



**SOLID WASTE MANAGEMENT
Annual Operations and Monitoring Report
Golden Refuse Disposal Site MR-17006
2013**



**Prepared by:
Ben Van Nostrand, B.Sc., P.Ag., ASCT.
Columbia Shuswap Regional District
Operations Management**

Columbia Shuswap Regional District
781 Marine Park Drive NE
SALMON ARM BC V1E 4P1
Telephone (250) 832-8194 / Toll Free 1-888-248-2771 / Fax (250) 832-1083
<http://www.csr.bc.ca>

1.0 INTRODUCTION

The Golden refuse disposal site (hereinafter referred to as “the landfill site”) is located at 350 Golden-Donald Upper Road, Golden, BC approximately 2 km northeast from the core of Golden. The legal description of the property is Subdivision 12 of Section 18, Township 27, Range 21, West of the 5th Meridian, Kootenay District. The landfill site is approximately 1.2 km north of the Kicking Horse river, the nearest major surface water body. The site has been in operation since the early 1970's as a natural attenuation landfill. In the late 1970's the permit was transferred to the Columbia Shuswap Regional District (CSRD). The property is leased to the CSRD by the Crown and covers an area of approximately 17 ha. The waste footprint currently covers an area approximately 4.4 ha. The landfill site is operated by Franklin Strain under contract with the CSRD (expires June, 2012).

The landfill site provides solid waste disposal and residual processing services to residents, businesses, and institutions located within the municipality of Golden and to the CSRD Electoral Area 'A'. CSRD manned transfer stations in Parson and a transfer station located in Field (owned and operated by Parks Canada) deliver solid wastes to the site in 50 yrd³ containers on a regular frequency. The site is operated under an approved Design and Operations Plan, in accordance with Operational Certificate 17006, issued by the Ministry of Environment on May 5, 2003 and amended on August 29, 2012.

Environmental monitoring including groundwater sampling, analysis and reporting continued at the site in 2013. Data collected from the groundwater monitoring program has been compared to the historical record to determine whether the site has affected groundwater quality and, if so, to what extent. The qualified professionals report is currently in draft and will be available upon request in April.

In accordance with the user-pay principles of the Solid Waste Management Plan, fees are charged for the disposal of all waste materials. The disposal fee for co-mingled municipal solid waste across scaled sites is set at \$70 per tonne, as per changes in the 2009 in accordance with the new Solid Waste Management Plan. Furthermore, in 2010 a differential tipping fee was introduced to encourage recycling by creating disincentive fees for loads which are not separated into appropriate marshalling areas.

2.0 BACKGROUND

With the exception of statutory holidays, the site is open to the public on the following schedule:

Year Round Monday to Saturday from 10:00 am to 4:00 pm

The site contains a lockable gate, a single truck scale with electronic weighing and reporting software, a scale house, and an internal transfer station. The site operates on a user pay system where payment is collected on a load weight bases.

3.0 OBJECTIVES

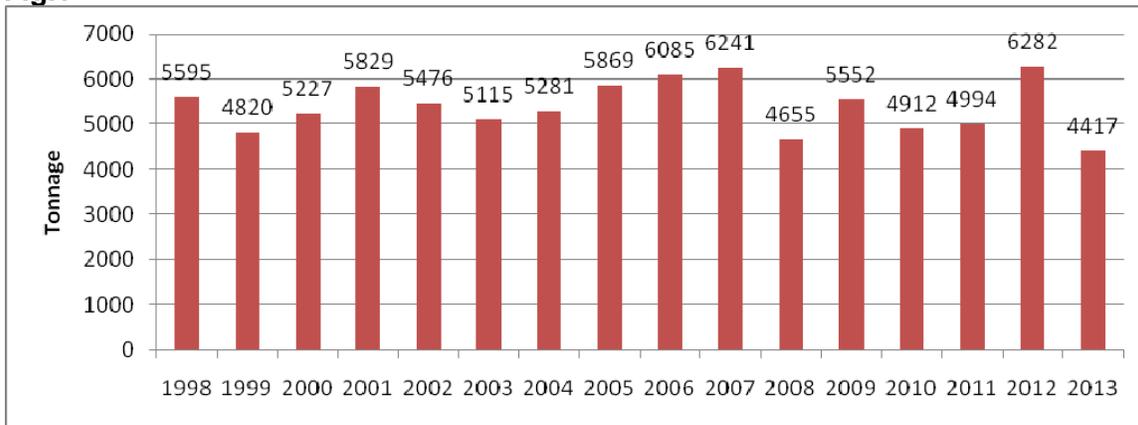
The objectives of this report are as a minimum to provide information required to meet the annual reporting requirements in Section 5.1 of Operational Certificate MR- 17006 issued by the BC Ministry of Environment on August 29, 2012.

