

## 2021 Worksheet for Calculating Closure and Post-closure Cost Estimates

All site data necessary to calculate estimates of closure and post-closure costs can be gathered by completing Table H.1. Data from Table H.1 should be inserted into Tables H.2 and I.1 to complete calculations.

**Table H.1: Site Data**

**Facility Name:**

**Permit Number:**

Description	Quantity	Units
Total Permitted Area		acres
Active Portion		
Composite Lined		acres
Soil Lined		acres
Area of Largest Cell/Phase Requiring Final Cap		
Composite Lined		acres
Soil Lined		acres
Perimeter Fencing		linear feet
Groundwater Monitoring Wells		VLF
Methane Gas Probes		VLF
Terraces		linear feet
Letdown channels		linear feet
Perimeter drainage ditches		linear feet
Average Daily Flow		tons/day
Landfill Disposal Cost		\$/ton

VLF = Vertical linear feet. The sum of the depths of all monitoring wells.

**Table H.2: Closure Cost Estimate**

**Facility Name:**

**Permit Number:**

	Task/Service	Quantity	Units	Multiplier <sup>a</sup>	Unit Cost <sup>b</sup>	Subtotal
<b>1</b>	<b>Preliminary Site Work</b>					
1.1	Conduct Site Evaluation	1	Lump sum	1	\$3,789.99	\$3,789.99
1.2	Dispose Final Wastes					
	Average Daily Flow <sup>c</sup>	c	tons/day			
	Disposal Cost <sup>d,e</sup>	d	tons/day	5 (5 days waste)	e	

1.3	Remove Temporary Building(s)	1	lump sum	1	\$3,475.44	\$3,475.44
1.4	Remove Equipment	1	lump sum	1	\$2,836.97	\$2,836.97
1.5	Repair/Replace Perimeter Fencing		linear feet	0.25 (25% of fencing)	\$3.72	
1.6	Clean Leachate Line(s)	1	lump sum	1	\$1,716.59	\$1,716.59
<b>2</b>	<b>Monitoring Equipment</b>					
2.1	Rework/Replace Monitoring Well(s)		VLF	0.25 (25% of wells)	\$79.69	
2.2	Plug Abandoned Monitoring Well(s)		VLF	0.25 (25% of wells)	\$31.90	
2.3	Rework/Replace Methane Probe(s)		VLF	0.25 (25% of probes)	\$68.83	
2.4	Plug Abandoned Methane Probe(s)		VLF	0.25 (25% of probes)	\$25.15	
2.5	Rework/Replace Remediation and/or Gas Control Equipment <sup>f</sup>	1	lump sum	0.05 (5% of equipment capital cost)	<sup>f</sup>	
<b>3</b>	<b>Construction</b>					
3.1	Complete Site Grading to include on- and off-site borrow areas		acres	1	\$1,502.63	
3.2	Construct Final Cap					
	Compacted On-site Clay Cap or		cubic yards	1	\$5.40	
	Compacted Off-site Clay Cap or		cubic yards	1	\$8.77	
	Install Geosynthetic Clay Liner Cap		square feet	1	\$0.57	
3.3	Construct Landfill Gas Venting Layer					
	Place Sand or		acres	1	\$40,178.88	
	Install Net and Geotextile		square feet	1	\$0.39	
3.4	Install Passive Landfill Gas Vents		acres	1	\$962.54	
3.5	Install Flexible Membrane Liner		square feet	1	\$0.44	

3.6	Drainage Layer					
	Place Sand or Install Net and Geonet		acres square feet	1 1	\$40,178.88 \$0.39	
3.7	Place On-site Topsoil		cubic yards	1	\$2.32	
	Place Off-site Topsoil		cubic yards	1	\$18.57	
3.8	Establish vegetative cover, including on- and off-site borrow areas		acres	1	\$1,070.89	
<b>4</b>	<b>Drainage/erosion control</b>					
4.1	Construct Terraces		linear feet	1	\$9.73	
4.2	Construct Letdown Channels		linear feet	1	\$106.38	
4.3	Clean Perimeter Drainage Ditches		linear feet	0.5 (50% of ditches)	\$7.41	
<b>5</b>	<b>Tasks Not Identified</b>					
<b>6</b>	<b>Subtotal</b>					
<b>7</b>	<b>Administrative Services<sup>g</sup></b>	1	lump sum	0.1 (10%)	<b>g</b>	
<b>8</b>	<b>Technical and Professional Services<sup>g</sup></b>	1	lump sum	0.12 (12%)	<b>g</b>	
<b>9</b>	<b>Closure Contingency<sup>g</sup></b>	1	lump sum	0.1 (10%)	<b>g</b>	
<b>10</b>	<b>Total Final Closure<sup>h</sup></b>					<b>h</b>

- a Multipliers are determined from the *Solid Waste Financial Assurance Program Report*, December 22, 2000.
- b Unit costs include a 1.21% inflationary adjustment for 2021.
- c New facilities: Insert the value for "W" in OAC 252:515-27-8(a)(2). Existing facilities: Insert reported annual tonnage for the previous year, divided by 312 operating days per year (52 weeks per year x 6 operating days per week).
- d Insert number of tons/day from above.
- e Insert landfill disposal cost per ton of waste (\$/ton).
- f Input capital cost for gas control/remediation equipment, if installed at the site.
- g Input subtotal from line 6.
- h Add rows 6 through 9.

