



December 2, 2013

Curt Stovall, P.E.  
Hazardous Materials and Waste Management Division  
Colorado Department of Public Health and Environment  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530

**RE: Stockpile Financial Assurance Cost Estimate and Stockpile Removal Timeframe Extension,  
OU2 Landfill Cap Stockpiling, Lowry Vista Project, Denver, Colorado**

Dear Mr. Stovall,

Walsh Environmental Scientists and Engineers, LLC (Walsh) is transmitting on behalf of IRG Redevelopment I, LLC (IRGI) the enclosed financial assurance cost estimates for the soil stockpile to be placed on the Operable Unit 2 (OU2) Landfill Cap as part of the Lowry Vista redevelopment project. With one exception, the soil stockpiling will be done in accordance with the Revised Request to Stockpile Soil on OU2 Landfill Cap prepared by Walsh and dated November 12, 2012. The exception is that IRGI no longer anticipates that the stockpile will be removed by January 1, 2015. Therefore, we are requesting that this date be extended to the current anticipated date of January 1, 2017 for stockpile removal or incorporation into the redevelopment project. The reason for the delay is that all work (i.e., contract executions, deliverable preparation, and regulatory negotiation and approval) associated with the redevelopment is taking longer than previously anticipated. It is also unknown how quickly 200,000 bcy of import soil can be found in the metro Denver area and hauled to the site.

These cost estimates have been prepared consistent with the parameters we discussed at our October 18 and November 21, 2013 working sessions whereas a cost estimate has been prepared to reclaim the stockpile under two different stockpile size scenarios: 100,000 bank cubic yards (bcy) and 200,000 bcy. The anticipated placement areas for the regraded 100,000 bcy stockpile will be on 21.4 acres as shown on Figure 1. The anticipated placement areas for the regraded 200,000 bcy stockpile will be on 30.8 acres as shown on Figure 2. The RS Means Heavy Construction Cost Data 2013, 27<sup>th</sup> Annual Edition was used for the majority of the construction cost estimating and our professional experience was used for the remainder.

***Cost Estimate Basis***

Each stockpile size reclamation cost estimate consists of the following cost items and assumptions:

- **Base Quantities**
  - It is estimated that the 100,000 bcy stockpile size footprint will be four acres and the 200,000 bcy stockpile footprint will be eight acres.
  - It is assumed that, except for conveyance channels, the soil stockpile will be re-graded to a more or less even thickness across the cap surface above the maximum probable flood (MPF) elevation of 5432 feet above mean sea level (referred to hereafter as the “5432 contour”). There is approximately 31 acres of open space on the cap above the 5432 contour. Nearly all 31 acres will

be utilized for the 200,000 bcy scenario. These 31 acres are divided into three areas as shown on Figure 2 and described below:

- All three areas are bound by the cap limits/access road on the south.
  - The westernmost area is 5.7 acres and bound by the cap limits on the west, and the Westerly Creek Dam on the north and east.
  - The central area is 16.6 acres and bound by the Westerly Creek Dam on the west, the 5432 contour on the north, and the Center Conveyance Channel (CCC) on the east.
  - The eastern area is 8.5 acres and bound by the CCC on the west, the 5432 contour on the north, and Westerly Creek on the east.
- As shown on Figure 1, the 100,000 bcy scenario will require approximately 21.4 acres of this area. It includes the eastern area described above and part of the central area. It does not include the westernmost area and the western limits of the central area will be bound by the existing line of gas vents, gas probes, and storm sewer manholes on the west. This reduces the central area size to 12.9 acres.
  - The soil will be re-graded to an average thickness of 2.9 feet for the 100,000 cy scenario and 4.0 feet for the 200,000 bcy scenario. It will be placed as additional Vegetative Layer (VL) thickness. The side slopes of the fill areas would be sloped at 4:1 or flatter slopes. The bottom ungraded portion of the stockpile will be re-vegetated in-place.
- **Procurement and Design**
    - It is assumed that CDPHE would hire a consulting firm to survey the stockpile, develop a revised grading plan and specifications, and act as Construction Quality Assurance (CQA) Engineer during the reclamation. The initial survey, and revised grading plan, design details, and specifications will be appended to the 2003 Phase 2 Corrective Action Plan (CAP) and submitted to the Colorado Department of Public Health and Environment (CDPHE) as a formal CAP amendment.
    - CDPHE will review and approve the amendment to the CAP at a cost of \$125/hr. It is assumed that 40 labor hours will be expended to procure the engineer and review the Revised CAP.
  - **Mobilization and Demobilization**
    - Mobilization and demobilization were estimated at a total of five percent (2.5 percent each) of the total field construction costs. This covers the cost to deliver and pickup a field trailer and heavy equipment from the site and to establish and remove a staging/laydown area.
  - **Site Preparation**
    - IRGI will have been operating the stockpile on the cap in accordance with their approved Stormwater Water Management Plan (SWMP). This means that some of the necessary erosion control best management practices (BMPs) such as the vehicle tracking control (VTC) pad and perimeter earthen berms will be in place at the time the stockpile operations cease. However the cost for additional VTC material has been included.
    - Erosion logs will be necessary around the perimeter of the disturbed area. The erosion log quantity was estimated by calculating the perimeters of the areas shown on Figures 1 and 2.
  - **Stockpile Regrading**
    - Scrapers and bulldozers will be used to regrade the stockpiles. The production rate for each dozer and scraper were assumed at 1,000 and 800 bcy/day, respectively based on RS Means unit rates. The number of scrapers and volume hauled was then balanced to meet the production rate of the two dozers so that all equipment is evenly utilized throughout the project duration.

