

# **Northern Utah Regional Landfill Authority**

## Regional Landfill Financial Analysis

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# Ranking the Landfill Sites

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## a. Background

The Northern Utah Regional Landfill Authority (NURLA) asked Zions Bank Public Finance (ZBPF) to perform a financial analysis to study the costs of acquiring and operating a long-term regional landfill in Box Elder County. ZBPF was asked to look at six specific sites in Box Elder County and to evaluate these sites strictly on a financial basis. In addition, ZBPF was asked to evaluate the sites based on the premise that all five NURLA-participating counties (Box Elder, Cache, Weber, Davis and Morgan) would send waste to one landfill. The six sites include Promontory, Little Mountain, West Hills, Rattlesnake Pass, Bulls Pass, and Monument Peak. A map of these sites, provided by JBR Environmental Consultants, is found in Appendix 1.

## b. Discussion of Sites

### *Promontory*

The Promontory site is located on the southwest tip of the Promontory Peninsula and is owned by Pacific West, LLC. Pacific West controls 4,000 acres and has a Class I Landfill Permit issued by the Utah DEQ, Division of Solid and Hazardous Waste for a 1,000 acre disposal cell surrounded by a 1,000 acre buffer zone.

The Promontory site is accessed by either crossing the Great Salt Lake Minerals (GSL) dike or the Union Pacific causeway. Currently, no agreements are in place to secure access across either of these roads. In addition, if access is granted across either of these roads, major construction would be required to improve the roads to handle the increased traffic. Pacific West, LLC estimated this cost to be approximately \$4.5 million. However, before accepting this amount, we would suggest that NURLA require a formal estimate from a qualified engineering firm detailing the costs of the improvements.

### *Little Mountain*

The Little Mountain site is an operating landfill owned by Box Elder County. The site consists of 112 acres of land owned by the county as well as a lease agreement to use 1,000 acres of land surrounding the 112 acres. The lease was entered into in 1996 with Nicoli Nicholas Sr. and Nicoli Nicholas Jr. Box Elder County makes a lease payment to the Nicholas' every year. In addition, Box Elder County agrees to pay the Nicholas' a royalty for every ton of waste placed on the leased land. The Little Mountain Landfill permit was renewed in 2006. In addition, a permit has been submitted to expand the landfill in order to accommodate waste from all five counties.

### *West Hills*

The West Hills site is owned by Davis County Solid Waste Management and Energy Recovery Special Service District and includes 1,280 acres located approximately 2.5 miles off of Exit 32 on Interstate 84.

### *Rattlesnake Pass, Bulls Pass, Monument Peak*

These sites are areas in Box Elder County that were identified by JBR Environmental Consulting, Inc. in a previous study as areas that would be feasible locations for a landfill, based on Geographic Information System (GIS) data. The land is owned by multiple private land owners.

## c. Ranking Methodology

The sites are evaluated and ranked based on the following costs: transportation, land, permit, infrastructure, upgrading roads, and royalties. It is important to note that only the differential costs are considered. The costs that are assumed to be the same at each location are not included in this evaluation. These include operating expenses, equipment, and the cost of the landfill liner. Below is a description of how each cost was calculated.

### *Transportation Costs*

The transportation costs of hauling waste from each county to the various landfill sites are based on travel times. The travel times are based on current road conditions and were derived by actually driving each route at posted speed limits and tracking the time. We have assumed that NURLA would have authorization to cross the causeway to the Promontory

site, which is not currently the case. There may be additional costs charged by Union Pacific to cross the causeway. In addition to driving the routes, the times and distances were checked using Google Maps and Google Earth. Where applicable, the travel time also includes a ten minute round trip stop at the weigh station in Perry, Utah (approximately three miles south of Brigham City). Appendix 2 includes a summary of the travel times to each site.

