

Report

Waste Diversion Ontario – Continuous Improvement Fund

City of Timmins Recycling Transfer Facility Evaluation & System Review



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System Review**

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1. Introduction

Waste Diversion Ontario (WDO) through their *Continuous Improvement Fund*, in conjunction with the City of Timmins (the City), retained AECOM to assess potential operational improvements to the City's curbside recycling collection and processing program.

Potential improvements considered in this report include the construction and operation of a recyclable materials transfer station for transfer of recyclables to a Materials Recovery Facility (MRF) for processing at the lowest processing cost and within an economically viable transportation distance from the City. Neighbouring municipalities may also be able to reduce their overall costs if they were to use the Timmins transfer station as a regional, centralized transfer point for their recyclable materials. However it should be noted that the cost impacts to these neighbouring municipalities is not part of the scope of work of this study.

Further improvements are considered in this report for municipal collection (as opposed to private collection) of separate recycling and garbage (referred to as *single stream collection*) and for co-collection (utilizing split-body trucks) of recycling and garbage (referred to as *dual stream collection*).

2. City of Timmins Curbside Recycling Collection & Processing Program

The City of Timmins currently contracts with Waste Management Inc. for the collection and processing of their recyclable materials. Waste Management Inc. transports recyclable materials to Canadian Fibers in Sudbury for processing and recovery of recyclable commodities for sale. Canada Fibres operates the MRF under contract with the City of Sudbury.

The City of Timmins collects their recyclables in fully commingled form (referred to as *single-stream recycling*) and recycles the following:

- Magazines, Catalogues, Household Fine Paper. Including inserts and glossy flyers. White and coloured writing and mailed paper, photocopy paper and envelopes.
- Metal Food and Beverage Containers. Steel and aluminum food and beverage cans. Rinse and push lid into can.
- Glass Bottles and Jars. Food and beverage bottles and jars, clear and coloured. Remove lids and rinse.
- Corrugated Cardboard. Layered cardboard boxes with a ripple between the layers. Flatten and tie in bundles no larger than 24" x 24" x 12".
- PET (#1) and HDPE (#2) Plastics. Transparent clear or coloured plastic bottles including 2-litre soft drink bottles and juice bottles.
- Boxboard. Cereal, detergent, shoe boxes, cigarette packages, clean pizza boxes, etc.



In 2007, The City of Timmins collected approximately 7,075 tonnes of garbage with their main fleet of five (5) trucks and an additional 665 tonnes with spare trucks used for heavier collection cycles and to supplement the main fleet during maintenance. In addition, Timmins received 1000 tonnes of garbage at Tisdale transfer station for a combined total of 8,740 and their contractor (Waste Management Inc.) collected approximately 2,700 tonnes of recyclable material. The City's waste generation rate is in the order of 700 kg/household/year which translates to 233 kg/capita/year based on the 2006 Census (Statistics Canada) data averaging 3 persons per household. Although that generation rate does not include residential waste drop off at the landfill, the City's rate would still be well below the national average of 283 kg/capita/year. The City supports waste and recycling collection for a population of approximately 43,000 people and serves roughly 10,275 homes. Multi-residential locations are predominantly served by the private sector.

In the spring of 2008 the City installed a weigh scale at their Deloro landfill which now allows them to track actual residential garbage tonnage inbound to landfill. Daily and annual average tonnes were estimated by utilizing daily scale data in the five (5) full months of July through November, 2008 and pro-rated over the year (Table 1). This report uses the year 2007 as the baseline 'status quo' in terms of recycling tonnages and costs and assumes no variation in garbage tonnage between 2007 and 2008.

Table 1: Status Quo Garbage and Recyclable Material Curbside Collection Program

Material Type	Tonnes/ Year	Tonnes/Day (252)	Tonnes/Day/ Truck	Trucks Per Day
Garbage	7,075	28.08	5.62	5.00
Recycling	2700	10.71	3.57	3.00

In 2007 garbage collection costs for the City of Timmins totalled approximately \$635,500. Table 2 breaks these costs down for maintenance, labour and material and supply costs. Timmins collects garbage utilizing four (4) side-load (1 operator each) trucks and one (1) rear-load (2 operators) truck. A further two trucks are utilized as spares (G3 & G6). Spare trucks are utilized on double collection days, that is, two collection days are collected in a single day the day after every 10 statutory holidays. Additional staffing is necessary and is supplemented by other (than waste collection) public works employees. Table 2 includes recycling program costs (\$304,480) paid to Waste Management Inc. The City's total waste and recycling program collection program cost was approximately \$942,000.

Table 2: 2007 City of Timmins Recycling & Garbage Collection Costs

	2007
Mechanical Labour	\$24,438.64
Mechanical Benefits	\$10,154.71
Mechanical Materials Supplies	\$178,462.79
Employee Labour	\$288,030.96
Employee Benefits	\$123,358.62
Waste Collection Materials and Supplies	\$11,094.02
Waste Management Inc (curbside recycling)	\$304,484.44
TOTAL	\$942,031.18

One of the most significant components of the City's waste collection budget is vehicle maintenance. This is due to the varying ages of the vehicles employed by the City for waste collection. This report considers the impact on maintenance budgets with future potential waste and recycling collection changes. The maintenance costs per vehicle are shown in Table 3 and Table 4 compares the average cost to maintain older vehicles (1991-1994) with the City's new vehicles (2002-2005).

Table 3: 2007 Maintenance Costs by Garbage Collection Vehicle

Vehicle	Vehicle Year	Mechanical Labour	Mechanical Benefits	Mechanical Materials Supplies	Total Maintenance by Collection Vehicle
G-1	1991	\$4,255.51	\$1,733.95	\$42,999.12	\$48,988.58
G-3 (spare)	1986	\$944.68	\$412.10	\$3,599.10	\$4,955.88
G-5	2005	\$385.33	\$176.89	\$16,230.69	\$16,792.91
G-6 (spare)	1992	\$131.54	\$62.27	\$3,975.67	\$4,169.48
G-7	1994	\$8,180.94	\$3,319.92	\$48,837.78	\$60,338.64
G-10	2002	\$5,292.01	\$2,217.43	\$28,410.67	\$35,920.11
G-12	1991	\$5,248.63	\$2,232.15	\$34,409.76	\$41,890.54
Sub - Totals		\$24,438.64	\$10,154.71	\$178,462.79	
TOTAL					

Table 4: 2007 Old Vehicle Versus New Vehicle Maintenance Costs

Vehicle	Vehicle Years	Mechanical Labour(per vehicle)	Mechanical Benefits	Mechanical Materials Supplies	Total Maintenance by Collection Vehicle
Old Vehicles	1991-1994	\$5,895.03	\$2,428.67	\$42,082.22	\$50,405.92
New Vehicles	2002-2005	\$2,838.67	\$1,197.16	\$22,320.68	\$26,356.51

It is clear that the cost to maintain the City's older trucks is significantly higher than for their newer 2001 and 2005 trucks. In 2007 the City spent over \$150,000 to maintain the three oldest trucks. This cost will be evident when the status quo system is compared to acquisition of new/replacement trucks, either single or dual stream for collection of garbage and recyclables.

3. Curbside Recycling Collection Options, Vehicle Requirements & Costs

3.1 Curbside Recycling Collection Options

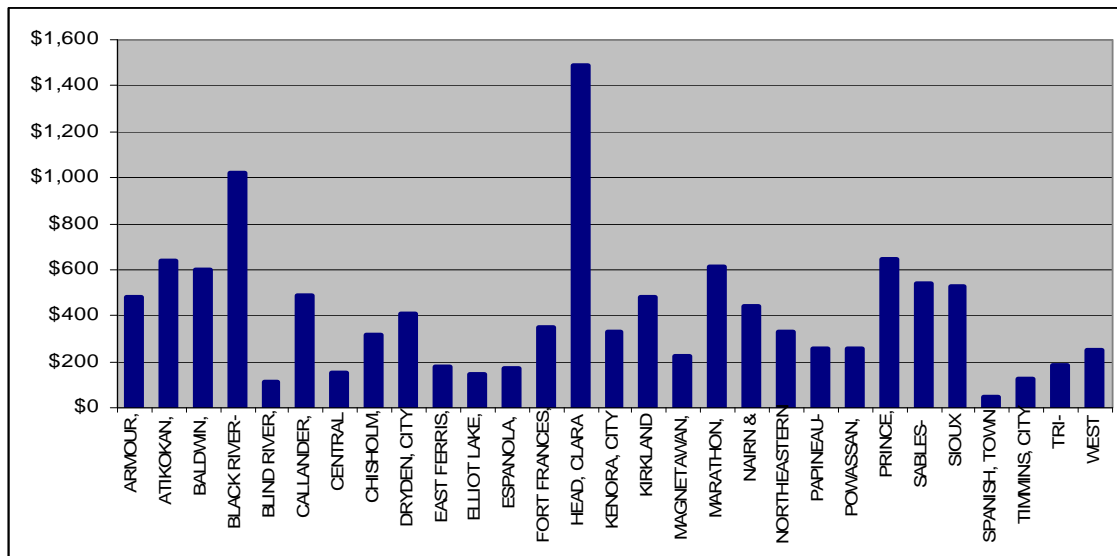
The City of Timmins has the options of maintaining their program 'status quo', that is, continuing to collect garbage using city-forces and contract recycling collection, transfer and processing. Alternatively the City can acquire in conjunction with either exiting collection vehicle replacement or acquisition of new trucks, collect garbage and recycling together in one truck (*dual stream collection*) or collect garbage and recycling in separate trucks (*single stream collection*), in both cases using city-forces. In all cases the City will continue to collect their recyclables in a fully commingled form (referred to as *single stream recycling*) This section discusses collection options.

3.1.1 Maintaining the Status Quo System

The current garbage and recycling system operated by the City is at risk of what could be substantial cost increases. Typical collection vehicle replacement schedules are five (5) to seven (7) years. Timmins has vehicles in their fleet that are now fifteen (15) years old and maintenance costs (and downtime for maintenance) will only continue to rise for the City. This presents ideal timing and a strong rationale for the City to examine the cost-benefit of collecting recycling and possibly co-collecting garbage and recycling with new collection fleet acquisition.



In addition based on the data provided below the City's current per tonne cost for recycling collection, transfer and processing appear to be artificially low in comparison to other jurisdictions in the North. Figure 1 shows the per tonne cost for recycling programs for municipalities in the Timmins "Rural North" municipal blue box category (*Waste Diversion Ontario*, 2008).

Figure 1: Rural North Municipal Blue Box Collection and Processing Program Cost/Tonne

Source: Waste Diversion Ontario (WDO) 2008

The average gross cost per tonne for rural north blue box collection and processing programs is \$406.00/recovered tonne compared to the City of Timmins \$128.00/recovered tonne¹. It is extremely unlikely that if the City were to let a new contract for recycling collection, transfer and processing that their cost per tonne would remain the same. Commodity pricing, particularly for paper products e.g. cardboard, are at an historical low which would also trigger higher bid prices associated with a new recycling contract for the City. If the City were, with a future contract, charged even the average cost per tonne for “Rural North” municipalities, their contract cost would be more in the order of \$900,000 to \$1,000,000 per year (compared to the current \$305,000/year).

3.1.2 New Recycling Vehicle Options & Types

Waste collection vehicle manufacturers and suppliers as well as other municipalities and private sector operators were consulted with regard to costs for each of single stream and dual stream collection and with respect to vehicle type and configuration preferences and/or recommendations.



Rear Load Vertical Split Truck

Collection vehicle manufacturers provided detailed vehicle specifications for both manual and automated collection vehicles as well as a range of pricing (Appendix A).

¹ A recovered tonne refers to a tonne of material actually sold after processing as opposed to a tonne collected at the curb.

Truck configurations, e.g. 60:40 versus 70:30 splits and the use of vertical and/or horizontal split trucks for dual stream co-collection, vary with various operators. Toronto has been using side load, 1 person trucks for recycling, all horizontal split as well as rear load, 2 person split trucks. Toronto uses horizontal splits for ergonomic purposes (ease of loading for the operators). These trucks are 70:30 splits for the collection of organics and garbage.

A representative of Waste Management Inc. Kitchener, Ontario cites rear packers as more efficient and able to collect a higher number of homes than side load trucks. The labour rate is higher (2 versus 1 operator). WMI co-collects organics and garbage using a 75:25 rear split for organics and garbage respectively.

Consultation with a representative of Miller Waste indicated that another efficient way to operate a co-collection program is to use recycling trucks as opposed to the larger (e.g. 32 cu yd) rear or side load split-trucks. The recycling truck features the ability to move the split wall to accommodate the amount of each stream collected after the truck is manufactured (unlike larger compaction-based split trucks).



Side Load Recycle Truck

This system is operated by Miller Waste in Markham, Ontario for the collection of single-stream recycling and organics collection. In that program the recycling truck packs out between 4-4.5 tonnes with 1-1.5 tonnes of that being organics (generally a 5-6 cu yd compartment for organics). Given the ability to vary the split in this type of truck, the City may want to consider it for collection of waste and recycling in harder to service areas e.g. narrow streets where larger trucks can have difficulty passing through and more distant areas like South Porcupine and up Kamiskotia Road where smaller waste and recycling quantities are collected and fuel costs can be reduced with the use of a smaller truck. If not fully utilized the truck could also be designated as a new spare.

A side-load recycling truck costs in the order of \$160,000 versus \$200,000 for a rear load 32 cu yd truck. It costs Miller Waste \$55.00/hour for the recycling truck versus \$85.00/hour to operate the larger (two operator rear) truck with higher maintenance for the rear load truck (\$45.00/hour) versus \$30.00/hour for the recycle truck.



Side Load Truck

In summary, there are a competitive number of manufacturers that fabricate single and dual stream collection trucks for the City to solicit future bids from. If the City ultimately elects a manual, as opposed to automated dual stream collection system (as opposed to a single-stream collection system) the horizontal split truck would be best suited to Timmins' collection staff from a health and safety/ergonomic stand-point. Different operators utilize different splits for dual stream collection depending on their routes and materials collected (typically recycling and organics). This report provides an assessment of

70:30 versus 60:40 splits for Timmins garbage and recycling dual collection in Section 3.2.

3.1.3 Manual Versus Automated Collection

A number of those consulted indicated a strong preference for fully automated collection of recyclables and garbage. Automated collection provides better working conditions for vehicle operators and can also be far more efficient than manual collection.

Toronto, for example, is moving to a fully automated system for collection. All trucks will be single-stream with automated arms for container pick up of each of organics, recycling and garbage. Toronto reports that in one area of the City they will reduce from 22 recycle/organics trucks and 17 garbage trucks to 18 trucks for all three waste streams and their goal is to collect 1500 homes (per 10 hour day) with automated collection as opposed to collecting roughly 700 homes manually.

The Labrie 60:40 split side-load Expert Helping Hand (Appendix A) can be adapted for manual, semi-automatic or fully automatic garbage and recycling collection for collection of different sized carts or bags.



Automated Side Load Truck

The vehicle specification sheets for a rear-load split truck provided by Universal Handling Equipment (Appendix A) also includes a cart-lifter.

