AMERICAN BRASS INCORPORATED
SUPERFUND SITE

EPA Facility ID: ALD981868466
Henry County, Alabama

Value Engineering Study
For
U.S. Environmental Protection Agency
Region 4 Atlanta, Georgia
Study Date: February 19 - 21, 2008
April 07, 2008

US Army
Corps of Engineers

US Environmental
Protection Agency

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EXECUTIVE SUMMARY

General

The United States Army Corp of Engineers (USACE) Hazardous, Toxic, and Radioactive Waste (HTRW) Center of Expertise (CX) performed a Value Engineering Screen and Study (VE Study) on the American Brass Incorporated Superfund Site project. The American Brass Incorporated Superfund Site study area covers approximately 148 acres, roughly 24 acres comprise the former foundry facility located about 3 miles west of Headland, AL and 3 miles east of the Dothan, AL airport on Route 134. This area is bounded on the north by Route 134 on the east by Arnold Faulkner Road, the south by the Houston County Line and on the west by farmland. The VE Study was conducted at the Headland City Building in Headland, AL on February 19 – 21, 2008. The study included a site visit on February 19, 2008. Those that participated are listed in Table 2. Others involved in the study included the current landowner, State of Alabama, and City of Headland.

The VE Studies are based on the principles and standards used in the Value Engineering (VE) Study process consisting of six phases. The EPA VE process is broken into two components, the screening phase comprises the first four phases (Information Gathering, Function Analysis, Speculation, Analysis) and the study phase encompasses the final two phases (Development and Presentation). A VE process studies the functions of individual items of a project and the relationships of those functions to the overall function of the project. The result of studying the functions in this way allows the team to take a critical look at how these functions are being met and then develop alternative ways to achieve the same function, while increasing the value and maintaining the primary function of the project. In the end, it is hoped the project will realize a reduction in cost, increase or maintain the execution of the primary function, and improve or maintain the bidability, constructability, and maintainability of the completed operable unit thereby improving the site environment. Another objective in executing a VE Study is to meet the requirements of the Office of Solid Waste and Emergency Response (OSWER) Directive OSWER 9335.5-24, Value Engineering for Fund Financed Remedial Design and Remedial Action Projects dated 14 April 2006. The VE process accomplishes this within the existing design schedule with minimal disruption. Preliminary proposals and comments resulting from a VE Study are briefed to the primary stakeholder, EPA, for comment and content, and screened to eliminate those considered to be outside the scope prior to full development to eliminate lost effort. The resulting proposals are then developed and provided to the EPA RPM, remedial action design team, or others designated by the RPM for comment. Following review comment incorporation, the final report is presented to the designer for incorporation within the design concurrently with comments from the EPA, USACE, State, or other stakeholder with no impact on the overall schedule. Guidelines for incorporation of VE design comments and recommendations are addressed in OSWER 9335.5-24.

Estimate of Construction Costs and Budget

The total projected capital construction cost for the entire remedial action, as identified in the Final Remedial Design Report for American Brass, Inc. Superfund Site Headland, Henry County, Alabama September 2007 is $5.75 million. Total present value O&M costs as identified in the Record of Decision (ROD) were estimated at $0.3 million, and include Long Term monitoring costs.

Summary of VE Study Results
During the speculation phase of this study, 48 creative ideas were identified. Twenty-two of these ideas were developed into thirteen VE recommendations with cost implications, where applicable. Twenty-three ideas were developed into design comments, and three ideas were eliminated from further consideration.

Table 1 presents a summary of the ideas that were developed into recommendations and cost addressed where considered feasible. Cost is an important issue for comparison of VE recommendations. Cost estimates as prepared for this VE Study are from the Remedial Design Report, published cost databases, and/or VE team member experience. The estimates provided should be of sufficient detail to allow a decision regarding implementation, but the estimates should not be used to compute actual savings associated with adoption of any one recommendation. Certain impacts from incorporating a recommendation may not have been foreseen, or savings applicable to one recommendation may reduce the actual savings for another incorporated recommendation.

TABLE 1
SUMMARY OF RECOMMENDATIONS

REC # NUMBER	DESCRIPTION	POTENTIAL SAVINGS (COST)
1	Combine Soil Removal/Wetlands RA into concurrent projects to compress schedule	$325,350
2	Reconsider excavation at wetland areas vs. destruction of existing wetlands with concentration only slightly above RA goals	$157,500
3	Take statistical samples to verify the need to remediate areas, and success of remediation. Do preconstruction sampling concurrently w/RA. In bid package, notify contractor that polygonal dimensions would meet design criteria for sampling/construction clarity, increase scale of design drawings	$698,848
4	Consider use of manufactured topsoil, e.g. add amendments to soil vs. purchase topsoil	$197,350
5	Recycle concrete (crush) and use on site, remove/recycle rebar, analyze concrete cores to determine reuse/disposal	$52,500
6	Evaluate application of ecological criteria only to areas where contamination impacts ecological areas. Use the top layer of clean soil in Cedar Creek headland and use for backfill elsewhere	$2,335,173
7	Redesign recharge area at the Cedar Creek entry	$61,250

REC # NUMBER	DESCRIPTION	POTENTIAL SAVINGS (COST)
	channel to limit erosion to wetlands (flatten the grade, possible recharge pond). Revise grading to reduce backfill requirements for wetland and incorporate a wetland pond/ponds	
8	Deep excavation-several feet below gw (groundwater) table- only go to the gw, identify and compare concentrations of soil and gw (using a shallow well) to determine the source of boron – soil contaminating gw or gw contaminating soil	$156,125
9	Reevaluate boron as an emerging essential nutrient – may require change in ROD – reassess risk	$1,774,731
10	Explore how discovery of ACM will effect future remedial activities for the site	($50,000)
11	Evaluate differing RA contracting mechanisms	Not Calculated
12	Include a credit for recycled steel in the RA	$162,000
13	Reevaluate sampling frequency from 500 cy to 2000 cy+	$35,700

Acknowledgments
This Value Engineering Study is part of a pilot program funded by the EPA HQ for fund lead Superfund projects. The study members should be commended for their effort and perseverance in accomplishing this very successful study. Special thanks are extended to the EPA RPM, the design firm, Black & Veatch Special Projects Corporation, the City of Headland, and the site owner for their cooperation and full participation in this VE study effort. This group of stake holders, combined with the USACE team of experts, shared information with each other and generated several significant ideas that could improve the value of this remediation. The designers, EPA RPM, stakeholders, and other technical personnel are always encouraged to participate in these studies to the maximum extent possible. The teamwork displayed by all involved in the study was essential for its success.

Significant Aspects of the VE Study
Several aspects of this study need to be recognized. First, as mentioned above, the participation of both the EPA RPM, the representative from the remedial design (RD) firm, and the owners had a very positive effect on the outcome of this study. The study team attempts to become familiar with the project prior to arrival at the study site. The people with the best first hand information about any project are the owners, designers, and other stakeholders. Having them present and participating in the study not only provides valuable insight, but assists in rapid solution to technical issues. The participation by the site owners that had recently purchased the property was particularly helpful. Their vision for development of the property differed in some cases with the remedial actions defined in the ROD, in particular the wetlands and the scope of the building demolition. These discussions will benefit all project stakeholders.

TABLE 2
VALUE ENGINEERING SCREENING STUDY TEAM MEMBERS

NAME	ORGANIZATION
Ken True	CVS, Contractor
Lindsey Lien	USACE EMCX
John Hartley	USACE
Jim Harbert	USACE
Curtis Payton	USACE
Brian Farrier	USEPA Region 4 RPM
Kirby Biggs	USEPA HQ OSWER
Tim Turner	Black & Veatch Special Projects Corporation
Tom Birks	Alabama Department of Environment Management
Bennie Nowell	Property Owner
Ronnie Nowell	Property Owner

Certification
This is to verify that the Value Engineering Screening Study was conducted in accordance with standard Value Engineering principles and practices.

Kenneth True, PE, CVS, CCE
Value Engineering Screening Study Team Leader

SECTION 1 – INTRODUCTION

This report documents the results of "the VE Study", on the American Brass Incorporated Project Henry County, AL. The VE Study was conducted at the Headland City Building in Headland, AL on February 19 – 21, 2008. The study included a site visit on February 19, 2008. The study team was from the USACE Environmental and Munitions Center of Expertise, the EPA Region 4 RPM, Alabama Department of Environmental Management, the design firm Black and Veatch Special Projects Corporation, EPA HQ, and facilitated by Kenneth True, a Certified Value Specialist (CVS) and Professional Engineer. The names and telephone numbers of all participants in the study are listed in Appendix A.

The Job Plan

This study followed the basic VE methodology as endorsed by Society of American Value Engineers (SAVE) International, the professional organization of Value Engineering. This report does not include any detailed explanations of the value engineering/value analysis processes used during the workshop in development of the results presented herein. A summary of the basic processes used in the study are included to give the reader an idea of the standard VE methodology, consisting of six phases:

Information Phase: The team studied the current intermediate Design, Basis of Design Report dated September, 2007, the Record of Decision (ROD), Proposed Plan, Portions of the Remedial Investigation and Supplemental Study, EPA criteria documents, figures, descriptions of project work, and the cost estimate to fully understand the project scope and required functions. This phase was largely done by the team prior to the on site portion of the VE Study.

Function Analysis Phase: The purpose of this phase is to clearly identify the function(s) of the project, and to formulate a concept from which new directions can be taken. A Function Analysis Model or Function Analysis System Technique (FAST) Diagram is completed as an end product of the Functional Analysis Phase. The Function Model developed for this project is included in Appendix C.

Speculation Phase: The CVS led the team brainstorming sessions to generate ideas that could potentially be beneficial to the remedial action. All team members contributed ideas and critical analysis of the ideas was discouraged until the Analysis Phase (see Appendix B).

Analysis Phase: Evaluation, testing, and critical analysis of all ideas generated during speculation was performed to determine potential for savings or improvement to the site remediation. Ideas that did not survive critical analysis were deleted. Those feasible ideas that survive the analysis phase are then developed into proposals. Those surviving ideas were assigned to members of the team for further development and validation of the merit of the proposal. Sometimes this attempt to substantiate the proposal results in the modification, or even elimination, of the original idea.

Development Phase: Usually during a full VE Study, more research and in-depth resolution is pursued with the entire group present to substantiate an idea. The ideas were developed enough on site to determine they were worthy of refinement. After returning to their individual offices, the VE Study team members completed development of the surviving ideas into written proposals. Proposal descriptions, along with technical support documentation, and cost estimates were prepared to support implementation of ideas. Development generally takes the form of a written document that clearly expresses the proposed idea, with a "Before" and "After" depiction. In addition, the VE Study team identified items of interest as Comments that were not developed as proposals. These comments follow the study proposals.

Presentation Phase: This portion of the study was done in a short presentation by the team to the EPA RPM, ADEM, and current site owner. The recommendations were in draft form at the time of the presentation. This report will be distributed for review by the EPA RPM to project supporters and decision makers. The EPA will determine responsibilities for implementation of accepted proposals.

This study differs slightly from a "standard" VE study. The differences lie in the applications of some of the methodologies to a Superfund Site. Also, the time the team spent together was reduced in part to attempt to reduce costs, save or accommodate EPA and other team members' schedules, and/or other obligations. The proposals were initially developed during the February 19 – 21 meeting, and completed when team members returned to their offices. In any case, the results should be considered as completion of a Value Engineering Study for this site.

Boundary of the Study

This study was performed for the American Brass Incorporated Superfund Site, Henry County, AL. The study evaluated the proposed remediation as identified in the Proposed Plan and ROD. Changes to the ROD were only proposed after coordination with the RPM.

Ideas and Recommendations

Part of the VE methodology is to generate as many ideas as is practical, evaluate each idea, and then select as candidates for further development only those ideas which offer added value to the project. If an idea thus selected, turns out to work in the manner expected, that idea is put forth as a formal VE recommendation. Recommendations represent only those ideas that are proven to the VE team's satisfaction. Certain recommendations combine several ideas that may address similar issues.

Design Comments

Some ideas that were not selected for development as recommendations were nevertheless judged worthy of further consideration. These ideas have been written up as Design Comments and are included in Section 4.

Level of Development

VE Studies are working sessions for the purpose of developing and recommending alternative approaches to a given project. As such, the results and recommendations presented are of a conceptual nature, and are not intended as a final design. Detailed feasibility assessment and final design development of any of the recommendations presented herein, should they be accepted, remain the responsibility of the EPA.

Guidelines for incorporation of recommendations are addressed in OSWER 9355.5-24. OSWER 9355.5-24 also defines the RPM reporting responsibilities to HQ EPA concerning which value engineering recommendations were incorporated into the design, and justification for not including a recommendation into the project.

SECTION 2 – PROJECT DESCRIPTION

Background

This report presents the results of the VE Study on the project American Brass Incorporated (ABI) Superfund Site, Henry County, Alabama and is intended to add value in terms of improved quality, enhanced construction methods, reduction in waste volume generated, or money expended on the remediation process. This VE Study was funded as part of a pilot program funded by HQ EPA, and coordinated by EPA Region 4 and the USACE EMCX.

Authority for the performance of these studies is contained in the Office of Solid Waste and Emergency Response (OSWER) Directive OSWER 9335.5-24, Value Engineering for Fund Financed Remedial Design and Remedial Action Projects, signed on 14 April 2006. This directive provides guidance concerning requirements addressing Value Engineering for Superfund Remedial Design and Remedial Action Projects.

Project Description

The American Brass Incorporated Superfund Project, Henry County, AL covers approximately 148 acres, 24 acres comprise the former foundry facility located about 3 miles west of Headland, AL and 3 miles east of the Dothan, AL airport on Route 134. This area is bounded on the north by Route 134, on the east by Arnold Falkner Road, on the south by the Houston County Line, and on the west by farmland. The study area includes the impacted soils at the source area, impacted wetlands, and the groundwater plume. Primary soil and wetland sediment contaminants are PCBs, lead, and a number of heavy metals. The groundwater is contaminated mainly with boron, nitrate, and ammonia.

Environmental compliance problems were first identified in the mid-1980s and continued until the closure of the facility in December 1992. During this period, numerous RCRA violations were recorded by both ADEM and EPA Region 4 leading up to the inclusion of the Site on the NPL on May 10, 1999.

The brass smelting operation was housed in the furnace building, a corrugated asbestos panel and metal structure immediately south of the ABI offices. The furnace building included the loading docks, furnaces, and the ambient air bag house. Scrap metal was delivered to the loading docks and transported by front-end loader for deposition into the furnaces operating at 2100-2200°F where the smelting occurred. Borax was sometimes used as a flux in the smelting process. The brass was retrieved from the furnace and poured into ingot molds, allowed to cool, shrink-wrapped, and then shipped to the customer.

After the brass had been removed, the material remaining in the furnace, referred to as "Brass Furnace Slag" was poured from the side of the furnace into slag pots (square-topped containers with tapered sides), weighed, and allowed to air cool. The slag pots were transferred to the ball mill building and crushed using two crushers then fed to the ball mill where they were further crushed. Brass residue was then separated from the ball mill residue and fed back into the furnace for reclamation.

The fine, gray residue from the ball mill had a powdery texture. Residue was directed to one of several holding bays located inside the ball mill residue building adjacent to and south of the ball mill building. When the bays became full, surplus residue was trucked approximately 300 yards from the facility, accessing public roads, to a ball mill residue pile. State inspectors found ball mill residue along the side of the transportation route to the ball mill residue pile and concluded that material had apparently spilled from the trucks during transportation causing soil and sediment contamination.

The overall cleanup strategy for the ABI site final remedy is to excavate the contaminated soils and sediment with offsite disposal and monitored natural attenuation (limited action) for the groundwater. The soil/sediment cleanup goals are presented in the August 24, 2006 Record of Decision (ROD), the major components for the Selected Remedy includes:

- Decontamination and demolition of all of the ABI buildings, pavement, and structures. Recyclable building material such as the structural steel will be recycled.
- Excavation of contaminated soil and sediments (estimated 36,970 cubic yards).
- Confirmatory sampling/analysis of the excavated areas to ensure the Site Remedial Goals have been attained.
- Disposal of the excavated materials in an approved and appropriate off-site disposal facility. Any soils or sediment with characteristics requiring it to be considered RCRA hazardous waste will be treated pursuant to RCRA treatment standard requirements found at 40 CFR 268, then disposed off-site in an appropriate waste disposal facility. Any soils or sediment with concentrations of PCBs greater than 50 parts per million (ppm) will be disposed off-site in a Toxic Substances Control Act (TSCA)-approved disposal facility.
- Backfill the excavated areas with clean imported fill and plant vegetative cover over the backfilled areas.
- Restore the impacted wetlands.
- Monitored natural attenuation of the groundwater beneath the site, with long-term monitoring of the groundwater to verify that the level of contamination in the groundwater is decreasing. If monitoring data indicate contaminant levels have remained steady or increased, an active remediation plan (such as recovery and treatment of the contaminated groundwater) will be developed and implemented.
- Engineering controls to control surface water runoff, dust, air quality, etc. and to ensure that the Remedial Action Objectives (RAO) are met during and after putting the remedy in place.
- Institutional controls as necessary to restrict future groundwater use.

Estimate of Construction Costs

The total projected capital construction cost for the entire remedial action, as identified in the Final Remedial Design Report for American Brass, Inc. Superfund Site Headland, Henry County, Alabama September 2007 is $5.75 million. Total present value O&M costs as identified in the Record of Decision (ROD) were estimated at $0.3 million, and include Long Term monitoring costs. Additional cost for removal actions completed at the site was approximately $12 M.

SECTION 3 – VE RECOMMENDATIONS

Organization of Proposals

This section contains the complete documentation of all recommendations resulting from this study. Each recommendation has been marked with a unique identification number. The parent idea, or ideas from which the proposal began, can be determined from the Creative Idea List located in Appendix B of this report. For tracking purposes, the original idea numbers that make up a recommendation are shown within the recommendation.