The travel times were then used to calculate a cost per ton based on a vehicle cost per hour of \$120 and a 24 ton load, as shown in Appendix 2. This method was used for comparison purposes only and does not represent actual quotes from trucking companies. The costs per ton do not include a fuel surcharge as it is assumed the surcharge would be applied uniformly and would, therefore, increase all of the costs per ton by the same percentage. The following table summarizes the cost per ton based on the travel times:

#### Estimated Cost per Ton

	Box Elder	Davis	Cache	Weber
Little Mountain	\$6.33	\$11.75	\$11.67	\$9.83
Promontory	14.67	12.25	19.00	10.33
West Hills	7.50	12.92	9.17	11.00
Rattlesnake Pass	10.17	15.58	11.83	13.67
Bull's Pass	10.67	16.08	12.17	14.17
Monument Peak	13.17	18.58	14.67	16.67

To determine the annual transportation costs to each site, the costs per ton were applied to the annual Municipal Solid Waste (MSW) tonnage from each county. The MSW amounts are based on the 2006 Landfill and Transfer Station Inventory data as reported by the Utah Division of Solid & Hazardous Waste. The base year used in this analysis is 2012. The annual growth rate applied to the tonnage is based on the projected population increases for each county, as reported by the Governor's Office of Planning and Budget (see Appendix 3). The waste projection and transportation costs for each county, as well as a summary of the transportation costs based on those projections, are included in Appendix 4 and Appendix 5, respectively.

It is important to note that the hauling costs could be much lower for some sites if a larger truck load is permitted. Trucking companies can apply to the Utah Department of Transportation (UDOT) for a permit that allows them to haul 41 tons of waste on double trailers on specific routes approved by UDOT. The general rule for routes is that the hauling locations cannot be more than one mile from the freeway. However, if the distance exceeds one mile, the trucking company can seek approval from UDOT by applying for a variance. UDOT confirmed that the 41 ton-load double trailers would not be allowed for hauling to the Little Mountain or Promontory sites. However, trucking companies might be able to get the permit for the West Hills site, depending on UDOT's evaluation of both the transfer station and landfill locations. Because approval is not in place at this time, a load of 24 tons is used for all routes in this analysis.

#### Land

The cost of the land used for the Little Mountain site is \$4,346,943, which is the value assigned to the landfill in a previous report prepared for NURLA. This cost includes not only the land, but also the existing infrastructure.

The cost of the 2,000 permitted acres on Promontory Point is \$10 million dollars as provided by the owners, Pacific West, LLC.

The cost of the 1,280 acres at West Hills is assumed to be \$700 per acre. Using the same acreage as West Hills, it is assumed that the land at Rattlesnake Pass would be \$600 per acre and the land at both Bull's Pass and Monument Peak would be \$500 per acre, based on the distance of the land from the freeway.

#### Permit

According to Utah State law, landfill permits must be renewed every 10 years. The Little Mountain Landfill permit was renewed in 2006. However, if NURLA acquires the Little Mountain Landfill, the leased 1,000 acres would need to be permitted, which would cost approximately \$30,000. The Promontory Landfill was permitted in 2004, so there would be no permitting cost associated with the Promontory site until 2014. The cost of the initial permitting of the remaining sites is estimated to be \$100,000.

### *Infrastructure*

The costs associated with constructing the infrastructure at the Little Mountain Landfill were used as the basis for the estimate of constructing the infrastructure at the other sites. The cost was calculated using the “Infrastructure,” “Building Improvements,” and “Land Improvements” classifications on the Little Mountain Asset Report, and adjusting for both general and construction inflation (see Appendix 6). The resulting estimated cost of \$2,470,225 is used as a basis for comparison purposes only.

### *Cost of Roads*

The inter-local agreement creating NURLA requires that NURLA help pay for the costs associated with any impact to county roads to any NURLA landfill. The estimates for upgrading the roads to the different sites in order to support the increased traffic are based on figures provided by Bill Gills, Box Elder County Road Supervisor. Mr. Gills provided the estimated cost per mile of upgrading a regular dirt road with no base. This cost was used for the West Hills, Rattlesnake Pass, Bulls Pass, and Monument Peak sites for the respective stretches of non-paved roads that would be required at each site. Mr. Gills provided a specific estimate for upgrading the two paved roads to the Little Mountain Landfill. These costs are detailed in Appendix 7.