According to Labrie, automated truck productivity ranges somewhat based on routes, but typically 1000 to 1200 stops is easily attained with the average automated truck. The automated trucks are used for cart collection but with the Expert 2000T Helping Hand Labrie drop frame automated units. The operator still has full capability to manually load waste in bags although, it removes a lot of the speed and productivity advantages of this type of equipment. Carts are really the key component in building a productive collection system with an automated truck. A manual system could make 700 stops compared to 1000 stops with an automated system.



There a significant ergonomic and health and safety benefits associated with automated collection including injury prevention (slip and fall), and injury from lifting (e.g. back injury).

The next section addresses the cost implications for Timmins for dual and single stream collection and manual versus automated systems.

3.2 Projected Curbside Recycling Collection Vehicle Requirements

The following projections for the number of vehicles required for single-stream manual and automated and dual stream manual and automated collection systems are based on a number of assumptions:

1. Both recycling and garbage truck cubic yard capacities are assumed at the minimum capacity (to be conservative) quoted by the manufacturers.
2. Side load, one-operator trucks as opposed to rear load, two-operator trucks are utilized for analysis purposes (the City may elect to evaluate rear-load versus side-load in a formal Tender/RFP process relative to varying compaction ratios and varying labour rates).
3. Only the main fleet (five trucks) are considered in the analysis as the spare trucks are assumed required for all scenarios.
4. It is assumed that each operator/vehicle can collect 1.5 loads (manual) and 2 loads (automated) per 8 hour day given breaks, lunch, and travel time from routes for tipping.
5. The City would replace existing 1991-1994 trucks in the case of single stream collection.
6. The City would replace all five (5) trucks with split trucks in the case of dual stream collection.
7. Automated collection allows collection of 30% more waste/recycling per route per day than manual collection based on manufacturer specifications.

Table 5 shows the current tonnage collection daily and annual averages for the five (5) existing garbage main fleet.

Table 5: Status Quo Tonnage Collection By Collection Vehicle

Truck Number	G1	G5	G7	G10	G12	Total
Year	1991	2005	1994	2002	1991	
Cu Yd Capacity	20	30	20	30	20	
Daily Average Tonnage	6.074	8.344	6.057	5.08	5.729	28.08
Annual Tonnage	1469.11	1858.80	1368.48	1170.48	1208.40	7075.27

Tables 6 through 13 consider manual versus automated collection, dual versus single stream collection and 70:30 versus 60:40 split side load trucks and based on cubic yard capacities provided for the existing fleet by the City and for new vehicles as provided by manufacturers.

Table 6: Single Stream Side-Load Manual Collection Vehicle Requirements

Trucks	Cubic Yard Capacity	kg/cu yard*	Tonnes Per Load	Loads Per Day	Tonnes Per Day Per Truck	Trucks Per Day
Existing 2002 and 2005	30	315	9.45	1.5	14.18	1.98
Replaced 1991-1994s	32	315	10.08	1.5	15.12	1.86
New Recycling Trucks	32	247.5	4.3	1.5	6.45	1.66

Table 7: Dual Stream Side Load Manual Collection Vehicle Requirements

70:30 Split Trucks	Cubic Yard Capacity	kg/cu yard*	Tonnes Per Load	Loads Per Day	Tonnes Per Day Per Truck	Trucks Per Day
Garbage	22.4	315	7.056	1.5	10.58	2.65
Recycling	9.6	247.5	2.376	1.5	3.56	3.01
						3.00
60:40 Split Trucks	Cubic Yard Capacity	kg/cu yard*	Tonnes Per Load	Loads Per Day	Tonnes Per Day Per Truck	Trucks Per Day
Garbage	19.2	315	6.048	1.5	9.07	3.09
Recycling	12.8	247.5	3.168	1.5	4.75	2.25
						3.00

*based on lowest of the range of kg/cu yd capacities for collection vehicles

Table 8: Single Stream Side Load Automated Collection Vehicle Requirements

Trucks	Cubic Yard Capacity	kg/cu yard*	Tonnes Per Load	Loads Per Day	Tonnes Per Day Per Truck	Trucks Per Day
Existing 2002 and 2005	30	315	9.45	2	18.90	1.49
Replaced 1991-1994s	32	315	10.08	2	20.16	0.53
New Recycling Trucks	32	247.5	4.3	2	8.60	0.70

Table 9: Dual Stream Side Load Automated Collection Vehicle Requirements

70:30 Split Trucks	Cubic Yard Capacity	kg/cu yard*	Tonnes Per Load	Loads Per Day	Tonnes Per Day Per Truck	Trucks Per Day
Garbage	22.4	315	7.056	2	14.11	1.99
Recycling	9.6	247.5	2.376	2	4.75	2.12
						3.00
60:40 Split Trucks	Cubic Yard Capacity	kg/cu yard*	Tonnes Per Load	Loads Per Day	Tonnes Per Day Per Truck	Trucks Per Day
Garbage	19.2	315	6.048	2	12.10	2.32
Recycling	12.8	247.5	3.168	2	6.34	1.69
						3.00

In all cases the number of trucks required to provide collection services is reduced from the existing fleet of five (5) garbage trucks and three (3) recycling trucks. This is, in part because of the increased cubic yard capacities for new trucks but is particularly notable with automated collection.

In the case of single-stream manual collection, the City would maintain their two newest trucks, replace the three (3) old trucks and add one truck. In the case of dual-stream manual collection (either 70:30 or 60:40 split) the City would replace the existing five (5) trucks with three (3) new split trucks. The only scenario that may require less than three (3) trucks is dual stream automated collection using a 70:30 split (e.g. may require only two trucks). Three trucks are recommended to ensure contingency for vehicle downtime, inclement weather, tonnage surges (e.g. recycling at Christmas) and given that the analysis indicates that 2.12 trucks are required per day for recycling. The cost implications are discussed in the next section.

3.3 Projected Curbside Recycling Collection Operating Costs

The following assumptions form the basis for projected operating costs associated with each collection option in Tables 10 through 13:

1. The 2007 budget provided by the City is used as the baseline for cost projections associated with all new programs.
2. The analysis assumes the use of side-load trucks and as such labour allocation is based on one operator per truck.
3. Mechanical labour, benefits and materials supplies for newly acquired trucks are assumed to be comparable to the City's newer 2002 and 2005 trucks at 2007 rates.
4. Existing spare trucks are assumed to be required in all program scenarios and are assumed to cost the same as was the case in 2007 with the exception of the dual-stream automated collection scenario. A third new truck is assumed as necessary to accommodate the projected 2.12 trucks per day required for recycling, seasonal fluctuations and the inability of the existing spares to provide back up for an automated dual stream collection program. In the case of the single stream automated system, the spares could back up the new trucks but would need to be retro-fitted with an automated arm. That one time cost is not factored into this analysis.
5. Employee labour and benefit costs for spare trucks are based on 20 days per year operation and benefit costs are rolled into employee labour costs.

The City currently refers to their fleet as G1 (Garbage 1) etc. as appropriate and as such new single stream recycling vehicles are dubbed R1 etc. as appropriate and dual stream vehicles are dubbed RG1 etc. as appropriate.

Table 10: Projected Single Stream Manual Collection Program Costs

Vehicles	Vehicle Number	Mechanical Labour	Mechanical Benefits	Mechanical Materials Supplies	Employee Labour	Employee Benefits	Waste Collection Materials and Supplies	Total
Existing 2002 and 2005	G5 & G10	\$5,677	\$2,394	\$44,641	\$82,295	\$35,245	\$3,170	\$173,423
Replaced 1991-1994s	G13, 14, 15	\$6,063	\$2,571	\$60,872	\$123,442	\$52,868	\$4,755	\$250,570
New Recycling Trucks	R1 & R2	\$5,677	\$2,394	\$44,641	\$82,295	\$35,245	\$3,170	\$173,423
Spares	G3 & G6	\$1,076	\$474	\$7,575	\$4,700	\$0	\$3,170	\$16,994
Sub - Totals		\$18,494	\$7,834	\$157,730	\$292,731	\$123,359	\$14,264	\$614,410

Table 11: Projected Single Stream Automated Collection Program Costs

Vehicles	Vehicle Number	Mechanical Labour	Mechanical Benefits	Mechanical Materials Supplies	Employee Labour	Employee Benefits	Waste Collection Materials and Supplies	Total
Existing 2002 and 2005	G5 & G10	\$5,677	\$2,394	\$44,641	\$82,295	\$35,245	\$3,170	\$173,423
Replaced 1991	G13	\$385	\$177	\$16,231	\$41,147	\$17,623	\$1,585	\$77,148
New Recycling Truck	R1	\$385	\$177	\$16,231	\$41,147	\$17,623	\$1,585	\$77,148
Spares	G3 & G6	\$1,076	\$474	\$7,575	\$4,700	\$0	\$3,170	\$16,994
Sub - Totals		\$7,524	\$3,222	\$84,678	\$169,289	\$70,491	\$9,509	\$344,713

Table 12: Projected Dual Stream Manual Collection Program Costs

Vehicles	Vehicle Number	Mechanical Labour	Mechanical Benefits	Mechanical Materials Supplies	Employee Labour	Employee Benefits	Waste Collection Materials and Supplies	Total
New 70:30 Split Trucks	RG1, RG2, RG3	\$1,156	\$531	\$48,692	\$123,442	\$52,868	\$4,755	\$231,443
Spares	G3 & G6	\$1,076	\$474	\$7,575	\$4,700	\$0	\$3,170	\$16,995
Sub - Totals		\$2,232	\$1,005	\$56,267	\$128,142	\$52,868	\$7,924	\$248,438

Table 13: Projected Dual Stream Automated Collection Program Costs

Vehicles	Vehicle Number	Mechanical Labour	Mechanical I Benefits	Mechanical Materials Supplies	Employee Labour	Employee Benefits	Waste Collection Materials and Supplies	Total
New 70:30 Split Trucks	RG1, RG2	\$771	\$354	\$32,461	\$82,295	\$35,245	\$3,170	\$154,295
Spares	RG3	\$771	\$354	\$16,231	\$4,700	\$0	\$3,170	\$25,225
Sub - Totals		\$1,542	\$708	\$48,692	\$86,995	\$35,245	\$6,339	\$179,521

In all cases these projections indicated that if the City were to move to collection of recyclable materials with city-forces and with additions/replacements to the existing fleet there would be cost-savings. Cost projections indicate that for maintenance alone, a shift to any of the program options identified above will reduce maintenance by at least \$30,000/year and potentially up to \$160,000/year (with the dual stream automated system). The above costs show an 'order of magnitude' difference in operating costs between program options but not a definitive annual cost estimate. Municipal program costs vary daily/yearly with unique travel distances, topography, weather conditions and can be affected by other impacts such as specific municipal by-laws, age of drivers, collective agreement changes and the like. The above analysis should not be considered in any other way than 'order of magnitude' and it does not account for increasing maintenance costs over time as vehicles age (e.g. up to the five to seven year typical replacement schedule for waste collection vehicles).

Also not included in projected annual operating costs are vehicle replacement costs that the City may want to consider. That is, the setting aside of dollars each year for the purpose of maintaining vehicle replacement schedules.

3.4 Projected Curbside Recycling Collection Capital Costs

A range of costs were provided by manufacturers for various collection vehicle configurations. Rear load single stream trucks were priced between \$180,000 and \$200,000. Side load split trucks were priced in a range between \$200,000 with increasing pricing as trucks become semi-automated and automated up to \$300,000. Universal Handling Equipment quoted \$118,600 for their rear load split truck, chassis extra (Appendix A).

Capital cost estimates are based on the use of side-load trucks and are based on the estimates provided by vehicle manufacturers but not accounting for any particular/unique specifications that the City may have.

The one-time capital costs associated with the carts/totes required for automated collection are factored in. Various cart specifications are provided by Rherig in Appendix B. Ongoing replacement of carts due to breakage or theft is not factored into these costs and would be assumed as part of the City's annual operating budget. This also assumes that the City would pay for the carts, as opposed to requiring individual homeowners to purchase them themselves.

With the carts come a one-time cost associated with promotion and education and cart freight and distribution to homes. Rehrig (Appendix B) provided an estimate of \$6/cart for freight, (\$123,330) and \$8/home for distribution (\$82,200). R.W. Beck and KPMG, as part of their *Blue Box Program Enhancement and Best Practices Assessment Project*, May 2007, determined that municipalities achieving a 60% diversion rate typically spend \$1 per household per year but that municipalities undergoing significant program change spent significantly more. In order to provide a budget estimate for the City, the five highest costs per household were averaged from the R.W. Beck, KPMG report with the assumption that those five municipalities were undergoing a program change. The average was approximately \$2.70 per household which would suggest the City should budget in the order of \$50,000 for promotion and education. Regardless of whatever collection program change, an increase in the promotion and education budget will be necessary.

Table 14: Projected Single Stream and Dual Stream Capital Costs

Collection Program	Number of Trucks	Average Cost/Truck	Carts/Totes*	Total Cost
Single Stream – Side Load - Manual	4	\$200,000		\$800,000
Single Stream – Side Load - Automated	3	\$300,000	\$1,130,250	\$2,030,250
Dual Stream – Side Load - Horizontal - Manual	3	\$250,000		\$750,000
Dual Stream – Side Load Automated	2	\$300,000	\$1,130,250	\$2,030,250

*based on two 240 L carts distributed to 10,275 homes at \$55/cart

Capital costs include vehicles only and are not discounted per municipal discount rates (e.g. \$20,000-\$30,000 per vehicle) and they do not account for any re-sale value the City might receive for its existing fleet. The least intensive capital cost program is the dual stream manual collection system. Fleet capital costs cannot, however, be considered in isolation of annual operating costs. All capital costs (collection vehicle, carts and transfer station) are evaluated in conjunction with projected operating budgets and MRF processing fees for each program option in Section 6.

4. Recyclable Materials Transfer Station Design, Operation and Cost

As it relates to the proposed transfer station, based on discussion with City of Timmins staff, it is our understanding that there is not currently an existing building in the City that could be purchased and appropriately retrofitted to serve as the proposed transfer station and accordingly a new purpose built facility needs to be created and will in all likelihood be constructed at the landfill site.

This section documents the conceptual design and costing (capital & operating costs) for two different transfer stations. One is based on a proprietary transfer system commonly referred to as Transtor (refer to Section 4.2) and the second (more traditional design) is based on a fully enclosed un-insulated building (using a clear span pre-engineered building) with a tip floor complete with a single overhead and man door

(sized for 2 days storage), a depressed pit to enable the top loading (using a high lift front end loader) of open top transfer trailers.

The Transtor does not require a tip floor per say, but rather the materials are dumped directly into hoppers that are utilized to self load open top trailers. We have included a price for a small partially enclosed building over the Transtor units in recognition of sometimes severe local winter weather conditions.

Both transfer station design options give consideration to receipt and handling of Timmins curbside material, single stream materials from other municipalities and cardboard from IC&I sources.