3.1 Total Tonnage of Waste Landfilled (Fig.1)

In 2013 approximately 11,120 tonnes of refuse and recoverable wastes were managed at the Golden landfill. The quantity of municipal solid waste landfilled at the site in 2013 was 4,417 tonnes, which represents a 42% decrease over 2012. Using the most recent census date (2011) the per capita disposal rate for 2013 was 0.65 tonnes/person/year, based on a population of 6,766 for the service area.

Over half of all incoming materials, 6,703 tonnes, were diverted to marshalling areas for recovery. Existing diversion programs include; drywall, asphalt shingles, concrete, contaminated soil, wood waste, metal and reusable items. 2013 saw the creation of a separate marshaling area for yard and garden waste which will be composted in 2014.

Fig.1



3.2 Design Volume/Life Expectancy

The Golden Design and Operations (D&O) Plan was prepared by EBA Engineering Consultants Ltd. in November 2007 and updated in 2013 in accordance with the requirements of the Operational Certificate. According to the updated plan, the site will be constructed and progressively closed in four phases which would consume an overall 1,230,000 m³ of air space.

Before the D&O plan was created waste had been placed across much of the landfill site. The CSRD is currently completing the construction of the pre-phase of the landfill which will then accommodate the phased development according to the D&O plan which will progress on top of the pre-phase. According to projections in the D&O Plan, phase 1 will reach capacity by 2028 with overall capacity being exhausted by 2098.

It was determined by survey that 8,089 m³ of air space was consumed at the site in 2013, representing a 39% decrease over 2012.

3.3 Accomplishments in 2013

The Golden landfill had four site inspections done in 2013. The contractor was found to be in compliance with the contract and the design and operations plan during all inspections.

As per the Operational Certificate the CSRSD prepared and submitted a Five Year Report. The report included a hydrogeological assessment report prepared by Western Water Associates and an updated Design and Operational Plan prepared by Golder Associates. Furthermore, detailed landfill imagery and tonnage/compaction data was supplied to the Ministry of Environment.

Site improvement and repair projects were completed at the Golden landfill in 2013. On site culverts were dug out to prevent clogging. New gravel was added to slopes around the transfer bay area which were showing signs of erosion. CSRSD staff had fewer interactions with neighbors who were complaining about odors at the site. The complaints were coming on hot days with no wind. CSRSD staff worked with the contractor to identify these situations and use a liquid deodorant on and around the active face. The use of the deodorant greatly reduced the odor complaints from the neighboring properties.

3.4 Occurrences or Observations of Wildlife

There were no reported observations or occurrences of wildlife in 2013.

3.5 Closure Planning

Each spring the CSRSD's Finance Department assesses closure reserves, future closure projects and landfill capacity to ensure adequate reserve funds are available for planned closure work. A copy of this assessment work has been included as Appendix 'A'.

3.6 Plans for 2014

Plans for 2014 include developing a new marshalling area for public drop off of recyclable materials and the application of intermediate cover on closed areas of the landfill. In addition, the CSRSD will advance a yard & garden composting program in Golden, partnering with Louisiana Pacific to deliver the service.

3.7 Training Programs

Although no formal training was completed by the contractor in 2013, CSRSD staff developed a guide for best landfilling practices based on a consultant's report done in 2012 and training was provided by CSRSD staff.

4.0 ENVIRONMENTAL MONITORING

The CSRD retained Summit Environment Consultants to conduct environmental monitoring at the site, as per the requirements of the Operational Certificate. Summit has provided conclusions and recommendations based on the 2013 data collected, which will be posted on the CSRD website for public review after April 1, 2014.

5.0 WASTE HIERARCHY

The CSRD continues to emphasize and encourage the 6R Hierarchy of Rethink, Reuse, Reduce, Recycle, Recovery and Residual management and continually strives towards a higher 'R' in waste management practice. The programs offered within each category along with successes and challenges experienced in 2013 are indicated below.