The road to the access roads to the Promontory site is located in Weber County. Kelly Hipwell, Weber County Road Director, explained that the road from the freeway to 4700 West is a state road and from 4700 West to the end of the road (approximately 7 miles) is a county road. Mr. Hipwell provided the estimated cost per mile to upgrade the seven miles of county road as detailed in Appendix 7.

### *Royalties*

The Promontory, West Hills, and Little Mountain sites are all subject to royalties based on how much waste is placed on the sites. All waste hauled to the Promontory Landfill would be subject to a \$1 per ton fee. Waste hauled to West Hills would be subject to a \$0.30 per ton fee for the first 25 years. Waste placed on the leased land at the Little Mountain Landfill would be charged one quarter of one percent (0.25%) of the tipping fee. For this analysis we are assuming a tipping fee of \$13 per ton for Little Mountain, which results in a fee of \$0.03 per ton. These royalty amounts were applied to the total waste from all five counties in the first year (2012 for this analysis), which is 574,382 tons.

## **d. Other Considerations**

Given the plan put forth by the Promontory site owners, there appears to be insufficient soil to provide daily cover for the proposed height of the waste mound. Providing the needed cover would require hauling additional soil from nearby land. If this is the case, the cost of hauling that soil is projected to be at least \$2.50 per ton.

## **e. Annualizing the Costs**

The costs outlined above were annualized in order take into account the different capacities of the proposed landfill sites. The capacity of the site determines the life of the landfill. Pacific West, LLC has estimated the landfill life of the Promontory site to be approximately 421 years. The life of the remaining sites is conservatively set at 80 years. The data used for calculating the annualized costs is found in Appendix 8. In comparing the costs of all sites we have used the concept of net present value using a discount rate of 5%. The discount rate approximates NURLA’s cost of capital.

## f. Conclusion/Site Rankings

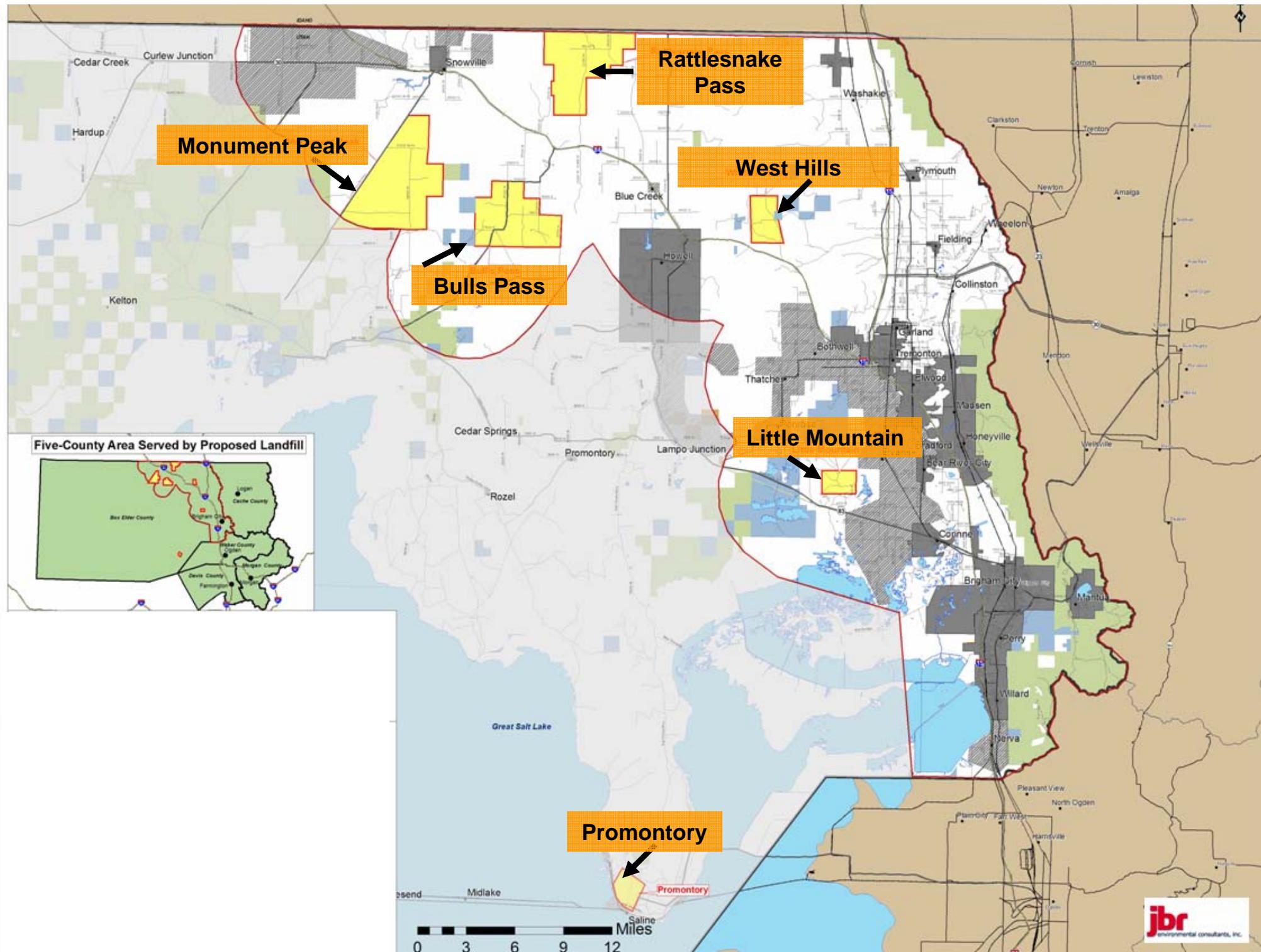
The following table shows the outcome of ranking the proposed sites based on annualized costs:

Rank	Site	Annualized Cost	Amount over Little Mt.	% over Little Mt.
1	Little Mountain	\$7,332,024	\$0	0.00%
2	West Hills	7,698,760	366,736	5.00%
3	Rattlesnake Pass	9,328,856	1,996,831	27.23%
4	Bulls Pass	9,584,344	2,252,319	30.72%
5	Promontory	9,911,720	2,579,695	35.18%
6	Monument Peak	11,208,595	3,876,570	52.87%

Based upon our findings, from a financial perspective, the best site for the NURLA landfill is the Little Mountain site, followed closely by the West Hills site. We recognize there are factors that are not financial in nature that may need to be considered before selecting a site. These might include political opposition to a particular site.

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## Appendix



Appendix 1  
Map of sites

## Landfill Transportation Data

Unload Time (min)	30
Vehicle Cost per hour	\$120
MSW per load (tons)	24

		Haul Time (one way)	Unload Time	Total Round Trip (hrs)	Cost per Load	MSW per Load (tons)	Cost per Ton	
Little Mountain	Layton	55.5	30	2.35	\$282	24	\$11.75	*
	Ogden	44	30	1.97	236	24	9.83	*
	Brigham City	23	30	1.27	152	24	6.33	
	Logan	55	30	2.33	280	24	11.67	
West Hills	Layton	62.5	30	2.58	\$310	24	\$12.92	*
	Ogden	51	30	2.20	264	24	11.00	*
	Brigham City	30	30	1.50	180	24	7.50	
	Logan	40	30	1.83	220	24	9.17	
Rattlesnake Pass	Layton	78.5	30	3.12	\$374	24	\$15.58	*
	Ogden	67	30	2.73	328	24	13.67	*
	Brigham City	46	30	2.03	244	24	10.17	
	Logan	56	30	2.37	284	24	11.83	
Bull's Pass	Layton	81.5	30	3.22	\$386	24	\$16.08	*
	Ogden	70	30	2.83	340	24	14.17	*
	Brigham City	49	30	2.13	256	24	10.67	
	Logan	58	30	2.43	292	24	12.17	
Monument Peak	Layton	96.5	30	3.72	\$446	24	\$18.58	*
	Ogden	85	30	3.33	400	24	16.67	*
	Brigham City	64	30	2.63	316	24	13.17	
	Logan	73	30	2.93	352	24	14.67	
Promontory	Layton	59	30	2.45	\$294	24	\$12.25	
	Ogden	47	30	2.07	248	24	10.33	
	Brigham City	73	30	2.93	352	24	14.67	*
	Logan	99	30	3.80	456	24	19.00	*

\*An additional 10 minutes round trip was added for stopping at the transfer station in Perry, Utah.