4.1 Traditional Transfer Station Size, Features & Cost

4.1.1 Transfer Station Size & Design Characteristics

Tables 15 through 17 present the assumptions and calculations for determining the minimum size for the transfer station tipping floor. Table 18 presents size requirements for a combination of options for receipt and handling of materials.

Table 15: Timmins Commingled Recyclable Materials Only (Option A)

Tipping Floor Calculation		Unit
A) annual tonnage to transfer station	2,700	tonnes
B) number of operating days per year	250	days
C) daily tonnages received at transfer station	10.8	tonnes/day
D) tonnes to be stored for 2 day storage capacity:	21.6	tonnes
Storage Calculation (based on a density of 300lbs/yd ³ for commingled recyclables)		
E) volume of commingled recyclable materials to be accumulated in 2 days	159	yd ³
Tip Floor Area Calculation (assume ideal geometry with a 6.5 feet average pile height)		
F) Floor space required for 2 days of incoming commingled recyclable storage	659	ft ²

Table 16: Additional Recyclables Materials from IC&I (Option B)

Tipping Floor Calculation		Unit
A) annual tonnage of additional IC&I source OCC	2,400	tonnes
B) number of operating days per year	250	days
C) daily tonnages received at transfer station	10	tonnes/day
D) tonnes to be stored for 2 day storage capacity:	20	tonnes
Storage Calculation (based on a density of 85 lbs/yd ³ for loose OCC)		
E) volume of loose OCC material to be accumulated in 2 days	498	yd ³
Tip Floor Area Calculation (assume ideal geometry with a 6.5 feet average pile height)		
F) The floor space required for 2 day of additional OCC storage	2,069	ft ²

Table 17: Other Municipal Recyclable Materials (Option C)

Tipping Floor Calculation		Unit
A) annual tonnage of additional recyclables	1,100	tonnes
B) number of operating days per year	250	days
C) daily tonnages received at transfer station	4.4	tonnes/day
D) tones to be stored for 2 day storage capacity:	8.8	tonnes
<u>Storage Calculation</u> (based on a density of 300 lbs/yd ³ for commingled containers)		
E) volume of commingled recyclable material to be accumulated in 2 days	65	yd ³
<u>Tip Floor Area Calculation</u> (assume ideal geometry with a 6.5 feet average pile height)		
F) The floor space required for 2 day of additional recyclable storage from other Municipals	269	ft²

Table 18: Timmins Transfer Station Options

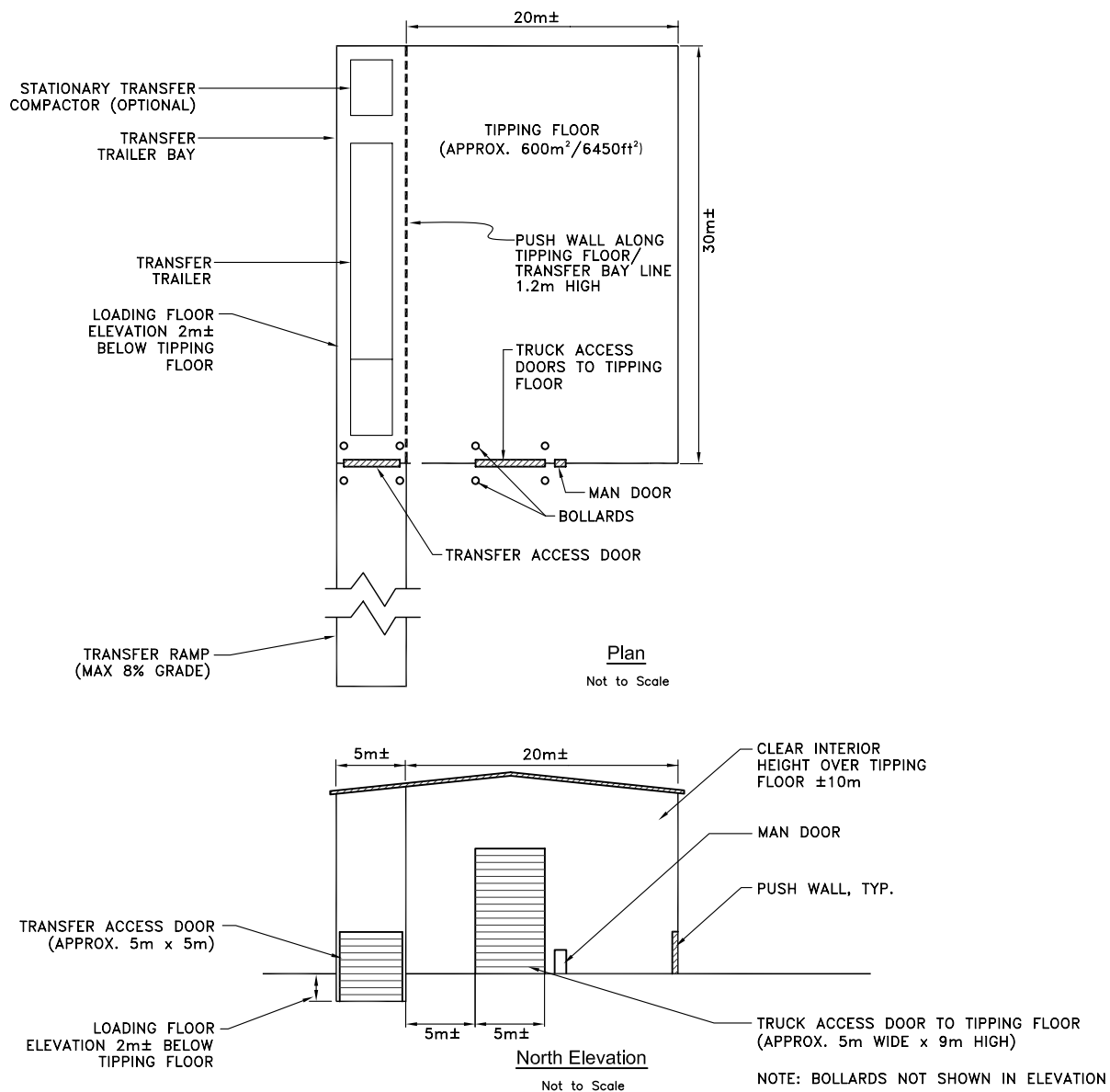
Floor Space Requirement		Unit
A) Option A only (Timmins Commingled Recyclable Material)	659	ft²
B) Option A and B (Timmins Commingled Recyclable Material plus Additional Recyclable Material from IC&I)	2,728	ft²
C) Option A and C (Timmins Commingled Recyclable Material plus Other Municipal Recyclable Material)	928	ft²
D) Option A, B and C (Timmins Commingled Recyclable Material plus Additional Recyclable Material from IC&I plus Other Municipal Recyclable Material)	2,997	ft²

The physical dimensions of the traditional transfer station meets the requirements to receive, store and transfer Option A, B and C and in fact ends up being somewhat over sized since the sizing of the tip floor, in this case, is not driven by the quantity of materials but rather the length of the transfer trailers as well as the need for and width of the overhead door to enable the delivery trucks to back into the building.

The traditional transfer station design features include the following:

- A. Tipping Floor for commingled recyclable materials and OCC storage and transfer (6450 ft²)
- B. Space for a stationary compactor (optional)
- C. Transfer trailer access door, loading bay and ramp
- D. 1 Truck access door 5 m x 9 m

Figure 2 provides a proposed transfer station plan and elevation.



Detail 1 - Transfer Building Plan and Elevation

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

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I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP

AECOM

**PROPOSED TIMMINS TRANSFER STATION
TRANSFER BUILDING PLAN AND ELEVATION**

PROJECT NUMBER
90050
DRAWING NUMBER
1
ISSUE/REVISION
0

4.1.2 Traditional Transfer Station Capital & Operating Cost Requirements

Table 19 outlines a capital cost estimate for construction of a new transfer station consisting of a fully enclosed un-insulated building (using a clear span pre-engineered building) with a tip floor complete with two overhead doors and one man door, a depressed pit to enable the top loading (using a front end loader) of open top transfer trailers.

Table 19: Capital Cost Estimate – Traditional Transfer Station

Capital Item	Cost
New Pre-engineered Building:	\$189,000
Site Preparation (Excavate/Levelling)	\$30,000
Foundation & Slab	\$47,000
Electrical & Mechanical Finish	\$61,000
Water Well System	\$57,000
Door Installation - 2 vertical lift unloading doors	\$90,000
Front-End Loader	\$250,000
TOTAL	\$724,000

Table 20 outlines an estimate of the annual operating cost for a traditional transfer station based on the City's current wage and benefit rates. While the front-end loader may not be utilized eight hours per day at the transfer station, that is it may be deployed to undertake work elsewhere at the landfill site (covering waste and working at the composting facility) it has been completely allocated to the transfer station for the purposes of this analysis. A 5% downtime was allocated for the new loader for maintenance purposes and at a rate of \$90.00/hour as provided by the City.

Table 20: Operating Cost Estimate – Traditional Transfer Station

Operating Item	Cost
Loader Operator/Tip Floor Spotter	\$45,936*
Benefits	\$17,455**
Maintenance (staff, PM, parts replacement & repair)	\$9,396
Utilities	
Fuel	
Equipment replacement (loader) – 7 years	\$37,500***
TOTAL	\$110,296

*based on \$22.00/hour, 8 hours per day, 261 days per year.

**based on a 38% benefit rate

***does not account for inflation

It is proposed that an open top walking floor trailer rather than a compactor and rear load trailer be used to transfer commingled recyclables from the transfer station to the MRF. The collection vehicles described in Section 3 typically pack out in a range between 180-315 kgs per cubic yard and at a 2:1 compaction ratio. Further compaction at the transfer station would prohibit effective processing and recovery at the MRF.

Open walking floor trailers with 120 cu yd capacity can hold approximately 13.5 tonnes of fully commingled recyclable material and those with 140 cu yd capacity can hold approximately 16 tonnes of commingled materials. Timmins generates approximately 10.8 tonnes of recycling per day which would require somewhere between 13 and 16 transfer trailer loads per month.

4.2 Transtor Transfer Station



The Transtor is a combination storage and transfer device that has been used in numerous municipal transfer applications including residential drop-off. The facility pictured is located in Dryden, Ontario. Each Transtor has 53 cubic yards of capacity with a 12' wide loading throat that allows it to accept any equipment. Transtors can be used indoors or outdoors and will integrate with 144 cubic yard or 100 cubic yard compaction trailers or walking floors. Units are powered by a JD49hp fully self contained engine and hydraulic system.



The proposed Transtor transfer station plan view for Timmins is shown in Figure 3.

Detailed long-term (fifteen years) capital and operating costs (as well as financing arrangements) from Haul-All Equipment Ltd. are provided in Appendix C and are summarized in Tables 21 and 22 below.

A cost estimate for a Cover All building is also provided (schematic provided in Appendix D).

Table 21: Capital Cost Estimate – Transtor Transfer Station

Capital Item	Cost
Transfer Station concrete and forming, binwall, fill, upper deck, approach ramps, scale and electrical, fencing, signs, lights, landscaping and grading	\$192,433
Transtor Unit (1)	\$113,720
Transtor Installation (1)	\$28,100
Compaction Trailer Installation (2)	\$317,672
Enclosure	\$150,000
TOTAL	\$801,925

**optional and/or can be added later, estimate based on fabrication and installation at \$50 per square foot to be conservative*

Table 22: Operating Cost Estimate – Transtor Transfer Station

Operating Item	Cost*
Tractor Trailer and Truck Contracted Maintenance and haulage	\$123,260
Transtor and Site Maintenance	\$4,960
TOTAL	\$128,220

*averaged over fifteen years includes inflation

The Transtor Transfer Station would feature one transtor unit, with 8 tonnes per day capacity and two transfer compaction trailers, each with a capacity of 19.3 tonnes. This provides a total daily capacity of approximately 46 tonnes. The City currently requires an approximate capacity of 10 tonnes per day and if CTWMB municipalities participate the City would require a total and approximate 14 tonnes per day capacity.

The compaction trailer would be required to transfer recyclables roughly every two days. When one trailer is absent the remaining Transtor unit and second trailer have more than sufficient capacity (27.3 tonnes combined) to store approximately two days tonnage. The use of two trailers, as opposed to simply adding more Transtor units, is important



because the probability of a Transtor unit failure is significantly less

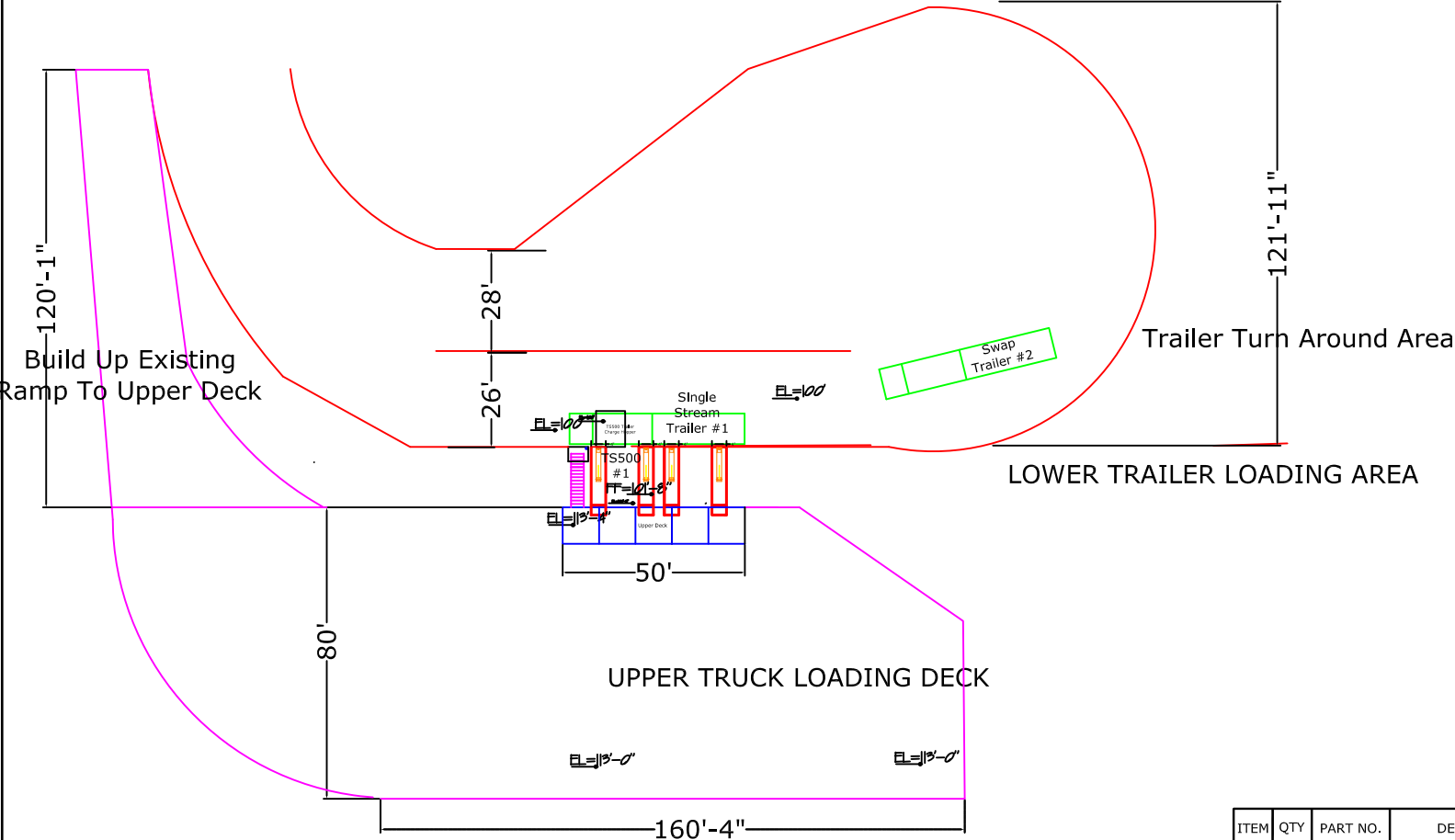
than the probability of road and weather related or truck-related transportation delays between Timmins and Sudbury. The City could consider putting additional wall and footings (for one future additional Transtor unit) during original construction which would cost somewhere in the range of \$40,000 to \$50,000.