Each recommendation is documented by a separate write-up that includes a description of both the original design and recommended change, a list of advantages and disadvantages, sketches where appropriate, calculations, cost estimate, and the economic impact of the recommendation on the first cost, and where applicable, the life cycle cost. The economic impact is shown in terms of savings or added cost.

VALUE ENGINEERING RECOMMENDATION # 1

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea #1: Re-evaluate construction schedule to facilitate parallel execution of tasks.

ORIGINAL DESIGN:

The current construction schedule identified in the Remedial Design Appendix B is built by placing each major site task in series.

RECOMMENDED CHANGE:

Given the large size of the site, it is recommended the tasks be run in parallel to the greatest extent possible to allow reduction in field management, home office, and ODC charges.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)	$325,350		$325,350

VALUE ENGINEERING RECOMMENDATION # 1

ADVANTAGES:

- More efficient use of management time.
- Reduction in site infrastructure rentals (trailers, porta-toilets, etc.).
- Schedule compression could allow adjustment of the project within the calendar year to avoid working during the wet times of the year.
- Reduction of government oversight costs (not captured in the savings build up).

DISADVANTAGES:

- Additional workload for the project manager and quality control.
- May require resourcing an additional foreman though the overall foreman man hours would not change.
- May require additional sample technician, though the overall sample technician man hours will not change.

JUSTIFICATION:

For cost buildup the following will be assumed at fully loaded rates.
Equipment usage was assumed to be equal for original and revised options.

Site personnel	Site superintendent $900/day Site safety officer $700/day Black and Veatch project manager $1000/day	**$2600/day**
Other Direct Costs	(3) site worker truck and fuel $45/day ea = $135/day Trailer, generator, utilities etc. $250/day Per Diem 3 workers @ $110/day = $330/day	**$715/day**
Home Office	Procurement, admin support, safety, program management engineering support	**$300/day**
Total/day	**($2600 + $715 + $300)**	**$3,615/day**

(Schedule compression would also eliminate time for a foreman. However an additional foreman would likely be required for the Cedar Creek work, so this was considered a no cost impact offset.)

Site setup and fencing (item 4) is part of the mobilization effort (item 3) and should be run concurrently resulting in a 10 day schedule savings.

VALUE ENGINEERING RECOMMENDATION # 1

Pre-construction testing (item 5) should also occur as soon as a site lab can be set up, so initial excavation areas can be determined. Use of a full time on-site lab tech with XRF and PCB assay field kits would facilitate pre-construction sampling and confirmation sampling real time concurrent with excavation work. This should realize a 20 day schedule savings.

As presented in the design report, remediation of the main process area (items 8, 9) is to proceed prior to initiation of work in the wetland areas (items 10, 11). Given the size of the project site, the wetland remediation and the main process area remediation could be run concurrently. This results in a reasonable schedule compression of 30 days, allowing for a 15 day start up on excavation only before ramping up concurrent sediment removal. The lead time on excavation would facilitate backfilling with soil derived from the material in the former ball mill waste pile that passes residential RGs but fails ecological clean up criteria.

Excavation restoration (item 9) in the process area should overlap in part with the excavation (items 8). Assume 50% overlap for a schedule reduction of 10 days.

Wetland restoration at (Bato Pond and Cedar Creek schedule item 11) one area should overlap in part with the excavation of the other. Assume 30% overlap for an approximate schedule reduction of 10 days.

Seeding and final erosion control installation (item 14) should overlap with backfill effort. 20 days for demobilization appears excessive. Assume 10 day reduction.

Summary:

Item	Schedule Compression (days)
Combine mobilization & site setup	10
Use on-site lab - field screening	20
Concurrent excavation in wetlands & process areas	30
Concurrent backfill/excavation operations	10
Concurrent wetland (Bato & Clear Creek) remediation	10
Concurrent final grading and reduce demobilization	10
Total	**90**

Total schedule compression: 90 days @ $3,615/day saves $325,350. This cost savings is based on the information provided by B&V that the schedule is based on working days. Weekend rental of vehicles, weekend per diem, and routine rotations home are not included in this savings. If the schedule actually represented calendar days, 6 days of labor savings ($17,400) would be removed from this total.

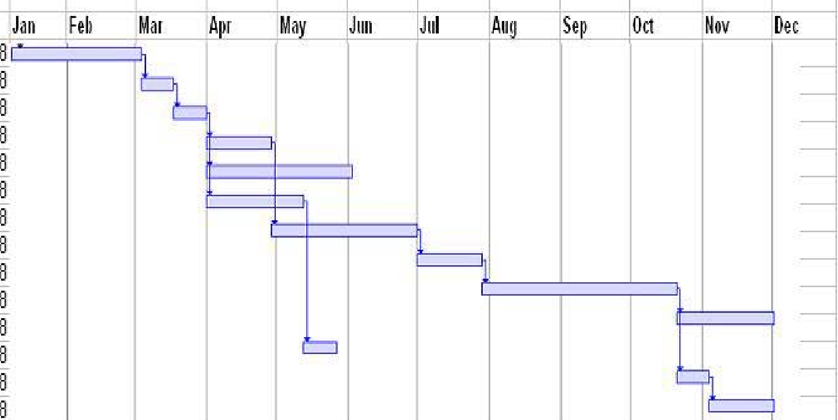
NOTE I: Depending on availability of trucking the schedule as developed under this recommendation may be optimistic on daily disposal shipping capability. Additional shipping may partially overlap with wetland restoration efforts. It may be reasonable to assume that 5-10 days of additional shipping may be required, reducing the savings by $37,050.

VALUE ENGINEERING RECOMMENDATION # 1

NOTE II: This savings is independent of savings identified by modification of the excavation effort per recommendation (12,14, & 21) and would still be applicable at a prorated level to the work remaining in the event there is a scope reduction associated with the Cedar Creek former ball mill waste pile area.

Appendix B – <u>Picture of RA Construction Schedule</u>

ID	Task Name	Duration	Start	Finish
1	NTP	0	1/8/2008	1/8/2008
2	RA Work Plan Submittal/Approval	40	1/8/2008	3/3/2008
3	Mobilization	10	3/4/2008	3/17/2008
4	Site Setup	10	3/18/2008	3/31/2008
5	Preconstruction Testing	20	4/1/2008	4/28/2008
6	Groundwater Modeling	45	4/1/2008	6/2/2008
7	Phase 1 Building Demo	30	4/1/2008	5/12/2008
8	Phase 1 Soil Exc/Disposal	45	4/29/2008	6/30/2008
9	Phase 1 Excavation Restoration	20	7/1/2008	7/26/2008
10	Phase 2 Sediment Excavation	60	7/29/2008	10/20/2008
11	Phase 2 Reestab Wetlands Veg	30	10/21/2008	12/1/2008
12	Install GW Monitoring Wells	10	5/13/2008	5/26/2008
13	Initiate GW Monitoring Program	10	10/21/2008	11/3/2008
14	Site Restoration/Demob	20	11/4/2008	12/1/2008



VALUE ENGINEERING RECOMMENDATION # 2

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea #2: Reconsider excavation at wetland areas vs destruction of existing wetlands when contaminate concentrations are only slightly above remedial action goals.

ORIGINAL DESIGN:

The original design called for excavation of the wetland area east of Arnold Faulkner Road and Bato Pond. This pond area is not within the property boundaries. The excavation was based on the results from one sample, AB022, which was taken adjacent to the road used to transport ball mill residue. This sediment sample had the following contaminant concentration levels:

Analyte	Concentration (ppm)	RG (ppm)
Cu	600	220
Pb	200	170
Bo	3 (u)	28
Zn	1900	780
PCB 1260	1.1	4.29

RECOMMENDED CHANGE:

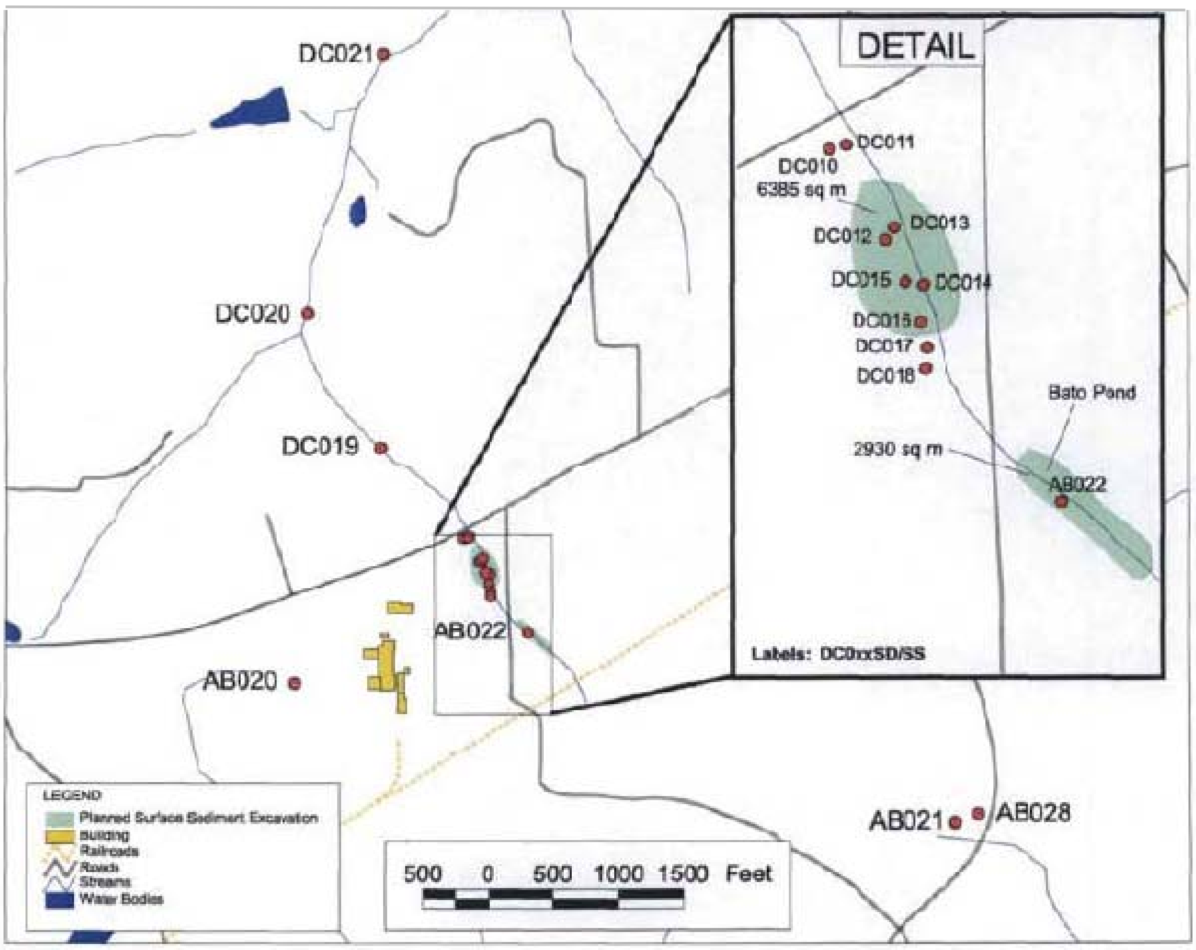
Two paths forward were considered:

1. Conduct additional sampling in Bato Pond to confirm the levels across Bato Pond are near or above the remedial goals (RGs).
2. Consider AB022 a delineation sample for those samples taken upstream of the pond that showed RGs were met in Bato Pond.

The second path was recommended given the slightly elevated concentration of Pb in sample AB022 taken adjacent to the road at the furthest upstream point in the pond.

VALUE ENGINEERING RECOMMENDATION # 2

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$157,500		$157,500
RECOMMENDED DESIGN	0		0
ESTIMATED SAVINGS OR (COST)	$157,500		$157,500



ROD Fig 5

VALUE ENGINEERING RECOMMENDATION # 2

ADVANTAGES:

- Eliminates extensive added sampling (not quantified).
- Eliminates excavation of Bato Pond without impacting remedy effectiveness.
- Does not destroy the existing ecological habitat, while essentially meeting RGs over the entire Bato Pond area.
- Eliminates need to excavate, drain pond, reestablish the wetlands adjacent to two residences.
- Eliminates disposal and off site transportation of 1500 cy of material (Ref. ROD Fig 5).
- PCBs are a greater concern for the surface water (SW) pathway than inorganics which are readily bound by the organics present in wetland sediments making them immobile, PCBs are not an issue in Bato Pond.

DISADVANTAGES:

- Some uncertainty remains concerning current contaminant levels present in pond sediments.

JUSTIFICATION:

Contaminant levels found by sample AB022 are essentially at the RGs that have been set for copper, lead, and zinc, i.e. they are within the same order of magnitude. It makes little sense to incur over 150,000 dollars or more in costs to disturb the ecological habitat of Bato Pond, while achieving such a small reduction in the levels of these naturally occurring inorganic compounds. The PCB concentration was below the RG.
Bato Pond is adjacent to two residences that would be impacted significantly by construction activities.

Presently, this small wetland is thriving. And it is very close to two residences. Disturbing this pond would have significant detrimental impact to both the wetland and the adjacent residences and would provide minimal environmental cleanup.

VALUE ENGINEERING RECOMMENDATION # 2

Cost Item	Units	$/Unit	Source Code	Original Design	
				Num of Units	Total $
Excavation (w/dewater)	CY	13	*	1500	$19,500
Trans & Disposal	Ton	40	*	1700	$68,000
Confirmation Sampling	1000 CY	500	*	2	$1,000
Fill & Compaction	CY	5	*	1500	$7,500
Restoration	Acre	$30K	*	1	$30,000
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
*B&V Estimate					$0
					$0
					$0
Subtotal					$126,000
Mark-up		@25%			$ 31,500
Redesign Costs					
Total					$157,500

VALUE ENGINEERING RECOMMENDATION # 3

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Combined Creative Idea #3, 4, 5 and 47:

a. Use a statistical sampling approach to determine and/or verify the need to remediate areas in question.
b. Use a statistical sampling approach for post-excavation for confirmation sampling.
c. Perform preconstruction sampling concurrently with remedial actions activities (onsite chemist and lab).
d. In the bid package, notify the Remedial Action Contractor that polygonal dimensions would meet the design criteria and/or intent for sampling/construction clarity. Furthermore, the design drawing scale should be increased.

ORIGINAL DESIGN:

The main goal of this project is to achieve EPA's goal of protecting human health and the environment, which requires successful soil cleanup at hazardous waste sites to eliminate unacceptably high risks associated with potential exposure to contaminated soils. It is important to achieve this goal in a cost-effective manner. The Black & Veatch Final Design Report dated September 2007 requires a "not-to-exceed" concept that entails removing all soil with contaminant concentrations exceeding the cleanup level. In fact, if additional soil removal is required, the contractor shall advance outward an additional 10 feet beyond the limits of excavation in the area of the failing side wall samples or one foot downward below the limits of excavation in the area of the failing excavation floor samples. The confirmation sampling process will then be repeated until the soil and sediment meets the performance standard.

RECOMMENDED CHANGE:

In lieu of the "not-to-exceed" concept, the contractor should be allowed to achieve the remediation goal utilizing an "area average" concept that involves removing soils with the highest contaminant concentrations such that the average (usually the upper confidence limit of the average) concentration remaining onsite after remediation is at or below the cleanup level. Furthermore, an "area average' method can be used to determine and/or verify if an area needs to be remediated. An important factor in using an "area average" method is the nature and extent of site assessment data. Therefore, consideration of the approach to implementing cleanup levels is interwoven with decisions about sampling and risk assessments, so performing preconstruction and/or verification sampling concurrently with remedial action activities is essential.

Related comment: The design drawing scale should be increased to allow the remedial contractor to accurately layout his work and prepare/plan his excavation delineation sampling plan. Once the contractor demarcates the area to be removed, he should be allowed to make adjustments to form polygonal shapes to facilitate excavation methodologies.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$4,439,494	$0	$4,439,494
RECOMMENDED DESIGN	$3,740,646	$0	$3,740,646
ESTIMATED SAVINGS OR (COST)	$698,848	$0	$698,848

ADVANTAGES:

- In lieu of specified cleanup levels that would be inherent to a "not-to-exceed' approach; the ROD provides remedial goals for soils and sediment.
- Exposure: Using the "area average" approach is applicable when you have random exposure.
- Toxicity: If the cleanup level is based on chronic exposure, then the "area average" is appropriate; however, care must be taken in implementing it as an "area average" based on a Remedial Action Level (RAL). This is because it is important to ensure the RAL (which may be significantly higher than the cleanup level) is protective of acute effects. The ROD anticipates that most, if not all, of the excavated soils/sediments will not be contaminated at levels that meet the regulatory definition of hazardous waste; therefore, the acute exposure should not be an issue.
- Confidence in the protectiveness of the cleanup level: If the cleanup level is the risk-based preliminary remediation goal calculated as the 95 percent UCL of the average post-remediation contaminant concentration, there is less than five percent chance that average exposure at that level will pose significant risk. Therefore in instances where there is adequate data coverage and exposure units are well defined, an "area average" approach may be appropriate.
- Confidence in the protectiveness of the cleanup level: The "area average" approach is specifically intended for situations where adequate site characterization data are available.
- Cost-effectiveness: The "area average" approach is likely to be more cost-effective for removal remedies.