## Population

### By County and Multi-County District

2000 - 2050\*

Area	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Box Elder	45,142	49,254	55,212	61,675	68,038	73,833	79,576	85,455	91,528	97,789
Cache	102,477	114,304	130,375	147,776	165,626	183,989	203,123	223,185	244,382	266,711
Davis	276,374	304,502	330,833	352,320	369,206	382,219	393,492	404,170	414,393	424,177
Morgan	8,525	10,183	12,760	16,200	20,384	24,595	29,159	34,290	40,085	46,596
Weber	212,707	230,145	251,528	271,339	289,584	306,227	322,399	338,579	354,929	371,429
Davis/Morgan	284,899	314,685	343,593	368,520	389,590	406,814	422,651	438,460	454,478	470,773

### Percent Increase over Previous Year\*

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	Average
Box Elder	1.09%	2.25%	2.30%	2.19%	1.86%	1.56%	1.48%	1.41%	1.36%	1.31%	1.6644%
Cache	2.29%	2.47%	2.65%	2.45%	2.24%	2.08%	1.95%	1.87%	1.81%	1.73%	2.1544%
Davis	2.77%	1.85%	1.49%	1.13%	0.84%	0.62%	0.56%	0.52%	0.49%	0.45%	1.1467%
Morgan	3.35%	4.37%	4.68%	5.08%	4.50%	3.61%	3.38%	3.24%	3.13%	3.00%	3.8140%
Weber	1.51%	1.87%	1.68%	1.44%	1.25%	1.07%	1.01%	0.97%	0.93%	0.90%	1.2713%
Davis/Morgan	2.79%	1.93%	1.61%	1.30%	1.02%	0.79%	0.75%	0.73%	0.72%	0.70%	1.2975%

Note: All populations are dated July 1

Source: 2005 Baseline Projections, Governor's Office of Planning and Budget

<http://www.governor.utah.gov/dea/People.html>

\*Data from 2000 to 2050 used in calculations, only every five years is shown.

## MSW Projection Variables

	2006 MSW Tons*	Annual Growth Rate**
Box Elder County	30,179	1.66%
Cache County	114,949	2.15%
Davis County (including Morgan)	175,197	1.30%
Weber County	205,000	1.27%
<b>Assumption for Analysis:</b>		
Year diversion of waste begins	2012	
Individual facility operation / diversion is ignored		
Discount Rate for PV analysis	5.0%	
Inflation Rate	3.5%	
Promontory Royalty Cost per ton	\$1.00	
West Hills Royalty Cost per ton	\$0.30	
Little Mt. Royalty Cost per ton (for leased land)***	\$0.03	

\* Data from 2006 Landfill and Transfer Station Inventory

\*\*Data from the Governor's Office of Planning and Budget 50 year population projections

\*\*\*The Little Mountain royalty is for MSW placed on the leased land and is equal to one quarter of one percent (0.25%) of the tipping fee. For this analysis a tipping fee of \$13 is used for a fee of \$0.03 per ton.

