

October 7, 2013

Mark Dakers, Acting Chief
MassDEP – Solid Waste Management Section
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Subject: 452 Old Fall River Road Landfill, Dartmouth Closure Project
Alternative 2 Closures Concept and Cost Estimate
SARSS V Contract No. BWSC 2008-01

Dear Mr. Dakers,

This letter summarizes Parsons Environmental & Infrastructure Group Inc. (Parsons) independent development of the Alternative 2 closure concept and associated cost estimate for the 452 Old Fall River Road Landfill located in Dartmouth, Massachusetts. The work was completed in accordance with Parsons' proposal (i.e. Work and Cost Plan) submitted to the Massachusetts Department of Environmental Protection (MassDEP) on June 21, 2013. The letter includes comments from MassDEP on August 8, 2013 and September 6, 2013.

In summary, the total landfill closure operations, maintenance and monitoring (OM&M) and material placement (operating) costs were estimated to be \$19,757,600. It is estimated that 1,317,173 cubic yards of soil will be needed to generate the revenue required to close the landfill based on a tipping fee of \$15 per cubic yard (\$10) per ton.

1.0 INTRODUCTION

1.1 Background and History

The former Cecil Smith Landfill ("the landfill") is an approximately 24.93 acre unlined/uncapped landfill comprised of a northern (22.44 acres) portion and southern (2.49 acres) portion. It is situated on 60-acres of site-assigned property ("site") located on a larger 94-acre tract of land located off Old Fall River Road in Dartmouth, Massachusetts. Currently, a single-family home is located in the center of the landfill area. The site currently is used as farmland for animals and temporary lodging. A wooden pallet refurbisher also conducts activity on the site. The 94 acre tract contains significant amounts of virgin land and tree growth and contains appreciable wetland areas. The area surrounding the site is best described as rural/residential with some agricultural activities.

The waste materials disposed in the landfill consists primarily of construction and demolition debris. The site itself (i.e. 60-acres) is a former sand and gravel operation that operated as such during the 1960's. During the late 1960's and early 1970's, the owner ("Cecil Smith") used the site for a variety of unpermitted solid waste activities. In the early-mid 1970's, MassDEP discovered that the site was being operated as an illegal solid waste dumping ground. In response, MassDEP initiated enforcement and ordered the owner to cease and desist all solid waste activities until such time that a solid waste site assignment and all necessary permits were secured. The owner ceased all activities and obtained a solid waste site assignment from the Town of Dartmouth Board of Health in 1975. MassDEP approved landfill construction plans in 1980. Records indicate that the cap/liner system was constructed after the issuance of



MassDEP's approval. The landfill never commenced operations. In 1996, MassDEP observed that the landfill liner/cap was removed.

After a series of failed legal efforts to properly close the site, in 2012, the owner arranged for Boston Environment Corporation (BEC) to bring about resolution to the site. As proposed, the project would include the assessment, closure, and capping of the landfill under the provisions of MassDEP's policy "Closure Activities at Inactive Unlined Landfill Sites" whereby a defined amount of approved grading/shaping materials (e.g. contaminated soils) would be delivered to the site in order to fund the closure/post-closure requirements.

For purposes of providing information to and soliciting comment from the public, the proponents (BEC) conducted a public informational session on the project on March 28, 2013. A 45-day public comment period concluded on May 13, 2013. Subsequently, MassDEP conducted additional public meetings in June and July 2013 and MassDEP is requiring the owner/proponent to address the comments received from the community.

1.2 Path Forward

In an effort to assess BEC's proposed approach, MassDEP is in the process of evaluating the following three alternatives:

1. Alternative 1: closure of the site (in accordance with 310 CMR 19.112) using grading and shaping soils (utilizing MassDEP's policy COMM-97-001) to establish minimum closure grades (5%)
2. Alternative 2: closure of the site (in accordance with 310 CMR 19.112) using grading / shaping soils (utilizing MassDEP's policy COMM-97-001) to offset closure and post closure costs, including setback of the 3:1 side slopes to facilitate a perimeter access road
3. Alternative 3: Excavation and removal of the landfill

MassDEP's priority at this time is to assess closure Alternative 2, as this is the currently proposed alternative by BEC. As such, MassDEP contracted with Parsons to conduct the following tasks for Alternative 2:

- Review the available information
- Developed a preliminary closure concept
- Developed cost estimate

This letter summarizes Parsons' methodology and results of these three tasks. Parsons and MassDEP will discuss at a later time doing a similar scope of work for Alternatives 1 and 3.

2.0 REVIEW OF AVAILABLE INFORMATION

Parsons reviewed the following information, which served as the basis of Parsons' concept closure plans and cost estimate:

- Environmental Notification Form prepared by SITEC Environmental, dated May 30, 2013
- Cecil Smith Landfill Final Closure Project prepared by BEC, dated December 17, 2012
- Alternatives Analysis prepared by SITEC Environmental, Inc., dated April 3, 2013
- Landfill Closure drawings provided by SITEC Environmental, Inc.



- Review of the Draft Outline Scope of Work: 452 Old Fall River Rd. Landfill, Dartmouth Assessment of Closure Alternatives SARSS Contractor Assistance Assist Boston Commissioner's Office and SERO BWP in Assessing Alternative Landfill Closures, dated June 7, 2013.

In addition, Parsons attended the following meetings with MassDEP:

- Scoping meeting on June 19, 2013 in Parsons' office
- Site visit on June 25, 2013 to visually observe the current site conditions
- Public meeting on June 27, 2013

3.0 CLOSURE APPROACH – ALTERNATIVE 2

Parsons developed a concept closure plan and profile to address closure Alternative 2 (as described in Section 1). The plans are concept level and are presented in **Attachment A** as Figures 1 and 2. Parsons' general basis for the concept closure plan was to close the site in accordance with the MassDEP 310 CMR 19.112 Landfill Final Cover Systems using grading and shaping soils per MassDEP Policy COMM-97-001). In addition, the plan includes:

- Accommodating / grading the volumes needed to offset closure cost
- Grading using a 3 horizontal to 1 vertical (maximum) and 5 percent (minimum) side slopes
- Constructing a perimeter access road for soil acceptance and post-closure maintenance and monitoring
- Capping the site
- Minimizing impact to surrounding wetlands
- Establishing stormwater, erosion and sediment controls
- Providing sufficient detail to complete the cost estimate presented in Section 4

In order to estimate the volume needed to offset the closure cost, an iterative process (between cost estimating and design) was conducted. The process started by developing an initial cost estimate (Section 4) to close the landfill so that a preliminary volume of material needed to generate the required revenue can be estimated. Subsequently, a preliminary grading plan was prepared using the initial volume estimate and then the cost estimate was further refined based on the updated plan (and volume estimate). Based on this procedure, Parsons estimates that 1,317,173 cubic yards of fill will be needed to generate the required revenue to close the landfill.