The Transtor system can be installed without the Cover All system for a lower capital cost than shown in Table 21 above. The City may want to elect that option as the Cover All system can be added at any time in the future if the City deems it necessary.

Both traditional and Transtor transfer systems would be effective however it is our opinion that the Transtor may be more appropriate and while initially capital and operating costs appear higher for the Transtor system, it's actually more economical when haulage to a MRF is factored in. The problem with the more traditional design is it will likely require a fire protection system (dry sprinklers) and accordingly a source of water. While the design details of such a fire protection system is beyond the scope of this study, it is anticipated that it will require a well pumping system able to deliver hundreds of gallons/per minute or a fire water storage pond, which may not be appropriate given the winter weather conditions. The Transtor with a Cover-All building would not be a fully enclosed structure and it is our opinion that a fire protection system would not be required.

REV NO.	BY	REVISION	DATE
1	DV	2 Trailers, 1 TS500	012109



ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL	MATERIAL SIZE		
VQuip Inc.							
BURLINGTON			ONTARIO	CANADA			
THE CORPORATION reserves all proprietary rights to this drawing and the data shown thereon. This drawing is submitted in confidence and must not be reproduced or copied without prior written consent or permission.			TITIMINS RECYCLING CONCEPT PLAN VIEW				
			TOLERANCES UNLESS OTHERWISE SPECIFIED <ul style="list-style-type: none">• DECIMAL DIM. +/- .005 (0.13mm)• FRACTIONAL DIM. +/- 1/32 (1.6mm)• ANGULAR DIM. +/- 1/2 DEG.				
						DRAWN	DV
						APP.	DV
MODEL	SCALE		DRAWING NO.		REV NO. 1		
ASS'Y NO.	DATE		Timmins				
	092808						

Further, the traditional design transfer requires a loader to top load the materials into the open top transfer trailers. Given the limited quantities of materials the loader will remain idle for most of the day unless the City is able to utilize it elsewhere on the landfill site. The Transtor consists of a self loading system and accordingly does not require a loader.

5. Recyclable Materials Processing Options & Costs

The City of Timmins has close and easy access to the Trans-Canada Highway which permits a good opportunity for transport of recyclables across Ontario. With the exception of Sudbury, single-stream recycling facilities are clustered in and around Toronto, including York Region, Peel Region, Halton Region and Guelph. There is one accessible facility in Quebec but that facility does not receive aluminum and so is not compatible with the Timmins program. Long-haul waste companies were contacted to assess an order of magnitude of cost for haulage from a newly constructed transfer station to the MRF in Sudbury and to the GTA. For the purposes of estimating haulage cost difference the quotation provided by Northern Environmental Services (NES) Inc. was utilized (Appendix E) except in the case of the quotation provided by Haul-All Equipment Ltd for the Transtor system (Appendix C). Discussion with NES indicated that haulage costs could be reduced if the City entered into a long-term (e.g. 7 year) contract with a prospective hauler. The costs in Table 23 are based on an average of 15 loads per month for 180 loads per year.

Table 23 provides cost estimates for haulage and processing at a few select MRFs in Ontario. The Guelph and York Region MRFs were assessed to determine the impact of a longer haul (than Sudbury) with varying processing rates. Guelph's processing cost information was not available by the time of this report but it is clear that lower processing costs (e.g. York Region) do not and would likely never offset the prohibitive cost of transportation to Southern Ontario. The Sudbury MRF offers the least-cost option whether the City uses a traditional or a Transtor transfer system.

Table 23: Recyclable Material Processing Options and Haulage Costs

MRF Location	Distance (km)	Haulage Cost Per Load	Haulage Cost Per Year	Haulage Cost Per Tonne	Processing Fee* Per Tonne	Annual Processing Fee*	Total Annual Cost	Total Cost Per Tonne
Sudbury	304	\$990	\$178,200	\$66	\$75	\$202,500	\$380,700	\$141
Guelph	747	\$2,674	\$481,367	\$178			\$481,367	\$178
York Region	676	\$2,420	\$435,614	\$161	\$64	\$172,800	\$608,414	\$225
Transtor to Sudbury	304	\$740	\$133,182	\$49	\$75	\$202,500	\$335,682	\$124
*includes \$5.00 administration fee								

Although no discussion with the City of Sudbury or the Sudbury MRF have occurred, discussions with Canada Fibres indicate that the Sudbury MRF (and the City) will have interest in the continued receipt of recyclables from Timmins. Timmins would enter into a Recyclables Acceptance Agreement and the current processing fee is approximately that reflected in Table 23. Canada Fibres also indicated that additional

single stream material from other municipalities in the Timmins area could be accommodated at the Sudbury MRF. Cardboard could be received and the City could likely negotiate an alternative processing fee.

During the course of completing this report AECOM had discussions with the local waste hauling company Northern Environmental Services who operate the City's Tisdale Transfer Station. NES indicated a strong interest in utilizing property (owned by them) near the City's Deloro landfill to construct a new MRF to process the City's single stream recyclable materials. The City may want to consider this local option by letting a Request for Expression of Interest (REOI) or RFP prior to transfer station construction and initiation of an agreement with Sudbury.

6. Recyclable Material Collection, Transfer & Processing

6.1 City of Timmins Collection, Transfer, Processing Options and Costs

Table 24 summarizes collection, transfer and processing operating costs for the options being considered by the City of Timmins. Both transfer station options are included in Table 24 but the only processing option considered from a collection and transfer standpoint is that with the City of Sudbury as the least-cost option.

Table 24: Collection, Transfer and Process Options Operating Costs

Collection Program	Annual Collection Cost	Annual Transfer Station Operating Cost	Annual Haulage Cost	Annual Processing cost	Total Operating Cost
Status Quo System					\$942,031
Single Stream – Side Load - Manual					
Traditional Transfer & Haulage	\$614,410	\$110,296	\$178,200	\$202,500	\$1,105,406
Transtor Transfer & Haulage	\$614,410	\$133,182		\$202,500	\$950,092
Single Stream – Side Load - Automated					
Traditional Transfer & Haulage	\$344,713	\$110,296	\$178,200	\$202,500	\$835,709
Transtor Transfer & Haulage	\$344,713	\$133,182		\$202,500	\$680,395
Dual Stream – Side Load - Horizontal - Manual					
Traditional Transfer & Haulage	\$248,438	\$110,296	\$178,200	\$202,500	\$739,434
Transtor Transfer & Haulage	\$248,438	\$133,182		\$202,500	\$584,120
Dual Stream – Side Load Automated					
Traditional Transfer & Haulage	\$179,521	\$110,296	\$178,200	\$202,500	\$670,517
Transtor Transfer & Haulage	\$179,521	\$133,182		\$202,500	\$515,203

From a pure operating budget standpoint the lowest cost option is the dual stream – side load, automated collection system. Table 25 below summarizes capital costs for each program option by annualizing each capital project/acquisition over a normal accepted life, seven (7) years for collection vehicles, ten (10) years for carts, fifteen (15) years for the Transtor system and a conventional twenty (20) years for a traditional transfer station.

Table 25: Annualized Collection and Transfer Station Capital Costs

Collection Program	Collection Vehicle Capital Cost	Carts/Totes Capital Cost	Transfer Station Capital Cost	Annual Collection Cost (7 year amortization)	Annual Carts/Totes (10 year amortization)	Annual Transfer Station Cost (15 year amortization - Transtor & 20 year amortization - traditional)	Total Annual Capital Cost
Status Quo System							
Single Stream – Side Load – Manual							
Traditional Transfer & Haulage	\$800,000		\$724,000	\$114,286		\$36,200	\$150,486
Transtor Transfer & Haulage	\$800,000		\$768,709	\$114,286		\$51,247	\$165,533
Single Stream – Side Load – Automated							
Traditional Transfer & Haulage	\$900,000	\$1,130,250	\$724,000	\$128,571	\$113,025	\$36,200	\$277,796
Transtor Transfer & Haulage	\$900,000	\$1,130,250	\$768,709	\$128,571	\$113,025	\$51,247	\$292,844
Dual Stream – Side Load - Horizontal - Manual							
Traditional Transfer & Haulage	\$750,000		\$724,000	\$107,143		\$36,200	\$143,343
Transtor Transfer & Haulage	\$750,000		\$768,709	\$107,143		\$51,247	\$158,390
Dual Stream – Side Load Automated							
Traditional Transfer & Haulage	\$900,000	\$1,130,250	\$724,000	\$128,571	\$113,025	\$36,200	\$277,796
Transtor Transfer & Haulage	\$900,000	\$1,130,250	\$768,709	\$128,571	\$113,025	\$51,247	\$292,844

When annualized, the least intensive capital cost program is a dual stream manual or automated program which essentially reflects the higher capital cost requirement for carts necessary to the automated programs. Table 26 shows the combined annual operating and annualized capital cost for each program option.

Table 26: Annualized Collection and Transfer Station Capital and Operating Cost

Collection Program	Total Annual Operating Cost	Total Annual Capital Cost	Total Annual Cost	Total Cost/Tonne*
Status Quo System	\$942,031		\$942,031	\$90
Single Stream – Side Load - Manual				
Traditional Transfer & Haulage	\$1,105,406	\$150,486	\$1,255,892	\$120
Transtor Transfer & Haulage	\$950,092	\$165,533	\$1,115,625	\$107
Single Stream – Side Load - Automated				
Traditional Transfer & Haulage	\$835,709	\$277,796	\$1,113,505	\$107
Transtor Transfer & Haulage	\$680,395	\$292,844	\$973,239	\$93
Dual Stream – Side Load - Horizontal - Manual				
Traditional Transfer & Haulage	\$739,434	\$143,343	\$882,777	\$85
Transtor Transfer & Haulage	\$584,120	\$158,390	\$742,510	\$71
Dual Stream – Side Load Automated				
Traditional Transfer & Haulage	\$670,517	\$277,796	\$948,313	\$91
Transtor Transfer & Haulage	\$515,203	\$292,844	\$808,047	\$77
<i>*10,440 collected tonnes of garbage and recycling</i>				

In combination, dual stream side load manual collection using the Transtor transfer system provides the lowest cost program overall.

The dual stream side load automated system is the next lowest cost program which reflects the fact that lower automated and Transtor operating costs and lower vehicle capital costs have a large impact in offsetting the higher capital costs associated with the purchase of the carts.

It is important to point out the current trend toward automated collection systems. Automated collection will support future employee demographics, that is it will attract and retain employees that would otherwise not apply for heavy manual labour-based positions. Automated collection, not only increases collection efficiencies but offers the highest degree of health and safety to city employees (and reductions in WSIB claims and related costs). The City currently has 60% of its collections workforce eligible for retirement in the next five (5) years making it timely to shift to an automated collection system.

An additional benefit to the automated cart-based system is that the carts offer Timmins a means to control the bear population from waste scavenging as the carts can be fitted with various types of locking mechanisms.

6.2 Receipt and Transfer of Materials from Other Municipalities

The Cochrane-Tamiskaming Waste Management Board (CTWMB) operates a series of depots with collection for processing at two MRFs located in each of Kapuskasing and New Liskeard. The combined collection and processing costs for the municipalities managed by the Board was reported at \$377/tonne in 2007, \$160/tonne for collection and transfer and \$217/tonne for processing. The lowest cost option for the

City of Timmins as discussed above is \$124/tonne (Table 23) for transfer and processing at the Sudbury MRF which may present opportunities for cost reductions for the CTWMB. Timmins is central and accessible to the CTWMB geographic region but any cost impact to the CTWMB relative to collection would still require assessment. CIF (*Continuous Improvement Fund*) staff is actively reviewing recycling program effectiveness in the North and discussions between CIF, the City and the CTWMB are strongly encouraged.

6.3 Receipt and Transfer of Materials from the IC&I Sector

The Transtor Transfer Station could add an additional Transtor to accommodate cardboard from the IC&I sector for transfer to Sudbury at a cost of \$138,085 for construction and an additional Transtor unit at a cost of \$113,720. Cardboard can be received at a traditional transfer station with no additional capital cost but with some increase in operating costs. Per tonne transfer costs combined with processing fees at the Sudbury MRF for loose cardboard make this program cost-prohibitive for the IC&I sector compared to the existing NES cardboard processing system. NES owns a new baler, bales material locally and ships OCC directly to market representing the most cost-effective way to handle this material. There is no advantage to the City to include OCC in their transfer and processing system.

7. Regulatory Requirements

Discussion with the MOE office in Timmins indicated that in the case of the transfer system to be located at the City's Deloro landfill, that a Certificate of Approval would only be required if the transfer facility (buildings etc.) is under a fifty (50) meter separation distance from the property boundary. The City is encouraged to assess the separation distance from the proposed transfer location to the property boundary and determine the need for a Certificate of Approval.

8. Conclusions & Recommendations

In general terms the City has an opportunity to reduce its curbside recycling (and garbage) system costs. At the very least the City will maintain a similar annual budget position but minimize the risk associated with future unknown costs that may be associated with newly contracted recyclable material collection, transfer and processing. As discussed in Section 3.1.1 if the City were charged the average blue box program cost for Rural North municipalities in the next contract round they could be looking at a recycling program cost in the order of \$900,000 - \$1,000,000 per year. This would put the City's total garbage collection and recycling budget in the range of \$1,500,000 - \$1,600,000 per year. In addition, it's arguable that the City needs to replace some of its existing and aging fleet (in particular the 1991 – 1994's) to avoid further increases in maintenance and potential downtime for trucks. This presents an opportunity for the City to begin to support its own curbside recycling collection program through new vehicle acquisition.

8.1 Recommended Collections & Processing System

The recommended collection and processing system for the City includes the following components:

1. Conversion from the current program to an automated dual stream collection program through current fleet replacement.

While a manual dual stream collection program presents a lower cost option than the automated program, the automated program offers a high productivity based program (compared to manual) with the benefit of reduced potential for worker injury and WSIB related incidence for the City, a system suitable to any city collection staff demographic and a system that may substantially reduce waste scavenging by bears.