**Table I.1: Post-Closure Estimate**

**Facility Name:**

**Permit Number:**

	<b>Task/Service</b>	<b>Quantity</b>	<b>Units</b>	<b>Multiplier<sup>a</sup></b>	<b>Unit Cost<sup>b</sup></b>	<b>Subtotal</b>
<b>1</b>	<b>Site maintenance</b>					
1.1	Site Inspections	4	per year	30 (30 yrs)	\$689.44	\$82,732.80
				8 (8 yrs)	\$689.44	\$22,062.08
1.2	General Maintenance	1	per year	30 (30 yrs)	\$2,066.99	\$62,009.70
				8 (8 yrs)	\$2,066.99	\$16,535.92
1.3	Remediation and/or Gas Control Equipment <sup>c, d</sup>	1	lump sum	0.3 <sup>c</sup>	<sup>d</sup>	
<b>2</b>	<b>Monitoring equipment</b>					
2.1	Rework/Replace Monitoring Well(s)		VLF	0.25 (25% of wells)	\$79.69	
2.2	Plug Abandoned Monitoring Well(s)		VLF	0.25 (25% of wells)	\$31.90	
2.3	Final Plugging of Monitoring Wells		VLF	1	\$31.90	
2.4	Rework/Replace Methane Probe(s)		VLF	0.25 (25% of probes)	\$68.83	
2.5	Plug Abandoned Methane Probe(s)		VLF	0.25 (25% of probes)	\$25.15	
2.6	Final Plugging of Methane Probes		VLF	1	\$25.15	
2.7	Final Plugging of Piezometer(s)		VLF	1	\$25.15	
<b>3</b>	<b>Sampling and analysis</b>					
3.1	Groundwater Monitoring Wells <sup>e</sup>		wells	60 (2/yrX30yr)	\$743.41	
	C&D <sup>e</sup>		wells	16 (2/yrX8yr)	\$183.50	
3.2	Methane Gas Probes		probes	60 (2/yrX30yr)	\$48.24	
3.3	Surface Water Monitoring Points		points	60 (2/yrX30yr)	\$89.59	
3.4	Leachate		samples	60 (2/yrX30yr)	\$144.37	

<b>4</b>	<b>Final cover maintenance</b>					
4.1	Mow and Fertilize Vegetative Cover (MSWLF)		acres	30 (30 yrs)	\$228.08	
	C&D LF		acres	8 (8 yrs)	\$228.08	
4.2	Repair Erosion, Settlement, and Subsidence for On-site Soils (MSWLF): 2CY/ac X 30yr		acres	60 (60 yrs)	\$3.31	
	C&D LF: 2CY/ac X 8 yr		acres	16 (16 yrs)	\$3.31	
	Repair Erosion, Settlement, and Subsidence for Off-site Soils (MSWLF)		acres	30 (30 yrs)	\$19.78	
	C&D LF		acres	8 (8 yrs)	\$19.78	
4.3	Reseed Vegetative Cover		acres	0.2 (20% reseeded over post-closure period)	\$1,070.89	
<b>5</b>	<b>Leachate management</b>					
5.1	Clean Leachate Line(s)	1	per year	30 (30 yrs)	\$1,767.92	\$53,037.60
5.2	Maintain Leachate Collection System and Equipment	1	per year	30 (30 yrs)	\$2,746.53	\$82,395.90
5.3	Collect, Treat, Transport, and Dispose of Leachate		gal/yr	30 (30 yrs)	\$0.35	
<b>6</b>	<b>Tasks not identified</b>					
<b>7</b>	<b>Subtotal</b>					
<b>8</b>	<b>Administrative Services<sup>f</sup></b>	1	lump sum	0.06 (6%)	<b>f</b>	
<b>9</b>	<b>Technical and Professional Services<sup>f</sup></b>	1	lump sum	0.07 (7%)	<b>f</b>	
<b>10</b>	<b>Post-closure Contingency<sup>f</sup></b>	1	lump sum	0.1 (10%)	<b>f</b>	<b>g</b>
<b>11</b>	<b>Total Post-closure<sup>g</sup></b>					

a Multipliers are determined from the *Solid Waste Financial Assurance Program Report*, December 22, 2000.

b Unit costs include a 1.21% inflationary adjustment for 2021.

c 5% of equipment capital cost, maintenance performed once per 5 yrs for 30 years (6 x 0.05 = 0.30).

d Input capital cost for gas control/remediation equipment, if installed at the site.

e If the approved groundwater monitoring plan requires monitoring for alternative constituents, unit costs shall be calculated in accordance with OAC 252:515-27-52(b) or (c).

f Input subtotal from line 7.

g Add lines 7 through 10.