5.1 Rethink

5.1.1 Composter Incentive Program

In the fall of 2009, the CSRD launched a Region wide composter incentive program. The CSRD purchased a number of Earth Machine outdoor compost units at a cost of \$45 per unit. These composters were then offered to residents in the spring of 2013 in Golden and Electoral Area A for the same price. To ensure that all residents receiving a composter understood the benefits of home composting as well as how to properly use the Earth Machine composter, all individuals purchasing a composter were given the option to attend a 30 minute training seminar given by CSRD staff.

5.2 Reduce

5.2.1 Media Communications and Advertising

The CSRD continues to utilize local radio advertisements aired on the EZ Rock Network (AM Stations – 1400 Golden) and newspaper advertisements in the local paper (Golden Star, The Force) to make residents aware of special events, and to promote various waste reduction themes. The CSRD also published The Loop Newsletter in the Golden Star, which included local event information, as well as ways to reduce household waste and promote sustainability in our communities.

5.3 REUSE

5.3.1 Marshalling Areas at Refuse Disposal Sites

The Golden Refuse Disposal Site contains reuse marshalling areas for wood waste and propane tanks. A large portion of wood waste material is chipped and reused as alternate daily cover (in a soil /wood blend) or placed on the unloading pads of the active face when the ground is

saturated and un-drivable. In 2013 the CSRD implemented a 2 stream wood waste diversion program at the Golden landfill, separating yard & garden waste from general wood waste to facilitate future composting programs planned for 2014.

5.3.2 Woodwaste grinding

In 2013, 3,944m³ of wood waste and yard waste was chipped at the landfill site. 632 tonnes of wood waste and 284 tonnes of yard waste were received at the site in 2013.

5.3.3 Propane Tank Collection

Propane tanks had not been collected at the site since 2009, but 289 tanks were collected in 2013.

5.3.4 Reuse Centre

The CSRD installed a Reuse Centre at the Golden landfill in the fall of 2009. In 2013, over 500 items were salvaged from the Reuse Centre by residents. Items include household items, sports equipment, building material, and appliances. Residents are required to pay the regular disposal rate for items, but can chose to place items that are in good working order in the Reuse Centre for someone to take home free of charge.

5.4 Recycling

5.4.1 Marshalling Areas at Refuse Disposal Sites

All CSRD landfills contain recycling marshalling areas for auto batteries (except for Salmon Arm), metal wastes including white goods and scrap metal, gypsum, asphalt shingles, concrete, and household recyclables, including mixed paper, newspaper, tin cans, glass containers, plastics #1 to #7 and corrugated cardboard.

5.4.2 Scrap Metal Recovery

This site recycled 187.3 tonnes of scrap metal in 2013, compared to 140.6 tonnes in 2012, which includes source separated metal wastes deposited at the site from commercial and residential sources, as well as metal transferred from the Parson Transfer Station. 174.7 tonnes were received at the site in 2013.

5.4.3 Ozone Depleting Substance Removal

In Golden, 221 refrigeration units were serviced to have the ozone depleting substances removed before recycling.

5.4.4 Household and Automotive Battery Recycling

In 2013, 121 automotive batteries were collected from the Golden landfill for recycling.

5.4.5 Gypsum/Asphalt Shingles/Concrete

Marshalling areas for gypsum, asphalt shingles and concrete have been established at the Golden landfill. 99.0 tonnes of shingles and 72.0 tonnes of drywall were transported for recycling in 2013. Approximately 650 tonnes of concrete were crushed in 2013 and will be used for road base on site in 2014. 63.8 tonnes of drywall, 138.1 tonnes of shingles, and 655.4 tonnes of concrete were received at the site in 2013.