VALUE ENGINEERING RECOMMENDATION # 3

DISADVANTAGES:

- Exposure: If exposure is not random across an exposure unit, but rather receptors spend more time in areas of high concentration, then remediating soils such that the average post-remediation concentration achieves the cleanup level may not be protective of the receptor with non-random exposure.
- Toxicity: If the cleanup level is based on acute exposure, it should be implemented as a "not-to-exceed" level, because any short term exposure exceeding the cleanup level could cause adverse effect.
- Confidence in the protectiveness of the cleanup level: Uncertainty about the cleanup protectiveness of the cleanup level may indicate it is most appropriately implemented as a "not-to-exceed" level.
- ARARs: If the cleanup level is an ARAR that the state designates as a "not-to-exceed" level, or an ARAR that was developed based on factors other than risk, then it is not appropriate to implement the cleanup level as an "area average".
- Confidence in the protectiveness of the cleanup level: Applications of "area average methods to sites with limited, incomplete, and/or partial data are inappropriate. However, if the quality of the site characterization data is the only factor limiting the use of the "area average" approach and the "area average" approach is likely to save on remediation costs, it may be more cost-effective to spend more on sampling to improve the quality of the data than to implement the cleanup level as a "not-to-exceed" level.
- Cost-effectiveness: The "area average" approach may require more extensive site characterization and statistical analysis. However, these costs may be offset by remediation cost savings due to the less extensive cleanup required.
- Community acceptance: Because the cleanup will leave in place some soils with contaminant concentrations that are above the cleanup levels, the community may not be confident in the remedy's protectiveness.
- Statistical expertise: The "area average" approach requires statistical expertise. The degree of expertise depends on the method used. The confidence response goal method is somewhat sophisticated, requiring some statistical training to understand, but it is formulaic and can be automated. The USEPA provides free software called ProUCL available for download at www.epa.gov/nerlesd1/tsc/download.htm.

JUSTIFICATION:

The ROD states, *"The purpose of this response action is to control risks posed by direct contact with soil, sediment, and groundwater, and to minimize migration of contaminates from soils/sediments to groundwater. The selected remedy shall excavate and dispose off-site soils/sediments contaminated at levels above the Remediation Goals shown in Table 21."* Chemical-specific preliminary remediation goals (PRGs) are concentration goals for individual chemicals for specific medium and land use combinations. There are two general sources of chemical-specific PRGs: concentration based on ARARs, and concentrations based on risk assessment.

Clean up levels are based on PRGs and are refined by considering the cost and implementability of remedial alternatives, including the feasibility of achieving the risk-based PRG. In some cases, the cleanup level is the same as the PRG. Decisions about whether to implement the cleanup level as a "not-to-exceed" level or as an "area average" will depend to some extent on the degree of uncertainty in the protectiveness of the cleanup. This degree of uncertainty is determined by many factors, including, but not limited to, the effectiveness and adequacy of site sampling, the exposure assumptions in the risk assessment, and the toxicity of the chemical of concern.

Remedial action levels (RAL) is a concept that goes hand-in-hand with the application of the cleanup as an "area average" method. The RAL is the maximum concentration that may be left in place within an exposure unit (a geographic area within which a receptor comes in contact with a contaminated media during the exposure duration) such that the average concentration (or 95% UCL of the average) within the exposure unit is at or below the cleanup level. The RAL must be statistically determined.

Implementing cleanup levels as "area averages" instead of "not-to-exceed" levels represents a less stringent and less costly option. It involves removing the areas of the exposure unit with the highest contaminate concentrations until the average or UCL_{95} concentration (i.e. post-remediation exposure point concentration) is at or below the cleanup level. This approach requires establishing a cleanup level that is the desired post-remediation exposure point concentration, and making a statistical determination of a remedial action level (RAL), the level to which all contaminated concentrations in soil within an exposure unit must be reduced to ensure that the estimated post-remediation exposure point concentration is at or below the cleanup level. The RAL is itself a maximum concentration, or "not-to-exceed" level, for the purposes of site remediation.

The issue with using a "not-to-exceed" approach is that you may not have collected enough confirmation samples to statistically prove you have met your cleanup goal. Though you may have four or five samples below the remedial goal, you will not be able to support a compliance determination with any type of confidence unless you implement an "area average" approach. Furthermore, if you are using a "not-to-exceed" approach and one of your confirmation results is slightly above the remediation goal or your establish cleanup level, the remediation contractor would be left with no choice but to perform additional excavation as outlined in the remedial design. With the "area average" approach, you may still be able to support the fact that your UCL_{95} is below your remediation goal; therefore, additional excavation would not be required.

VALUE ENGINEERING RECOMMENDATION # 3

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Excavation	CY	$7	RD		$0	42,376	$296,632
Assume 20% additional excavation to meet "not-to-exceed" level	CY	$7	RD	50,851	$355,958		$0
Backfill	CY	$5	RD	50,851	$254,255	42,376	$211,880
Transp.–Subtitle D	Ton	$15	RD	65,327	$979,905	54,089	$811,335
Disposal – Subtitle D	Ton	$30	RD	65,327	$1,959,810	54,089	$1,622,670
Additional Sampling	each	$100			$0	500	$50,000
					$0		$0
					$0		$0
Subtotal					$3,549,955		$2,992,517
Mark-up		@25%	RD		$887,489		$748,129
Redesign Costs							
Total					$4,439,494		$3,740,646

VALUE ENGINEERING RECOMMENDATION # 4

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea #9: Allow the use of manufactured topsoil in lieu of imported topsoil.

ORIGINAL DESIGN:

The Final Remedial Design Report dated September 2007 requires the excavated areas to be backfilled with clean imported fill and plant vegetative cover over the backfilled areas. Suitable topsoil will be placed over the remediated areas and vegetation (i.e. grass) will be planted.

RECOMMENDED CHANGE:

In lieu of imported native or virgin topsoil, the remedial design will allow the contractor to manufacture topsoil with organic material. An example of this is to use spent mushroom substrate (mushroom soil) as a soil amendment. Another example is composted poultry litter which is high in nitrogen and is used extensively as a low-cost fertilizer throughout the southeast. The excavated areas will be backfilled with the required imported clean soil as required by the Remedial Design. Instead of stopping six inches below the planned grade and then place six inches of imported topsoil, the backfill will continue to a point near finish grade. The soil will be sampled and analyzed to determine the required amount of amendments (including organic matter and nitrogen) needed to meet acceptable topsoil standards. Once an application rate is determined, the mushroom soil or composted poultry litter will be applied on the surface and then incorporated into the soil with discs or standard farm tilling procedures.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$308,450	$0	$308,450
RECOMMENDED DESIGN	$111,100	$0	$111,100
ESTIMATED SAVINGS OR (COST)	$197,350	$0	$197,350

VALUE ENGINEERING RECOMMENDATION # 4

ADVANTAGES:

- Widely used cost effective alternative to imported topsoil.
- Topsoil may contain herbicide contamination resulting from farming procedures.
- Composting poultry litter has gained popularity in recent years because the process reduces volume and provides a more nutrient-rich fertilizer.
- Composting will eliminate many pathogenic organisms.
- Universities and extension services have conducted extensive research showing soils treated with composted organics produce plants with better root systems, greater resistance to pests and diseases, and higher yields.
- Lower costs than commercial fertilizers and adds organic matter to the soil while maintaining soil pH levels.
- Amendments are easy to handle and environmentally safe.

DISADVANTAGES:

- There may be a public perception that spreading poultry litter on fields may expose wildlife to infectious diseases and parasites.
- Possible short term odors.
- Quality Control issues related to assuring a full depth homogeneous mixture.

JUSTIFICATION:

The existing Remedial Design requires the backfilled areas to be covered with 6 inches of suitable topsoil to support a vegetative growth. The existing site's sandy soil does not meet recommended organic content and nutrients needed to be classified as suitable topsoil; therefore, the topsoil will be required to be imported at a premium cost. If you are trying to improve the quality of turf growing in poor or marginal soils, using spent mushroom substrate (SMS) or composted poultry litter as a soil amendment is a widely used alternative to importing expensive native or virgin topsoil. Spent mushroom substrate (sometimes called mushroom soil, recycled mushroom compost, or mushroom compost) or composted poultry litter (composed of manure, bedding material, and wasted feed) can improve the structure of the soils, reduce surface crusting and compaction, promote drainage, increase microbial activity, and provide nutrients to turfgrasses. These improvements promote faster turf establishment, improved turf density and color, increased rooting, and less need for fertilizer and irrigation.

Because of the unique requirements for wetland topsoil, this recommendation is not applicable for the wetland restoration.

The use of chicken litter to manufacture top sil on site was offered by the landowners at the exit breifing. They indicated this is a common practice in this area and would plan to do something simlialr as part of a sod farming operation on the north section of the property.

VALUE ENGINEERING RECOMMENDATION # 4

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Topsoil (Existing)	CY	23.53	Means*	10,487	$246,759		$0
					$0		$0
5” Clean Fill	CY	6.57	Means*		$0	8,739	$57,415
1” tilled-in organic soil	CY	18.00	Internet		$0	1,748	$31,464
					$0		$0
* RS Means Cost Database					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
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					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$246,759		$88,879
Mark-up		@25%	RD		$61,690		$22,220
Redesign Costs							
Total					$308,450		$111,100

VALUE ENGINEERING RECOMMENDATION # 5

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea 10 – Recycle/crush clean concrete and reuse on site.
Creative Idea 11 – Separate Rebar contained in the concrete for recycling.
Creative Idea 39 – Analyze the concrete cores to assess if the concrete can be recycled or requires disposal.

ORIGINAL DESIGN:

The original design assumed the concrete removed from building floor demolition and limited asphalt removal would be buried on site. Similarly, asphalt pavement removal will be limited to parking areas overlying contaminated soils to be excavated for disposal.
Quantity of material identified in the RD estimate is 12,600 square feet (sf), cost associated with the demolition is $10.50 per sf, at a total cost for demolition of $132,300.

RECOMMENDED CHANGE:

In lieu of simply burying the concrete and asphalt on site, the VE team proposes the concrete and asphalt be crushed and used on site for roads, erosion control, or deep fill. Rebar will be removed from the concrete floors and foundations and recycled. Prior to removal, concrete cores will be taken in the furnace building and analyzed to determine if the concrete is suitable for reuse.

Actual area is nearly 100,000 sf (including the 40,000 sf furnace building) based on quantity take off from figure 4-2 of the RD, documented in idea number 46. Total cost based on a $10.50/sf would then be $1,050,000 ($630,000 w/o furnace bldg). Volume of concrete salvaged based on an 8" slab thickness would be approximately 67,000 cubic feet (40,200 w/o furnace bldg) or nearly 2500 cubic yards (cy) or 5000 tons (1500 cy/3000 tons w/o furnace bldg). Steel in concrete is assumed to be #4 steel rebar placed on 12" centers each direction. Amount of steel per square foot is approximately 1.34 pounds/sf or 67 tons with furnace bldg/40 tons without.

Cost of concrete crusher 200 tph – 350/hr (RS Means) Total cost to process ranges from $2 - $4 per ton. Costs identified by the Environmental Council *of* Concrete Organizations for processing concrete for recycling may cost up to $4/ton, http://www.ecco.org/pdfs/Ev15.PDF . $3/ton was used in this analysis. If coring is used to sample beneath the slabs, include sampling and analysis of the concrete to determine if the concrete slabs can be reused on site or require disposal.

VALUE ENGINEERING RECOMMENDATION # 5

SUMMARY OF COST ANALYSIS (CASE 2)			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$860,625	$0	$860,625
RECOMMENDED DESIGN	$808,125	$0	$808,125
ESTIMATED SAVINGS OR (COST)	$52,500	$0	$52,500

ADVANTAGES:

- Reduces the amount of fill required on site.
- Reduces the amount of material imported for use as haul roads.
- Conserves resources.
- Recycling steel will result in a net credit to the project.
- Sampling will identify if recycling the concrete is appropriate.

DISADVANTAGES:

- May add minimal cost to the project in sampling.
- May complicate site logistics/traffic patterns.
- Adding stockpile areas for unused concrete may add congestion in the construction area.

JUSTIFICATION:

Beneficially recycling the concrete removed from the buildings will reduce the amount of aggregate needed for a number of uses, and eliminates the need to transport and dispose off site or bury the concrete on site as originally identified in the remedial design. The cost of removing the rebar from the concrete was assumed to be equivalent in cost benefit from recycling.
http://www.ecco.org/pdfs/Ev15.PDF

VALUE ENGINEERING RECOMMENDATION # 5

Cost Item	Units	$/Unit		Original Design		Recommended Design	
				Num of Units	Total $	# of Units	Total $
Case 1 - 100,000 sf Concrete					$0		$0
Demolition	sf	10.50		100000	$1,050,000		$1,050,000
Excavate	cy	7		2500	$17,500		$0
BF/Compaction	cy	5		2500	$12,500		$12,500
Soil/Aggregate	Ton	13.35		5000	$66,750		$0
Processing	Ton	3		5000	$0		$15,000
Testing same for both					$0		$0
Recycle/sell rebar	Ton	575		67	$0		($38,525)
Separate rebar & concrete	Ton	575		67	$0		$38,525
Subtotal Case 1					$1,146,750		$1,077,500
Markup		25%			$286,688		$269,375
Total Cost					$1,433438		$1,346,875
					$0		$0
Case 2 – 60,000 sf Concrete					$0		$0
Demolition	sf	10.50		60000	$630,000		$630,000
Excavate	cy	7		1500	$10,500		$0
BF/Compaction	cy	5		1500	$7,500		$7,500
Soil/Aggregate	Ton	13.35		3000	$40,050		$0
Processing	Ton	3		3000	$0		$9,000
Testing same for both					$0		$0
Recycle/sell rebar	Ton	575		40	$0		($23,000)
Separate rebar & concrete	Ton	575		40	$0		$23,000
Subtotal Case 2					$688,500		$646,500
Markup		25%			$172,125		$161,625
Total					$**860,625**		$**808,125**

VALUE ENGINEERING RECOMMENDATION # 6

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea 12 – Evaluate application of ecological cleanup criteria only to areas where residual contamination may impact wetland areas.

Creative Idea 14 – Reuse top layer of material in the Cedar Creek former ball mill waste pile area for deeper backfill. (Modified: During the VE briefing this material was said to be relatively clean, however, review of RI data showed the top layer at Cedar Creek to have PCB and metals contamination above all applicable clean up criteria which would preclude this possibility).

New Version- Reuse material excavated from 1-5 ft in the Cedar Creek former ball mill waste pile area that passes PRG requirements but fails for ecological assessment as backfill in the process area.

Creative Idea 21 – Regrade site to minimize/slow runoff to the wetland areas and reduce required backfill.

ORIGINAL DESIGN:

The current design for excavation at the Cedar Creek former ball mill storage pile calls for removal of material to a depth of 20 ft (or the water table) based on removal criteria generated from an ecological risk assessment. Much of the rest of site is an industrial area and per the new owners will remain so. Industrial criteria or groundwater protectiveness criteria would typically be applied to an industrial area though in this case application of residential PRG did not add significant additional volume so residential criteria were used for the site. One foot of soil will be removed in most of the excavations in the process area. Clean offsite material would be used to backfill all excavations.

RECOMMENDED CHANGE:

Cleanup criteria should be applied selectively during excavation of the Cedar Creek former ball mill pile based on actual, or reasonable future ecological exposure scenarios. Material removed from the 1-5 ft interval of the former ball mill storage pile area which exceeds ecological sediment and/or surface soil exposure criteria (failure of this material is driven by boron) while meeting residential soil RGs should be placed as backfill in the process area after removal of the one foot of soil from the area. The process area of the site has approximately two feet of topography variation. Further flattening the site during backfilling of the process area would reduce required backfill and would further slow runoff and inhibit erosion during the revegetation phase of the project.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			$2,335,173

Continued Next Page – Excavation Map

VALUE ENGINEERING RECOMMENDATION # 6

VALUE ENGINEERING RECOMMENDATION # 6

ADVANTAGES:

- Applying remediation criteria more specifically to a given area based on actual exposure or migration scenarios will reduce the amount of material to be removed from the site and ultimately replaced.
- Reduction in material removal will shorten the duration of the project and provide the property to the new owners for beneficial use sooner than currently scheduled.
- Deep excavation would not be required which would have site safety benefits associated with both work hours and overnight site control.
- Keeping material from the former ball mill waste pile that fails sediment criteria but meets residential RGs on site as backfill in the more industrial setting of the process area would reduce the amount of material needlessly taking up landfill volume and would reduce the volume of truck traffic associated with waste removal and backfill.

DISADVANTAGES:

- Potential for leaching of residual boron in material from the Cedar Creek excavation placed in the process area which could impact the natural attenuation of the boron groundwater plume. (Material could be screened for groundwater criteria prior to selection for backfill though the leach potential of the soil that could be used for backfill should also be screened against the current groundwater plume in that area to determine if the adverse impact would be significant).

- Perception that potentially contaminated material was being left on site.

JUSTIFICATION:

Review of the RI and supplemental RI sediment analytical data from the Cedar Creek area shows PCB to be the primary excavation driver in the uppermost one foot of the former ball mill area. A number of metals exceeding all cleanup criteria are present in that interval as well. The soils deeper than one foot are impacted above any regulatory levels with boron only. The maximum contaminant detection reported in the supplemental RI from the 1-5 ft interval was 760 ppm Bo, which is below residential RG, though all samples from that interval failed ecological criteria for boron. Only 3 samples in 5-10 feet exceeded ecological criteria with a maximum detection of 210 ppm boron which meets groundwater protection standards.

It needs to be determined whether the material in the 1-5 ft interval would be deemed soil, which is most applicable since they are not in contact with wetlands or a water body, or sediment for which a lower cleanup criterion is applied. Since the soils are contaminated only with boron below 1 foot, modification of that designation could result in a reduction in the amount of soil excavated from 1-5 feet.