- For the 200,000 bcy estimate, it was assumed that the vents, probes, and manholes will be extended prior to covering that area with the re-graded soil from the stockpile.
  - For the 200,000 bcy estimate, it was also assumed that the regraded material will be placed in two roughly even lifts of two feet each. Costs have been included to compact the lower lift. It is assumed that the bottom four feet of the stockpile will have been consolidated sufficiently due to the weight of the soil stockpiled above it.
  - The earthen berms in place around the stockpiles will be spread with the stockpiled soil. These berms will only be two feet high, thus it is assumed that the berm volume is negligible.
  - The entire reclaimed area will be fine-graded using a bull dozer.
  - The soil being accepted is being screened using the contamination screening process described in the November 12, 2012 request to stockpile soil. Geotechnically, the soil being accepted is being screened to exclude bedrock, boulders, organic soil, and anything more than occasional cobbles.
- **Site Restoration**
    - The original stockpile area, the spread stockpile soil areas, plus an additional 10 percent are assumed to be disturbed and require revegetation.
    - All non-soil BMPs (VTC, rock filters, erosion logs) will be removed and disposed of once the vegetation is established.
- **Field Overhead and Oversight**
    - A full-time superintendent will be onsite during the project duration.
    - The CQA Engineer will spend one hour/week reviewing field reports and will send a CQA Monitor to the site once a week at a cost of \$70/hr.
    - CDPHE will visit once per month at a cost of \$125/hr during the regrading to observe project progress.
- **Construction Completion**
    - The CQA Engineer will perform an as-built survey of the completed reclamation and prepare a CQA Certification Report on the overall stockpile reclamation effort. The CQA Report will be appended to the 2005 CQA Certification Report.
    - CDPHE will review and approve the CQA Report at a cost of \$125/hr.
- **Total Cost Estimate**
    - The total estimated cost was rounded to the nearest \$1,000.
    - A summary of the cost estimates are given below. Detailed cost estimates for each of the stockpiles are attached as Tables 1 and 2 for the 100,000 and 200,000 bcy scenarios, respectively.

<b>Stockpile Size (bcy)</b>	<b>Estimated Cost to Reclaim</b>
100,000	\$395,000
200,000	\$813,000

***Required Financial Assurance***

Prior to beginning stockpile operations, IRGI will submit a financial assurance instrument suitable to CDPHE to cover the cost above for reclaiming a 100,000 bcy size stockpile. Before the stockpile size exceeds 100,000 bcy, the financial assurance will be increased by \$418,000 to cover the cost of

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reclaiming the 200,000 bcy size stockpile. Volumes will be tracked using load counts of soil hauled in. It may be verified using survey methods. The maximum volume of soil to be stockpiled on the cap is 200,000 bcy.

***Closing***

Please feel free to contact me at (303) 573-5545 or [jwallace@walshenv.com](mailto:jwallace@walshenv.com) if you have any questions. You can also contact Brad Coleman, P.E. at (303) 362-2335 or [bacoleman@burnsmcd.com](mailto:bacoleman@burnsmcd.com) or John Yerton at (303) 304-2933 or [jyerton@irgco.com](mailto:jyerton@irgco.com) with any questions.

