1,333,776	\$250,000	\$349,618	\$227,494	\$26,000	\$1,525,648	\$3,712,537	\$7,917,674		
2015-16		\$7,917,674	16,835,970	\$0.0500	100%	\$820,754		\$242,119	\$128,275	\$1,361,148	\$1,475,452	\$250,000	\$342,626	\$204,745	\$26,000	\$1,096,736	\$3,395,558	\$5,883,264		
2016-17		\$5,883,264	17,256,870	\$0.0500	100%	\$841,272		\$220,508	\$86,449	\$1,328,229	\$1,629,461	\$250,000	\$335,773	\$184,270	\$26,000	\$1,302,936	\$3,728,440	\$3,483,093		
2017-18		\$3,483,093	17,688,291	\$0.0500	100%	\$862,304		\$201,057	\$52,820	\$1,306,181	\$1,666,970	\$250,000	\$329,058	\$165,843	\$26,000	\$31,620	\$2,469,491	\$2,319,743		
2018-19		\$2,319,743	18,130,499	\$0.0500	100%	\$883,862		\$183,551	\$29,741	\$1,297,154	\$1,776,290	\$250,000	\$322,477	\$149,259	\$26,000	\$52,252	\$2,576,278	\$1,040,619		
2019-20		\$1,040,619	18,583,761	\$0.0500	100%	\$905,958		\$167,796	\$6,074	\$1,150,734	\$1,756,325	\$250,000	\$316,027	\$134,333	\$26,000	\$32,897	\$2,515,583	(\$324,230)		
2020-21		(\$324,230)	19,048,355	\$0.0500	100%	\$928,607		\$153,616	\$0	\$2,739,800	\$1,793,692	\$250,000	\$309,707	\$120,900	\$26,000	\$33,555	\$2,533,854	(\$118,284)		
2021-22		(\$118,284)	19,524,564	\$0.0500	100%	\$951,822		\$140,855	\$0	\$1,092,677	\$1,808,605	\$250,000	\$303,513	\$108,810	\$26,000	\$34,227	\$2,531,154	(\$1,556,761)		
2022-23		(\$1,556,761)	20,012,678	\$0.0500	100%	\$975,618		\$129,369	\$0	\$1,104,987	\$1,919,777	\$250,000	\$297,442	\$97,929	\$26,000	\$34,911	\$2,626,059	(\$3,077,833)		
2023-24		(\$3,077,833)	20,512,995	\$0.0500	100%	\$1,000,009		\$119,032	\$0	\$1,119,041	\$1,881,673	\$250,000	\$291,493	\$88,136	\$26,000	\$60,609	\$2,597,911	(\$4,556,703)		
2024-25		(\$4,556,703)	21,025,820	\$0.0500	100%	\$1,025,009		\$109,729	\$0	\$1,134,738	\$6,463,643	\$250,000	\$285,664	\$79,322	\$26,000	\$36,321	\$7,140,950	(\$10,562,915)		
2025-26		(\$10,562,915)	21,551,466	\$0.0500	100%	\$1,050,634		\$101,356	\$0	\$1,151,990	\$6,927,068	\$250,000	\$279,950	\$71,390	\$26,000	\$370,000	\$7,924,408	(\$24,264,388)		
2026-27		(\$17,335,333)	22,090,252	\$0.0500	100%	\$1,076,900		\$93,821	\$0	\$1,170,720	\$7,107,772	\$250,000	\$274,351	\$64,251	\$26,000	\$377,400	\$8,099,775	(\$32,844,838)		
2027-28		(\$24,264,388)	22,642,508	\$0.0500	100%	\$1,103,822		\$87,039	\$0	\$1,190,861	\$8,783,672	\$250,000	\$268,864	\$57,826	\$26,000	\$384,948	\$9,771,311	(\$41,423,008)		
2028-29		(\$32,844,838)	23,208,571	\$0.0500	100%	\$1,131,418		\$80,935	\$0	\$1,212,353	\$8,806,346	\$250,000	\$263,487	\$52,043	\$26,000	\$392,647	\$9,790,523			