VALUE ENGINEERING RECOMMENDATION # 6

Application of ecological criteria in Cedar Creek also needs to be evaluated in terms of fate and transport conditions present at the site. Ecological exposure results from animals coming into direct contact with surface soils and sediments, burrowing animals encountering contaminated soil at depth, erosion of contaminated soils and sediments with redistribution within the habitat, and leaching of contaminants at depth with discharge of the resulting contaminated groundwater into the environment. Descriptions of the wetland areas in the RI document indicate there are no springs or seeps in the area indicative of discharge of groundwater into the wetland areas. Groundwater elevations are also significantly lower than creek bed/wetland water levels suggesting that if any connection exists between surface water and groundwater it is in the form of groundwater recharge from the wetlands and creeks.

A brief literature review suggests that earthworms and most small burrowing animals live in the upper 1 meter of soil. Larger burrowing animals, such as ground hogs, may dig deeper though those animals were not identified in the wetland evaluation report. Barring extensive gully formation, which needs to be prevented in order to ensure the integrity of the railroad right of way topographically above this location, there is virtually no possibility of the deeper soils coming into contact with the fish, plants or benthic creatures that were evaluated in the ecological risk assessment.

The current landowner wants to eliminate Cedar Creek headwater wetlands while retaining the creek to drain irrigation water. They state that initial conversations about regulatory status of the wetland with Mobile Corps of Engineers suggest that due to the relatively young nature of the wetland and it's apparently artificial origin the wetland may not be subject to regulation. This designation would potentially remove the ecologic risk driver from the soils at this site, depending on evaluation of the impact of residual contaminants at industrial levels on riparian rather than wetland species. The changed site plans proposed by the site owners will preclude the need for wetland restoration**.** If elimination of the wetland by the owner eliminates the ecological driver for this site, then the total excavation would be limited to the uppermost 1 ft of soil only.

COST BUILDUP:

The design document supplies very little data as to how quantities were determined or the surface areas of the different excavation sites. Scaling the former ball mill waste pile area adjacent to the railroad tracks, not including the wetland and creek area, from the design drawings (Ref Figure 4-2, see above) results in an approximate area of 102, 500 sq ft. It is estimated that the ball mill waste pile area is approximately 1/6 (16%) of the total area to be excavated resulting in an estimated area for the rest of the excavation to be 512,800 sq ft. Soil in the process area is to be removed to a depth of 1 ft, while the ball mill waste pile area excavation is planned for 20 ft in places. Averaged out to a uniform volume, the ball mill excavation depth is estimated to be about 12 ft. Calculated soil volume based on these depths and areas resulted in 45,550 cy excavated from the ball mill waste pile area and 18,990 cy from the rest of the site, for a total of approximately 64,540 cy. The total amount is about 18.6% higher than the design amount. Adjusting the calculated quantities to correspond to the volume in the RD estimate, results in 38,000 cy for the waste pile area and 16,000 cy for the process area in round numbers. (Note that strict application of the correction factor results in approximately 2,000 cy lost to rounding error which was reallocated to the two areas. That rounding error was not addressed in the savings calc below so the savings are conservative.)

Leaving material below 5 ft in place at the ball mill waste pile area would reduce the amount of excavation and backfill by approximately 21,790 cy. By reusing the material failing ecological criteria but passing RG screening from the ball mill waste pile site as process area backfill, the imported fill requirement approximately drops by an additional 12,450 cy for a total backfill and transportation and disposal savings of 34,240 cy.

Excavation cost	21,790 cy X $7 =	$152,530
Trans and disposal cost	34,240 cy X $45 =	$1,540,800
Backfill cost	34,240 cy X $5 =	$171,200
.33%	safety eqpt =	$33,000
Contractor fee	.1 X $1,897,530 =	$189,753
1/3 reduction in project duration	.33X $460,270 =	$151,890
Sub total		$2,239,173

With the plan in place to eliminate the Cedar Creek wetlands, assume that 60% of the wetland restoration would not be required. This is an extremely conservative estimate of wetlands requiring restoration. .6 X $160,000 =$96,000

Grading the site to further flatten topography would further slow site runoff, which would have positive effects on revegetation, would further reduce or eliminated mobilization of sediments from the site to the wetlands (or erosion control barriers), and may allow for balancing of cut and fill within the site (assuming the soil from the 1-5 ft interval of the former waste pile is used as process area backfill) thereby eliminating the need for imported fill other than top soil amendments. Even if the soil from the 1-5 ft interval of the former waste pile is not used, regrading the site can reduce the amount of imported fill required. The value of this action was not calculated but could result in total elimination of the backfill line item.

PROCESS AREA:

Additional savings may be realized in the process area through refinement of the estimate excavation limits. A significant portion of the area to be excavated lies beneath standing buildings the owner has expressed interest in keeping and reusing. Since the buildings and floor slab act as an effective cap for the contamination, there is no completed pathway which would require immediate remediation. Leaving the contamination in place beneath the buildings would require a deed restriction being put on the buildings with the owner accepting liability for remediation below the slab in the event the buildings were ever demolished. The ownership status of the site buildings and demolition responsibility is uncertain at this time. It is possible if the government tears down the buildings and they are deemed not to be government property, without the owners permission in order to remediate the soils, it would constitute a taking for which the owner could seek compensation for the buildings from the government.

Excavation south and east of the ball mill building is defined based on only one sample which is insufficient for determining the removal quantity in this area. The hot spot removal associated with the former RR spur (approx 19,200 sq ft/ 713 cy material) is also based on only one sample. Refinement of the characterization of these areas could result in significant cost savings beyond the cost of sampling. These potential savings were not calculated due to lack of analytical data.

VALUE ENGINEERING RECOMMENDATION # 7

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:
Creative Idea 13 – Redesign recharge area at Cedar Creek entry channel to limit erosion to wetlands (flatten the grade).
Creative Idea 18 – Revise grading to reduce backfill requirements for wetland and incorporate a wetland pond.

ORIGINAL DESIGN:

- Reconstruction of wetland in the Cedar Creek upland.
- Backfill of all excavations to near surface with structural or select fill and topsoil for the last few inches

RECOMMENDED CHANGE:
Consider filling the areas to be constructed as wetlands not to the grade level but to a deeper completion elevation as allowable. This could be done especially for the head of the creek on the southwest part of the remediation area south of the railroad tracks. The change would eliminate the need to place fill in the excavations from the base to design surface. Alternatively the pond could be constructed to only have boundaries where the depth of excavation is likely to intersect groundwater (i.e. 16 ft bgs). In either case this would provide lacustrian habitat at the head of Cedar Creek as well as obviate the need for approximately 17,000 to 36,000 cubic yards of backfill.

SUMMARY OF COST ANALYSIS			
Values are based on the figures in the design estimate using only 17,000 cubic yards	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$264,850		
RECOMMENDED DESIGN	$183,600		
ESTIMATED SAVINGS OR (COST)	$61,250		$61,250

VALUE ENGINEERING RECOMMENDATION # 7

ADVANTAGES:

- Creates more diversity in habitat.
- Creates reservoir where natural siltation with fluvial deposits can occur.
- Decreases soil import requirement for backfill.
- Accelerates schedule for completion of project.
- Potential for wetland mitigation bank credit.

DISADVANTAGES:

- Smaller aerial extent of land suitable for agricultural use.
- May require more careful management of grading to prevent back flushing of creek water into the pond created.
- Potential for pond to act as recharge basin and capture some runoff that may otherwise flow to Cedar Creek.
- May result in more stringent cleanup criteria due to benthic faunal exposure at 0-3 feet below the new excavation base.
- Child safety issues.

JUSTIFICATION:

The potential for saving $61,250 accounts for just over 1 percent of the total project cost. If it is possible to create an open water pond without violating any local wetlands management regulations and if groundwater proves to be high enough to feed into such a feature, then the customer could consider this a viable option. Since there are already multiple open water ponds in the vicinity of the site, the *additional* risk to children posed by another pond added to the community is somewhat limited.

Note: This Recommendation is Mutually Exclusive of Creative Idea 20.

REFERENCES:

Black & Veatch Final Remedial Design Report. September 2007.

VALUE ENGINEERING RECOMMENDATION # 7

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design		
				Num of Units	Total $	Num of Units	Total $	
Import & place backfill	cy	5		42,376	$211,880	25,376	$126,880	1
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
Subtotal					$211,880		$126,880	
Mark-up		@	25%		$52,970		$31,720	
Redesign Costs							$25,000	
Total					$264,850		$183,600	

1 Recommended number of units based on 17,000 cubic yards of open hole filled with groundwater

VALUE ENGINEERING RECOMMENDATION # 8

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Combined Creative Idea #15 and 16 – To identify and compare concentrations of soil and groundwater (shallow well) to determine source of boron. In other words, determine whether the soil is contaminating the groundwater or whether the groundwater is contaminating the soil. In addition, the potentially contaminated soil excavation should be limited to the top of groundwater table.

ORIGINAL DESIGN:

The current design requires deep excavation (15'-20') at the former ball mill pile area. Sampling during the remedial investigation revealed the groundwater table to be estimated at 16 feet below grade. Black & Veatch Final Design Report dated September 2007 Excavation Map (15'-20') identifies a 150' diameter circular area to be excavated and disposed at a Subtitle D landfill. Furthermore, this assumption was based on one (72 mg/kg) sample of the five soil samples analyzed at 15-20' that exceeded the boron cleanup goal of 66 mg/kg.

RECOMMENDED CHANGE:

The VE Team recommends the Remedial Action Designer evaluate the site information to determine if the soil boron contamination in the subject area is a result of contaminated soil that contributed to the groundwater contamination or is the groundwater contamination currently contributing to the soil contamination. Based on a preliminary review, the monitoring wells at the brass furnace slag pile location and the ball mill residue pile location suggests the source of the boron contamination is groundwater. The groundwater boron concentrations at these two locations (MW-05 and MW-09) exceed the adjacent soil boron concentration; therefore, any remediation below the groundwater table can be considered groundwater remediation. The ROD selected remedy for the groundwater remediation is natural attenuation with long-term monitoring to verify decreasing contamination levels. As a result, the recommended change is to stop the deep excavation at the groundwater table.

VALUE ENGINEERING RECOMMENDATION # 8

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$156,125	$0	$156,125
RECOMMENDED DESIGN	$0	$0	$0
ESTIMATED SAVINGS OR (COST)	$156,125	$0	$156,125

ADVANTAGES:

- Limits the soil excavation depth.
- Do not have to pump and treat/dispose groundwater that accumulates in the excavation.
- Only one of the five samples collected at this depth for the Remedial Design was slightly above the 66 mg/kg cleanup goal for boron. Any trace boron contamination will be reduced as a result of the groundwater natural attenuation remediation selected remedy.
- Will not have to excavate wet soil that often leads to unsafe side wall collapses resulting in additional soil to be removed and disposed off-site.

DISADVANTAGES:

- Public perception if confirmation sampling results reveal boron levels above the cleanup goal.
- Additional remedial action may be required in the event the groundwater natural attenuation theory does not prove successful.

JUSTIFICATION:

A site assessment is an early step in determining site conditions which may require remediation of a release. Characterization of a release includes the identification of specific contaminant concentrations throughout the soil and groundwater media, discharges to surface water and air, and any other conditions which pose a risk to human health and environment associated with the release. Then distinct areas of contamination need to be identified, which includes the volume of all media affected by the release causing the contamination. For example, if soils were contaminated and that migrated to groundwater, both the contaminated soil and groundwater would be part of the distinct area of contamination associated with the release. In some cases, characterizing all contaminated media as a distinct area is not practical. Many regulatory agencies have approved a site characterization limited to a single medium. An example of this situation is when a remediator completes a soil media cleanup and an associated groundwater cleanup will take a period of years before attainment can be demonstrated. This philosophy was echoed in the Record of Decision by requiring the excavation and offsite disposal of the soil media followed by the groundwater remediation through natural attenuation.

In the furnace slag pile and the ball mill residue pile locations, the soil contamination is higher near the surface and rapidly decreases as you near the groundwater table. The furnace slag pile and the ball mill residue pile, or the source of contamination, has already been removed. The Remedial Design addresses the removal of any subsurface soil contaminated soil media followed by remediating the groundwater through natural attenuation. So in reality, the Remedial Design and the Record of Decision have already split the site into two distinct areas of contamination (soil media and groundwater) and is in line with recognizing that characterizing the site as one distinct area is not practical. Therefore, excavating any soil below the groundwater table that might contain residual or trace contamination from the original contamination source is impractical and unjustifiable.

Cost Item	Units	$/Unit	Source Code	Original Design	
				Num of Units	Total $
Excavation beyond GW table elevation	CY	7.50	Eng Judgment	1600	$12,000
Dewater & Treat Water	CY	0.25	Means	1600	$400
T&D	Ton	$45	RD est.	2500	$112,500
					$0
					$0
Subtotal					$124,900
Mark-up		@25%			$31,225
Redesign Costs					
Total					$156,125

VALUE ENGINEERING RECOMMENDATION # 9

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea 20 – Reassess the risk of boron in terms of Region 3 and 9 PRGs or as an emerging essential nutrient.

Based on review comments by the EPA this recommendation has been divided in to two aggregate parts for the sake of clarity; 9A and 9B. The **ORIGINAL DESIGN** section applies to both parts of the recommendation. Part (9A) addresses the issue of groundwater remediation goals; part (9B) addresses the soil cleanup design criteria.

ORIGINAL DESIGN:

- Table 21 of the ROD establishes a remedial goal for subsurface soil of 242 mg/kg (based on soil screening level for groundwater protection) and 66 mg/kg for surface soils (based on terrestrial invertebrate protection in the uplands) and 28 mg/kg for sediments (based on benthic invertebrate protection in the wetlands).
- Table 22 of the ROD establishes a remedial goal for groundwater of 1,400 µg/L (based on human health).
- The original design calls for excavation of soil from 0 to 3 feet on the basis of protection of ecological receptors and excavation of soil from 3 to 20 feet on the basis of protection of groundwater to the extent that it exposes human receptors.
- The table below summarizes the remediation goals established in the ROD:

Remediation Goal soil (mg/kg)	Remediation Goal groundwater (µg/L)	Basis of protection	Applicable depth (ft bgs) *
242		Groundwater (human receptors) Soil Screening Level to achieve 1400 µg/L	3 - 20
66		Earthworm survival (terrestrial invertebrate)	0-2
28		Amphipod survival (benthic invertebrate)	0-3
	1,400	unknown†	~16-100 +

* based on verbal communication with Black and Veatch.

† The HQ of 1 identified in the ROD corresponds to a value of 1400 µg/L. However the ROD did not include the methodology supporting the calculation, or what reference concentration was used (i.e. soil starting point) in the derivation of the value.

VALUE ENGINEERING RECOMMENDATION # 9

(9A) RECOMMENDED CHANGE:

Based on review comments by the EPA this recommendation has been divided in to two aggregate parts for the sake of clarity; 9A and 9B. This Part (9A) addresses the issue of groundwater remediation goals.

The RI for the site was dated 2001. The reference dose for boron was based on a toxicity value of 0.09 mg/kg/day first issued in 1989 which, translates into a PRG of approximately 3300 µ/L. The current EPA Region 3 and 9 tap water PRG for boron of 7,300 µ/L was updated in 2004 and corresponds to a reference dose of 0.20 mg/kg/day. Both values relate to an HI of 1, assuming there are no other chemicals that may contribute to the HI calculation, which appears to be the case at this site. In comparing 7,300 µ/L with the value of 1400 µg/L in Table 22 of the ROD, it is evident that taking a new look at the groundwater remediation goal in terms of a tap water PRG the groundwater remedial goal may be extremely conservative. In taking the argument to a slightly more conservative level, recent research suggests that boron at a dosage of up to 13 mg per day may be beneficial as part of an overall nutritional supplement package. If this is validated, then an average consumption of 2 liters of water per day (70 kg daily adult human average need, EPA Risk Assessment Guidance) would result in an exposure of 13mg/day from water containing 6,500 µg/L of boron. In any case, the difference in the numbers is compelling enough to revisit the Table 22 of the ROD.

In addition, based on Oakridge soil screening calculations (http://rais.ornl.gov.epa/ssl1.htm), a default (very conservative) dilution attenuation factor (DAF) of 20 would be applied to the groundwater concentration value of 7,300 µg/L and a soil screening level of 470 mg/kg should be acquired as the cleanup goal for protectiveness of groundwater. This represents nearly a twofold increase over the value of 242 mg/kg currently established.

Using the tap water PRG of 7,300 µg/L or any other groundwater goal higher than 1,400 µg/L would also mean the boron plume dimensions requiring monitoring could likely be limited to three well clusters (i.e. MW-5, MW-8, and MW-9). This savings has not been calculated in the summary below since it is less tangible, but it could nevertheless be significant over the long term monitoring (LTM) lifetime for the project.

(9A) SUMMARY OF COST ANALYSIS			
Monitoring cost savings were not calculated	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			

VALUE ENGINEERING RECOMMENDATION # 9

(9A) ADVANTAGES:

- Reduces plume monitoring areal extent.
- May reduce groundwater sampling costs.

(9A) DISADVANTAGES:

- Only likely to trigger an Explanation of Significant Difference (ESD) or ROD amendment if the groundwater threshold is revisited.

(9A) JUSTIFICATION:

Cost savings and plume size estimates cold be reduced substantially. In addition, cleanup schedule and long term O&M of the groundwater monitoring system could be reduced significantly.

(9A) REFERENCES:

Black & Veatch. 2007. *Data Summary Report American Brass, Inc. Site, Headland, Henry County, Alabama*. U.S. EPA Region 4, Atlanta, GA. August 2007.

Black & Veatch. 2007. *Final Remedial Design Report American Brass, Inc. Superfund Site, Headland, Henry County, Alabama*. U.S. EPA Region 4, Atlanta, GA. September 2007.