Sincerely,

**WALSH ENVIRONMENTAL ENGINEERS AND SCIENTISTS, LLC**



Jon Wallace, P.E.  
Project Engineer

**Attachments:**

- Table 1 – Stockpile Financial Assurance Cost Estimate – 100,000 bcy
- Table 2 – Stockpile Financial Assurance Cost Estimate – 200,000 bcy
- Figure 1 – 100,000 cy Stockpile Regrading Plan
- Figure 2 – 200,000 cy Stockpile Regrading Plan

cc: Brad Coleman, Burns and McDonnell Engineering Co., Inc.  
John Yerton, IRG Redevelopment I, LLC

**Table 1**  
**Financial Assurance Cost Estimate**  
**On-Cap Soil Stockpile Reclamation**  
**Lowry Vista Redevelopment**  
**IRG Redevelopment I, LLC**

**Stockpile Size: 100,000 cubic yards**

Item Description	Quantity	Unit	Unit Cost	Unit Cost Reference	Cost	Remarks
<b>Base Quantities</b>						
Stockpile Size:	100,000	cubic yards				
Stockpile Area:	4	acres				base assumption
Ave. Regraded Thickness:	2.9	feet				base assumption
Volume Regraded:	81,285	cubic yards				(stockpile size) - (ave. thkns x stockpile area)
Area Regraded:	17.4	acres				(vol. regraded) / (ave. regraded thkns)
Total Area Regraded:	21.4	acres				Material Placed in areas shown on the Figure 1
Assumed Production Rate:	4,400	cy/day				based on two dozers and three scrapers
Fieldwork Duration	4.1	week				5 day work week, based on assumed production rate plus 10%
<b>Procurement and Design</b>						
CDPHE Procurement and Review	40	hours	\$125	CDPHE review cost/hour	\$5,000	base assumption
Stockpile Survey	4	acres	\$398	2013 RSMeans, 02 21 13.09 0020	\$1,590	stockpile area
Engineer Design/PH2 CAP Amend.	1	lump sum	\$10,000	professional experience	\$10,000	
				<b>Subtotal</b>	<b>\$16,590</b>	
<b>Mobilization and Demobilization</b>						
Mobilization	1	each	2.5%	professional experience	\$8,306	percent of total fieldwork, incl. equip transp, laydown area, field trailer
Demobilization	1	each	2.5%	professional experience	\$8,306	percent of total fieldwork, incl. demob of above items
				<b>Subtotal</b>	<b>\$16,612</b>	
<b>Site Preparation</b>						
Erosion Control Logs	5,596	linear foot	\$4.50	professional experience	\$25,182	12 inch diameter logs, staked 6 inches, assumed placed along 5432 contour (2150 ft), both sides of CCC above the 5432 contour (1100 ft), and along western edge of regraded area (450 ft)
Construction Entrance Geotextile	32	square yard	\$2.03	2013 RSMeans, 31 32 19.16 1500	\$65	CDOT minimum 12'x70'
Construction Entrance Aggregate Base	32	square yard	\$7.17	2013 RSMeans, 32 11 23.23 0100	\$229	CDOT minimum 12'x70'x6"
				<b>Subtotal</b>	<b>\$25,476</b>	
<b>Stockpile Regrading</b>						
Spread by dozer, no compaction	38,000	cubic yard	\$1.85	2013 RSMeans, 31 23 23.17 0020	\$70,300	assumes slightly less than half spread by dozer, 1,000 bcy/day production per dozer (19 working days)
Cut, haul, and spread by scraper	43,285	cubic yard	\$3.64	2014 RSMeans, 31 23 16.50 1000	\$157,559	assumes slightly over half spread by scraper, 800 bcy/day production per scraper (18 working days)
Fine grading	21.4	acre	\$1,666	2013 RSMeans, 31 22 13.20 0280	\$35,612	Cost per 100,000 sf is \$3825
				<b>Subtotal</b>	<b>\$263,471</b>	
<b>Site Restoration</b>						
Seeding	23.5	acre	\$1,565	2013 RSMeans, 32 92 19.13 0020	\$36,783	The RS Means rate was conservatively increased by 50% to account for soil amendments
Erosion Log Removal	5,596	linear foot	\$1.13	professional experience	\$6,296	Assume one fourth the cost of placement
Construction Entrance Removal	32	square yard	\$6.90	2013 RSMeans, 02 41 13.17 5050	\$221	
				<b>Subtotal</b>	<b>\$43,299</b>	
<b>Field Overhead and Oversight</b>						
Superintendent	4.1	week	\$2,000	2013 RSMeans, 01 31 13.20 0260	\$8,129	
Clerk	4.1	week	\$500	2013 RSMeans, 01 31 13.20 0020	\$2,032	
Field Office Expenses	4.1	week	\$48	2013 RSMeans, 01 52 13.40 0100	\$194	
CQA Engineer	4.1	hours	\$150	professional experience	\$610	assumes 1 hr per week
CQA Monitor	32.5	hours	\$70	professional experience	\$2,276	assumes 8 hrs per week
CDPHE Observation	3.9	hours	\$125	CDPHE review cost/hour	\$484	assumes a 4 hr visit once per month
				<b>Subtotal</b>	<b>\$13,724</b>	
<b>Construction Completion</b>						
Topographical Survey	23.5	acre	\$398	2013 RSMeans, 02 21 13.09 0020	\$9,346	all disturbed area
Certification Report Addendum	1	lump sum	\$5,000	professional experience	\$5,000	
CDPHE Review Process	10	hour	\$125	CDPHE review cost/hour	\$1,250	
				<b>Subtotal</b>	<b>\$15,596</b>	
<b>Total Cost Estimate</b>					<b>\$395,000</b>	