Assumptions used to develop the Alternative 2 concept plans include:

- The northern portion of the landfill (i.e. north of the Algonquin Gas easement) will receive grading and shaping soils and be capped; however, the southern portion of the landfill (i.e. south of Algonquin Gas easement) will only be capped (within no additional grading and shaping soil)
- Installation of perimeter access road within limits of waste will be considered capped
- A 10 foot bench will be created every 40 vertical feet
- The landfill cap components from top to bottom are proposed as follows and in general accordance with 310 CMR 19.112:



- Topsoil (8 inch layer) – vegetative growth layer
- Common fill (10 inch layer) – barrier protection layer/vegetative support layer
- Geocomposite layer – drainage layer
- Geomembrane liner – barrier layer
- Sand (6 inch layer) – bedding layer for geomembrane
- No gas venting system is required due to the soil nature of the fill material

4.0 COST ESTIMATE

Based on the approach described above, Parsons developed a Class 3 – Budgetary Estimate with an aggregated accuracy -10% to +30%. The cost estimate was organized into two parts as follows:

COST ESTIMATE	COST
Landfill Closure and OM&M (30 years): <i>Refer to Section 4.1 and Attachment B1 – Summary and Detailed Estimate for the Landfill Closure and OM&M</i>	\$13,169,700
Revenue Generation (i.e. required fill to offset closure cost): <i>Refer to Section 4.2 and Attachment B2 – Summary and Detailed Estimate for the Revenue Generation</i>	\$13,169,700

Parsons utilized Success Enterprise Software by US Cost to prepare the cost estimate and incorporated best practices typical of similar projects.

Parsons pricing information is based on information from the following documents and sources:

- Pricing information from contractors (see Section 4.2)
- Pricing information from active landfills in Eastern Massachusetts (see Section 4.2)
- Parsons estimating database
- 2013 RS Means Construction Database

4.1 Basis of Estimate – Landfill Closure and OM&M

Parsons landfill closure and OM&M cost estimate includes all labor, material, and equipment costs and contingencies for engineering, construction, operation and monitoring costs, and all indirect costs including mobilization and site overhead. Parsons organized the landfill closure and OM&M cost estimate into the following Work Breakdown Structure:

1. Direct Costs
 - Site Preparation
 - Site Improvements, including landfill cap
 - Site storm water systems
2. Indirect Costs
 - Mobilization / demobilization
 - Site operating services
 - Temporary site facilities
3. Operations and Maintenance
4. Long Term Monitoring



The Basis of Estimate (BOE) is included in **Attachment B** and includes assumptions, clarifications and quantities used in the development of the estimate. Some of the key assumptions are summarized as follows:

- Landfill footprint is 24.93 acres
- Material bulk factor of 15% to account for reduction in volume from trucking volume (loose) to in place volume (compact)
- Engineering costs are 10% of total closure costs
- 30 years of O&M, including semi-annual groundwater sampling at four locations
- A full time Health and Safety, QA/QC and Field Engineer will be on site during construction
- Excludes costs associated with demolition / disposal of existing structures located on site
- 10% Contingency
- 15% Contractor overhead
- 5% Contractor profit

4.2 Basis of Estimate – Revenue Generation

In order to offset the landfill closure and OM&M cost discussed in Section 4.1, revenue would be generated through the acceptance of grading / shaping soils utilizing MassDEP’s policy COMM-97-001 (the volume of this material is presented in Section 3). Parsons contacted several local landfills located in Massachusetts and Rhode Island to obtain the current rate (tipping rate) for disposal of this material in landfills similar to the Old Fall River Road Landfill. These rates are presented in the table below.

Landfill	Location	Tipping Fee Rate (July 2013) (See Note 1)	Proximity to Landfill
Central Landfill	Johnston, RI	\$15/Ton (\$22.50/cy)	35 miles
Greater New Bedford Municipal	New Bedford, MA	\$15-\$25/Ton (\$22.50-\$37.50/cy)	10 miles
Fall River Landfill	Fall River, MA	\$30/Ton (\$45/cy) (see Note 2)	13 miles
Haverhill Landfill	Haverhill, MA	\$15-\$25/Ton (\$22.50-37.50/cy)	96 miles

Notes: 1. lined landfill that receives industrial waste
 2. density and conversion factor for common fill is assumed to be 1.5 tons per cubic yard

The tipping fee rates above are based on normal market conditions under which grading / shaping soils is available and where there are few receiving sites (i.e. landfills) for the material. The tipping fee rates are typically influenced by factors such as availability of material, available receiving sites, and proximity to the site.