U.S. EPA. 2006. *EPA Superfund Record of Decision: American Brass, Inc. EPA ID ALD981868466 OU01 Headland, AL*. U.S. EPA Region 4, Atlanta, GA. 24 August 2006.

U.S. EPA. 2004. *Supplemental Remedial Investigation Report (Rev.1), American Brass, Inc., Headland, Alabama*. United States Environmental Protection Agency Science and Ecosystem Support Division, Athens, Georgia and CDM Federal Programs Corporation, Atlanta, Georgia. April 2004.

VALUE ENGINEERING RECOMMENDATION # 9

Based on review comments by the EPA this recommendation has been divided in to two aggregate parts for the sake of clarity; 9A and 9B. This part (9B) addresses the soil cleanup design criteria.

(9B) RECOMMENDED CHANGE:

Based on Oakridge soil screening calculations (http://rais.ornl.gov.epa/ssl1.htm), a default (very conservative) dilution attenuation factor (DAF) of 20 would be applied to the groundwater concentration value of 7,300 µg/L and a soil screening level of 470 mg/kg should be acquired as the cleanup goal for protectiveness of groundwater. This represents nearly a twofold increase over the current value established at 242 mg/kg. It also represents a potentially large change in the need for excavation at the head of Cedar Creek since none of the detected concentrations in soil below 5 feet bgs exceeded 470 mg/kg. Adopting this value as a soil cleanup criterion for subsurface sediment would obviate the need for excavation, hauling, and disposal beyond 5 feet bgs in the former ball mill residue pile area and by extension obviate the need for excavation dewatering and discharge water management.

Even if the soil screening level is not altered, it appears that the design which used 66 ppm (boron) as a cleanup goal to the total depth of 20 feet bgs used this criterion inappropriately. After 3 feet bgs, benthic fauna are not active so the cleanup criteria should be changed after that excavation depth to 242 ppm for boron from 3 to 20 feet. Since there are no exceedances of 242 ppm after the 5 foot depth interval of excavation, no further excavation should be necessary after 5 feet.

(9B) SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$4,080,654		$4,080,654
RECOMMENDED DESIGN	$2,305,923		$2,305,923
ESTIMATED SAVINGS OR (COST)	$1,774,731		$1,774,731

The basis for these costs is the series of unit costs identified in the one-page Engineering Cost Estimate presented in Appendix C of the Final Remedial Design Report (Black & Veatch, 2007-September).

VALUE ENGINEERING RECOMMENDATION # 9

(9B) ADVANTAGES:

- Obviates the need for any excavation below 5 feet.
- Obviates the need for any excavation dewatering.
- Substantially reduces hauling and disposal efforts.
- Reduces confirmation sampling costs.

(9B) DISADVANTAGES:

- Only likely to trigger an Explanation of Significant Difference (ESD) or ROD amendment if the soil screening level of 242 mg/kg is revisited.

(9B) JUSTIFICATION:

The potential for saving $1.7 million (plus) is a significant change that alters the design approach.

An ESD or a ROD amendment may not be necessary in that it appears that the design which used 66 ppm (boron) as a cleanup goal to the total depth of 20 feet bgs used this criteria inappropriately. After 3 feet bgs, benthic fauna are not active so the cleanup criteria should be changed after that excavation depth to 242 ppm for boron. Since there are no exceedances of 242 ppm after the 5 foot depth interval of excavation, no further excavation should be necessary after 5 feet.

Therefore, the only effort to amend the ROD or execute an ESD would be to address any change in the soil screening level threshold that may be too conservative.

(9B) REFERENCES:

Black & Veatch. 2007. *Data Summary Report American Brass, Inc. Site, Headland, Henry County, Alabama*. U.S. EPA Region 4, Atlanta, GA. August 2007.

Black & Veatch. 2007. *Final Remedial Design Report American Brass, Inc. Superfund Site, Headland, Henry County, Alabama*. U.S. EPA Region 4, Atlanta, GA. September 2007.

U.S. EPA. 2006. *EPA Superfund Record of Decision: American Brass, Inc. EPA ID ALD981868466 OU01 Headland, AL*. U.S. EPA Region 4, Atlanta, GA. 24 August 2006.

U.S. EPA. 2004. *Supplemental Remedial Investigation Report (Rev.1), American Brass, Inc., Headland, Alabama*. United States Environmental Protection Agency Science and Ecosystem Support Division, Athens, Georgia and CDM Federal Programs Corporation, Atlanta, Georgia. April 2004.

VALUE ENGINEERING RECOMMENDATION # 9B

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design		
				Num of Units	Total $	Num of Units	Total $	
Excavate	cy	7		42376	$296632	23686	$165802	[1]
Dewater	cy	6		42376	$254256	23686	$142116	[1]
Haul and Dispose	ton	45		54439	$2449755	30142	$1356390	[2]
Backfill	cy	5		42376	$211880	23686	$118430	[1]
Confirmation testing	1000 sq ft	100		520	$52000	~420	$42000	[3]
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
					$0		$0	
Subtotal					$3264523		$1824738	
Mark-up		@	25%		$816131		$2280923	[4]
Redesign Costs							$25000	
Total					$4080654		$2305923	

[1] Recommended number of units based on 18690 cubic yards from 5 to 20 feet.

[2] Recommended number of units based on 18690 cubic yards converted to tonnage by a multiplication factor of 1.3 (derived from Black and Veatch conversion of 42376 cy to 55089 tons).

[3] Recommended number of units based on square footage of footprint of excavation deeper than 5 feet.

[4] Mark-up based on B&V fees, licensing charges & admin fees (cumulative).

VALUE ENGINEERING RECOMMENDATION # 10

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea # 23 – Explore how discovery of ACM (Asbestos Containing Materials) will affect the future remedial activities for the site.

ORIGINAL DESIGN:

The original design did not address any asbestos issues.

RECOMMENDED CHANGE:

During a site walk, the Value Engineering Team noted that the furnace building had many corrugated panels on the exterior sides and roof of the structure that appeared to be transite. In addition, the team noted there were several broken pieces of the corrugated panels lying about the exterior wall of the building and in the debris around the building. On the morning of 21 February 2008, the VE Team collected a representative sample of the corrugated siding that had fallen to the ground and provided it to a representative of Black & Veatch under chain of custody documentation. Black and Veatch subsequently forwarded the sample to a lab for analysis.

The material noted on the furnace building was identified as transite (an asbestos containing material). The design will need to be revised to address – at a minimum – broken and fallen pieces of the furnace building siding that remain scattered on the ground.

The EPA and its contractors should also determine the exact requirements for leaving ACM in place at this site. This could include minimum standards for maintaining the ACM in a non-friable condition.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$0		
RECOMMENDED DESIGN	~$50,000		
ESTIMATED SAVINGS OR (COST)	($50,000)		($50,000)

VALUE ENGINEERING RECOMMENDATION # 10

ADVANTAGES:
- Addresses an issue that may have been overlooked.

DISADVANTAGES:

- None.

JUSTIFICATION:

Addressing this issue will make the project more complete. This addition to the project also results in disclosure of the fact that the site has ACMs to the current land owners.

VALUE ENGINEERING RECOMMENDATION # 11

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea 24 – Evaluate different RA contracting mechanisms.

ORIGINAL DESIGN:

The remedial action contracting method proposed for this site is a performance based contract. This was the basis for the remedial design documents completed to date.

RECOMMENDED CHANGE:

Utilize a cost plus fee type contract or a fixed unit cost contract. Otherwise, revise the site characterization and design document prior to proceeding with a fixed price performance based contract.

SUMMARY OF COST ANALYSIS

No costs were computed for this recommendation, however considerable cost savings may result in selecting a contracting method other than a performance based contract.

An evaluation of cost or savings is not possible since there are numerous factors that go into a contractors bid or proposal beyond the scope of work, including current business climate, contractor workload, and proximity to site etc. Allocation of risk to a contractor always carries a cost to the government. In cases where it appears the scope is set and risks are limited to changed site condition, the government will still pay for the changed condition via modification to the contract. In cases where it appears the contractor has assumed the risk, they generally don’t assume all of it. The contractor takes on minimal risk in a cost based contract, while the government assumes the responsibility to properly manage the project and identify opportunities to realize savings. This recommendation is intended to point out additional consideration needs to be made to the design document and the proposed contracting method to ensure the best option is chosen for the government and the contractor.

VALUE ENGINEERING RECOMMENDATION # 11

ADVANTAGES:

- Costs can be optimized if the contracting mechanism selected is appropriate to the level of knowledge about the site, detail of the design, and scope of work

- Defining the work in advance will eliminate the need to do a very difficult best value analysis on a number of different individual contractor approaches along with a wide range of contractor assumptions. Defining the work will enable contractors to price a bid that more accurately reflects the actual level of work. Defining the scope of work minimizes contingencies and reduces the risk for future claims or modifications.

- When risk allocation is accounted for through the contracting mechanism, the potential for disputes and claims in order to avoid large losses by the contractor or unplanned overruns by the government is reduced. Selecting the appropriate contracting mechanism allows for an equitable distribution of risk, which generally results in the government and the contractor working as a team to complete the project.

DISADVANTAGES:

- May require additional effort and delay the project execution while the project is further defined.

JUSTIFICATION:

The reason for selection of the performance based contract was not made available to the VE team. There were not any apparent advantages identified to require the use of a performance based contract. Other contracting vehicles may minimize government risk while optimizing remedial action performance at an overall lower cost to the government.

DISCUSSION:

The Value Engineering study team recommends the RA design team consider all available contracting mechanisms and select an appropriate mechanism consistent with the risks inherent in the final design documents. Contract mechanisms span the spectrum from firm fixed price, using sealed-bidding, performance based contracting at a fixed price through unit-price, to time and materials contracts.

Fixed-price contracts are most appropriate for contracts where the scope is well defined. A well-defined scope provides the contractor with sufficient information to prepare a bid price with minimal risk that the ultimate cost of performance will exceed the bid price.

ADVANTAGES:

- Minimal government effort to award/administer the contract.

- Government has a firm-fixed price upon bid opening.
- Low price through full and open competition.

DISADVANTAGES:

- No opportunity for government to contractor discussions.
- The contractor may assume worst-case scenario if the scope is not clear.
- Increased risk for claims and modifications.

Performance based contracts typically differ from fixed price contracts in that they define the objective(s), or "what" needs to be done, and the contractor decides how to accomplish the objective(s). Performance based contracting at a firm fixed price are the most appropriate contracts when the project is well characterized and objectives are well defined. While the performance work statement places the risk for execution of the project on the contractor, the contractor may have to build in contingencies into its pricing if the overall project risk is not well defined. While some of that risk can be transferred through insurance, the cost/benefit should also be analyzed. Just as in all firm fixed price contracts, the risk of claims increases.

The performance based contracting method will work only on sites considered "environmental services" type projects. If the government defines the overall contract as a construction type action, the "Differing Site Conditions" clause will negate any benefit in using a performance based contract. In other words, the contractor will notify the Contracting Officer under the Differing Site Conditions clause of any latent or unknown condition and if those conditions exist, the contractor will be entitled to equitable adjustment.

ADVANTAGES:

- Government has a firm fixed price upon bid opening.
- The responsibility for execution and the majority of the risk lies with the contractor.
- The contractor has incentive to complete the project quickly and maximize profit.
- Low price through full and open competition.

DISADVANTAGES:

- The contractor may assume worst-case scenario if the scope is not clear.
- The contractor has incentive to transfer risk back to the government (by claiming poor site characterization, differing site conditions, poorly defined scope, etc.)
- Increased risk for strained/broken relationships between the government and the contractor.

Cost reimbursable contracts are most appropriate for projects with broad scope definition. Cost-reimbursement contracts relieve the contractor from cost risks associated with the poorly defined scope and/or less characterized project. The contractor receives payment for his actual cost of performing the work, plus a fee (profit) for undertaking the work. The government also has the flexibility to adjust scope and performance requirements as site conditions change.

ADVANTAGES:

- Maximum flexibility in adjusting to site changes/conditions.

- The government and the contractor are more likely to work together as a team to address problems.
- The project characterization and scope definition can be less defined.

DISADVANTAGES:

- The contract requires more aggressive government oversight.
- The contractor incurs more administrative effort to comply with collection of cost information.
- Project costs cannot be fully defined until project completion.

Time and materials contracts are contracts that reimburse the contractor for quantities at a negotiated cost. Profit is included in the negotiated cost. A subset of time and materials contracts is a unit price contract. A unit price contract transfers the cost risk of scope growth from the contractor to the government, but leaves the overall cost risk for execution of the project with the contractor.

ADVANTAGES:

- Minimal government effort to award the contract.
- Allows for a less characterized project.
- Government has a defined upper limit to the cost of the project.

DISADVANTAGES:

- As the least preferred method of contracting, the government must justify such use.
- Contractor has little incentive to control, be efficient, and to cut costs. Increased quantities mean increased profits.
- The government must provide adequate contract oversight to minimize potential abuse.
- The contractor may assume worst-case scenario in its pricing if the scope is not clear.

The designer may consider other contracting mechanisms that blend aspects of these basic contract types. On a continuum from least cost risk to the government to greatest cost risk to the government the mechanisms are:

1. Firm fixed price
2. Firm fixed price, performance based
3. Cost reimbursable, incentive fee
4. Cost reimbursable, award fee
5. Cost reimbursable, fixed fee
6. Time and Materials/Unit Price

The design document for the American Brass site, as it currently exists, is well suited for a cost reimbursable type contract. There are a number of significant unknowns associated with this project that preclude the use of any type of fixed price contract if the intent is to get best value for the government. Principle among these is that the areas identified for excavation are in some cases based on very limited numbers of sampling or only a single sample. The areas of sparse characterization were identified by review of the RI, Supplemental RI, and Data Summary Reports. Those areas should be identified in contracting documents since it is possible, if not likely, that a contractor will not take the time to review characterization documents before developing a cost.

Other unknowns include disposition of the Cedar Creek wetlands and the need for wetland restoration, evaluating the relative benefit of excavating contaminants from areas of the wetlands against the resulting habitat destruction and the potential for restoration failure, future use of the buildings and the need to remove the building or the floor slab to access contamination, and the confirmation of the applicable clean up criteria at depth in the Cedar Creek former ball mill waste pile area. Some of these issues may be quickly dealt with in the request for bid process but others require substantial revision of the design if a fixed price type of contract is to be utilized.

If the contractor is given a performance based contract to clean up to a given criteria it is quite possible they may be able to significantly reduce their excavation quantities through additional characterization and realize a substantial profit. On the other hand, the government faces risk that the contractor will invoke the differing site conditions clause if a construction contract is used or the changes clause if a service contract is used when conditions are different than originally anticipated. If a performance based contract is used, it is in both the government's and the contractor's best interest to have the project fully characterized and to fully define when the changes clause could be invoked.

VALUE ENGINEERING RECOMMENDATION # 12

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Item 46 – Include a credit for the salvage value of the structural steel removed from the site.

ORIGINAL DESIGN:

The cost estimate included with the Remedial Design does not include any credit for the potential salvage value of the structural steel frames in the existing buildings on site.

RECOMMENDED CHANGE:

Recommend that the salvage value of the steel be included in the cost estimate as a credit. Per the remedial design, all but the furnace building and the drum crusher building is to be demolished as part of the remediation. The reason is there are contaminates under the floor slabs of some of these buildings. The team did not identify any samples that were taken under the administration building. Before this or any of the buildings are destroyed, the presence of contamination should be verified. If there is no contamination, then the buildings could remain. The cost for the demo should be deleted from the estimate and the cost of the steel salvage not included.

Alternate One

Another approach, if the landowner does not want the buildings destroyed, is to remove the floor slabs, and the contaminates, without removal of the buildings. This may leave a small amount of contamination under the footings. No costs were computed for this option.

Alternate Two

Assuming there are contaminates in the soils under all slabs, some have been confirmed, and the slab acts as containment. Reach an agreement with the owner to leave contaminates in place. Costs were not computed for this alternate, but it would be the least expensive to the government.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	0	0	
RECOMMENDED DESIGN	$162,000	0	
ESTIMATED SAVINGS OR (COST)	$162,000	0	$162,000

VALUE ENGINEERING RECOMMENDATION # 12

ADVANTAGES:

- Recognizes salvage costs.
- Recycles steel.

DISADVANTAGES:

- Requires on site handling and transportation of scrap steel.

JUSTIFICATION:

The RD estimate includes a cost of $31,500 for demolition of site buildings excluding the furnace and crusher buildings. This does not include cost for concrete slab demolition. The estimate does not address disposal of the debris. An estimate of the steel in the scheduled demo results in a significant quantity of steel, 463 tons. Depending on demo efficiencies, storage time, and hauling, this amount of steel has a salvage value that should be captured.

The Remedial Design Report, page 3-1 states "• Decontamination and demolition of all of the ABI buildings, pavement, and structures. Recyclable building material such as the structural steel will be recycled." Recycling the steel was considered but cost of the salvage material is not apparent in the estimate. (No breakdown of the estimate was available).

As pointed out in other parts of this VE report, the furnace building appears to be sided and roofed with transit board that contains asbestos. Asbestos removal would be required prior to furnace building demolition, refer to Creative Idea/Recommendation 23.

Calculation Sheets, Recommendation 12

Building Dimension were scaled from a photograph, therefore, accuracy is plus or minus 20 %.