Another benefit to the automated program is that the distribution of carts, renewed promotion and education of the program and the move to weekly (as opposed to bi-weekly) collection of recyclables will almost certainly increase participation rates in the recycling program. The R.W. Beck & KPMG *Blue Box Program Enhancement and Best Practices Assessment Project*, May 2007 report cites that municipalities that collect recyclables less frequently than garbage tend to exhibit lower recovery rates, as compared to municipalities where collection frequency of garbage and recyclables is equal.

2. A negotiated *Recyclables Acceptance Agreement* with the City of Sudbury for long term processing at the Sudbury MRF operated by Canada Fibres.

Initial discussion with Canada Fibres indicates a continued interest by the Sudbury MRF to receive recyclables from the City and an interest in receipt of materials from the CTWMB jurisdiction. The transfer of recyclables to Sudbury, as opposed to another single-stream processing facility, is the most economical option for Timmins and discussions between the City, WDO and Sudbury should ensue.

3. The City should evaluate further efficiencies that may be gained with a shift from a 5-day (8 hour) to a 4-day (10 hour) collection cycle.

The 4-day cycle may be more efficient than using spare trucks on double collection days after the 10 statutory holidays as necessary additional staffing by public works employees could be avoided (and so avoid lost time from other work).

8.2 Recommended Recyclable Materials Transfer System

The recommended transfer system for the City includes the following components:

1. Construction and contracted operation (and haulage) of a Transtor Transfer Station that features a Transtor unit and two compaction trailers.

While either the traditional transfer station or the Transtor transfer station is suitable to the City, the Transtor system does not require fixed fire suppression e.g. dry sprinkler equipment or water supply which, given the location of the landfill, makes the Transtor system ideal. The Transtor system also offers the lowest cost haulage arrangement of those evaluated.

2. The City should not build transfer station infrastructure to receive support IC&I source cardboard given the current private sector infrastructure already in place.
3. The City should have discussions with CFI and CTWMB to identify mutual benefits associated with CTWMB recyclable materials transfer from Timmins to Sudbury.

Table 27 below summarizes the difference in recycling system characteristics for status quo and the recommended recycling system. The increased cubic yard capacity of new trucks plus automation will allow the City to reduce its fleet to four (4) trucks and to maintain an annual operating budget combined with a new annual capital budget to support new collection vehicles, carts, a transfer station and haulage for slightly less than the current operating budget (with no consideration of capital).

Table 27: Recycling System Characteristics Status Quo and Recommended System

Recycling System Characteristics	Status Quo	Recommended System
Number of Trucks*	10	4
Tonnes/Day/Recycling/Truck	3.57	6.34
Tonnes/Day/Garbage/Truck	5.62	12.10
Total Annual Operating Cost	\$942,031	\$515,203
Total Annual Capital Cost	**	\$292,844
Total Annual Cost	\$942,031	\$808,047
Total Cost/Tonne	\$90	\$77

*includes two spares (1 new, 1 existing)

**existing fleet will need replacement

The recommended system demonstrates long term cost efficiencies for the City of Timmins recycling program. Implementation of these options would be considered improvements to Timmins recycling program and would be eligible for funding through the CIF. If the City decides to implement the options detailed in the report, it would be advisable to consider applying to the CIF for financial assistance. If the City elects other options outside the recommended approach, the potential funding available through CIF may be lower.

Appendix A

Sample Collection Vehicle Specifications and Cost Quotations

Appendix A: Collection Vehicle Supplier Vehicle Descriptions and Costs

Supplier	Rep	Brand	Model	Price	Operators Required	Compression	Discription
Joe Johnson Equipment	Patrick McGee	Labrie	Expert Helping Hand	\$280,000 to \$300,000	1	Waste 600-900 Lbs/cubic yard Recycle 300-500 Lbs/cubic yard	60/40 dropframe sid loader, adapted for manual and semi-automatic or fully automatic refuse or recycling operations. Optimization of collection operations, picks up bags or different sized containers and carts from any type of route can be equipped with cart tipper.
		Leach	Alpha-III	\$200,000.00	2-3	Waste 800-1000 Lbs/cubic yard Recycle 300-500 Lbs/cubic yard	Rear loading single stream truck
Universal Handling Equipment	Rhyan Bisson	Universal Handling Equipment	Ram x4 Dual Stream	\$118,600	min 2 operators	-	Rear loader, 60/40 split body. Price includes cart lifter at \$7,450.00.
Shu-Pak	David Tanner	Shu-Pak		\$200,000.00 to \$210,000.00	1		2 stream sideloader vertical 60/40 split trucks on international chassie. Manual operation
				\$240,000.00 to \$250,000.00	1		2 stream sideloader horizontal 60/40 split trucks on international chassie. Manual operation
				\$205,000.00 to \$215,000.00	1		2 stream sideloader vertical 60/40 split trucks on international chassie. Semi automatic operation
				\$245,000.00 to \$255,000.00	1		2 stream sideloader horizontal 60/40 split trucks on international chassie. Semi automatic operation
				\$180,000.00 to \$190,000.00	min 2 operators		Single stream trucks on international chassie. Manual operation

When working on an automated collection truck:

1. Always wear your PPE (vests, gloves, etc.)

2. Watch out for blind spots when changing lane

3. When using the automated arm, watch for obstacles behind the cart

4. When using the automated arm, watch for pedestrian behind the cart or around the truck
5. Inspect your vehicle and mechanical arm before each trip

6. Check your brakes regularly

7. Drivers - Wear your seatbelt

8. Drive defensively

9. Do not stand behind the truck when it is packing/cycling

10. Don't stand behind a backing truck



The Labrie Environmental Group distributes and supports its products via a 50-strong distributor network that spans the United States and Canada, and operates a U.S-based Parts and Customer Support Center that offers maintenance, training, after-sales and parts services.

For further information about our products, contact a Distributor near you or call one of our offices at the numbers listed below. Our complete Distributor network is listed on our website at www.labriegrup.com

Labrie Environmental Group



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EXPERT^(t) HELPING HANDTM

THE MOST EFFICIENT AUTOMATED DROP FRAME ON THE MARKET!



Hybrid collectionTM. Pioneered by Labrie.

The EXPERT^(t) 2000 Helping HandTM is a dropframe, side loading unit perfectly adapted for manual, semi-automated or fully-automated refuse or recycling collection operations.



Versatile. Optimized unit ownership.

The EXPERT^(t) 2000 Helping HandTM is one of the most versatile units available on the market. Any municipality or private hauler that needs to pick up bags curbside or streetside will still have the right unit for the job when switching to an automated collection program. This units fulfills the industry's evolving demands for years to come.



Highly flexible. Maximized operations.

The EXPERT^(t) 2000 Helping HandTM contributes to optimizing collection operations by picking up bags or different-sized containers and carts found on practically any type of route when equipped with a cart tipper on the left-hand side.



Best payload. Maximum productivity.

How come it has the best compaction and load distribution available on today's market? Its tapered body means it can collect more houses on the same legal payload and ensures facilitated dumping.



Short walking distance. Maximum efficiency.

The short walking distance from the cab, and shorter wheelbase (shorter than any other manufacturer) make the EXPERT^(t) 2000 Helping HandTM the most efficient drop-frame, sideloading collection unit on the market.



Reduced fuel consumption & noise pollution. Maximum enviro-proficiency.

Best-in-class hydraulics mean less overheating and less demand on the engine.



Vehicle Options



1. Also available in manual version, or semi-automated with or without cart tipper on either side



2. Dutch door



3. Spill shield behind grabber



4. Dual or triple camera system



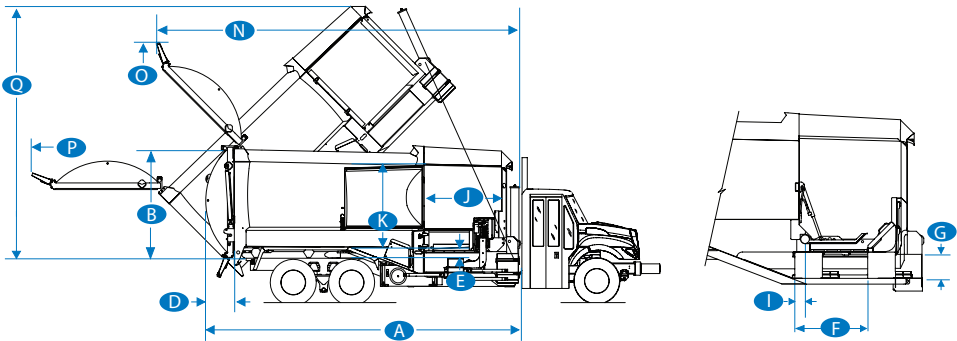
5. Fire extinguisher - 20 lbs



6. Clean out tools - Broom & shovel

Helping Hand™

- **Reach: 84 inches**
- **Reliable**
- **Productive**



Dimensions	2 axles		3 axles	
	Imperial	Metric	Imperial	Metric
	22 yd³	16.8 m³	31 yd³	23.7 m³
A.....	O.A. length.....	237 in.....6,020 mm.....	292 in.....7,417 mm.....	
B.....	O.A. height above frame.....	102 in.....2,591 mm.....	102 in.....2,591 mm.....	
C.....	O.A. width*.....	96 in.....2,438 mm.....	96 in.....2,438 mm.....	
D.....	Tailgate length.....	18 in.....457 mm.....	33 in.....838 mm.....	
E.....	Loading height above frame.....	5.5 in.....140 mm.....	5.5 in.....140 mm.....	
F.....	Packer stroke.....	52 in.....1,321 mm.....	52 in.....1,321 mm.....	
G.....	Packer height.....	18 in.....457 mm.....	18 in.....457 mm.....	
H.....	Packer width*.....	72 in.....1,829 mm.....	72 in.....1,829 mm.....	
I.....	Packer penetration inside body.....	12 in.....305 mm.....	12 in.....305 mm.....	
J.....	Hopper opening width.....	71 in.....1,803 mm.....	71 in.....1,803 mm.....	
K.....	Hopper opening height.....	77 in.....1,956 mm.....	77 in.....1,956 mm.....	
L.....	Dumping angle, body*.....	45°.....45°.....	45°.....45°.....	
M.....	Angle of slope, raised*.....	24°.....24°.....	24°.....24°.....	
N.....	O.A. length, tailgate raised, body down.....	292 in.....7,417 mm.....	332 in.....8,433 mm.....	
O.....	O.A. height, tailgate raised, body down, above frame.....	195 in.....4,953 mm.....	195 in.....4,953 mm.....	
P.....	O.A. length, dumping position.....	406 in.....10,312 mm.....	446 in.....11,328 mm.....	
Q.....	O.A. height, dumping position, above frame.....	201 in.....5,105 mm.....	228 in.....5,791 mm.....	

*not shown on drawing

Body Specifications

Body floor:..... 3/16" HR A572 GR 50
Body bottom side walls:..... 10-gauge HR A715 GR 80
Body upper side walls:..... 12-gauge HR A715 GR 80
Body roof:..... 12-gauge HR A715 GR 80
Body long sills:..... HSS tubing, 6" x 2" x 3/8", A500 Grade C

Body Capacities

2-axle chassis..... 15, 17, 19, 20, 22 and 24 yd³ (11.5, 13, 14.5, 15, 17 and 18 m³)
3-axle chassis..... 27, 29, 31, 33, 35 and 37 yd³ (20.5, 22, 24, 25, 27 and 28 m³)

Hopper Specifications

Loading height:..... 5½" above frame
Hopper floor:..... 3/16" S107 abrasion resistant steel 65,000 psi
Hopper floor wear plates:..... ASTM AR500
Hopper sides:..... 3/16" S107 abrasion resistant steel 65,000 psi
Hopper slope:..... ¼" ASTM AR425
Hopper slope wear plates..... ¼" ASTM AR500
Hopper door dimensions:..... 71" x 73"
Crusher panel:..... 10-gauge HR A715 GR 80

Tailgate Specifications

Sides and rear walls:..... 12-gauge ASTM A715 GR 80
Upper tube frame:..... 4" x 4" x 3/16" A500 Grade C
Bottom tube frame:..... 7" x 3" x ¼" A500 Grade C
Framing sides:..... 3/16" S107 abrasion resistant steel 65,000 psi

Arm Specifications

Pick up capabilities:..... 32 to 96 gal. carts
Lift capacities:..... 400 lbs at maximum reach
Arm reach:..... 84 in (standard)
..... 120 in (option)

Packer Specifications

Rails wear plates:..... ¼" ASTM AR500
Packer horizontal wear shoes:..... ½" ASTM AR425
Packer side wear shoes:..... ¼", ASTM AR425
Top of packing ram:..... ¼" S107 65,000 psi
Face plate of packing ram:..... ¼" S107 65,000 psi
Width of packing ram:..... 72"
Height of packing ram:..... 18"
Stroke of packing ram:..... 52"

Hydraulics

Control valve:..... Parker VG35
Pump:..... Denison T6DC
Pump flow packer:..... 20.4 gpm @ 700 rpm
Pump flow arm:..... 16.3 gpm @ 700 rpm
Hydraulic reservoir:..... 65 gallons (conventional cab)
Hydraulic system pressure:..... 3,000 psi
Return line filter/Nominal filtration:..... 150 gpm, 7 micron

Cylinders

Body lifting:..... Telescopic, 3 stages, 6½" bore x 140" stroke on 15 yd³ body;
..... 4 stages, 150" on 20 yd³ body; 4 stages 180" on 27 yd³ body
..... and 5 stages, 204" on 31 yd³ body
Packer:..... 4" x 2½" x 40"
Tailgate:..... 2½" x 1¾" x 39"
Horizontal reach:..... 2" x 1¼" x 70"
Up/down:..... 3" x 1½" x 16"
Grabber:..... 1½" x 1" x 6¼"

Productivity Data

Arm cycle time:..... 8 to 20 sec. at 700 rpm
Packer cycle time:..... 20 sec. at 700 rpm
Dumping cycle time:..... 60 sec. at 1,500 rpm
Tailgate cycle time:..... 55 sec. at idle

SHU-PAK®

THE ORIGINAL

SHU-PAK®

↑↓ TWO STREAM PATENTED



SHU-PAK®, the original one man side loader has been servicing municipalities and contractors for over 40 years. Since it was first introduced we have constantly improved and developed this vehicle with a commitment to producing a product which will provide continuous service under the most severe operating conditions.

Having over 40 years experience, we realize there are many variables to refuse collection and flexibility is important, which is why the SHU-PAK® side loader can be configured to best suit your particular application.

- Body capacities from 17 to 40 cu. Yd.
- Smooth Side Body
- Top hinged hydraulic tailgate
- Split body and hopper or unitized
- Shallow or deep hoppers
- Medium or high compaction packers
- Various hydraulic pumps available
- Installation to conventional or cab forward chassis
- Available in vertical split two compartment bodies



SHU-PAK®II is a new model of the original one operator side loader which can collect and compact two streams of refuse. This vehicle was engineered to provide operator's with a SINGLE vehicle which could collect TWO streams simultaneously with ONE operator. The advantages are obvious, fewer vehicles mean reduced costs for labour, maintenance and with the rising fuel prices, some big relief at the pumps. Fewer trucks on the road coupled with the new LEV (low emissions vehicle) chassis, you're being kinder to the environment as well.