Total tons of MSW hauled in first year (2012) 574,382

















### Box Elder County Landfill Transportation Cost Summary

<b>1 Year</b>	<b>Box Elder</b>	<b>Davis/Morgan</b>	<b>Cache</b>	<b>Weber</b>	<b>Total</b>	<b>Rank</b>
Little Mountain	\$238,707	\$2,515,764	\$1,723,876	\$2,459,725	\$6,938,071	1
Promontory	552,794	2,622,818	2,807,454	2,584,796	8,567,862	3
West Hills	282,679	2,765,557	1,354,474	2,751,557	7,154,266	2
Rattlesnake Pass	383,187	3,336,510	1,748,502	3,418,601	8,886,800	4
Bulls Pass	402,032	3,443,564	1,797,756	3,543,671	9,187,023	5
Monument Peak	496,258	3,978,833	2,167,158	4,169,025	10,811,274	6
<b>10 Years</b>	<b>Box Elder</b>	<b>Davis/Morgan</b>	<b>Cache</b>	<b>Weber</b>	<b>Total</b>	<b>Rank</b>
Little Mountain	\$2,409,978	\$24,988,974	\$17,788,023	\$24,404,019	\$69,590,994	1
Promontory	5,581,002	26,052,334	28,969,066	25,644,901	86,247,304	3
West Hills	2,853,921	27,470,149	13,976,304	27,299,411	71,599,785	2
Rattlesnake Pass	3,868,649	33,141,405	18,042,137	33,917,450	88,969,642	4
Bulls Pass	4,058,911	34,204,766	18,550,367	35,158,333	91,972,375	5
Monument Peak	5,010,218	39,521,569	22,362,086	41,362,744	108,256,616	6
<b>50 Years</b>	<b>Box Elder</b>	<b>Davis/Morgan</b>	<b>Cache</b>	<b>Weber</b>	<b>Total</b>	<b>Rank</b>
Little Mountain	\$12,577,124	\$121,286,741	\$102,645,076	\$117,846,772	\$354,355,712	1
Promontory	29,125,970	126,447,879	167,164,838	123,838,980	446,577,668	3
West Hills	14,893,962	133,329,396	80,649,703	131,828,592	360,701,653	2
Rattlesnake Pass	20,189,593	160,855,465	104,111,434	163,787,039	448,943,531	4
Bulls Pass	21,182,524	166,016,603	107,044,151	169,779,247	464,022,525	5
Monument Peak	26,147,178	191,822,293	129,039,524	199,740,291	546,749,286	6
<b>100 Years</b>	<b>Box Elder</b>	<b>Davis/Morgan</b>	<b>Cache</b>	<b>Weber</b>	<b>Total</b>	<b>Rank</b>
Little Mountain	\$26,559,775	\$233,826,839	\$247,768,082	\$225,790,885	\$733,945,580	1
Promontory	61,506,847	243,776,917	403,508,019	237,271,778	946,063,560	4
West Hills	31,452,365	257,043,688	194,674,921	252,579,634	735,750,608	2
Rattlesnake Pass	42,635,428	310,110,772	251,307,626	313,811,061	917,864,886	3
Bulls Pass	44,732,253	320,060,850	258,386,714	325,291,953	948,471,769	5
Monument Peak	55,216,374	369,811,241	311,479,874	382,696,415	1,119,203,905	6

## Inflation-Adjusted Infrastructure Costs

Classification	Description	Date Acq	Total Cost	Inflation-Adjusted Costs	Inflation Rates
Infrastructure	Landfill Construction	08/29/97	636,273.82	1,335,983.48 *	2.70% General Inflation 5.00% Construction Inflation 7.70% Total Inflation
	HDPE 60 Mil Pond Liner	08/23/99	27,540.00	34,082.19	
	Asphalt Road	07/01/96	7,593.29	17,171.28 *	
	Gravel SWM Roads	07/01/98	37,464.00	73,039.11 *	
	Landfill Construction	07/01/98	210,202.39	409,806.63 *	
	Environmental Cover	09/30/05	16,194.39	17,080.69	
			\$ 935,267.89	\$ 1,887,163.38	
Bldg Improvements	Furnace, Clean Burn	02/01/01	5,495.00	6,447.49	
	Electric Work	01/01/98	7,362.44	9,357.41	
	Building Landfill	01/01/98	200,000.00	389,916.24 *	
	Electric Hookup	07/01/97	36,595.00	47,766.80	
	Remove Pump House & Repair	01/01/98	9,242.55	NA	
			\$ 258,694.99	\$ 453,487.94	
Land Improvements	Liner Lower Pond	10/31/00	88,931.00	107,163.35	
	Fence, Chain Link	02/09/01	7,473.46	9,754.97	
	Fencing-SWM	07/01/98	9,958.00	12,656.28	
			\$ 106,362.46	\$ 129,574.61	