**Table 2**  
**Financial Assurance Cost Estimate**  
**On-Cap Soil Stockpile Reclamation**  
**Lowry Vista Redevelopment**  
**IRG Redevelopment I, LLC**

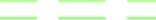
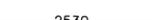
**Stockpile Size: 200,000 cubic yards**

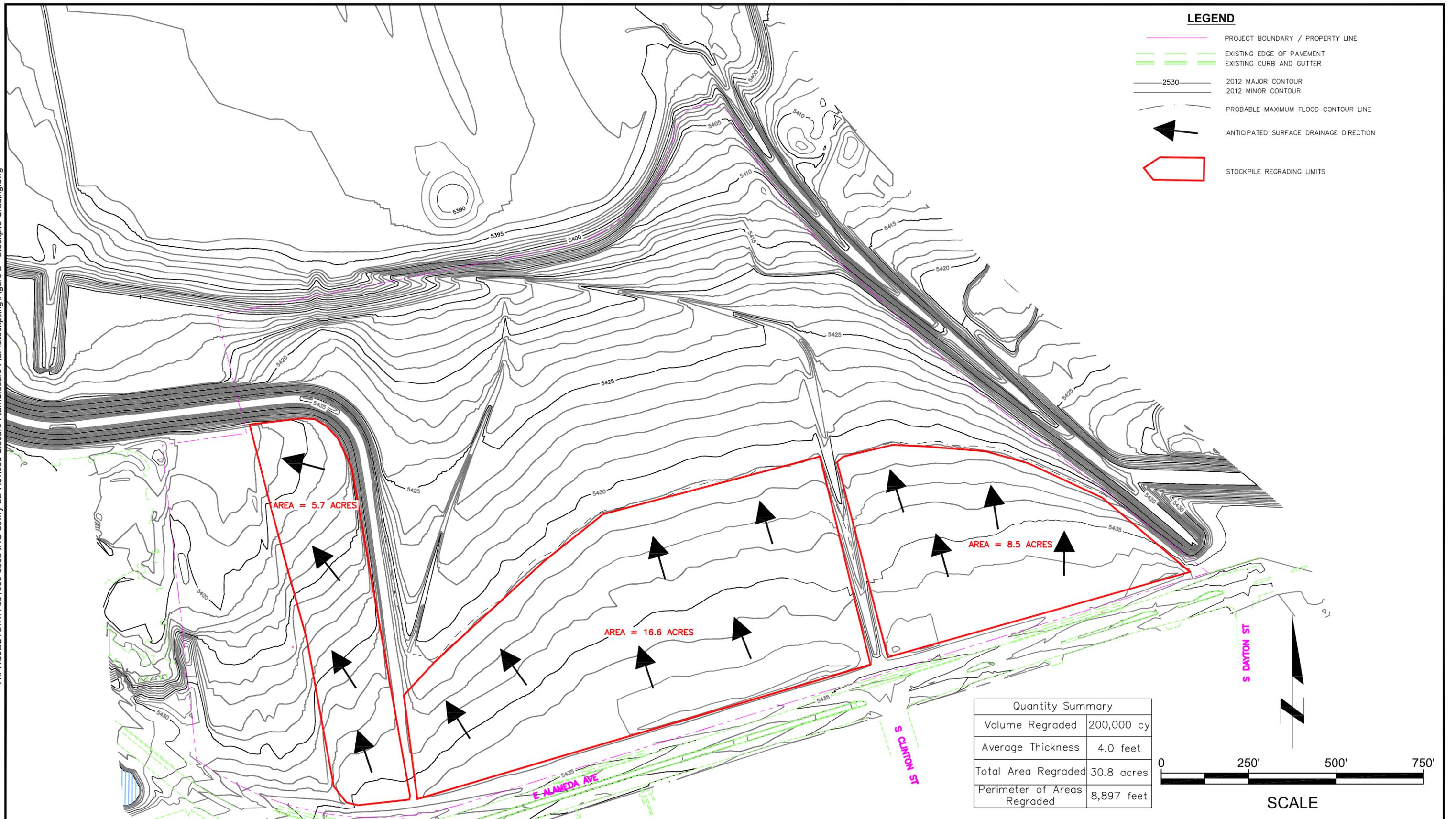
Item Description	Quantity	Unit	Unit Cost	Unit Cost Reference	Cost	Remarks
<b>Base Quantities</b>						
Stockpile Size:	200,000	cubic yards				
Stockpile Area:	8	acres				base assumption
Ave. Regraded Thickness:	4.0	feet				base assumption
Volume Regraded:	147,986	cubic yards				= (stockpile size) - (ave. thkns x stockpile area)
New Area Regraded:	22.8	acres				= (vol. regraded) / (ave. regraded thkns)
Total Area Regraded	30.8	acres				Material placed in locations shown on Figure 2
Assumed Production Rate:	6,000	cy/day				based on two dozers and five scrapers
Fieldwork Duration	5.4	week				5 day work week, based on assumed production rate plus 10% for weather delays
<b>Procurement and Design</b>						
CDPHE Procurement and Review	40	hours	\$125	CDPHE review cost/hour	\$5,000	base assumption
Stockpile Survey	8	acres	\$398	2013 RSMMeans, 02 21 13.09 0020	\$3,180	stockpile area
Engineer Design/PH2 CAP Amend.	1	lump sum	\$15,000	professional experience	\$15,000	
				<b>Subtotal</b>	<b>\$23,180</b>	
<b>Mobilization and Demobilization</b>						
Mobilization	1	each	2.5%	professional experience	\$17,748	percent of total fieldwork, incl. equip transp. laydown area, field trailer
Demobilization	1	each	2.5%	professional experience	\$17,748	percent of total fieldwork, incl. demob of above items
				<b>Subtotal</b>	<b>\$35,496</b>	
<b>Site Preparation</b>						
Erosion Control Logs	8,900	linear foot	\$4.50	professional experience	\$40,050	12 inch diameter logs, staked 6 inches, assumed placed along 5432 contour (2500 ft), both sides of CCC above the 5432 contour (1100 ft), and along western edge of cap limits (1100 ft)
Construction Entrance Geotextile	32	square yard	\$2.03	2013 RSMMeans, 31 32 19.16 1500	\$65	CDOT minimum 12'x70'
Construction Entrance Aggregate Base	32	square yard	\$7.17	2013 RSMMeans, 32 11 23.23 0100	\$229	CDOT minimum 12'x70'x6"
				<b>Subtotal</b>	<b>\$40,344</b>	
<b>Stockpile Regrading</b>						