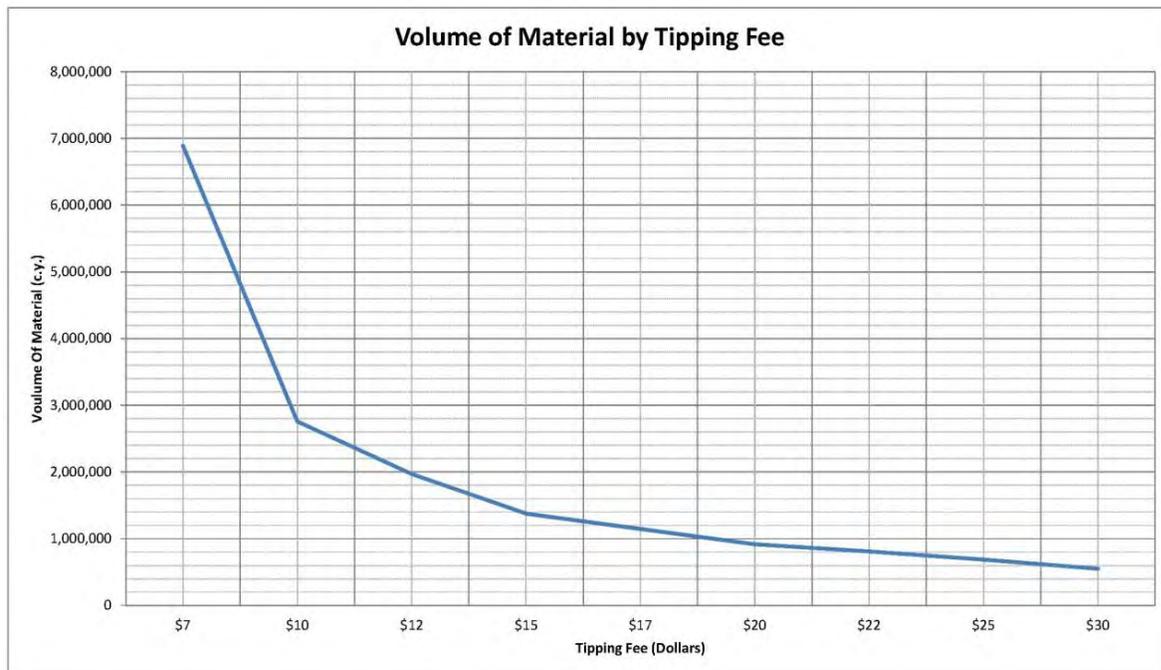
Taking into account that inclusion of Old Fall River Road Landfill (with considerable capacity) would reduce tipping fee rates, a tipping fee rate of \$15 per cubic yard for grading / shaping soils is assumed for this estimate. The \$15 per cubic yard tipping fee rate consists of \$5 per cubic yard for material placement with the remaining \$10 per cubic yard allocated for revenue



generation to be used for the landfill closure and OM&M. The material placement unit cost is assumed to remain constant. A summary of the revenue generation is as follows:

COST COMPONENTS	COST
Revenue landfill will generate from accepting material (tipping rate):	\$19,757,600
Cost to contractor to place material	\$6,587,900
Revenue available to apply towards landfill closure and OM&M	\$13,169,700

It should be noted that the estimated volume of fill required to offset the closure and OM&M cost is primarily dependent on the tipping fee rate. As the cost of tipping fees fluctuates, the volume of material (and landfill height) will also fluctuate linearly. The figure below illustrates the fluctuation in volumes for a range of tipping fees.



*Volume calculated by subtracting material placement cost (\$5/cy) from tipping fee to reflect the net revenue



Mr. Dakers
MassDEP
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5.0 CLOSING

Parsons appreciates the opportunity to provide MassDEP this letter report and is available to address any questions you may have.