The body design has two compartments split horizontally with separate packers for each compartment. The lower packer is equipped with a crusher panel and high compaction ram cylinders while the upper packer is equipped for medium to light compaction. This design allows the vehicle to be adaptable to many different applications such as separation of wet and dry refuse, or commingled recyclables and refuse, or commingled recyclables and newsprint etc..

ALL SHU-PAK CHASSIS'S ARE NOW LOW EMISSIONS

Shu-Pak Model PK 29+4 Yard Side Loading Refuse Packer Split Vertically 50/50 - 60/40 - 70/30

- Body, 100% welded formed steel construction.
- Unitized body and hopper design.
- Roof corners of body, sloped 12" (45°) for additional tree clearance.
- Body window, 9" X 9" covered with expanded metal.
- Two piece top hinged hydraulically operated tailgates each with its own 2½" bore cylinder, hydraulic door locks, manual safety locks, pins and wet seal. Both doors have anti drop safety circuits built into them.
- AIR/HYD control lever in cab.
- 1.4 cubic yard hopper, floors and sides made with ¼" A.R. plate.
- Packing ram is 18" tall and is made from ¼" A.R. plate.
- Ram guided by two guide rails in floor with steel wear shoes.
- Packer cylinders 5" bore 3" rod, installed diagonally.
- Crusher panel mounted to front of body, 3 ½" crusher cylinder with 1½" bore.
- Crusher control, AIR/HYD located in cab (can be relocated to suit).
- Full hopper enclosure with aerodynamic canopy, LH/RH loading doors, packer controls on right side of hopper and in cab (optional LH controls and safety steps available).
- Weatherproof packer control box located in cab all wires and circuits individually labeled).
- Proximity sensors, H.D. industrial type.
- Packer electronically controlled with integral diagnostic system.
- Selector switch for one or three cycles of ram.
- Motivator switch located in cab to manually excite engine.
- Automatic transmission, engine excites when packer is activated.
- Transmission neutral lock out switch (deactivates engine auto excite when not in neutral).
- Two 7 3/8" - three stage underbody hoist cylinders with AIR/HYD control in cab with separate valve bank to manually lower body in the event of air loss.
- Main control valve with system relief press set at 1850 PSI.
- Gauge to monitor system pressure.
- Body mounted valve bank with air shifted spools for all functions. Steel hydraulic lines used where ever possible.
- Body safety props.
- Chassis drop frame modifications (provides low pitch in height at hopper).
- Front mounted 45 G.P.M. shaft drive gear pump (optional PTO pump available).
- 57 IMP. GAL. (68 US) hydraulic reservoir with clean out and inspection cover.
- 10 micron return line filter, 100 mesh suction trainer.
- All pressure hoses SAE100R2 or equal, steel lines make up over 80% of our hydraulic system.
- LED body clearance lights, tail lights and back up lights.
- Sealed wiring.
- Mud guards in front of rear wheels.
- Rubber mud flaps rear of rear wheels.
- Right hand Stand-up Drive - Equipped with AUTOMATIC bifold bus doors. Doors open when work brake is applied and close when its released (dash mounted "override" so operate can leave the doors open). See attached Stand-Up Drive flyer for additional options.

Chassis 2008 International Work Star 7400 SBA 6X4

{International MaxxForce 9, 300 HP, 800 lb-ft Torque @ 1200 RPM
ALLISON 3500_RDS_P}4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive
Front Axle: Wide Track, I-Beam Type, 16,000-lb Capacity
Rear Tandem: Single Reduction 40,000-lb Capacity With Driver Controlled Main Locking
Differential in Rear-Rear Axle and 200 Wheel Ends Gear Ratio: 5.29
Bendix Anti-Lock Brake System
AM/FM Stereo With Weather-band, Clock, Includes Multiple Dual Cone Speakers
Air Conditioning, Cruise Control, Air Ride Drivers Seat, Intermittent Wipers Etc.
More details available on request.



Stand-Up Drive Conversion

Customers have been asking us for years to offer the “Spacious” Shu-Pak Cab Conversion as a stand alone product. It’s been over 45 years since we did our first cab conversion and now we’re offering that experience to you. We are proud to present the all new Shu-Pak Equipment Inc. S.U.D.C

CAB CONVERSION FOR STAND-UP DRIVE

Shu-Pak Equipment Inc. Cab Conversion © 2008

(INTERNATIONAL WORKSTAR)

Left or Right Conversions

STANDARD ITEMS

- Original Chassis windshield, "A" pillar and fenders are maintained for maximum cab integrity.
- Right hand side of cab shall be extended for stand-up drive and a sliding door with a large 24" x 78" opening. Allowing easy access to the cab and includes right hand grab bar.
- The "TRUE" Maximum step in height on right side is 18" from ground with Shu-Pak 29 yd body and hopper installed ***, 20" without a body. Less than 13" when the "included" retractable step is used.
- Dual steering shaft driven through a H.D. gear boxes.
- Floor is made from 1/8" Checker plate and is a spacious 27" wide by 32" deep.
- Tub side and rear walls are fabricated from 12 ga 50W plate and the front firewall is made from 3/16" plate.
- All gauges and accessories required for safe operation of vehicle are supplied and include the following:
 - a) Column mounted signal and hazards with intermittent wiper and washer controls.
 - b) R.H. foot throttle.
 - c) Air operated foot brake.
 - d) Air toggle switch to apply service brakes (work brake) mounted door frame.
 - e) Transmission shift control relocated to center of cab.
 - f) Dash mounted horn button.
 - g) Teleflex gauge cluster with speedometer, oil, rpm etc.
 - h) Air-pressure gauge.
- R.H. steering wheel mounted to provide for maximum operator comfort.
- Ignition switch is accessible from both driving positions.
- Heated and powered rectangular 7" x 15.75" mirrors, provided with chassis will be installed on



extension.

- Back rest and three point seat belt on stand up side.
- R.H. door chain. (Across R.H. door opening)
- Cab extension shall be painted to match original manufacturers colour.
- 5lb Fire Extinguisher
- Three triangle reflectors (no flares)
- Hood mounted bus boy mirrors (non heated)
- Left foot rest integrated into floor

****** Step height with 16,000# front suspension and 315/80R22.5 tires. Other suspension and tire combinations may affect step height.***

OPTIONAL ITEMS

- Stainless Steel heated floor using engine coolant complete with flow control valves. Includes one steel grate.
- Adjustable floor height using steel grates. Can be installed with one grate up to three stackable grates.
- 25,000 BTU / 295 CFM Auxiliary heater complete with three speed fan.
- Heated Bus Boy mirrors.
- Bi-fold doors.
- Automatic bus doors activated with work brake switch. When the work brake is applied the doors open and close when the brake is released.
- Butt seat, allows operator to reduce their standing weight while driving between stops.
- Cover to prevent accidental operation of foot pedals on right side.
- Sliding left side driver seat included with the stand-up left side option.

Optional automated doors shown below.



Optional Bi-Fold doors shown below.



Optional heated floor shown below.



SHU-PAK® THREE STREAM

PATENTED



SHU-PAK® III is our flagship and it can collect and compact THREE separate commodities using just **one** operator. The SHU-PAK® III has many of the same features as the SHU-PAK® II plus it includes two extra capacity "PAC-KING" deep hopper packers. The upper or lower compartments can be split vertically giving a total of three compartments. The body split ratios and tailgates are tailored to meet your specific application.

Check Out Our "All New" Website At:

www.shu-pak.com

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EQUIPMENT INC.

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Canada N3H 4R7
Phone: 519-653-2472
Fax: 519-653-2719

SHU-PAK®

THE "ORIGINAL" ONE OPERATOR SIDE LOADER



SHU-PAK® Equipment Inc.

Manufacturer of the

"ORIGINAL" SHU-PAK® SIDE LOADER for over 40 years.

We manufacture "only" side loaders as we feel
this is the most efficient collection vehicle available.

With our experience and flexibility we can help
make your next selection of collection vehicle as...

EASY AS 

Appendix B

Sample Cart / Tote Specifications for Automated Collection



EVR® II CARTS

The Industry's Only Universal/Nestable Cart

- Fully Assembled EVR II carts stack inside one another to maximize storage space and minimize delivery costs
- Carts can be ordered fully assembled and Ready to Roll™ directly from the factory
- Carts are compatible with both Semi-Automated and Fully Automated Collection Systems
- Superior material and Advanced Rotational Molding produces carts that are virtually maintenance-free with lower life cycle costs.
- EVR II carts are durable and long-lasting, even in demanding applications. Toter carts do not break - they "Bounce Back"
- New 48 Gallon mid-size container is perfect for urban areas, single unit dwellings, and municipal recycling programs
- Patented Rugged Rim® adds rigidity and places extra material into critical wear areas for extended life
- Features factory installed 360-degree rotating steel stop bar in a reinforced and completely sealed leak-proof journal
- Large foot print and aerodynamic design creates industry leading wind and set-down stability
- All EVR II carts meet ANSI standards of Z245.30 for safety and Z245.30 for compatibility

SPECIFICATIONS

Item #	Description	Dimensions (l x w x h)	Load Rating
79296	96 Gallon XHD Universal/Nestable Cart	35.25" x 29.75" x 43.25"	335 lbs.
79264	64 Gallon XHD Universal/Nestable Cart	31.75" x 24.25" x 41.75"	224 lbs.
79248	48 Gallon XHD Universal/Nestable Cart	28.75" x 23.50" x 37.50"	168 lbs.



EVR CARTS

Rolling Out Total Solution

- Superior material and Advanced Rotational Molding produces carts that are virtually maintenance-free with lower life cycle costs
- Available in three carts styles: Universal, Nestable, and Fully Automated
- Nestable Carts, when fully assembled, stack one inside another to maximize storage space and minimize delivery costs
- Nestable Carts can be ordered fully assembled - Ready to Roll™ - directly from the factory
- Universal Carts are compatible with both Fully Automated and Semi-Automated lifters
- EVR carts feature exact volumes of 32, 64, and 96 Gallons for equitable billing
- Completely molded-in steel stop bar journal prevents leakage of material and odors
- Narrow profile fits easily through gates and doors
- All EVR carts meet ANSI standards of Z245.30 for safety and Z245.60 for compatibility

SPECIFICATIONS

EVR UNIVERSAL CARTS

Item #	Description	Dimensions (l x w x h)	Load Rating
76596	96 Gallon XHD Universal Cart	34.50" x 29.25" x 46.75"	335 lbs.
76564	64 Gallon XHD Universal Cart	30.00" x 27.50" x 40.00"	224 lbs.
76532	32 Gallon XHD Universal Cart	24.25" x 19.25" x 38.50"	112 lbs.

EVR FULLY AUTOMATED CARTS

Item #	Description	Dimensions (l x w x h)	Load Rating
57596	96 Gallon XHD Fully Automated Cart	34.50" x 29.25" x 46.75"	335 lbs.
57564	64 Gallon XHD Fully Automated Cart	30.00" x 27.50" x 40.00"	224 lbs.
52532	32 Gallon XHD Fully Automated Cart	24.25" x 19.25" x 38.50"	112 lbs.

20 gallon insert option for conversion of 32 gallon carts

Part	Description	Dimensions (l x w x h)	Load Rating
VR120	20 gal XHD Insert	18.90" x 19.60" x 28.75"	70 lbs.



CO-COLLECTION CARTS

One Cart Source Separated Collection

- Works in conjunction with compartmentalized trucks to allow for the efficient collection of two separate materials in one cart with one truck
- "Butterfly" lid design helps divert materials during collection and greatly reduces cross-contamination
- Lids stand freely in an open position for safe and convenient loading of recyclables with both hands
- Toter's EVR carts can be transitioned to Co-Collection carts without having to buy new containers
- Double-wall rotationally molded lids and divider lends superior strength and durability
- Secure-fitting lids help keep insects out and odors in; rain gutter restricts water entry
- Easy, two-step lid assembly

- Lids available in multiple colors for easy material identification
- Permanent graphic area under the lid for material identification
- Narrow profile fits easily through standard gates and doors
- User instructions in English and Spanish on cart lid
- **Universal design for fully or semi-automated collection**

SPECIFICATIONS

Item #	Description	Dimensions (l x w x h)	Load Rating
77564	64 Gallon XHD Universal Co-Collection	29.00" x 29.50" x 41.75"	224 lbs.
77596	96 Gallon XHD Universal Co-	34.00" x 30.50" x 49.00"	335 lbs.

Collection



*EVR® II on a
fully automated arm*



*EVR® II on a
semi-automated lifter*



*Ready-to-Roll carts require no additional
assembly before delivery to customers.*

EVR® II CARTS



TOTAL SOLUTIONS

ROLLING OUT

- Delivering nestable carts permits a one-driver/one-person crew for quick and efficient delivery of carts to residents.
- Ability to nest carts means fewer delivery trips which saves you both fuel and labor costs.
- Optional on-route delivery from Toter available.



Carry 3-4 times more Toter nestable carts on a delivery route than competitor carts.





Toter carts are easy to roll



48, 64, and 96 gallon EVR[®] II Carts



- Advanced Rotationally Molded carts have NO molded-in stress, unlike injection-molded carts which are subjected to pressures upward of 20,000 psi during molding.
- Such high levels of molded stress and pressure can cause injection molded carts to prematurely crack and break, rendering them useless.

Toter carts bounce back, not break!

EVR® II FEATURES INCLUDE:

Convenient 48 gallon size available in addition to 32, 64, and 96 gallon sizes.

Patented Rugged Rim® adds extra rigidity and places extra material in critical wear areas for extended cart life.

Factory installed 360° rotating steel stop bar in a completely sealed leakproof journal.

Large footprint and aerodynamic design create industry leading wind and "set-down" stability.

Nestable design allows fully assembled carts to be stacked one inside another for storage and delivery efficiencies and cost savings.

Multilingual user instructions

Universal design makes cart compatible with both fully and semi-automated lifters.

Textured surface resists scratches and hides unsightly dirt.

Cart does not fall over when lid is flipped back.

Low, narrow profile design is easy to maneuver and easily fits through gates and doors.

Molded-in axle journals produce 4-6 times more support than drilled holes.

5/8" axle has over 2,000 lbs.+ bending strength.

Bottom wear chime for outstanding abrasion protection.

Carts meet ANSI standards Z245.30 for safety and Z245.60 for compatibility.



Appendix C

Haul-All Equipment Ltd. Transtor Transfer Station Specifications and Cost Quotations

VQUIP INC.