5.4.6 Residential Recycling Service

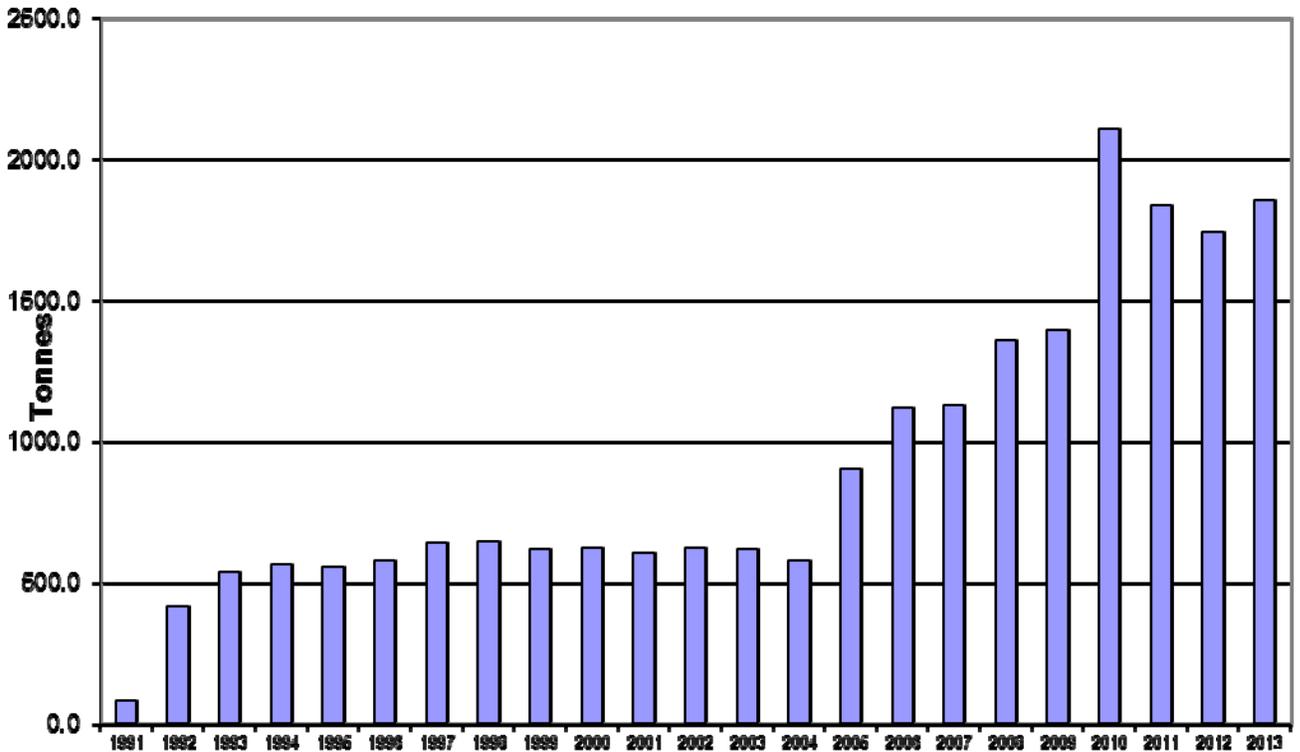
Opportunities to deposit recyclable items such as: newspaper, mixed waste paper, food cans, glass containers, plastic containers #1 to 7, and corrugated cardboard exist at all Regional District Refuse Disposal sites and depots found in downtown municipalities. In Golden, the downtown recycle depot is located in the bottle depot parking lot. The recycle depot also has bins for the collection of cardboard only. The Town of Golden also provides a curbside collection program.

5.4.6.1 Depot Recycling

Recycle depots exist at all refuse disposal sites and within the municipalities of Salmon Arm, Sicamous, Revelstoke and Golden. In the fall of 2009, the recycling collection changed to a comingled collection system. A total of 229 tonnes of mixed waste paper, tin food cans, newspaper glass jars and bottles, corrugated cardboard and plastics #1 to 7 were collected in 2013 from the Golden landfill and downtown depot. This is a 14.5% increase over the previous year depot collection program for Golden only.

On a region wide basis, the depot collection program increased 6.4% from 2012 to 1852 tonnes. The following graph represents recycling quantities collected region wide (from all depots) since 1991.