Sincerely,



Paul G. Boyajian
Project Manager

cc: Scott Anderson

Attachments

Attachment A: Figures

Attachment B: Cost Estimate

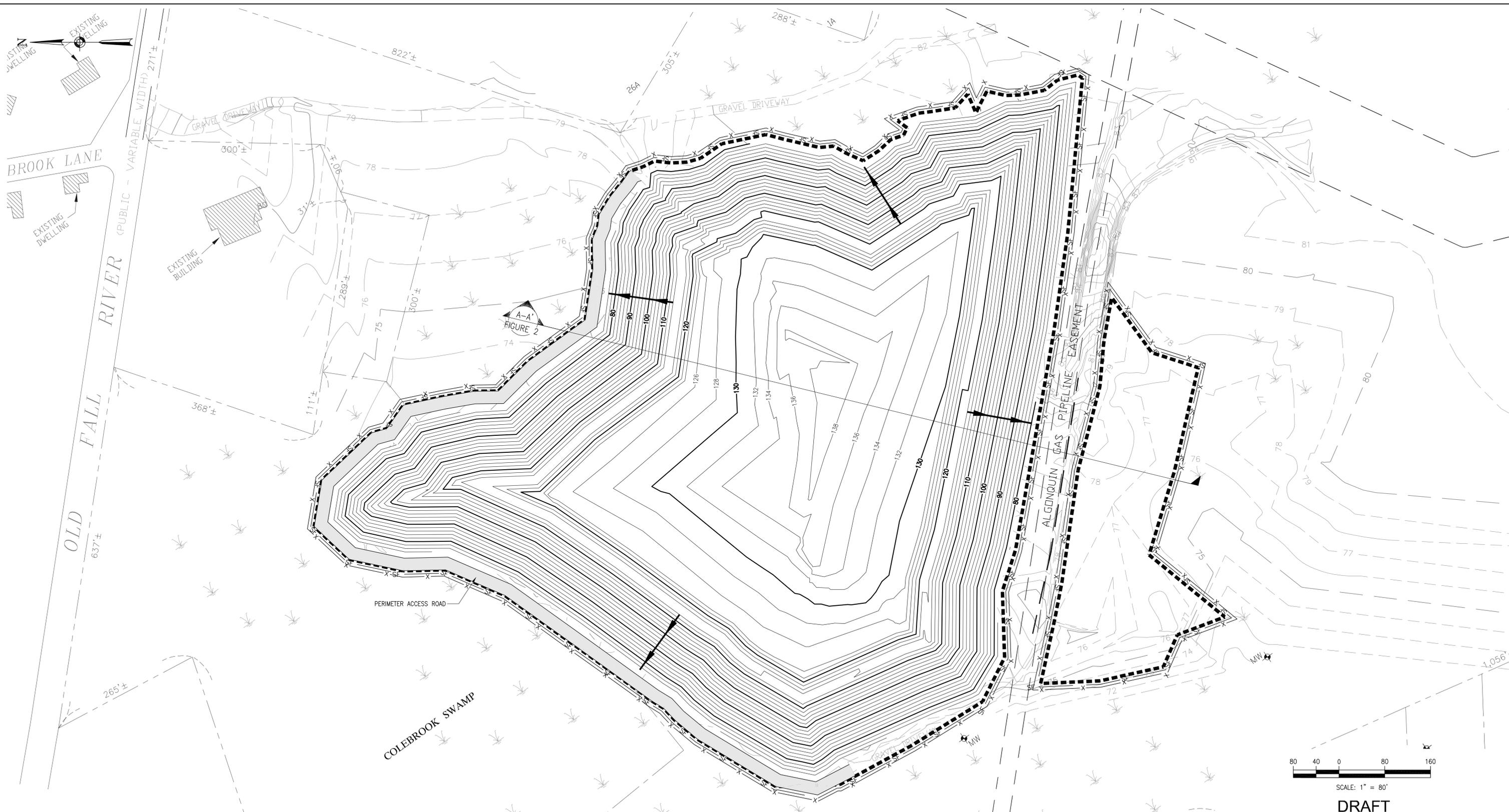


Attachment A

Figures

Figure 1: Concept Plan

Figure 2: Concept Cross Section



DRAFT
NOT FOR CONSTRUCTION

- LEGEND:**
- 120 PROPOSED MAJOR ELEVATION CONTOUR
 - 121 PROPOSED MINOR ELEVATION CONTOUR
 - PROPOSED CHAIN LINK FENCE
 - PROPOSED SILT FENCE
 - PROPOSED DRAINAGE DOWNCHUTE
 - PROPOSED PERIMETER ACCESS ROAD
 - EXISTING LIMITS OF WASTE
 - EXISTING WETLANDS

NO.	REVISION	DRWN.	CHKD.	RVWD.	APRVD.	DATE
A	ISSUED FOR CLIENT REVIEW	RR	RR	SMA	PGB	09/17/13
B	ISSUED AS FINAL	RR	RR	SMA	PGB	10/07/13

MassDEP
Massachusetts Department of Environmental Protection

FALL RIVER ROAD LANDFILL
DARTMOUTH, MASSACHUSETTS

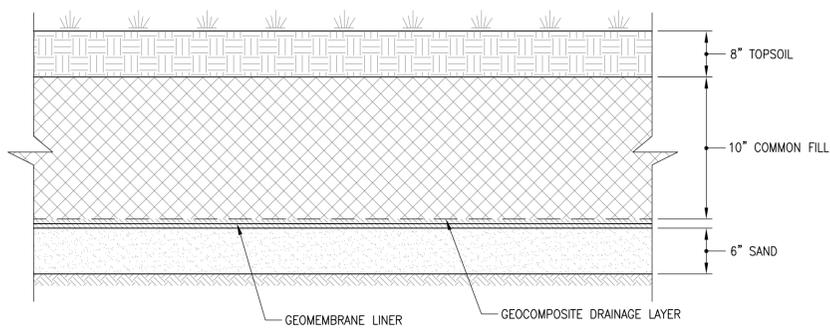
**PROPOSED
SUBGRADE PLAN**

JOB NO. 447675		CONTRACTOR'S JOB NO.		SCALE: AS SHOWN	
RR	SMA	PUB	07/17/13	RR	PGB
DRWN.	CHKD.	APPRVD.	DATE	DRWN.	DATE
SHEET NUMBER			REV	DATE	
FIGURE 1			B		

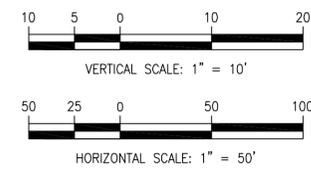
PARSONS
100 HIGH STREET, 4TH FLOOR
BOSTON, MA 02110



SECTION A-A'
SCALE: 1:50H:1:10V
FIGURE 1



TYPICAL CAP CROSS-SECTION
N.T.S.



DRAFT
NOT FOR CONSTRUCTION



NO.	REVISION	DRWN.	CHKD.	RVWD.	APRVD.	DATE
A	ISSUED FOR CLIENT REVIEW	RR	RR	SMA	PGB	09/17/13
B	ISSUED AS FINAL	RR	RR	SMA	PGB	10/07/13

JOB NO. 447675
CONTRACTOR'S JOB NO.
SCALE: AS SHOWN

FALL RIVER ROAD LANDFILL
DARTMOUTH, MASSACHUSETTS
PROPOSED CAPPING
PROFILE

RR	SMA	PJB	07/17/13
DRWN.	CHKD.	APPRVD.	DATE

PARSONS
100 HIGH STREET, 4TH FLOOR
BOSTON, MA 02110

SHEET NUMBER
FIGURE 2

REV
B

Attachment B

Cost Estimate

Attachment B1: Landfill Closure and Operations, Maintenance and Monitoring (OM&M) Cost Estimate