	SF	lbs/SF	Pounds of Steel
Office Bdlg	220x60=13,200		
Cafeteria	65x40 = 2600		
	15,800	12	189,600
Unnamed	60x40 = 2400		
Loading Dock	110x40= 4400		
Staging Area	100x100= 10,000		
	16,800	15	252,000
Baghouse	60x40 = 2400		
Ballmill	310x55=17,050		
	19,450	25	486,250

Tons= 463 Salvage Price $350 x 463= $161,700
Use $162,000

Calculation Sheets, Recommendation 12 - continued

Non Demo Bdlgs

Furnace	400x100=40,000		
Drum crusher	80x70 = 5,600		
	45,600	30	1,368,000

Tons= 684
Salvage Price $350x684=$239,400
Use $240,000
(Does not include transit removal)

Scrap	$425/ ton
Demo	- $ 60/ton
Transport	- $ 15/ton
Salvage Price	$350/ton

VALUE ENGINEERING RECOMMENDATION # 13

PROJECT: AMERICAN BRASS INC. SF SITE VALUE ENGINEERING STUDY

LOCATION: HENRY COUNTY, AL

STUDY DATE: 19 – 21 FEBRUARY, 2008

DESCRIPTIVE TITLE OF RECOMMENDATION:

Creative Idea 48 – Reevaluate sampling frequency for disposal from 500 yd^3 to 2000 yd^3 .

ORIGINAL DESIGN:

The design provides for the following action for offsite disposal of excavated waste:
The excavated material will be characterized by collecting and compositing representative samples for total metals analysis, TCLP metals analysis, and total PCB analysis, at a minimum frequency of 1 test per 500 cubic yards of material to be disposed.

RECOMMENDED CHANGE:
Increase the volume sampled from 500 yd^3 to a more optimal sampling volume based on what landfill will accept. (Use 2000 yd^3 for estimating purposes).

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$47,600		$47,600
RECOMMENDED DESIGN	$11,900		$11,900
ESTIMATED SAVINGS OR (COST)	$35,700		$35,700

VALUE ENGINEERING RECOMMENDATION # 13

ADVANTAGES:

- Increases productivity, compresses schedule.
- Reduces analytical costs.
- Complies with Waste Acceptance Criteria.

DISADVANTAGES:

- Lesser certainty about contaminant concentrations to soils going to disposal facility.
- If TCLP fails at landfill, more hazardous material would need to be sent to a Subtitle C landfill.
- Sampling frequency may need to be increased.

JUSTIFICATION:

The following information is relevant to the recommendation:

Excavate the soil down to appropriate depths in the entire limits of excavation, using conventional means such as bulldozers, track hoes, and loaders.

The vast majority of the excavated soil/sediment is expected to be classified as non-hazardous waste that is suitable to be disposed in a Subtitle D landfill. These non-hazardous soils are planned to be sent to a landfill similar to Springhill Regional Landfill in Graceville, FL.
The amount of non-hazardous waste to be disposed is estimated to be approximately 54,500 tons, or (at 1.6 t/ yd^3) 34,060 yd^3.

An estimated 350 cubic yards of soil containing PCBs at concentrations greater than 50 mg/kg which will be classified as TSCA-regulated waste and must be disposed at a TSCA disposal/treatment facility.
Prepare the waste manifests for each load.

The remedial design requires appropriate characterization testing of the excavated material to be performed at the necessary frequency to meet the landfill's Waste Acceptance Criteria.

<u>Analysis of impact of change</u>

In the current design, 3 samples are needed for each 500 yd^3 portion sampled: PCB; TCLP metals, and Metals. Each of these analyses cost approximately $200 each, so each portion sampled will have a cost of $600. This frequency may be reduced further, especially for PCBs which are not present throughout the site.

VALUE ENGINEERING RECOMMENDATION # 13

Analysis of impact of change - continued

A sampling frequency of 500 yd^3 for the disposed 34,060 y^3 (33,710 yd^3 nonhazardous + 350 yd^3 PCB), would result in 68 sampling events for a sampling cost of $40,800.

A revised sampling frequency of 2000 y^3 for the disposed 34,060 yd^3 would result in 17 sampling events for a reduced sampling cost of $10,200.

This change would result in a savings of $30,600.

At a labor rate of 1 hour per sample (take sample/prepare manifest) 51 hours of labor would be saved (17 samples versus 68 samples). Using a labor rate of $100/hour, a savings of $5,100 could be realized ($6800 - $1700).

The total cost savings from reduced sampling frequency and labor is $35,700.

Further time and cost savings may be realized due to reduced sampling requirements, but these potential savings are not calculated here.

This estimate is contingent upon the sampling frequency required by the Springhill Landfill.

The original design did not cost out the sampling regimen noted above.

Acceptance of this recommendation would produce a savings of over $25,000 and would reduce the construction schedule.

SECTION 4 -SUMMARY OF DESIGN COMMENTS

SUMMARY OF DESIGN COMMENTS	
CMT #	**Design Comment / Description**
6	**DETERMINE IF GROUNDWATER IS AEROBIC OR ANAEROBIC TO ASSESS MONITORED NATURAL ATTENUATION**. Assess existing groundwater data to determine if the groundwater is aerobic or anaerobic. The groundwater environment will determine the probability for success of the proposed MNA program.
7, 8	**IDENTIFY THE CONTENTS OF THE TRANSFORMER POTS MOUNTED ON THE TELEPHONE POLES AND THE TRANSFORMERS MOUNTED ON THE LARGE PAD EAST OF THE FURNACE BUILDING.** Determine if the transformers at the ABI site contain PCBs. Many older transformers contain PCB oil. If the ABI transformers contain PCBs, they must be disposed of in accordance with all appropriate local, state, and federal regulations.
19	**FOR POTENTIALLY CONTAMINATED DEEP EXCAVATION CONFIRMATION SAMPLING, ALL SAMPLES TO BE OBTAINED FROM AN EXCAVATOR BUCKET TO MINIMIZE OSHA ISSUES.** Typical excavation confirmation procedures require the samples to be obtained at the source. In order to collect the bottom and side wall samples, the sampler is required to enter the excavation. Therefore, the appropriate shoring, benching, and/or sloping will be required to meet OSHA 1926 trenching and excavation standards. The objective is to minimize any volatilization before the sample is analyzed. The contamination of concern for the American Brass Superfund site is heavy metals; therefore, volatilization is not an issue. For that reason, samples can be obtained from an excavator bucket of soil brought to the surface thus eliminating the need for anybody to enter the excavation. As a result, the Remedial Action Contractor will not be required to perform addition excavation and/or expense to met OSHA trenching and excavation requirements for worker entry.
22	**DETERMINE IF SIDING ON THE FURNACE BUILDING IS ASBESTOS CONTAINING MATERIAL (ACM).** The VE team noted that the siding and possibly the roof material on some of the ABI buildings is likely to be ACM. A sample of the building siding material from the furnace building was collected and sent to a laboratory for asbestos analysis. The analysis for the furnace building showed the sample contained asbestos. If the furnace building is demolished, additional precautions will be required. ACM must be disposed of at a facility certified to accept ACM.
25	**ASSESS SAMPLING FREQUENCY TO EVALUATE PCB CONTAMINATION CHARACTERIZATION AND REMOVAL.** 40 CFR 761 as promulgated in August 1998 and subsequently amended by EPA in June 1999 may be applicable to the planned remedial activities at ABI. The intent of

SUMMARY OF DESIGN COMMENTS	
CMT #	**Design Comment / Description**
	the new rule is to provide for less burdensome mechanisms for obtaining EPA approval for a variety of activities, to streamline procedures, and to focus on Self-Implementing requirements. Section 761.61 specifies a PCB cleanup level of less than or equal to (≤) 50 ppm for a site characterized as a low occupancy area and if the site will be secured by a fence and marked with required signs. If a low occupancy area is not secured by a fence and marked by required signs, then the specified soil cleanup level is ≤25 ppm. For high occupancy areas, the specified PCB soil cleanup level is 1 ppm for sites that will not be fenced or marked with required signs. 40 CFR 761.265 ["*Subpart N—Cleanup Site Characterization Sampling for PCB Remediation Waste in Accordance with § 761.61(a)(2)*"] describes the method of sampling on a 3-meter grid for the purpose of site characterization. 40 CFR 761.285 ["*Subpart O—Sampling to Verify Completion of Self- Implementing Cleanup and On-Site Disposal of Bulk PCB Remediation Waste and Porous Surfaces in Accordance with § 761.61(a)(6)*"] describes the method of sampling on a 1.5-meter grid for the purpose of confirming adequacy of cleanup. The EPA and Design Contractor might consider using the EPA TSCA Program sampling protocol for both site characterization and confirmation sampling. An excellent resource for consultation regarding the methods and means of site characterization and confirmation is Dr. Francis Tran of the EPA (Region 8) in Denver Colorado: < tran.francis@epa.gov > 303-312-6036 1595 Wyncoop Street, Denver CO 80202
26	**CONSIDER USING RAIL CARS TO TRANSPORT THE EXCAVATED MATERIAL TO THE DISPOSAL FACILITY.** There is a railroad track the runs through the ABI property. It is reported the EPA used the railroad to transport waste material for disposal during the emergency removal action conducted during the late 1990s. The remedial design should include the option of utilizing the railroad for transport of the excavated material.
27, 10	**COLLECT SUBGRADE SAMPLES FOR THE FURNACE BUILDING, COOLING AREA, AND OTHER OUT BUILDINGS.** During the RI and Supplemental RI, no soil samples were collected under the slabs of the furnace building, the cooling area, and several of the out buildings. The current RD assumes the soil under the slabs of several of the out buildings and pavements are contaminated and the soil under the furnace building is uncontaminated. Additional sampling under the slabs will help to better refine the limits of contamination. If coring is used to sample beneath the slabs, include sampling and analysis of the concrete to determine if the concrete slabs can be reused on site or require disposal.
28	**CONSIDER OBTAINING ADDITIONAL SAMPLES BETWEEN EXISTING CEDAR CREEK SAMPLES 39 AND 41 TO DETERMINE**

SUMMARY OF DESIGN COMMENTS	
CMT #	Design Comment / Description
	PCB LEVELS BETWEEN THE TWO EXISTING SAMPLES. Reference Figure 4 in the ROD. These samples identified PCB concentrations of 9.1 ppm and 11.0 ppm in the sediments. There is a potential that the levels between this reach is below the remediation goal of 4.3 ppm for sediments between the two points. Consider the sampling costs compared to the savings in remediation and restoration costs when doing the evaluation.
29	**EVALUATE WHAT PERIMETER AIR MONITORING REQUIREMENTS ARE APPROPRIATE AND NECESSARY.** Section 4.5 refers to PCB air monitoring. The cost estimate includes $30k/ month for air monitoring inclusive of equipment and personnel. This task needs to be reviewed in terms of resource loaded costs, i.e. can the site safety person handle the sampling or does a separate person have to be there. The need for PCB sampling should be restricted to the period of the project where TSCA PCBs are being removed. Those PCBs are currently identified as being under the ball mill building only and the site owner has expressed a desire to keep the building which would eliminate excavation of TSCA level PCB soil. For excavation activities outside of the TSCA areas it is recommended that particulate monitoring be performed at each of the residences adjacent to the site. It may be necessary to develop a dispersion model based on average (max?) concentrations of site contaminants to develop action trigger levels based on particulate loading determined at the residence particulate monitors. It is expected that maintaining dust control sufficient to eliminate nuisance dust will eliminate contaminant risks to the workers given how close the pre-excavation site conditions are to industrial standards. That reasoning may also apply to the residences, though the dispersion model will provide an additional comfort level for the occupants of those residences.
30	**RE-EVALUATE EXISTING SCOPE FOR WETLAND RESTORATION TO ENSURE THAT THE RESTORATION IS LIMITED TO REMEDIATION INCURRED DAMAGE.** ***NOTE:*** *The current site owners have indicated they have been speaking with Mobile District Corps of Engineers about removal of the Cedar Creek Wetlands for the purpose of sod farming and have received preliminary indications that this may be acceptable. If the owners proceed with wetland removal it will eliminate the need for restoration and will simplify excavation since less care will need to be taken to avoid damaging wetland areas outside the immediate excavation.* Wetland restoration primarily focused on the Cedar Creek wetland and should include basic coverage of other wetland areas that may be impacted by sediment excavation as well. The wetland restoration design phases include a task for improving surrounding forest areas, repair of eroded areas, and removal of invasive species. While commendable in terms of overall wetland restoration, the requirement for restoration under this project would be limited to repairing

SUMMARY OF DESIGN COMMENTS	
CMT #	**Design Comment / Description**
	damage resulting from the remediation effort. Restoration of forested habitat would be appropriate if limited to individual plantings within the excavated wooded wetland areas where contaminated sediment removal has taken place. Per the wetland restoration plan included as appendix D of the design document, Phases I and II appear to be related to removal actions. Phase III improvement of surrounding forest habitat, Phase IV improvement of riparian habitat (if outside the area of excavation), Phase V establishment of wetland swales, and Phase VI restoration of forest habitat, all appear to be related to improvement of the quality of the existing wetlands which would preclude those tasks from the scope of work.
31	**DETERMINE WHAT THE APPROPRIATE VEGETATION COVER IS FOR THE NON-WETLAND AREAS.** Determine the most appropriate species of vegetation needed to restore the excavations in the non-wetland areas particularly surrounding the former facility. The restoration plan should consider the reuse of the facility property soil properties, and the survivability and maintenance of any vegetation planted.
32	**COORDINATE THE NEEDS OF THE SITE OWNER WITH REGARD TO SITE RESTORATION AS APPROPRIATE.** This can be done at a minimal cost resulting in potential savings to the government and enhanced value for the stakeholders
33	**DURING WETLAND RESTORATION COLLECT PLUGS FROM ADJACENT AREAS FOR RE-VEGETATION.** While backfill is being placed in the wetland area relatively large plugs of plants should be collected at intervals from the adjacent intact wetlands. These larger plugs include hydric soils and an established root mass that generally ensure a better survival rate than individually planted plants with relatively wide planting spacing. The plugs also provide some channel roughness to slow flows and reduce erosion to prevent scour of individual plants which should be placed in intervening areas. Plugs can be collected with shovels or larger plugs can be collected with backhoe or mini-excavator buckets. Areas where plugs are collected can be backfilled with soil or left to silt in depending on size. Note: If Cedar Creek wetland removal is perused by the site owners it would be possible to generate some replacement wetland areas in the former ball mill waste pile area by minimizing backfilling to keep that area low and planting the area with large plugs salvaged from the areas of the wetland which are to be removed. This would save on revegetation costs and the added roughness from the plugs placed at the base of the slope would be good erosion protection.
34	**OBTAIN ACCESS AND RIGHT OF ENTRY TO BATO POND, IF ADDITIONAL RA ACTIVITIES ARE PURSUED THERE.** See recommendation number 2 concerning its recommendation to not pursue RA at Bato Pond.
35	**ESTABLISH SEPARATE DECONTAMINATION STATIONS AND**

SUMMARY OF DESIGN COMMENTS	
CMT #	**Design Comment / Description**
	LOAD OUT AREAS FOR THE CEDAR CREEK AREA AND THE MAIN FACILITY AREA TO KEEP THE DIRT ROADS FREE FROM CONTAMINATION. Remediation equipment will be required to use public roads to access the Cedar Creek area from the main facility area. Decontamination and load out areas should be established within each area to ensure that contamination does not get transported to offsite areas.
38	**DECONTAMINATE EQUIPMENT IN THE FURNACE/BALL MILL BUILDINGS PRIOR TO RECYCLING/REMOVAL.** Decontamination of building surfaces was accomplished during the removal actions completed for the site, however after a cursory inspection, it appears much of that equipment, especially in the ball mill, building was abandoned and will likely require decontamination prior to its removal, and recycling.
40	**EVALUATE THE NEED TO DECONTAMINATE BUILDING SURFACES.** The potential exists that wind blown dust has recontaminated buildings and equipment since EPA decontaminated those surfaces during the first removal action. The likelihood these surfaces presents a risk is small. Verify the current level of contamination does not present an unacceptable risk, particularly in those buildings that are not demolished.
41	**EVALUATE THE NEED FOR AN ACM ABATEMENT VS GENERAL CONTRACTOR FOR SPILL RESPONSE OF ACM FRAGMENTS IN SOIL.** During the site walk it was noted that pieces of broken transite were present on the ground surface. The contractor needs to review state regulations related to spill response of non-friable ACM in soil to determine if it is required that asbestos abatement contractors are required for the spill response effort. It is possible, given the non-friable nature of the material, that the general contractor may be able to properly bag and ship the material to an appropriate landfill facility. However, basic asbestos training may be required for general contractor workers which could add enough cost to drive the removal to the abatement contractor.
42	**ENSURE THAT SPECIFICATIONS FOR WETLAND BACKFILL ACCOMMODATE LOW PERMEABILITY BASE AND SYNTHETIC HYDRIC SOILS.** Section 4.4.2 addresses the need to backfill the wetland area with like materials by reference to specification 8. That specification was not included for review. Not knowing what is in that specification, ensure that there is a requirement for a hydric soil equivalent with high organics and low compaction. There also must be significant attention paid to forming a low permeability basal layer so the restored excavation cut does not act as a drain between the wetlands and the underlying sandy units. This need for attention to be paid to those soil types is also presented in the wetland remediation design. However, a third party plan is typically not included as a contract document.
43	**MAKE SURE THAT CERTIFIED FILL IS USED FOR BACKFILL.** The specification should require that any backfill used at the site is analyzed for TAL metals and TCL organics to verify that the material is free of

SUMMARY OF DESIGN COMMENTS	
CMT #	**Design Comment / Description**
	contamination, coordinate with the ADEM for applicable state requirements.
44	**DETERMINE AN APPROPRIATE USE FOR THE GAC IN THE CRUSHER BUILDING.** This GAC is thought to have been left behind by the EPA during its earlier removal activities. It has potential value if it can be reused or sold and the government credited accordingly. Recommend the EPA RPM coordinate with the site owner or try to find another user. If that is unsuccessful, the GAC can be incorporated as a soil amendment.
45	**REFINE AND EXPAND CURRENT DESIGN/GOVERNMENT ESTIMATE.** As presented in the design the current design estimate in the amount of $5.75 mil exists as a series of unsupported line items. This level of estimate is insufficient to serve as either a valid government estimate or as a basis for contractor proposal evaluation. The estimate should be supported by a resource loaded schedule so the ratio of management effort to work effort, process efficiency, mob-demob costs, etc. can be evaluated. Markups should be separated from indirect and direct costs to ensure all reasonable markups are captured. Prime contractor management costs and markups must also be included separately for the same reason. On other projects where mark ups were missed estimate revisions showed significant cost increases associated with markups which may have had impact on funding sources.