Figure 1-Recycling Collected in Depots Region Wide



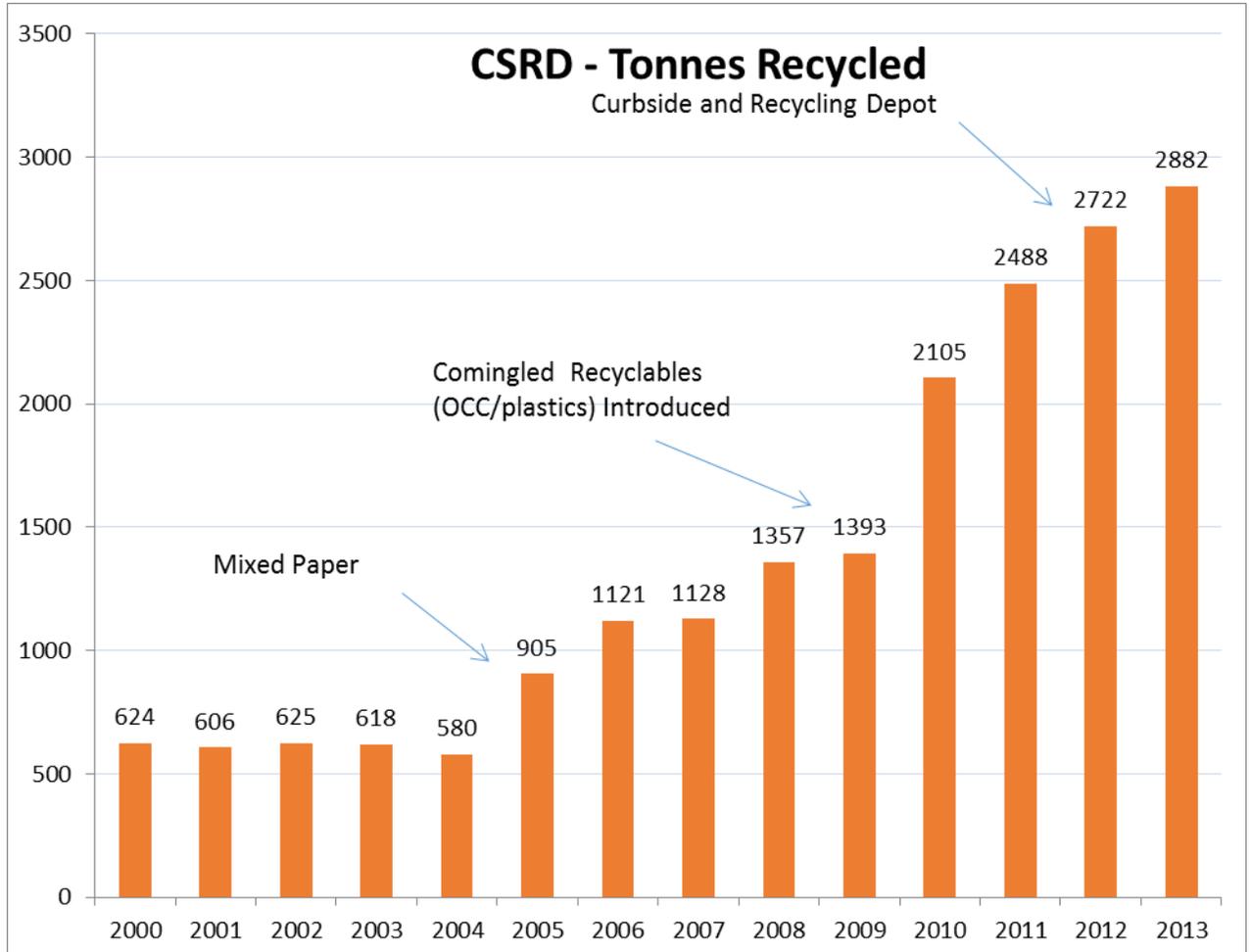
5.4.6.2 Curbside Recycling

Recycling is collected through a curbside cart collection system from all single family dwellings within the Town of Golden. The material is delivered to a reload facility operated by VP Waste, baled, and sent to Cascades Recovery in Kelowna. In 2013, 170 tonnes of material was collected through the curbside program. This is a 45% increase over last year.

This, combined with the depot program, resulted in an overall tonnage of 399, or a 26% increase overall for Golden.

There is a 5.9% increase in recycling from 2012 over the entire region for all depot and curbside collection tonnages combined in 2013, amounting to 2,882 tonnes.

Figure 2-Increase in Recycling Regional Wide Combining Depot and Curbside Amounts



5.4.7 Recycle Fair Events

Spring and fall Stewardship collection events were held in Golden in 2013. Tires, small appliances, power tools, lights and light fixtures, paint, pesticides, old gasoline, and batteries were accepted as Golden does not have permanent drop off facilities for most of these items.