Spread by dozer, no compaction	54,000	cubic yard	\$1.85	2013 RSMMeans, 31 23 23.17 0020	\$99,900	assumes 54,000 bcy spread by dozer, 1,000 bcy/day production per dozer (27 working days)
Cut, haul, and spread by scraper	93,986	cubic yard	\$3.64	2014 RSMMeans, 31 23 16.50 1000	\$342,110	assumes remaining 107,000 spread by scraper, 800 bcy/day production per scraper (27 working days)
Compaction	991,470	square foot	\$0.10	professional experience	\$99,147	assumes regraded soil outside of stockpile footprint is compacted at approximately the 2 foot thickness
Raise gas probes	3	each	\$2,000	professional experience	\$6,000	GP 25, 26, and 26
Raise gas vents	2	each	\$1,000	professional experience	\$2,000	GV 01 and 02
Raise storm sewer manholes	2	each	\$3,000	professional experience	\$6,000	two storm sewer manholes are raised per CCOD Public Works requirements.
Fine grading	30.8	acre	\$1,666	2013 RSMMeans, 31 22 13.20 0280	\$51,253	Cost per 100,000 sf is \$3825
				<b>Subtotal</b>	<b>\$606,410</b>	
<b>Site Restoration</b>						
Seeding	33.8	acre	\$1,565	2013 RSMMeans, 32 92 19.13 0020	\$52,938	The RS Means rate was conservatively increased by 50% to account for soil amendments
Erosion Log Removal	8,900	linear foot	\$1.13	professional experience	\$10,013	Assume one fourth the cost of placement
Construction Entrance Removal	32	square yard	\$6.90	2013 RSMMeans, 02 41 13.17 5050	\$221	
				<b>Subtotal</b>	<b>\$63,171</b>	
<b>Field Overhead and Oversight</b>						
Superintendent	5.4	week	\$2,000	2013 RSMMeans, 01 31 13.20 0260	\$10,852	
Clerk	5.4	week	\$500	2013 RSMMeans, 01 31 13.20 0020	\$2,713	
Field Office Expenses	5.4	week	\$48	2013 RSMMeans, 01 52 13.40 0100	\$258	
CQA Engineer	5.4	hours	\$150	professional experience	\$814	assumes 1 hr per week
CQA Monitor	43.4	hours	\$70	professional experience	\$3,039	assumes 8 hrs per week
CDPHE Observation	5.2	hours	\$125	CDPHE review cost/hour	\$646	assumes a 4 hr visit once per month
				<b>Subtotal</b>	<b>\$18,322</b>	
<b>Construction Completion</b>						
Topographical Survey	33.8	acre	\$398	2013 RSMMeans, 02 21 13.09 0020	\$13,450	all disturbed area
Certification Report Addendum	1	lump sum	\$10,000	professional experience	\$10,000	
CDPHE Review Process	20	hour	\$125	CDPHE review cost/hour	\$2,500	
				<b>Subtotal</b>	<b>\$25,950</b>	
<b>Total Cost Estimate</b>					<b>\$813,000</b>	