APPENDICES

The appendices in this report contain backup information supporting the body of the report, and the mechanics of the workshop. The following appendices are included.

CONTENTS

APPENDIX A
STUDY PARTICIPANTS

Study Participants / Attendees						
American Brass, Inc. Superfund Site February 19-21, 2008						
Name	**Firm/Agency**	**Role in Study**	**Phone**	**Feb 19**	**Feb 20**	**Feb 21**
Ken True	Contractor, kentrue@maladon.com	VE Team Facilitator	402-339-1936, 402-516-2635 cell	Yes	Yes	Yes
Curtis Payton	US Army Corps of Engineers, curtis.payton@usace.army.mil	Geologist Environmental /Geotech.	916-557-7431, 916-346-5613 cell	Yes	Yes	Yes
John Hartley	US Army Corps of Engineers, John.R.Hartley@usace.army.mil	VE Team Member	402-293-2523	Yes	Yes	Yes
James M. Harbert	US Army Corps of Engineers, Jim.Harbert@usace.army.mil	VE Team Member	570-895-7052, 570-840-2929 cell	Yes	Yes	Yes
Lindsey Lien	US Army Corps of Engineers, lindsey.k.lien@usace.army.mil	VE Team Member	402-697-2580	Yes	Yes	Yes
Tim Turner	Black & Veatch, turner@bv.com	Project Manager	770-521-8125, 404-401-1618 cell	Yes	Yes	Yes
Kirby Biggs	USEPA/OSWER/OSRTI/TIFSD/TIIB	Observer/Participant From EPA HQ	703-299-3438, 703-946-1467 cell	Yes	Yes	Yes
Brian Farrier	EPA Region 4, farrier.brian@epa.gov	EPA RPM		Yes	Yes	Yes
Benny Nowell	Land Owner	Land Owner	334-983-3888, 334-726-1288	No	PM	PM
Tom Birks	Alabama Department of Environmental Management, Engineering Services Section, wtb@adem.state.al.us	Observer	334-271-7967	Site Visit	No	Exit Brief
Ronny Nowell	Land Owner	Land Owner	334-983-3888, 334-726-1429 cell	No	No	Exit Brief

APPENDIX B
CREATIVE IDEAS LIST

List of CREATIVE IDEAS American Brass Inc., SF Site		
Idea Category: R-Recommendation D-Design Comment E-Eliminated		
ID #	**Name of Idea / description**	**Value Potential**
1	Combine Soil Removal/Wetlands RA into concurrent projects to compress schedule	R
2	Reconsider excavation at wetland areas vs. destruction of existing wetlands with concentrations only slightly above RA goals	R
3	Take statistical samples to verify the need to remediate areas	Combine w/4
4	Take statistical samples to verify the success of the remediation	R
5	Do preconstruction sampling concurrently with remedial action activities (onsite chemist and lab)	R combine w/3&4
6	ID if gw is aerobic or anaerobic to assess MNA	D
7	ID contents of transformer pots at site	D
8	ID contents of large pad mounted transformer east of furnace bldg	D
9	Need a large amount of topsoil, allow manufacture of topsoil as an option	R
10	Recycle concrete (crush) and use on site	R
11	Recycle rebar	Combine w/10
12	Evaluate application of Eco criteria only to areas where contamination impacts Eco areas	R w/14
13	Redesign recharge area at Cedar Creek entry channel to limit erosion to wetlands (flatten the grade, possible recharge pond)	R Combine w/18
14	Take top layer of soil in Cedar Creek headland (clean) and use for deep backfill	R w/12
15	Deep excavation-several feet below gw table- only go to the groundwater	R
16	Identify and compare concentrations of soil and gw (shallow well) to determine source of boron – soil contaminating gw or gw contaminating soil	R Combine w/15
17	Chemically stabilize shallow soils to allow RCRA D disposal in lieu of RCRA C	E
18	Revise grading to reduce BF requirements for wetland and incorporate a wetland pond/ponds	R w/13
19	Deep excavations - sample from bucket to avoid OSHA issues	D

ID #	Name of Idea / description	Value Potential
20	Reevaluate boron as an emerging essential nutrient – may require change in ROD – reassess risk	R
21	Regrade site to minimize need for backfill and runoff to the wetland area (on building site area)	R w/12&14
22	Determine if siding on furnace bldg is ACM	D
23	Explore how discovery of ACM will effect future remedial activities for the site	R
24	Evaluate differing RA contracting mechanisms	R
25	Evaluate sampling frequency to evaluate PCB contamination characterization and removal	D
26	Consider the use of adjacent railroad track for transport	D
27	Provide additional subgrade samples for furnace building, cooling area, other out buildings	D
28	Increase sample density in reach between existing samples 39 and 41 (cedar creek)	D
29	Evaluate what perimeter air monitoring requirements are appropriate/necessary	D
30	Reevaluate existing scope for wetland restoration to ensure the restoration is limited to remediation incurred damage	D
31	Non wetland areas, what is the appropriate vegetative cover	D
32	Coordinate needs of owner with site restoration as appropriate	D
33	During wetland excavation use plugs collected from adjacent areas for revegetation	D
34	Obtain right of entry for Bato pond if sampling/RA is needed	D
35	Establish separate decon areas and load out at Cedar Creek and in main facility area (keep dirt roads clean)	D
36	Build on-site TSCA disposal cell	E
37	Dispose of ACM at an on site disposal cell if owner wants	E
38	Decon on site equipment in the furnace/ball mill building	D
39	Analyze concrete cores to assess proper disposal/reuse	D combine w/10&11
40	Evaluate the need to decon building surfaces	D
41	Evaluate the need for an ACM abatement vs. general contractor for ACM in top foot of soil	D
42	Make sure specs for wetland backfill accommodate low permeability base and synthetic hydric soils	D

ID #	Name of Idea / description	Value Potential
43	Make sure certified clean fill is provided	D
44	Recycle GAC in crusher building if it is Gov property Determine if GAC is bioavailable when mixed w/soil	D
45	Expand the detail in the current GE for RD	D
46	Include a credit for recycled steel in the RA	R
47	In bid package, notify contractor that polygonal dimensions would meet design criteria for sampling/construction clarity, increase scale of design drawings	R Combine w/3&4
48	Reevaluate sampling frequency from 500 cy to 2000 cy+	R

APPENDIX C
Function Model Table

American Brass Inc., Function Model

Item	Aspects of Item	Function
Transportation	Haul Soil/Debris	Remove Contaminants
Excavation	Ecosystem Human Health Water 0-1 feet 1-10 feet 10-GW GW to max depth	Remove Contaminants
Disposal	TSCA, RCRA C/D EPA Facility Approval Waste Acceptance Criteria	Isolate Waste
Confirmation Sampling	Field Screen Fixed Lab Test Frequency	Verify Removal
Decontamination	Equipment Decon Floor Slab Decon Bldg Surfaces Decon	Facilitate Recycling/Reuse Minimize exposure
Asbestos Abatement	Sales Agreement Need/(non-need) for Removal? Broken Asbestos adjacent to building	Facilitate Recycling/Reuse Minimize exposure
Slab/Foundation Removal	Recycle Sampling On Site Reuse	Facilitate Recycling/Reuse Minimize exposure
Building Demolition	Subgrade Access	Access Contamination
Dust	Respirable Contaminants	
Backfill	Restore Grade Wetlands (Low Perm Base and Syth Hydric Soils) Approve Borrow Source	Support Wetlands
Top Soil/Grade/Seed/Mulch	Provide Vegetation/drainage	Prevent Erosion
Wetland Restoration	Establish habitat Establish hydrology Wetland before channels	Mitigate Destruction
RD Site Characterization	Wetland Sub Slab Eco vs. HH vs. Water Excavation Limits	Define Quantities Refine/Optimize Quantities
Monitoring Natural Attenuation at the Site	New Well Placement Sampling and Analysis	Obtain Data… Assessment NA Monitor Plume 4D
Contracting Strategy	Distribute Risk RFP State Plan Objectives and Milestones	
Transformers	Contain PCBs	Remove Contaminants
Blue Tanks	ID Function/Contents	Determine Fate
Well Head	PCBs In Pump Motors Abandon or Protect	Determine Presence of PCBs

APPENDIX D
PHOTOGRAPHS

Entrance to site, looking south. Note water tanks on far right, west, of photo.

Looking south from entrance. Office Building on left, Bag House in distance.

At site entrance, looking NE

Interior of Office Building.

Interior of Office Building.

Looking south from entrance. Cafeteria building foreground, Furnace Building background.

Looking west from approximately in front of the Cafeteria. Note two houses in background (off property)

Bag House.

Bag House and Furnace Buildings.

Corrugated siding on the Furnace Building may contain asbestos.

All electrical wiring has been removed.

Underside of roof deck in the Furnace Building.

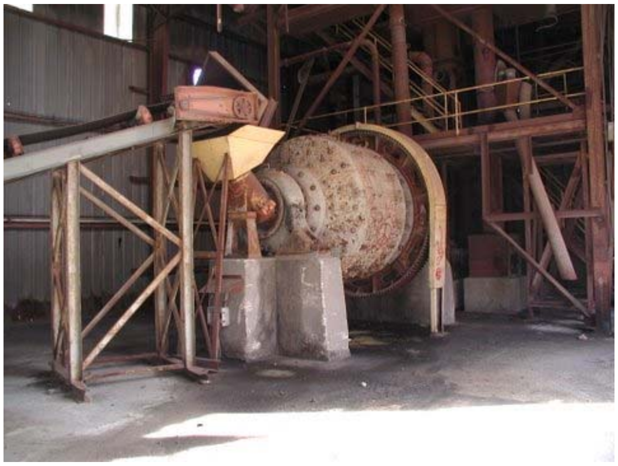
Equipment in the Furnace Building.

Equipment in the Furnace Building.

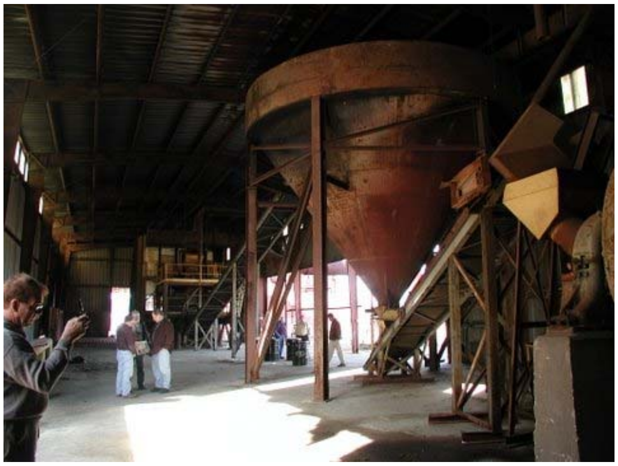
Tree line near railroad.

Ball Mill Residue Building.

Loading dock at the south end of the Furnace Building



Ball Mill.



Equipment in the Ball Mill Building.

Bag House, looking generally north.

Looking east from the back of the Ball Mill Residue Building.

Looking west at site from Arnold Faulkner Road.

Looking generally southwest from the railroad down Cedar Creek.

Looking east from Arnold Faulkner Road up Dunham Creek, (Bato).

APPENDIX E
ACRONYMS LIST

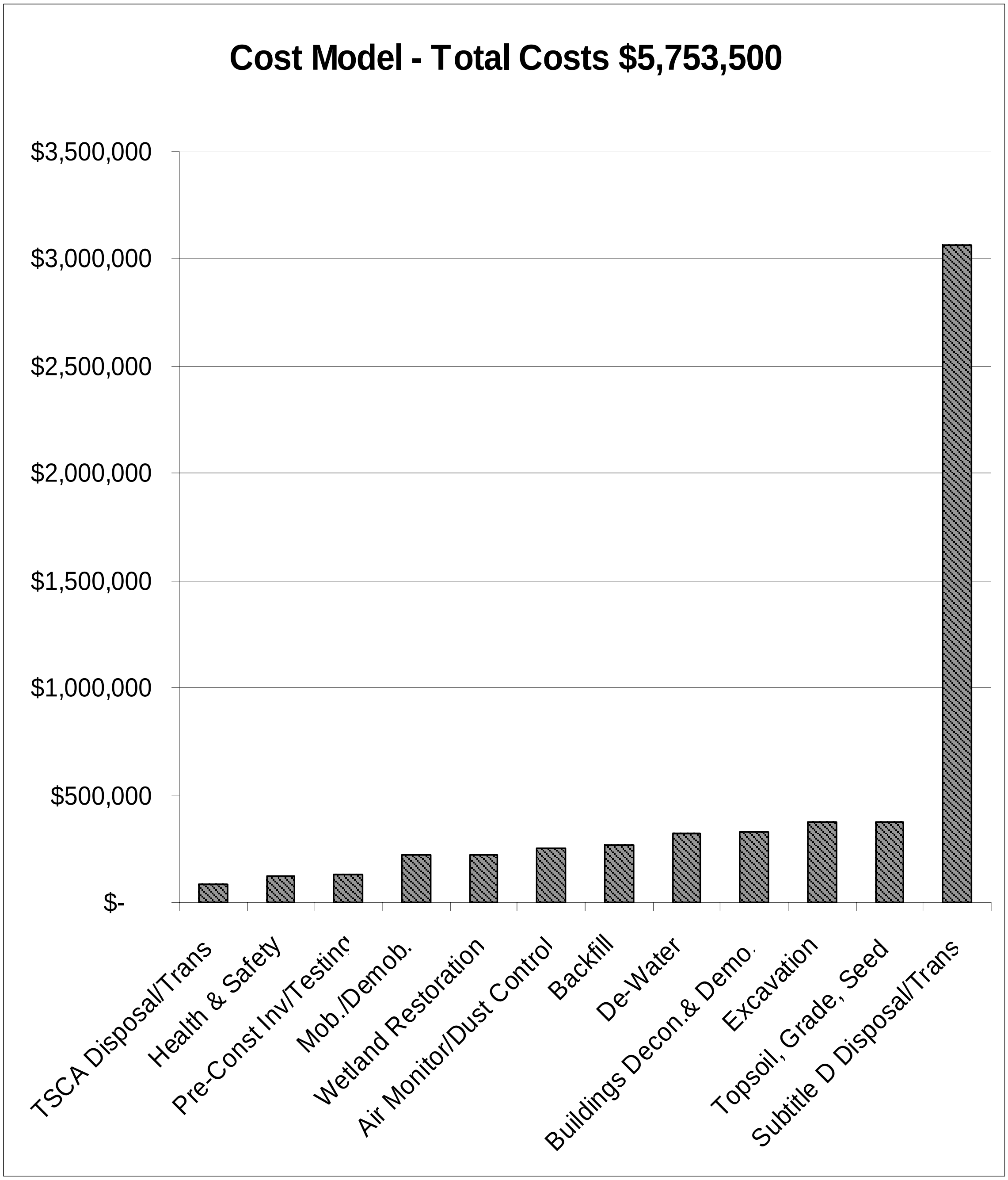
Acronyms List

°F	degrees Fahrenheit
µg / L	micrograms per liter
ABI	American Brass, Incorporated
ADEM	Alabama Department of Environmental Management
amsl	above mean sea level
ACM	asbestos containing material
ARARs	applicable or relevant and appropriate requirements
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
CAH	chlorinated aliphatic hydrocarbons
CCE	Certified Cost Engineer
CCV	Continuing calibration verification
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
cis-DCE	cis-1,2, dichloroethene
CLP	Contract Laboratory Program
cm/ day	centimeters per day
cm/ sec	centimeter per second
COC	contaminant of concern also chemicals of concern
COPC	chemicals of potential concern
CPT	cone penetrometer technology
CVS	Certified Value Specialist
CWA	Clean Water Act
CX	center of expertise
DNAPL	dens non-aqueous phase liquid
DO	dissolved oxygen
DOE	U.S. Department of Energy
DPE	dual phase extraction
DPT	direct push technology
DQOs	data quality objectives
DW	domestic well
EAB	enhanced anaerobic bioremediation
ECD	electron capture detector
Eh	reduction/ oxidation potential
EMCX	Environmental and Munitions Center of Expertise
EPA	U.S. Environmental Protection Agency
FFS	focused feasibility study
FS	feasibility study
ft	feet
ft/ day	feet per day
ft^3	cubic feet
FWQC	Federal Water Quality Criteria
GAC	granulated activated carbon
gpm	gallons per minute
GPS	global positioning system
GRA	general response action
HTRW	Hazardous, Toxic and Radioactive Waste
in	inches

K	hydraulic conductivity
L	lower aquifer zone
LGAC	liquid granulated activated carbon
LTTD	Low Temperature Thermal Desorption
M	middle aquifer zone
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
mg/ L	milligrams per liter
MIP	membrane interface probe
mL	milliliter
mm / yr	millimeters per year
MTBE	methyl tert-butyl ether
MW	monitoring well
NAPL	non-aqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	operation and maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
PA	preliminary assessment
PAC	powdered activated carbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PE	Professional Engineer
POTW	publicly owned treatment works
PP	proposed plan
ppb	parts per billion
PRB	permeable reactive barrier
PRG	Preliminary Remediation Goals
PRP	potentially responsible party
PVC	polyvinyl chloride
RA	remedial action
RAO	remedial action objectives
RAL	Remedial Action Level
RCRA	Resources Conservation and Recovery Act
RD	remedial design
RG	Remediation Goals
RI	remedial investigation
ROD	record of decision
RPM	remedial program manager
SAP	sampling and analysis plan
SARA	Superfund Amendments and Reauthorization Act of 1986
scfm	standard cubic feet per minute
SDWA	Safe Drinking Water Act
SPME	solid phase micro extraction
SVE	soil vapor extraction
TBC	to be considered
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure

TMDL	total maximum daily load
UCL	Upper Confidence Limit
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
UV	ultraviolet
VC	vinyl chloride
VE	Value Engineering
VGAC	vapor granulated activated carbon
VOC	volatile organic compound
WBZ	water bearing zone

APPENDIX F
COST MODEL CHART and TABLE



Cost Model Chart Values on following page

Cost Model Table of Chart Values

Cost Model			
Category		Cost $	Cost %
Subtitle D Disposal/Trans	$	3,062,200	53.22%
Topsoil, Grade, Seed	$	375,900	6.53%
Excavation	$	370,800	6.44%
Buildings Decon.& Demo.	$	330,300	5.74%
De-Water	$	317,800	5.52%
Backfill	$	264,900	4.60%
Air Monitor/Dust Control	$	250,000	4.35%
Wetland Restoration	$	225,000	3.91%
Mob./Demob.	$	218,800	3.80%
Pre-Const Inv/Testing	$	127,500	2.22%
Health & Safety	$	125,000	2.17%
TSCA Disposal/Trans	$	85,300	1.48%
Total	$	5,753,500	100.0%

APPENDIX G
TEAM LEADER AND USACE RESUMES

Kenneth L. True, P.E., CVS.
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Home: 402-339-1936
E-mail kentrue@maladon.com

Summary

Seven years working as an independent Value Engineering (VE) consultant and working part time for URS Corporation as a VE specialist. Thirty-one years with the Corps of Engineers (CE). Retired as the Northwest Division Value Engineer, coordinator for Division's Architect /Engineer selection process, and team leader for Engineering Divisions Engineering Quality Management System. Other CE work included cost engineering, Division construction quality control management team leader, District construction supervision and inspection, Engineering Division project management, District Value Engineer and nine years of construction field experience.