Transtor Site Cost Estimate - Dec 20, 2008 - Cut Into Existing Slope For : Timmins - Recycling Single Stream

Transtors - Initial Installation	2	TS500	VQuip Labour Rate	\$	95	Including Per Diem Allowance
Spare Footings and Binwall for Expansion Capacity	0	TS500	Local Labour Rate	\$	55	No Per Diem Allowance
Planned Binwall Overall Length Calculation	9.8	m Binwall Loading Area	Footing Depth	1.8		m- Depending Upon Frost Load
	5.4	m Wall to Grade Transition and Rolloff Wall	Footing Width	0.9		m - Each Footing Width
	15.2	m Total Binwall Linear Feet		18.4		m Upper Ramp Depth From Transtor Face
	15.2	m Binwall Rounded to Nearest 10 Feet Section				ASSUMES 3,00 lb/ft SOILS

Item	Description	Take Off Qty Each	Basis of Qty	Estimate Quantity	Pricing Unit	Price	Total	Notes
Concrete & Forming								
	Site Footing Excavation	1	Lot	32.0	m3 of Excavation	\$ 20	641	
	Trailer Load Slab	1	50' x 12' x 6" Thick	16.4	m3 3500 psi Concrete & Rebar	\$ 541	8,889	
	TS500 Footings & Rebar, Installed	2	Lot	28.1	m3 3500 psi Concrete & Rebar	\$ 541	15,186	
Binwall & Fill								
	Contech Binwall - Type C 15' Face Height Vertical	15.2	Face m - 15' Face Vertical	15	Linear m Design C Binwall	\$ 1,700	25,840	4 Week Delivery
	Existing soil excavation and removal	1	Lot	1	Lump Sum Excavation	\$ 2,000	2,000	
	Footing Drainage Tile - In Front and Behind Binwall	15.2	Face Feet + Drain	15	Linear m 4" Drainage Tile	\$ 16	243	
	Binwall Fill - Grade B - < 8% Fines	1	Fill Binwall Boxes	185	m3 B Fill	\$ 50	9,234	Using 1' Lifts, Hand compactor & Hand Labour
	Install Labour - 20' (Binwall Day 3 Man Crew 10 Hr Day)	3	Days - 3 Man Crew	108	Local Labor	\$ 55	5,940	3 Man Crew, 20' Per Day, 10 Hour Days
	Filter Cloth	1.52	15' x 2' Every 10' Wall	35	Sq. m Binwall Joint Filter Cloth	\$ 1	35	Recommended at Gaps
Upper Deck and Approach Ramps								
	Upper Deck Fill - B Fill - 13' Depth	1	80'x60'x9'	1,351	m3 - Site Fill - Rough Estimate	\$ 25	\$ 33,778	Installed & Compacted
	Upper Deck Side Fill	1	All Fill	500	m3 - Site Fill - Rough Estimate	\$ 20	\$ 10,000	Installed & Compacted
	Approach Ramp	1	Lot Estimate	280	m3 - Site Fill - Rough Estimate	\$ 20	\$ 5,600	Installed & Compacted
	Approach & Departure Ramp Road Base - 24" Depth	1	Print	540	m3 - Traffic Surface	\$ 33	\$ 17,763	Installed & Compacted
Scale and Electrical								
	Conduit and Cable to Site	1	Allowance	1	Local Electrical Allowance	\$ 10,000	\$ 10,000	
Amenities-Bollards, Signs, Lights etc.								
	Safety & Warning Signs	1	Deliniators, Signs	1	Lump Sum	\$ 2,000	\$ 2,000	
	Access Stairway and Handrails - Galvanized	2	One Set	2	Lump Sum	\$ 8,000	\$ 16,000	
Fencing								
	Safety Fencing - Top Of Binwall - Open Areas	60	Linear m	60	Lump Sum Estimate	\$ 67	\$ 4,000	
Landscaping and Grading								
	Slope Rip Rap and Drive Lane Stone	36	m2 - 1' Deep	1	m2	\$ 100	\$ 4,800	
	Final Grading	1	Stripped Soil or Imported	1	Lump Sum	\$ 3,000	\$ 3,000	
SUBTOTAL CONSTRUCTION COSTS							\$ 174,948	
Project Cost Contingency						10.00%	\$ 17,495	
Contractor Profit						10.00%	\$ 17,495	
Design, Engineering and Permitting						10.00%	\$ 17,495	
Surveying and Soil Testing							\$ 5,000	
TOTAL EXCLUDING SALES TAXES							\$ 232,433	

VQUIP INC.

Transtor Site Cost Estimate - Dec 20, 2008 - Cut Into Existing Slope For : Timmins - Recycling OCC

Transtors - Initial Installation
Spare Footings and Binwall for Expansion Capacity
Planned Binwall Overall Length Calculation

1 TS500
0 TS500
4.9 m Binwall Loading Area
4.2 m Wall to Grade Transition and Rolloff Wall
9.1 m Total Binwall Linear Feet
9.1 m Binwall Rounded to Nearest 10 Feet Section

VQuip Labour Rate \$ 95 Including Per Diem Allowance
Local Labour Rate \$ 55 No Per Diem Allowance
Footing Depth 1.8 m- Depending Upon Frost Load
Footing Width 0.9 m - Each Footing Width
18.4 m Upper Ramp Depth From Transtor Face
ASSUMES 3,00 lb/ft SOILS

Item	Description	Take Off Qty Each	Basis of Qty	Estimate Quantity	Pricing Unit	Price	Total	Notes
Concrete & Forming								
	Site Footing Excavation	1	Lot	16.0	m3 of Excavation	\$ 20	320	
	Trailer Load Slab	1	50' x 12' x 6" Thick	16.4	m3 3500 psi Concrete & Rebar	\$ 541	8,889	
	TS500 Footings & Rebar, Installed	1	Lot	14.0	m3 3500 psi Concrete & Rebar	\$ 541	7,593	
Binwall & Fill								
	Contech Binwall - Type C 15' Face Height Vertical	9.1	Face m - 15' Face Vertical	9	Linear m Design C Binwall	\$ 1,700	15,470	4 Week Delivery
	Existing soil excavation and removal	1	Lot	1	Lump Sum Excavation	\$ 2,000	2,000	
	Footing Drainage Tile - In Front and Behind Binwall	9.1	Face Feet + Drain	9	Linear m 4" Drainage Tile	\$ 16	146	
	Binwall Fill - Grade B - < 8% Fines	1	Fill Binwall Boxes	111	m3 B Fill	\$ 50	5,528	Using 1' Lifts, Hand compactor & Hand Labour
	Install Labour - 20' (Binwall Day 3 Man Crew 10 Hr Day)	3	Days - 3 Man Crew	108	Local Labor	\$ 55	5,940	3 Man Crew, 20' Per Day, 10 Hour Days
	Filter Cloth	0.91	15' x 2' Every 10' Wall	21	Sq. m Binwall Joint Filter Cloth	\$ 1	21	Recommended at Gaps
Upper Deck and Approach Ramps								
	Upper Deck Fill - B Fill - 13' Depth	1	30'x60'x9'	507	m3 - Site Fill - Rough Estimate	\$ 25	\$ 12,667	Installed & Compacted
	Upper Deck Side Fill	1	All Fill	200	m3 - Site Fill - Rough Estimate	\$ 20	\$ 4,000	Installed & Compacted
	Approach Ramp	1	Lot Estimate	-	m3 - Site Fill - Rough Estimate	\$ 20	\$ -	Installed & Compacted
	Approach & Departure Ramp Road Base - 24" Depth	1	Print	-	m3 - Traffic Surface	\$ 33	\$ -	Installed & Compacted
Scale and Electrical								
	Conduit and Cable to Site	1	Allowance	1	Local Electrical Allowance	\$ 5,000	\$ 5,000	
Amenities-Bollards, Signs, Lights etc.								
	Perimeter Fencing and Gates	1	Lump Sum	1		\$ 5,000	\$ 5,000	
	Safety & Warning Signs	1	Deliniators, Signs	1	Lump Sum	\$ 2,000	\$ 2,000	
	Access Stairway and Handrails - Galvanized	2	One Set	2	Lump Sum	\$ 8,000	\$ 16,000	
Fencing								
	Safety Fencing - Top Of Binwall - Open Areas	60	Linear m	60	Lump Sum Estimate	\$ 67	\$ 4,000	
Landscaping and Grading								
	Slope Rip Rap and Drive Lane Stone	36	m2 - 1' Deep	1	m2	\$ 100	\$ 4,800	
	Final Grading	1	Stripped Soil or Imported	1	Lump Sum	\$ 3,000	\$ 3,000	
SUBTOTAL CONSTRUCTION COSTS							\$ 102,373	
Project Cost Contingency						10.00%	\$ 10,237	
Contractor Profit						10.00%	\$ 10,237	
Design, Engineering and Permitting						10.00%	\$ 10,237	
Surveying and Soil Testing							\$ 5,000	
TOTAL EXCLUDING SALES TAXES							\$ 138,085	

Haul-All Equipment Ltd.
4115 - 18th Ave. North
Lethbridge, Alberta
Canada T1H 5G1



Tel: 800-567-0103x24
Fax: 905-336-3035
doug.vanderlinden@vquip.com
www.haulall.com

SALES QUOTATION

For:	AECOM 512 Woolwich Street - Suite 2 Guelph, Ontario N1H 3X7 Attention: Cathy Smith Job Site : Timmins Recycling	Date: Dec 18, 2008 Salesman: Doug Vanderlinden Tel: (519)763-7783 x 5113 Email: Cathy.Smith@aecom.com
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Qty.	Model	Description	Unit Price	Extended Price
1	TS500S	HAUL-ALL TRANSTOR Transfer Unit - Stainless Steel Body Shell <u>Standard Features:</u> * 53 Cubic Yard Volumetric Capacity * 27,000 lb. Lift Capacity - Up to 500 Lbs/Cubic Yard Material Density * Over Center Hydraulic Dumping Using Twin Series Mounted 6" Hydraulic Cylinders * Capable of Top Loading 13' 6" Transfer Trailers * Dupont Powder Painted Frame and Galvaneel Steel Panels * Dual Function Split Lid Accomodates Full Size Truck Unloading * 3 Minute Cycle Time with 18 gpm Hydraulic Flow * Complete with 2 TS960 Footing Plates Ready for Concrete Casting	\$105,168	\$105,168
1	7359/7358	<u>Standard Additional Equipment:</u> 3/4" Twist-On Quick Couplers (1 Male, 1 Female) c/w Dust Caps	\$221	\$221
1	TS-072	115 Volt AC Pumping Unit For Lid with TS086 - 17FLA Motor @ 110 volts	\$4,965	\$4,965
1	TS-4703	Immersion Oil Reservoir Heater c/w Thermostat for TS072 Lid Opener - 750 Watts @ 110 volts	\$565	\$565
		All Transtors Painted Transtor Grey		
		Single Drop Chute - Door Size 20" x 50" With Rain Seal Kit	NC	NC
1		Freight From Lethbridge Factory to Job Site	\$2,800	\$2,800
TOTAL			\$113,720	\$113,720

Warranty: Haul-All One Year Parts & Labour FOB Transfer Site - Ontario	Terms: This Quotation Binding for 120 days All Pricing in Cdn Funds, Taxes Extra Where Applicable Payment: 35% Deposit with Order, 55% Due Upon Completion At Factory, 10% Balance Due at Delivery to Designated Staging Area or Stored At Factory Staging Area Surcharge: Price Valid For Orders and Deposits Received Before July 2009 Subject to CPI Price Increase 3.0% After That Date Ordering: Order Units with 7.5 Month Total Project Lead Time Allow 6 Months for Production and 45 Days for Installation
Notes: This quotation is for the supply of Transtor product only. Delivery and site installation is provided by Vquip Inc. under separate sales quotation. Customer is responsible for all construction costs including excavation, reinforcing bar and footings, binwall, electrical services, conduit, wiring, terminations and civil work.	

VQuip Inc.
4430 Mainway Drive
Burlington, Ontario
Canada L7L 5Y5



Tel: 800-567-0103 x 23
Fax: 905-336-3035
doug.vanderlinden@vquip.com
www.vquip.com

INSTALLATION QUOTATION

For: AECOM
512 Woolwich Street - Suite 2
Guelph, Ontario
N1H 3X7
Attention: Cathy Smith
Job Site : Timmins Recycling

Date: Dec 18, 2008
Salesman: Doug Vanderlinden

Tel: (519)763-7783 x 5113
Email: Cathy.Smith@aecom.com

1	AR Construction Closed Top Ejection Trailer c/w Flip Up Roof	\$75,242
	Standard specifications included on page 2 of this quote	
	Equipped with :	
1	Hendrickson HT250 Air Ride Fixed Susp. c/w Axle and 11R22.5 (3 Axles)	\$22,236
1	Roof Compaction c/w Front Flip Top Roof With Hydraulic Lock	\$9,468
1	Anti Roof Coating c/w Roof Tie Downs	\$164
1	Two Side Access side doors c/w Greasable Hinges	\$669
1	Front Ladder c/w Fall Arrest Cage	\$437
1	Front Floor Clean Out Trap Door; Bolt on Ram Shoes	NC
1	Rear Bumper Extensions	\$615
1	Reinforced Manual Tailgate c/w Heavy Duty Lock	\$992
1	Sealed Tailgate - D Seal	\$412
1	Remote Ready With Transmitter & Receiver	\$3,850
1	LED Clearance Lights At Front & Rear Of Trailer	NC
1	Holland Landing Gear 200,000 Capacity c/w Rollers	NC
1	Hydraulic Reservoir on Trailer - 130 Gallon	\$2,975
1	Hydraulic Tank 110v Immersion Heater Mounted on 2" Plug	\$876
1	Hannay Hose Reel with 25' Twin Hose Connectors	\$1,650
1	Hydraulic Pressure Gauge on Front Wall	NC
1	Engine Ready Kit with Including Front Access Panels	\$1,850
1	John Deere 49HP Turbo Charged Diesel Engine Complete with 30 Gallon Pump	
	12V DC Air Compressor and 30 USG Fuel Tank	\$29,750
1	Auto Pack and Retract Cycle	\$5,300
1	Delivery to Customer Job Site	\$2,350

Total Quote, Subject to Terms and Conditions Below

\$158,836

Warranty: Haul-All One Year Parts & Labour FOB Central Transfer Site - Ontario	Terms: This Quotation Binding for 90 days All Pricing in Cdn Funds, Taxes Extra Where Applicable Payment: 35% Deposit with Order, 55% Due Upon Completion At Factory, 10% Balance Due at Delivery to Designated Staging Area or Stored At Factory Staging Area Surcharge: Price Valid For Orders and Deposits Received Before December 2008 Orders and Deposits After January 1, 2008 Subject to CPI Price Increase 3.7% Ordering: Order Units with 4 Month Total Project Lead Time
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VQuip Inc.
4430 Mainway Drive
Burlington, Ontario
Canada L7L 5Y5



Tel: 800-567-0103 x 23
Fax: 905-336-3035
doug.vanderlinden@vquip.com
www.vquip.com

Installation Quotation

For: AECOM
512 Woolwich Street - Suite 2
Guelph, Ontario
N1H 3X7
Attention: Cathy Smith
Job Site : Timmins Recycling