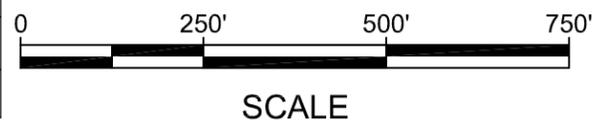
Y:\PROJECT\SIWA-001853-0002-1KG-Lowry-2b-Revised Closure Plan\Closure Plan\Stockpiling\Figure 2 - Stockpile Grading.dwg

**LEGEND**

-  PROJECT BOUNDARY / PROPERTY LINE
-  EXISTING EDGE OF PAVEMENT  
EXISTING CURB AND GUTTER
-  2530  
 2012 MAJOR CONTOUR  
2012 MINOR CONTOUR
-  PROBABLE MAXIMUM FLOOD CONTOUR LINE
-  ANTICIPATED SURFACE DRAINAGE DIRECTION
-  STOCKPILE REGRADING LIMITS



Quantity Summary	
Volume Regraded	200,000 cy
Average Thickness	4.0 feet
Total Area Regraded	30.8 acres
Perimeter of Areas Regraded	8,897 feet



**Walsh**  
Environmental Scientists and Engineers, LLC  
an ecology and environment company

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NO.	DATE	REVISION	BY	CHK

**Lowry Vista  
Redevelopment Project**

Project Number: WA-001853-0002	Date: December 2, 2013	Engineer: BAC	Drawn By: JMW
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**Figure 2**  
200,000 cy Stockpile Regrading Plan  
Stockpile Financial Assurance Cost Estimate  
Operable Unit 2 Landfill Zone