Major Accomplishments

- Participated in numerous CE VE studies in various roles.
- Achieved Certified Value Specialist Certificate from the nationally accredited program maintained by the Society of American Value Engineers, International.
- Successfully lead more than fifty VE studies.
- Leading role in the CE Value Engineering Advisory Committee.
- Prepared and presented a special one-day VE workshop for EPA regional office personnel. Delivered this presentation to the majority of the regional offices. This workshop highlighted some of the very successful Value Engineering applications performed on superfund sites.
- Taught in the CE PROSPECT program for fifteen years. Subjects included roofing, construction quality management, soils and masonry.
- Member of America Society of Civil Engineers, Society of American Value Engineers, and past member of American Society of Military Engineers.
- Active in many local community organizations.

Education

BS in Civil Engineering, University of Nebraska at Omaha
Mod I, VE workshop, Mod II, VE workshop
SAVE International yearly conferences and workshops
Numerous CE 40 hour workshops including HTRW overview program

Registrations

Professional Engineer, State of Colorado
Certified Value Specialist, SAVE International

R. Curtis Payton, II
(916) 557-7431
(916) 346-5613
curtis.payton@usace.army.mil

Summary

Registered geologist with over 20 years experience in environmental, geotechnical and seismic investigations. Prepares work plans, scopes of work, PA reports, SI reports, RI reports, cost estimates, proposals, design documents and public presentations for both government and private sector projects. Has directed multi-rig drilling efforts, performed trenching, borehole logging (including downhole), sampling (all media), aquifer testing, installation and development of water production and monitoring wells, groundwater modeling and contaminant fate and transport studies. He is an expert in the field of trench logging for both fault and forensic environmental investigations. Project Manager or Team Lead of several base wide environmental programs and brings experience in managing multiple contractor teams and Corps staff toward the goal of site closure and NPL delisting.

Major Accomplishments

- Coauthored, prepared and presented installation work plans and budgets to DA personnel in Maryland for BRAC & IRP installations.
- Implemented forensic environmental investigations to determine responsible parties along a petroleum pipe line corridor involving 4 pipelines and 5 RPs.
- Audited contractor efforts in the construction of UV-ox waste water treatment plant, 100-foot deep hydropunch operations, cleanup of pesticide contaminated infrastructure for a carnation farm, landfill grading, .
- Managed and completed performance of 21 Preliminary Assessments in 30 days to meet customer deadline.
- Created standard internal government estimate format used by more than 20% of current Sacramento Project Management Staff in the HTRW PPMD group.
- Completed mathematical analysis of two different risk assessment methodologies to identify which was more conservative depending on the types of analytes assessed.
- Liaison between multiple contractors toward a common goal of site closure for Army RCRA and CERCLA sites.
- Fault investigations at every major fault system. Identified (within 100 feet) the location of the northern split of the Tule Pond Splay on the Hayward fault.
- Earthquake assessments of residential and commercial structures for damage to foundations and structural walls. Currently a member of the USACE Structural Safety Assessment Team ready to deploy in the event of a major earthquake.
- Installed over 100 wells in a wide variety of depositional environments.
- Current member of USACE Center of Expertise Value Engineering Team for EPA Superfund Program.

Education

B.S. Earth Sciences (Geology) at the University of California at Santa Cruz

Ctr. for Army Leadership LEAD Class – Reno, NV

USACE Leadership Development Program II

Registrations

California State Registered Professional Geologist No. 5608

California Registered Environmental Assessor I No. 1930

John R. Hartley
Omaha NE. 68124
Work 402-293-2523
John.R.Hartley@USACE.ARMY.MIL

Summary

Fifteen years of providing technical support and project management with the US Army Corps of Engineers. Experience includes contaminated site characterization and remediation, geotechnical sampling, geotechnical design, drainage design and erosion control, and environment restoration including disturbed lands, wetlands and streams. Experience in writing investigation and removal action work plans, design documents and investigation reports. Knowledge of RCRA, CERCLA, SARA, TSCA, and Clean Water Act to ensure projects are designed and executed with full regulatory compliance.

- Project Manager with responsibility for business development, project scoping, estimating, design review and acceptance, contract negotiation and management. Identify the most efficient contract mechanism for the project and prepare project acceptance documentation. Coordinate with customer, contractors, regulatory agencies, regional Corps of Engineers districts and private concerns to preclude conflict of interests or jurisdictional disputes and to maintain effective public relations.
- Field Construction Manager with responsibility for review and approval of work plans and design packages. Provide technical assistance to ensure the most efficient method of implementing site remediation. Provide constructability and value engineering reviews of plans. In coordination with the contractor modify conceptual design and execution plan in the field as needed during execution of design-build projects to accommodate changing site conditions.

Major Accomplishments

- Project and Field Management of disturbed land projects for U.S. Park Service including estuary restoration.
- Performed contaminated wetland characterization and remediation, and landfill capping, at several sites for USFWS.
- Project Manager and geologist at Pemaco Superfund Site, CA. Investigation Utilized extensive direct push sampling and real time analysis, including the use of a membrane interface probe, to continuously log solvent contamination in the soil.
- Project and Field Manager for design and construction of on-site repositories for mine waste site. Perform the regulatory review and design justification..
- Project and Field Manager for design and construction at two large FEMA group home two sites in support hurricane relief efforts.
- Project Manager for in-house design of Rocky Mountain Arsenal Hazardous Waste Landfill. Developed a soil/water contaminant partitioning model to estimate leachate generated in RMA landfill for use in material testing.
- Project Manager for Rocky Mountain Arsenal Basin F and Submerged Quench Incinerator closure.
- Performed 2-d modeling in support of pump-and-treat, bioremediation, and soil-vapor-extraction remedial designs.

Education

Ph.D. Candidate in Geochemistry at University Of Texas at Austin
M.S. in Geology at University Of New Orleans
B.S. in Geology at University Of Nebraska at Omaha

James M. Harbert
U.S. Army Corps of Engineers, Baltimore District
Northeast Resident Office
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Jim.Harbert@usace.army.mil

Summary

As Team Leader for the Hazardous, Environmental, and Toxic Waste section of a Resident Office, I manage a team of Project Engineers and Construction Representatives responsible for the administration of Superfund and other environmental cleanup projects throughout Eastern Pennsylvania. I analyze future workloads and prepare budgets to assure my team is properly manpowered to meet future needs. I direct the review and analysis of administrative and technical contractor submittals, technical problem resolution, modification analysis and scope of work development, and contract progress evaluation. I review and interpret the requirements of plans and specifications for subordinate personnel direct surveillance of construction contracts and maintain liaison with participants in discussion with regulatory and customer agencies. The environmental field has required my team to be proficient in innovative technologies, nonstandard contractual mechanisms and to be attentive to public relationship concerns associated with high profile projects. (Supervisor's Name: James P. Moore. Phone 570-895-7052.)

Temporary assignments: I was the Resident Engineer and Contracting Officer Representative for the Northeastern Resident Office three times over the past 10 years. I exercised delegated responsibility for contract enforcement. Required skills included engineering, contract administration, construction inspection, office administration, personnel management, safety management and various government regulations, policies, and procedures applicable to the work. Types of projects included construction and rehabilitation of a wide variety of specialized and conventional structures and facilities with a focus on environmental cleanup, military construction, family housing renovation, and civil works such as the Wyoming Valley Levee raising project. (Supervisor's Name: Denis duBreuil. Phone 717-770-7312.)

Major Accomplishments

Lackawanna Refuse Superfund: The work involved the remediation of a hazardous waste landfill including a multilayer geosynthetic cap system, waste excavation/relocation, buried drum removal/disposal and a leachate collection system. All drums (8,000) and highly contaminated solid waste (40,000 cubic yards) disposed off-site.

Moyer Landfill Superfund: The work consists of the remediation of a 65 acres hazardous waste landfill including a multilayer geosynthetic cap system, waste excavation/ relocation, and a leachate collection.

Austin Avenue Radiation Superfund: This project consists of the reconstruction and/or remediation of twenty-one properties contaminated with radioactive materials that were located in five municipalities in Delaware County, PA. The warehouse property required excavation of radioactive contaminated soil up to 20 feet deep.

Strasburg Landfill Superfund: The work consists of the remediation of a that includes a multilayer cap over a hazardous waste landfill approximately 32 acres in area, waste excavation and relocation, leachate collection and treatment system, and a gas control and flare treatment system.

Havertown Superfund: This project involved a groundwater treatment plant construction under a design-build/cost-plus-fixed fee contract. The wastes were primarily oil contaminated with pentachlorophenol (PCP).

Education

BS, Civil Engineering, The Pennsylvania State University, University Park, PA

Registrations

Commonwealth of Pennsylvania Department of Bureau of Professional and Occupational Affairs, Professional Engineer

Timothy R. Turner, P.E.
Project Manager, Black & Veatch Special Programs Corporation
Phone: 770-521-8125
E-mail: turnertr@bv.com

Summary

Mr. Turner has over 22 years of experience as a civil engineer specializing in environmental and geotechnical engineering. Work experience includes project management of several U.S. Environmental Protection Agency (EPA) Region 4 Superfund projects including: remedial investigation/feasibility study (RI/FS), remedial design (RD) and remedial action (RA). Work experience also includes construction management, media sampling, subsurface exploration, and groundwater monitoring well installation. He also has experience with the Resource Conservation and Recovery Act (RCRA) regulations and permitting including the preparation of RCRA Part B permit applications.

Major Accomplishments

- Project Manager on several EPA Superfund Remedial Action projects including the Escambia Wood Treating Company site in Pensacola, Florida and the Whitehouse Waste Oil Pits site in Jacksonville, Florida.

- Conducted numerous Remedial Investigation/Feasibility Studies (RI/FSs) at EPA Superfund sites including the American Creosote Works site in Louisville, Mississippi and the Raleigh Street Dump Site in Tampa, Florida.

- Developed RCRA Part B permits for the Westinghouse Savannah River Site in Aiken, South Carolina.

Education

B.S. Civil Engineering, The University of Akron, 1985

Professional Registration

Professional Engineer Georgia, 1998; South Carolina, 1991

Professional Associations

Diplomat - American Academy of Environmental Engineers

Lindsey K. Lien
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Summary

Working knowledge of and practical experience with design and start-up of process equipment used in treatment systems. Provides technical assistance on granular activated carbon, advanced oxidation technologies, soil washing, solids handling and other soil and water treatment technologies. Writes technical guidance and design specifications for HTRW unit processes. Registered Professional Engineer NE-5616, July 1983 to present

Major Accomplishments

- National coordinator for a HQ-EPA/HQ-USACE initiative to develop an implementation plan for application of the Value Engineering (VE) process nationally. The initiative involves developing a VE protocol concurrently with a pilot program for performing up to 10 VE Studies at fund lead sites.

- Served as the HTRW-CX team leader for a variety of technical evaluations and resulting reports such as independent remedy assessments and Five Year Reviews with HTRW-CX staff in addition to authoring portions of those reports. One of those five year reviews was presented a national award for the Brown and Bryant Site by the USEPA as "The Outstanding Five Year Review of 2006", 2000 to present.

- Provided technical oversight during model development for the RACER budgeting cost estimating computer program used by Department of Defense agencies, and other private, local, state, and federal agencies, 1996-Present.

- Vineland Chemical Company, OU-2 Soils remedial action team member since initiation of remedial action – construction phase at the site. Activities included evaluation of requests for proposal, participation in the process design formulation, pilot studies, design and facility construction and ongoing operations, 2000 – present.

- Defense Depot Ogden, OU-4 start up and prove out of an innovative peroxide/ozone groundwater treatment plant treating vinyl chloride and chlorinated solvents, 1998.

- Maywood Formerly Used Site Remedial Action Program (FUSRAP). Full scale pilot plant study for segregating radioactive soils from clean soils using innovative soil sorting technologies, 1998-2000.

- Participated in numerous Remediation System Evaluations (RSE's) including Ellsworth AFB, SD, Oconomowoc, WI, Silresm, MA, Higgins Farm, NJ, Peerless Plating, WI, Hanford, WA as well as numerous others, 2000 to present.

Education

B.S. Civil Engineering, South Dakota State University, 1978
M.S. Civil/Environmental Engineering, University of Nebraska, 1985

Affiliations

Registered Professional Engineer, Nebraska E-5616, 1983
Gulf Coast Hazardous Substance Research Center, Technology Transfer Committee 1999-present

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U.S. Environmental Protection Agency
Office of Superfund Remediation and Technology Innovation
1200 Pennsylvania Ave. NW (5203P)
Washington, DC 20460
703-299-3438 (v)
biggs.kirby@epa.gov

Professional Experience

2007-present – U.S. EPA/Office of Superfund Remediation and Technology Innovation/Technology Innovation and Field Services Division/Technology Innovation and Information Branch
2004-2007 – U.S. EPA/Office of Superfund Remediation and Technology Innovation/Assessment and Remediation Division/State, Tribe, and Site Identification Branch
1990-2003 – U.S. EPA/Office of Emergency and Remedial Response/State, Tribal, and Site Identification Center
1983-1989 – U.S. EPA/Hazardous Site Control Division/Director's Staff
1982-1983 – U.S. EPA/Office of Emergency and Remedial Response/Office of Assistant Administrator/Strategic Planning & Budget Staff
1981-1982 – U.S. EPA/Office of Hazardous Waste Enforcement/Office of Waste Programs Enforcement
1980-1981 – U.S. EPA/Hazardous Waste Enforcement Task Force
1979-1980 – U.S. EPA/Office of Administration/Management and Organization Division
1978-1979 – L. Miranda and Associates/Consultant to U.S. EPA Office of Toxic Substances
1975-1978 – Merck & Company–Baltimore Aircoil/Accounts Representative
1972-1975 – General Electric Credit Corporation/Credit and Collections Manager

Education

1999 – Masters Public Policy/University of Maryland/specialization: Environmental Policy
1972 – B.A. Economics/University of Virginia

Skills/Projects

- **1985 – present** – Federal Government Project Officer and COTR Certification
- Detailed knowledge and practical experience with national regulations, policies, and guidance, related to U.S. EPA's Superfund program.
- Expert: State/U.S. EPA Superfund cooperative agreements/contracts regulations, implementation, practices, EPA/State Relations
- Policy Analysis/Policy Formulation/Program and Budget Analysis/Legislative Impacts/Negotiation/Program Implementation/Course Delivery/Regulation Development
- **current:** Workgroup Leader: U.S. EPA Superfund Triad Working Group
- **current:** Federal Advisor/Project Officer: cooperative agreement with the Environmental Council of the States/Interstate Regulatory Technology Council
- **current:** Independent Design Review, Value Engineering, Long Term Monitoring and Optimization
- **current:** Alternative Technology Development and Demonstration

Awards/Recognition

2005 – Superfund Charter Member
2004 – Federal Employee of the Year 2004 - Seattle Federal Executive Board - for Bunker Hill, ID
2001 – Sustained Superior Performance
1998 – Team excellence award for "Plan to Enhance the Role of States and Tribes in the Superfund program"
1998 – Enhanced State/Tribal Role award –Assistance Workgroup Chair
1995 – EPA Excellence Award, "Organizational Innovation and Promotion of Labor-Management Partnership", in the thoughtful redesign and de-layering of a major organization
1995 – EPA Team Excellence Award - Streamlining Advisory Group, Office of Solid Waste and Emergency Response
1991 – Consulting Engineers Council of Oregon Engineering Excellence, 1991 Grand Award for the "Cost of Remedial Actions Model."
1990 – American Consulting Engineers Council - Engineering Excellence Competition, Finalist for the Cost of Remedial Actions Model