Source: Box Elder County Auditor

**TOTAL \$1,300,325.34 \$ 2,470,225.93**

\*Uses the Total Inflation rates

## Estimates to Upgrade Roads

### Regular Dirt Road with no Base\*

Granular Pit run base	\$ 78,000
Crushed Road Base	65,000
3 inch asphalt	152,000
<b>Total Cost per Mile</b>	<b>\$ 295,000</b>

	Miles of Dirt Road	Cost to Upgrade
West Hills	4.0	\$1,180,000
Rattlesnake Pass	6.0	1,770,000
Bulls Pass	5.0	1,475,000
Monument Peak	5.0	1,475,000

### Road to Little Mountain\*

	Cost per Mile	Miles	
From St. Road to 6800 N	\$ 70,000	4.5	\$ 315,000
From 6800 N to Little Mountain	140,000	6.0	840,000
<b>Total Cost</b>			<b>\$ 1,155,000</b>

### Road to Promontory\*\*

4700 W to the end of the road	\$ 120,000	7.0	\$ 840,000
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### Summary

Site	Total Cost
Little Mountain	\$1,155,000
Promontory	840,000
West Hills	1,180,000
Rattlesnake Pass	1,770,000
Bulls Pass	1,475,000
Monument Peak	1,475,000

\*Source: Bill Gills, Box Elder County Road Director

\*\*Source: Kelly Hipwell, Weber County Road Director

## Box Elder County Landfill Site Evaluation

### Annualized Costs

	<b>Little Mountain</b>	<b>Promontory</b>	<b>West Hills</b>	<b>Rattlesnake Pass</b>	<b>Bulls Pass</b>	<b>Monument Peak</b>
Land	\$221,823	\$500,000	\$45,723	\$39,191	\$32,659	\$32,659
Permit	3,885	0	12,950	12,950	12,950	12,950
Infrastructure	0	160,692	160,692	160,692	160,692	160,692
Cost of Roads	149,578	108,784	152,815	229,223	191,019	191,019
Transportation*	6,938,071	8,567,862	7,154,266	8,886,800	9,187,023	10,811,274
Royalties*	18,667	574,382	172,315	0	0	0
<b>TOTAL</b>	<b>\$7,332,024</b>	<b>\$9,911,720</b>	<b>\$7,698,760</b>	<b>\$9,328,856</b>	<b>\$9,584,344</b>	<b>\$11,208,595</b>

\*Cost during the first year of landfill operation

### Annualized Cost Calculation Data

	<b>Little Mountain</b>	<b>Promontory</b>	<b>West Hills</b>	<b>Rattlesnake Pass</b>	<b>Bulls Pass</b>	<b>Monument Peak</b>
Land	\$4,346,943	\$10,000,000	\$896,000	\$768,000	\$640,000	\$640,000
Permit	30,000		100,000	100,000	100,000	100,000
Infrastructure		2,470,226	2,470,226	2,470,226	2,470,226	2,470,226
Cost of Roads	1,155,000	840,000	1,180,000	1,770,000	1,475,000	1,475,000
<b>Total</b>	<b>\$5,531,943</b>	<b>\$13,310,226</b>	<b>\$4,646,226</b>	<b>\$5,108,226</b>	<b>\$4,685,226</b>	<b>\$4,685,226</b>

**Discount Rate** 5%

### Estimated Life

	<b>Little Mountain</b>	<b>Promontory</b>	<b>West Hills</b>	<b>Rattlesnake Pass</b>	<b>Bulls Pass</b>	<b>Monument Peak</b>
Land	80	421	80	80	80	80
Permit	10	10	10	10	10	10
Infrastructure	30	30	30	30	30	30
Roads	10	10	10	10	10	10

### Present Value Factors $(1+i)^{n-1}/i(1+i)^n$

Land	19.60	20.00	19.60	19.60	19.60	19.60
Permit	7.72	7.72	7.72	7.72	7.72	7.72
Infrastructure	15.37	15.37	15.37	15.37	15.37	15.37
Roads	7.72	7.72	7.72	7.72	7.72	7.72