5.4.8 Extended Producer Responsibility

Provincial stewardship programs such as the beverage container deposit-refund system, paint, pesticides and other residuals, waste oil and oil containers, tire recovery programs, pharmaceuticals and electronics contribute to diverting materials from local landfills. Unfortunately, the Province of British Columbia does not require Stewardship agencies to report quantities recycled on a regional district basis; therefore quantities

diverted from CSRD landfills through extended producer responsibility programs are largely unknown.

5.4.9 *Private Sector Recycling*

At this time the Regional District does not have quantitative values of wastes collected through other programs and therefore cannot adequately determine the overall waste diversion rate from the Town of Golden. However, in 2013 the CSRD passed a bylaw to require the recording and submission of information respecting the management of refuse and recyclable materials managed by privately operated municipal solid waste and recyclable material operations. The goal of the regulatory system is to ensure proper management of privately operated facilities by specifying operating requirements so as to protect the environment, to ensure that regional and municipal facilities and private facilities operate to equivalent standards and to achieve the objectives of the Solid Waste Management Plan. Staff are developing strategies to implement the bylaw for 2014.

Appendix 'A' - Solid Waste Landfill Closure and Post-Closure Liability

The Environmental Management Act of B.C. and the Ministry of Environment of B.C. set out the landfill criteria to properly close and maintain all active and inactive landfill sites. Under the guidelines, there is a requirement for closure and post-closure care of solid waste landfill sites. Provisions are therefore made over the estimated remaining life of the CSRD landfill sites based on scalehouse records and through tipping fees.

The main components of the landfill closure plans are: final capping using an engineered cap design and the implementation of a drainage and gas management plan. The post-closure care requirements may involve:

- cap maintenance;
- groundwater monitoring;
- gas management system operation and maintenance;
- inspections;
- leachate treatment and monitoring;
- and annual reports.

Post-closure care activities begin once the entire landfill site no longer accepts waste and continues on for a period of 25 years. As the date of the site closure is unknown, management estimates the liability to begin after the closure of the current active phase, assuming another phase will not be opened. In the event another phase is opened, the start date for the liability will be adjusted to begin upon closure of the newly opened phase.

Table 1 below sets out the liability based on the estimated capacities used in cubic metres, multiplied by the estimated total expenditures, expressed as discounted present values, assuming 0.00% (2012 - 1.10%) inflation and 3.85% (2012 - 2.90%) long-term borrowing rate (fall issue MFA 25 year rate). The amount remaining to be recognized in future years is \$1,229,700 (2012 - \$3,068,100). The annual provision is reported as an Operating Fund expense and the accumulated provision is reported as a liability on the Consolidated Statement of Financial Position. Reserve funds totaling \$843,389 (2012 - \$830,505) have been established to provide for this liability in the Landfill Closure Special Reserve Fund. Finally, the table also indicates the remaining landfill life in years and remaining capacity (100 minus %used) on the open phases and the anticipated post-closure costs recognized on the total site capacity used.

TABLE 1

	Estimated Remaining Life (Years)	Estimated Total Expenditure for Closure	Cumulative Capacity Used (m ³)	Total Estimated Capacity (m ³)	Used (%)	Liability for Closure to December 31, 2013
Salmon Arm (phase 2 of 5)	13	\$ 1,203,800	85,628	383,778	22.3	\$ 268,600
Golden (pre-phase)	15	199,000	613,416	613,416	100.0	199,000
Golden (phase 1 of 4)	15	227,000	46,496	157,000	29.6	67,200
Revelstoke (pre-phase)	2	255,000	70,000	70,000	100.0	255,000
Revelstoke (phase 1 of 4)	2	572,100	95,029	98,535	96.4	551,700
Sicamous (phase 2 of 4)	12	160,200	64,366	166,000	38.8	62,100
Sicamous (phase 4 of 4)	30	135,300	110,000	125,000	88.0	119,100
Closure liability subtotal		\$ 2,752,400	1,084,935	1,613,729	67.2	1,522,700
Post closure liability subtotal						786,500
2013 total liability						2,309,200
Less: Expenses previously recognized						(3,447,500)
2013 reduction in the liability for landfill closure						\$ (1,138,300)