Attachment B2: Revenue Generation Estimate

Attachment B1

Landfill Closure and Operations, Maintenance and Monitoring (OM&M) Cost Estimate

**TABLE 1
 LANDFILL CLOSURE AND OM & M COST ESTIMATE SUMMARY**

	DESCRIPTION	QUANTITY	UNIT	COST	TOTAL AMOUNT	COMMENTS
010-1	DIRECT COSTS					
010-101	Site Preparation				\$418,800	
01-101-1	Site Clearing	1	AC	\$3,000		Includes clearing & grubbing
01-101-2	Site Access Road	2,000	LF	\$134,000		Includes construction of permanent gravel access road into site including all materials, grading
01-101-3	Erosion & Sediment Control	1	LS	\$281,800		Erosion control
010-102	Site Improvements				\$5,842,900	
01-102-1	Site Fencing	4,375	LF	\$160,000		Includes installation of perimeter chain link fence and access gate(s)
01-102-2	Landfill Cap	24.93	AC	\$5,638,500		Includes construction of landfill cap consisting of 8" top soil, 10" common fill, geocomposite drainage layer, geomembrane liner (40 mil HDPE) , 6" sand bedding layer, grading & compaction, and hauling of materials.
01-102-3	Site Restoration	1	LS	\$44,400		Includes local road repair, seeding and wetland plantings
010-103	Site Storm Water Systems				\$420,400	
01-103-1	Riprap Channels/Ditches	1	LS	\$216,600		Includes construction and placement of riprap channels for collection and conveyance of stormwater into detention basins
01-103-2	Storm Drainage Piping	1	LS	\$198,600		Includes installation of storm drain piping to convey stormwater into and within the detention basins
01-103-3	Storm Drainage Structures	1	LS	\$5,200		Includes installation of storm drain structures such as drain manholes, headwalls, flared end outlets, etc.
010-1	Total Direct Costs				\$6,682,100	
010-2	INDIRECT COSTS					
010-201	Mobilization & Initial Expenses	1	LS	\$100,000	\$100,000	Includes construction trailers (pads), wheel wash, truck scale, dump trucks and dumpsters
010-202	Site Operating Services	1	LS	\$2,221,000	\$2,221,000	Includes construction equipment used on site, field office trailers, inspection/testing during filling operations and construction field and engineering support
010-204	Temporary Site Facilities	1	LS	\$317,500	\$317,500	Includes miscellaneous field office equipment (e.g. water coolers, portalets, etc.), field office expenses, truck wash station, and truck scale
010-203	Demobilization	1	LS	\$95,000	\$95,000	Includes removal of daily construction equipment and clean up of disturbed areas
010-2	Total Indirect Costs				\$2,733,500	
	TOTAL DIRECT & INDIRECT COSTS				\$9,415,600	
010-3	CONSTRUCTION QUALITY ASSURANCE REPORTING					
	Design Support During Construction	1	LS	\$115,500	\$115,500	Includes Sr. Engineer for construction duration (full time for 12 mos)
	Quality Assurance	1	LS	\$75,000	\$75,000	Includes all reporting and technical correspondence
010-3	Total Construction Quality Assurance Costs				\$190,500	
	Subtotal Construction Cost				\$9,606,100	
010-6	CONTINGENCY (10% Total Direct Cost)				\$668,300	
010-7	CONTRACTOR OVERHEAD (15% Total Direct Cost)				\$1,002,400	
010-8	PROFIT (5% Total Direct Cost)				\$334,200	
	TOTAL ESTIMATED CONSTRUCTION COST				\$11,611,000	
010-4	OPERATION & MAINTENANCE (PER YEAR)					
010-401	Cover Maintenance	30	YR	\$17,400	\$522,000	O&M includes miscellaneous cover maintenance, mowing of landfill cap and surrounding areas. Miscellaneous cover maintenance involves repairing breaks in liner, slope washouts, etc. Mowing will occur on average 20 days per year.
010-402	Mowing	30	YR	\$15,551	\$466,500	
010-5	LONG TERM MONITORING (PER YEAR)					
010-501	Semi-Annual Groundwater Sampling	30	YR	\$4,690	\$140,700	Includes sampling of groundwater around landfill cap, within stormwater systems, and at downstream locations.
010-502	Annual Reporting	30	YR	\$14,318	\$429,500	Includes the preparation of documents by technical personnel.
	TOTAL LANDFILL CLOSURE and OM & M COSTS				\$13,169,700	

Estimate Date: 10/7/13 ; Rev. No. 3
 Client: MassDEP
 Estimator: C. Iannuzzi/G Lum
 Checked By: D. Reddington/S. Anderson
 Doc Scope Date:

PEI
Parsons Environmental & Infrastructure
MassDEP Old Fall River Road Landfill Closure and OM&M



LINE ITEMS DETAIL REPORT
Showing Extended Cost

	Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
LANDFILL CLOSURE and OM&M CONSTRUCTION COST ESTIMATE									
010-1-DIRECT COST									
010-101-SITE PREPARATION									
01-101-1-SITE CLEARING									
01-101-1-CLEARING									
Clearing & grubbing, medium trees, to 12" diameter, cut and chip	1.0	ACRE	36.0	\$1,721		\$1,255		\$2,976	\$2,976
CLEARING Direct Total	1.00	LS	36.0	\$1,721		\$1,255			\$2,976
SITE CLEARING Direct Total	1.00	ACRE	36.0	\$1,721		\$1,255			\$2,976
01-101-2-SITE ACCESS ROAD									
01-101-21-GRADING									
312216100100 Fine grading, for construction access roadway, 22' wide, gravel base, large area, 6,000 S.Y. or more	4,867.0	S.Y.	38.9	\$1,998		\$1,734		\$1.00	\$3,732
312216103312 Fine grading, slopes, steep, large quantities, finish grading cap material	900.0	M.S.F.	225.0	\$11,547		\$10,018		\$24	\$21,565
GRADING Direct Total	1.00	LS	263.9	\$13,545		\$11,752			\$25,297
01-101-22-OTHER SITE EARTHWORK									
313713100100 Rip-rap and rock lining, random, 4" min. broken stone, machine placed for construction access entrance	75.0	L.C.Y.	19.4	\$993	\$2,700	\$854		\$61	\$4,547
OTHER SITE EARTHWORK Direct Total	1.00	LS	19.4	\$993	\$2,700	\$854			\$4,547
01-101-23-ACCESS ROAD MATERIAL									
312323154070 Borrow, processed gravel, 3 C.Y. bucket, spreading, front end loader, wheel-mounted	1,900.0	B.C.Y.	15.2	\$809	\$28,595	\$667	\$3,211	\$18	\$33,282
312323155080 Construction Access Road, processed gravel fill, 5 C.Y. bucket, loading and/or spreading, front end loader, wheel mounted	1,900.0	B.C.Y.	76.0	\$4,046	\$47,500	\$6,688		\$31	\$58,234
312323204076 Cycle hauling(wait, load,travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 20 C.Y. truck, cycle 8 miles, 40 MPH, excludes loading equipment	1,900.0	L.C.Y.	45.6	\$1,669		\$8,433	\$1,292	\$6.00	\$11,394
312323235100 Compaction, riding, vibrating roller, 4 passes, 12" lifts	1,900.0	E.C.Y.	9.5	\$506		\$419	\$247	\$1.00	\$1,172

		Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
ACCESS ROAD MATERIAL Direct Total		1.00	LS	146.3	\$7,031	\$76,095	\$16,206	\$4,750		\$104,082
SITE ACCESS ROAD Direct Total		2,000.00	LF	429.6	\$21,569	\$78,795	\$28,812	\$4,750		\$133,926
01-101-3-EROSION & SEDIMENTATION CONTROL										
312514160200	Synthetic erosion control, polypropylene mesh, stapled, 6.5 oz./ S.Y.	98,600.0	S.Y.	986.0	\$45,570	\$224,808			\$3.00	\$270,378
312514161000	Synthetic erosion control, silt fence, polypropylene, ideal conditions, 3' high	4,375.0	L.F.	43.8	\$1,993	\$9,406			\$3.00	\$11,399
EROSION & SEDIMENTATION CONTROL Direct Total		1.00	LS	1,029.8	\$47,562	\$234,214				\$281,777
SITE PREPARATION Direct Total		1.00	LS	1,495.3	\$70,852	\$313,009	\$30,067	\$4,750		\$418,679
010-102-SITE IMPROVEMENTS										
01-102-1-SITE FENCING										
0101-102-11-FENCING & GATES										
323113104756	Access gate, painted tubular steel, single, 12', includes excavation, concrete foundations, hardware, backfilling	3.0	Ea.	7.8	\$355	\$14,400	\$107		\$4,954	\$14,862
323113200500	Install Fence, chain link industrial, galvanized steel, 6 ga. wire, 2" posts @ 10' OC, 6' high, includes excavation, & concrete	6,295.0	L.F.	944.3	\$39,895	\$94,425	\$10,772		\$23	\$145,092
FENCING & GATES Direct Total		1.00	LS	952.1	\$40,250	\$108,825	\$10,879			\$159,954
SITE FENCING Direct Total		1.00	LS	952.1	\$40,250	\$108,825	\$10,879			\$159,954
01-102-2-LANDFILL CAP										
01-102-21-FINE GRADING & SOIL PREPARATION										
312216101020	Fine grading	98,600.0	S.Y.	1,232.5	\$63,663		\$35,848		\$1.00	\$99,511
FINE GRADING & SOIL PREPARATION Direct Total		1.00	LS	1,232.5	\$63,663		\$35,848			\$99,511
01-102-22-CAP MATERIAL & EARTHWORK										
22-01	Borrow, topsoil or loam, 5 C.Y. bucket, loading and/or spreading, front end loader, wheel mounted	30,837.0	L.C.Y.	528.6	\$28,146	\$678,414	\$46,520		\$24	\$753,080
22-02	Backfill, Common Fill layer, 300 H.P. dozer, excludes compaction	38,545.0	L.C.Y.	462.5	\$24,627	\$693,810	\$22,163		\$19	\$740,601
22-03	Geocomposite Drainage Layer	1,086,000.0	S.F.	9,774.0	\$456,446	\$803,640	\$100,122		\$1.00	\$1,360,208
22-04	Polymeric liner and cover system, top cover, rough textured H.D. polyethylene (HDPE), 40 mil, incl. 4 suits & resp./day/worker	1,086,000.0	S.F.	9,774.0	\$456,446	\$434,400	\$100,122		\$1.00	\$990,968
22-05	Backfill, Sand bedding layer, 300 H.P. dozer, excludes compaction	23,126.0	L.C.Y.	462.5	\$24,626	\$462,520	\$22,162		\$22	\$509,309
22-06	Cycle hauling(wait, load,travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 20 C.Y. truck, cycle 20 miles, 35 MPH, excludes loading equipment	92,508.0	L.C.Y.	4,995.4	\$182,833		\$923,780		\$12	\$1,106,613

	Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
CAP MATERIAL & EARTHWORK Direct Total	1.00	LS	25,997.1	\$1,173,124	\$3,072,784	\$1,214,871			\$5,460,779
01-102-23-SEEDING & SODDING									
329219131000 Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed	120,661.0	S.Y.	362.0	\$16,801	\$50,678	\$10,678		\$1.00	\$78,157
SEEDING & SODDING Direct Total	1.00	LS	362.0	\$16,801	\$50,678	\$10,678			\$78,157
LANDFILL CAP Direct Total	1.00	LS	27,591.6	\$1,253,588	\$3,123,462	\$1,261,397			\$5,638,446
01-102-3-SITE RESTORATION									
01-102-31-LOCAL ROAD REPAIR									
320116715280 Cold milling asphalt paving, 1" to 3" asphalt pavement, 5,000 to 15,000 S.Y., cold planing & cleaning	15,000.0	S.Y.	210.0	\$10,664		\$25,436		\$2.00	\$36,100
LOCAL ROAD REPAIR Direct Total	1.00	LS	210.0	\$10,664		\$25,436			\$36,100
01-102-32-WETLAND RESTORATION									
Wetland Replication	0.2	ACRE				\$8,333		\$41,667	\$8,333
WETLAND RESTORATION Direct Total	1.00	LS				\$8,333			\$8,333
SITE RESTORATION Direct Total	1.00	LS	210.0	\$10,664		\$25,436	\$8,333		\$44,434
SITE IMPROVEMENTS Direct Total	1.00	LS	28,753.7	\$1,304,501	\$3,232,287	\$1,297,712	\$8,333		\$5,842,834
010-103-SITE STORM WATER SYSTEMS									
010-103-1-RIPRAP CHANNELS/DITCHES									
313713100200 Rip-rap and rock lining, random, broken stone, 18" minimum thickness, machine placed for slope protection, not grouted	2,565.0	S.Y.	2,711.2	\$127,461	\$53,865	\$35,275		\$84	\$216,601
RIPRAP CHANNELS/DITCHES Direct Total	1.00	LS	2,711.2	\$127,461	\$53,865	\$35,275			\$216,601
010-103-2-STORM DRAINAGE PIPING									
334113602040 Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 24" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	3,105.0	L.F.	1,490.4	\$71,251	\$80,730	\$11,408		\$53	\$163,389
334113602420 Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP) flared ends, 6'-2" long, 24" diameter, class 3, excludes excavation or backfill	480.0	L.F.	152.6	\$7,320	\$27,120	\$747		\$73	\$35,187
STORM DRAINAGE PIPING Direct Total	1.00	LS	1,643.0	\$78,571	\$107,850	\$12,155			\$198,576
010-103-3-STORM DRAINAGE STRUCTURES									
334913101160 Storm Drainage Outlet Control Structure (OCS), Frames, and Covers, concrete, precast, 5' I.D., 6' deep, excludes footing, excavation, backfill, frame and cover	2.0	Ea.	24.0	\$1,186	\$3,700	\$367		\$2,626	\$5,253
STORM DRAINAGE STRUCTURES Direct Total	1.00	LS	24.0	\$1,186	\$3,700	\$367			\$5,253

	Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
SITE STORM WATER SYSTEMS Direct Total	1.00	LS	4,378.2	\$207,218	\$165,415	\$47,797			\$420,430
DIRECT COST Direct Total	1.00	LS	34,627.2	\$1,582,572	\$3,710,711	\$1,375,577	\$13,083		\$6,681,943
010-2-INDIRECT COST									
010-201-MOBILIZATION & INITIAL EXPENSES									
Mobilization/Demobilization - Includes all construction trailers (pads), wheel wash station, truck scale, dump trucks, dumpsters	1.0	LS				\$100,000		\$100,000	\$100,000
MOBILIZATION & INITIAL EXPENSES Direct Total	1.00	Lot				\$100,000			\$100,000
010-202-SITE OPERATING SERVICES									
010-202-1-FIELD OFFICES									
Job Site Office Trailer(s)	36.0	Mts				\$108,000		\$3,000	\$108,000
Scale House Office Trailer(s) - incl. personnel (1 attendant full time for 36 months) and scale house	36.0	Mts				\$288,000		\$8,000	\$288,000
FIELD OFFICES Direct Total	36.00	Months				\$396,000			\$396,000
010-202-2-INSPECTION & TESTING									
Soil Testing Tech.(1 personnel @ 8 hrs/week, for 156 Wks)	1,248.0	Hrs	1,248.0	\$57,658				\$46	\$57,658
Storm/Sanitary System Investigation	36.0	EA				\$8,640		\$240	\$8,640
INSPECTION & TESTING Direct Total	36.00	Months	1,248.0	\$57,658		\$8,640			\$66,298
010-202-3-CONSTRUCTION FIELD SUPPORT									
Expense Allowance (travel, lodging, meals)	36.0	MO				\$90,000		\$2,500	\$90,000
Foreman (full time for 36 months)	36.0	MO				\$291,168		\$8,088	\$291,168
Health & Safety Technician (full time 36 months)	36.0	MO				\$187,200		\$5,200	\$187,200
QA/QC (full time for 36 months)	36.0	MO				\$197,395		\$5,483	\$197,395
Senior Engineer	36.0	MO				\$324,000		\$9,000	\$324,000
CONSTRUCTION FIELD SUPPORT Direct Total	1.00	LS				\$1,089,763			\$1,089,763
010-202-4-ENGINEERING SUPPPORT									
Engineering Support (10% of closure costs)	1.0					\$669,000		\$669,000	\$669,000
ENGINEERING SUPPPORT Direct Total	1.00	LS				\$669,000			\$669,000
SITE OPERATING SERVICES Direct Total	0.00	Months	1,248.0	\$57,658		\$2,163,403			\$2,221,061
010-203-DE-MOBILIZATION									
010-203-1-EQUIPMENT DE-MOBILIZATION									
Ofc./Constr trailers (2 office trailers, scale house, Equipment, & Materials De-mobilization)	3.0	EA				\$30,000		\$10,000	\$30,000

	Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
Truck Scale Equipment De-mobilization	1.0	LS				\$10,000		\$10,000	\$10,000
Truck Washer De-mobilization	1.0	LS				\$10,000		\$10,000	\$10,000
EQUIPMENT DE-MOBILIZATION Direct Total	1.00	LS				\$50,000			\$50,000
010-203-2-FINAL RESTORATION & CLEAN UP									
Construction Staging Area Restoration	1.0	LS				\$20,000		\$20,000	\$20,000
Wetland Restoration/Replication	1.0	LS				\$25,000		\$25,000	\$25,000
FINAL RESTORATION & CLEAN UP Direct Total	1.00	LS				\$45,000			\$45,000
DE-MOBILIZATION Direct Total	1.00	LS				\$95,000			\$95,000
010-204-TEMPORARY SITE FACILITIES									
Field Office Expense, field office lights & HVAC	36.0	Month		\$5,472				\$152	\$5,472
Field Office Expense, office equipment rental, average	36.0	Month		\$7,200				\$200	\$7,200
Field Office Expense, telephone bill; avg. bill/month, incl. long distance	36.0	Month		\$2,916				\$81	\$2,916
Portable Toilets - Rental	36.0	Mts				\$10,800		\$300	\$10,800
Rice Lake Steel 100T Truck Scale- 12 Month Rental	3.0	YR			\$111,000			\$37,000	\$111,000
Temporary Electrical Hook-up - Ofc/Constr. Trailer(s)	1.0	LS				\$60,000		\$60,000	\$60,000
Truck Wash Station	1.0	LS				\$120,000		\$120,000	\$120,000
Water Coolers	2.0	EA				\$100		\$50	\$100
TEMPORARY SITE FACILITIES Direct Total	1.00	LS		\$15,588	\$111,000	\$190,900			\$317,488
INDIRECT COST Direct Total	1.00	LS	1,248.0	\$57,658	\$15,588	\$111,000	\$2,549,303		\$2,733,549
010-3-CONSTRUCTION QUALITY ASSURANCE									
DESIGN SUPPORT DURING CONSTRUCTION									
Expense Allowance (travel, lodging, meals)	3.0	MO				\$7,500		\$2,500	\$7,500
Senior Engineer	12.0	MO				\$108,000		\$9,000	\$108,000
DESIGN SUPPORT DURING CONSTRUCTION Direct Total	1.00	LS				\$115,500			\$115,500
QUALITY ASSURANCE									
Reporting (includes technical services, reproduction, misc. materials & supplies)	3.0	EA				\$75,000		\$25,000	\$75,000
QUALITY ASSURANCE Direct Total	1.00	LS				\$75,000			\$75,000
CONSTRUCTION QUALITY ASSURANCE Direct Total	1.00	LS				\$190,500			\$190,500
010-4-OPERATION & MAINTENANCE (30 YEARS)									

	Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
010-401-COVER MAINTENANCE									
01000 Misc. Cover Maintenance (assumed operators with machinery for 6 days per year)	180.0	Days	\$144,000		\$162,000	\$216,000		\$2,900	\$522,000
COVER MAINTENANCE Direct Total	1.00	LS	\$144,000		\$162,000	\$216,000			\$522,000
010-402-MOWING									
Mowing (20 days per avg.)	600.0	Days	6,600.0	\$316,542	\$150,000			\$778	\$466,542
MOWING Direct Total	1.00	LS	6,600.0	\$316,542	\$150,000				\$466,542
OPERATION & MAINTENANCE (30 YEARS) Direct Total	1.00	LS	6,600.0	\$460,542	\$312,000	\$216,000			\$988,542
010-5-LONG TERM MONITORING (30 YEARS)									
010-501-SEMI-ANNUAL GROUNDWATER SAMPLING									
Per Diem	180.0	Days				\$16,200		\$90	\$16,200
Technician (2 days per year)	180.0	Days	1,980.0	\$111,000				\$617	\$111,000
Vehicle Rental	180.0	Days				\$13,500		\$75	\$13,500
SEMI-ANNUAL GROUNDWATER SAMPLING Direct Total	1.00	LS	1,980.0	\$111,000		\$29,700			\$140,700
010-502-ANNUAL REPORTING									
Annual Reports (includes technical services, reproduction, misc. materials & supplies)	30.0	EA				\$429,540		\$14,318	\$429,540
ANNUAL REPORTING Direct Total	1.00	LS				\$429,540			\$429,540
LONG TERM MONITORING (30 YEARS) Direct Total	1.00	LS	1,980.0	\$111,000		\$459,240			\$570,240
010-6-CONTINGENCY (10%)									
Contingency- 10% of Total DIRECT Cost	1.0	LS				\$668,300		\$668,300	\$668,300
CONTINGENCY (10%) Direct Total	1.00	LS				\$668,300			\$668,300
010-7-CONTRACTOR OVERHEAD (15%)									
Construction Costs & Contractor Overhead - 15% of Total DIRECT Cost	1.0	LS				\$1,002,400		\$1,002,400	\$1,002,400
CONTRACTOR OVERHEAD (15%) Direct Total	1.00	LS				\$1,002,400			\$1,002,400
010-8-PROFIT (5%)									
Profit - 5% of Total DIRECT Cost	1.0	LS				\$334,200		\$334,200	\$334,200
PROFIT (5%) Direct Total	1.00	LS				\$334,200			\$334,200
LANDFILL CLOSURE and OM&M CONSTRUCTION COST ESTIMATE Direct Total	1.00	LS	44,455.2	\$2,211,771	\$3,726,299	\$1,798,577	\$5,433,027		\$13,169,674

<i>Quantity / UoM</i>	<i>Labor Hours</i>	<i>Labor Cost</i>	<i>Material Cost</i>	<i>Equipment Cost</i>	<i>SUB Cost</i>	<i>Parsons ODC</i>	<i>TOTAL Unit Cost</i>	<i>TOTAL Cost</i>
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ESTIMATE GRANDTOTAL

\$13,169,674

Attachment B2

Revenue Generation Estimate

**TABLE 2
 REVENUE GENERATION ESTIMATE SUMMARY**

	DESCRIPTION	QUANTITY	UNIT	COST	TOTAL AMOUNT	COMMENTS
020-01	DIRECT COSTS					
020-01	Material Placement	1	LS	\$5,067,500	\$5,067,500	Placement & compaction of material
020-1	Total Direct Costs				\$5,067,500	
010-6	CONTINGENCY (10% Total Direct Cost)				\$506,800	
010-7	CONTRACTOR OVERHEAD (15% Total Direct Cost)				\$760,200	
010-8	PROFIT (5% Total Direct Cost)				\$253,400	
	TOTAL MATERIAL PLACEMENT (A)	1,317,173	CY	5	\$6,587,900	
	TOTAL TIPPING FEES (B)	1,317,173	CY	15	\$19,757,600	Landfill disposal fee
	NET REVENUE GENERATION (B - A)	1,317,173	CY	10	\$13,169,700	(Tipping Fees - Total Material Placement)

Estimate Date: 10/7/13 ; Rev. No. 3
 Client: MassDEP
 Estimator: C. Iannuzzi/G Lum
 Checked By: D. Reddington/S. Anderson
 Doc Scope Date:

PEI
Parsons Environmental & Infrastructure
MassDEP Old Fall River Road Landfill Revenue Generation



LINE ITEMS DETAIL REPORT
Showing Extended Cost

	Quantity / UoM	Labor Hours	Labor Cost	Material Cost	Equipment Cost	SUB Cost	Parsons ODC	TOTAL Unit Cost	TOTAL Cost
REVENUE GENERATION ESTIMATE									
020-0-MATERIAL PLACEMENT									
020-01-DIRECT COST									
020-0101-MATERIAL PLACEMENT									
312323157080 Compactor (2 EA)	592.0	DAY	9,472.0	\$540,756	\$651,200			\$2,013	\$1,191,956
312323157080 Dozer (2 EA)	592.0	DAY	9,472.0	\$540,756	\$680,800			\$2,063	\$1,221,556
312323157080 Laborer (4 Men) -	592.0	DAY	18,944.0	\$862,899				\$1,458	\$862,899
312323157080 Loader (2 EA)	592.0	DAY	9,472.0	\$540,756	\$1,250,304			\$3,025	\$1,791,060
MATERIAL PLACEMENT Direct Total	1.00	LS	47,360.0	\$2,485,169	\$2,582,304				\$5,067,473
DIRECT COST Direct Total	1.00	LS	47,360.0	\$2,485,169	\$2,582,304				\$5,067,473
020-02-CONTINGENCY (10%)									
Contingency- 10% of Total DIRECT Cost	1.0	LS				\$506,800		\$506,800	\$506,800
CONTINGENCY (10%) Direct Total	1.00	LS				\$506,800			\$506,800
020-03-CONTRACTOR OVERHEAD (15%)									
Construction Costs & Contractor Overhead - 15% of Total DIRECT Cost	1.0	LS				\$760,200		\$760,200	\$760,200
CONTRACTOR OVERHEAD (15%) Direct Total	1.00	LS				\$760,200			\$760,200
020-04-PROFIT (5%) -									
Profit - 5% of Total DIRECT Cost	1.0	LS				\$253,400		\$253,400	\$253,400
PROFIT (5%) - Direct Total	1.00	LS				\$253,400			\$253,400
MATERIAL PLACEMENT Direct Total	1.00	LS	47,360.0	\$2,485,169	\$2,582,304	\$1,520,400			\$6,587,873
REVENUE GENERATION ESTIMATE Direct Total	1.00	LS	47,360.0	\$2,485,169	\$2,582,304	\$1,520,400			\$6,587,873

<i>Quantity / UoM</i>	<i>Labor Hours</i>	<i>Labor Cost</i>	<i>Material Cost</i>	<i>Equipment Cost</i>	<i>SUB Cost</i>	<i>Parsons ODC</i>	<i>TOTAL Unit Cost</i>	<i>TOTAL Cost</i>
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ESTIMATE GRANDTOTAL

\$6,587,873