Date: Dec 18, 2008
Salesman: Doug Vanderlinden

Tel: (519)763-7783 x 5113
Email: Cathy.Smith@aecom.com

Compaction Trailer Details

Dimensions	Overall Length - 51 ft. Overall Width - 102" Overall Height - 13' 6"
Payload	See Detailed Weight Distribution
Frame and Walls	Long Life Semi Elliptical Wall Construction - Steel Wall, Fully Welded 14" Steel I-Beam Frame Understructure Rails c/w 4" I Beam Crossmembers
Lid	298" Top Door Complete With (2) 3" Double Acting Singe Stage Cylinders
Tailgate	Single Piece Tailgate c/w Safety Chains Heavy duty hinges - Mounted Passenger Side UHE Internal Over Center Locking Mechanism - Mounted Driver's Side
Ram	Heavy Duty Rear Extended Bumper c/w Protective Eyebrows over the Lighting Ejection Ram Cylinder - 6 Stage With Intermediate Cylinder Support 1/8" AR500 -Ram Face c/w Side and Floor Wings to Reduce Spillage Upgraded Ram c/w Tighter Guide Tolerances with Side & Floor Deflectors
Axles	Reinforced Top Mounted Hinges c/w Heavy Lock Mechanism Dana D22 Axles - 5/8" Wall, 77.5" Track With Cam Enclosures, Koyo Bearing Sizes HM212049, HM218248 Rims - 22.5 x 8.25 Disc Wheels - 10 Stud Hub Piloted Hubs - Outboard Drums With Hub Pilot Setup Bridgestone R250F 11R22.5 16 Ply Tires
Brakes	Midland Grau Air Brake System 16-1/2" x 7" Asbestos Brake Linings
5th Wheel	Anchorlok Gold 30-30 Spring Brakes, Haldex Auto Slack Adjusters HD 1/2" King Pin Plate c/w Holland SAE 2" King Pin - 49" Fifth Wheel Height Holland Mark V, Ultimate Capacity 2000,000lb Landing Gear c/w Rollers for Feet
Electrical	Two Speed Manual Crank On Driver's Side Front wall mounted 7-way ATA Receptacle c/w Air Connections Sealed Wiring Harness w/ LED Grommet Mounted Lights, Equipped with Intermediate Side Turn Signals. New Design Haul-All Wireless Remote Control LED Mounted Tail Lights
Hydraulic	130 Gallon Hydraulic Reservoir Air Over Hydraulic Control System 2,000psi Ejection Relief and 1,850psi Packing Relief
Other	Hannay Hose Reel with 1" Transtor Hydraulic Wing Design Hydraulic Disconnects Mudflaps - 1 Pair, Mounted Behind Rearmost Axle Heavy Duty Rear Bumper With Tow Hooks and Light Protection Screens Trailer Sandblasted, Primed and Painted One Colour Polyurethane 2 Side Access Doors c/w Greasable Hinges

VQuip Inc.

December 20, 2008

DRAFT FOR DISCUSSION
PRIVATE & CONFIDENTIAL

DETAILED TRANSTOR COSTING

		Qty	Annual Payment Tax Excl.	Year 1 Cost	Year 2 Cost	Year 3 Cost	Year 4 Cost	Year 5 Cost	Year 6 Cost	Year 7 Cost	Year 8 Cost	Year 9 Cost	Year 10 Cost	Year 11 Cost	Year 12 Cost	Year 13 Cost	Year 14 Cost	Year 15 Cost	15 Year Total	Pretax Capital Required
CAPITAL REQUIRED																				
Finance Haul-All TS500 Transtors		2	\$11,887	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	356,623	227,439
Finance Transtor Installation and Commissioning		2	\$2,938	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	88,131	56,206
Finance Transtor Site Development		1	\$24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	364,453	232,433
Finance High Compaction Trailer		2	\$21,643	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	56,477	58,172	58,172	58,172	58,172	58,172	736,903	317,672
TOTAL CAPITAL COSTS				97,232	97,232	97,232	97,232	97,232	97,232	97,232	97,232	97,232	110,424	112,119	112,119	112,119	112,119	112,119	1,546,109	833,750
OPERATING COSTS																				
Cost / Hour - Contracted Opn - Tractor & Trailer Mtce			\$ 105	99,411	102,394	105,465	108,629	111,888	115,245	118,702	122,263	125,931	129,709	133,600	137,608	141,737	145,989	150,368	1,848,940	
Site Operator			\$ -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transtor and Site Maintenance		2	\$ 4,000	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	10,438	10,751	11,074	11,406	11,748	12,101	148,791	
TOTAL OPERATING COSTS				107,411	110,634	113,953	117,371	120,892	124,519	128,255	132,102	136,065	140,147	144,352	148,682	153,143	157,737	162,469	1,997,732	
TOTAL COSTS				204,643	207,866	211,185	214,603	218,125	221,751	225,487	229,335	233,298	250,572	256,470	260,801	265,261	269,856	274,588	3,543,841	

Cost Per Tonne - Operating	\$39.79	\$40.98	\$42.21	\$43.48	\$44.78	\$46.13	\$47.51	\$48.93	\$50.40	\$51.91	\$53.47	\$55.08	\$56.73	\$58.43	\$60.18	\$49.33
Cost Per Tonne - Capital	\$36.02	\$36.02	\$36.02	\$36.02	\$36.02	\$36.02	\$36.02	\$36.02	\$36.02	\$40.90	\$41.53	\$41.53	\$41.53	\$41.53	\$41.53	\$38.18
Cost Per Tonne - Total	\$75.81	\$77.00	\$78.23	\$79.50	\$80.80	\$82.14	\$83.53	\$84.95	\$86.42	\$92.82	\$95.00	\$96.61	\$98.26	\$99.96	\$101.72	\$87.52

EQUIPMENT PRICING	Price \$\$ Tax Extra	Demo Unit On Site Assy 30% Cost Estimate 3 Axle, JD Engine	Transtors		Rolling Stock													
			Monthly Finance Factor		0.008711074	0.011354798	Paid Monthly In Arrears											
			Term In Years		15	10												
			Interest Rate		6.50	6.50	Subject to Lender Review											
			Inflation		3.0%	Compounding Annually												
			100.00%	103.00%	106.09%	109.27%	112.55%	115.93%	119.41%	122.99%	126.68%	130.48%	134.39%	138.42%	142.58%	146.85%	151.26%	

DESIGN NOTES:

- (1) Design Is Based Upon a Single Transfer Station, Using 110v Power for Lid Openers
(2) Transtor Site Development Includes Binwalls, Backfill, Grade Separation and Concrete Footings
(3) Site Development is An Estimate Only Subject to Local Cost Review and Overall Site Plan
(4) Compaction Trailer Hauls All Loads Using JD Diesel Engine

		Daily Yr 1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15		
Tonnes - Single Stream Recycling		10	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700		
Total Tonnes			2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	40,494	
TONNES PER WORKING DAY			10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
m3 per Year			13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498	13,498		
Fluffed Incoming m3 To Transtor / Yr		25%	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872	16,872		
Incoming m3 Per Week - Average			324	324	324	324	324	324	324	324	324	324	324	324	324	324	324		
M3 Per Working Day - Average		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65		
Units / m3 Provided		1	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
Required System Empty Cycles Per Unit		2.1	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	8,252	Cycles
Transtor System Loading %			76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%		
Required Transfer Trailer Loads			140	140	140	140	140	140	140	140	140	140	140	140	140	140	140		
Trailer Load - % Volume Capacity Per Trip			61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%		
Trailer Load - % Weight Capacity Per Trip			65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%		
Estimated Average Trailer Load Weight - Tonnes			19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3		
Estimated Transfer Trailer Loads Per Day			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Average Trailer Turn Around Time - Hours Per Load			6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8		
Annual Trailer Hours Required			3.6	947	947	947	947	947	947	947	947	947	947	947	947	947	947		
Annual Available Trailer Hours			20.0	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200		
Tractor and Trailer Utilization %				18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%	18.2%		

Hauling Miles Per Truck and Trailer	759	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455	39,455		
Total Estimated Hauling km	1,517	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910	78,910		

Design Based Upon :

GENERATION DATA			TRANSTOR DATA		TRAILER LOAD DATA		Incoming Material Density		Tonnes/Yr	
Average Incoming MSW Density - Lb/Yd		200.0	40	m3 TRANSTOR	8,182	Tractor Weight - kg	kg/m3	Ave mt/Day		
WORK CYCLE			TRAILER DATA		18,182	Trailer Weight - kg	Comp. MSW	200		10.38
Working Days Per Week		5	75	m3 Compacting Trailer	56,000	State Weight Loading - kg		0		-
Working Days Per Year		260			29,636	Net Available Payload - kg			10.38	2,700
Weekly Available Trailer (Hours)		50			2.63	Compaction Factor	395	kg/m3 for Max Payload	Average Incoming Density in kg/m3	
Load and Unload Time (Hours)		0.5			198	m3 Effective Trailer Capacity	2.63	Max Compaction Factor	200	
Landfill Travel & Return (km)		564			2		Number of Trailers Required		Fluffed Density Into Trailer in kg/m3	
Average Trailer Speed - km/hr		90					Based Upon Utilization Above		150	
Planned Trailer Cycles Per Day		1								

VQuip Inc.

December 20, 2008

DRAFT FOR DISCUSSION

PRIVATE & CONFIDENTIAL

DETAILED TRANSTOR COSTING

CAPITAL REQUIRED

	Qty	Annual Payment Tax Excl.	Year 1 Cost	Year 2 Cost	Year 3 Cost	Year 4 Cost	Year 5 Cost	Year 6 Cost	Year 7 Cost	Year 8 Cost	Year 9 Cost	Year 10 Cost	Year 11 Cost	Year 12 Cost	Year 13 Cost	Year 14 Cost	Year 15 Cost	15 Year Total	Pretax Capital Required
Finance Haul-All TS500 Transtors	1	\$11,887	11,887	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	23,775	344,736	113,720
Finance Transtor Installation and Commissioning	1	\$2,938	2,938	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	5,875	85,193	28,103
Finance Transtor Site Development - Single Stream	1	\$14,434	14,434	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	24,297	354,590	138,085
Finance High Compaction Trailer	1	\$21,643	21,643	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	43,285	715,260	158,836

TOTAL CAPITAL COSTS			50,902	97,232	97,232	97,232	97,232	97,232	97,232	97,232	97,232	110,424	112,119	112,119	112,119	112,119	112,119	1,499,779	438,744
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OPERATING COSTS

Cost / Hour - Contracted Opn - Tractor & Trailer Mtce		\$ 105	56,806	58,511	60,266	62,074	63,936	65,854	67,830	69,865	71,961	74,119	76,343	78,633	80,992	83,422	85,925	1,056,537	
Site Operator		\$ -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Transtor and Site Maintenance	1	\$ 4,000	4,000	4,120	4,244	4,371	4,502	4,637	4,776	4,919	5,067	5,219	5,376	5,537	5,703	5,874	6,050	74,396	
TOTAL OPERATING COSTS			60,806	62,631	64,510	66,445	68,438	70,491	72,606	74,784	77,028	79,339	81,719	84,170	86,695	89,296	91,975	1,130,933	

TOTAL COSTS			111,709	159,863	161,742	163,677	165,670	167,724	169,838	172,017	174,260	189,763	193,838	196,289	198,814	201,415	204,094	2,630,712	
	Cost Per Tonne - Operating		\$58.47	\$60.22	\$62.03	\$63.89	\$65.81	\$67.78	\$69.81	\$71.91	\$74.07	\$76.29	\$78.58	\$80.93	\$83.36	\$85.86	\$88.44	\$72.50	
	Cost Per Tonne - Capital		\$48.94	\$93.49	\$93.49	\$93.49	\$93.49	\$93.49	\$93.49	\$93.49	\$93.49	\$106.18	\$107.81	\$107.81	\$107.81	\$107.81	\$107.81	\$96.14	
	Cost Per Tonne - Total		\$107.41	\$153.71	\$155.52	\$157.38	\$159.30	\$161.27	\$163.31	\$165.40	\$167.56	\$182.46	\$186.38	\$188.74	\$191.17	\$193.67	\$196.24	\$168.64	

			Transtors	Rolling Stock	
EQUIPMENT PRICING	Price \$\$ Tax Extra		0.008711074	0.011354798	Paid Monthly In Arrears
(1) 53 Yard TRANSTOR	\$113,720	Demo Unit	15	10	
(2) TRANSTOR Install and Commissioning	\$28,103	On Site Assy	6.50	6.50	Subject to Lender Review
(3) Transtor Site Development - OCC	\$138,085	30% Cost Estimate			
(4) Compactor Trailer	\$158,836	3 Axle, JD Engine			

Inflation	3.0%	Compounding Annually																	
	100.00%	103.00%	106.09%	109.27%	112.55%	115.93%	119.41%	122.99%	126.68%	130.48%	134.39%	138.42%	142.58%	146.85%	151.26%				

DESIGN NOTES:

- Design Is Based Upon a Single Transfer Station, Using 110v Power for Lid Openers
- Transtor Site Development Includes Binwalls, Backfill, Grade Separation and Concrete Footings
- OCC Site Development Costs Carried in Single Stream Model
- Compaction Trailer Hauls All Loads Using JD Diesel Engine

	Daily Yr 1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	
Tonnes - OCC	4	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	
Total Tonnes		1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	1,040	15,600
TONNES PER WORKING DAY		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
m3 per Year		10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	
Fluffed Incoming m3 To Transtor / Yr	40%	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	14,560	
Incoming m3 Per Week - Average		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	
M3 Per Working Day - Average	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	
Units / m3 Provided	1	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	
Required System Empty Cycles Per Unit		500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	7,500 Cycles
Transtor System Loading %		72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	
Required Transfer Trailer Loads		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	
Trailer Load - % Volume Capacity Per Trip		61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	61.4%	
Trailer Load - % Weight Capacity Per Trip		23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	
Estimated Average Trailer Load Weight - Tonnes		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
Estimated Transfer Trailer Loads Per Day		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Average Trailer Turn Around Time - Hours Per Load		6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	
Annual Trailer Hours Required		541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	
Annual Available Trailer Hours		2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	
Tractor and Trailer Utilization %		20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	
Hauling km Per Truck and Trailer		45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	45,091	

GENERATION DATA	TRANSTOR DATA	TRAILER LOAD DATA	Incoming Material Density	
Average Incoming MSW Density - Lb/Yd	40 m3 TRANSTOR	8,182 Tractor Weight - kg	kg/m3	Ave mt/Day
WORK CYCLE	TRAILER DATA	18,182 Trailer Weight - kg	Comp. MSW	100
Working Days Per Week	5	56,000 State Weight Loading - kg	-	4.00
Working Days Per Year	75 m3 Compacting Trailer	29,636 Net Available Payload - kg		
Weekly Available Trailer (Hours)	3.95 Compaction Factor	395 kg/m3 for Max Payload	Average Incoming Density in kg/m3	100
Load and Unload Time (Hours)	296 m3 Effective Trailer Capacity	3.95 Max Compaction Factor	Fluffed Density Into Trailer in kg/m3	100
Landfill Travel & Return (km)	1 Number of Trailers Required			
Average Trailer Speed - km/hr	Based Upon Utilization Above			
Planned Trailer Cycles Per Day				

Appendix D

Cover-All Building Schematic

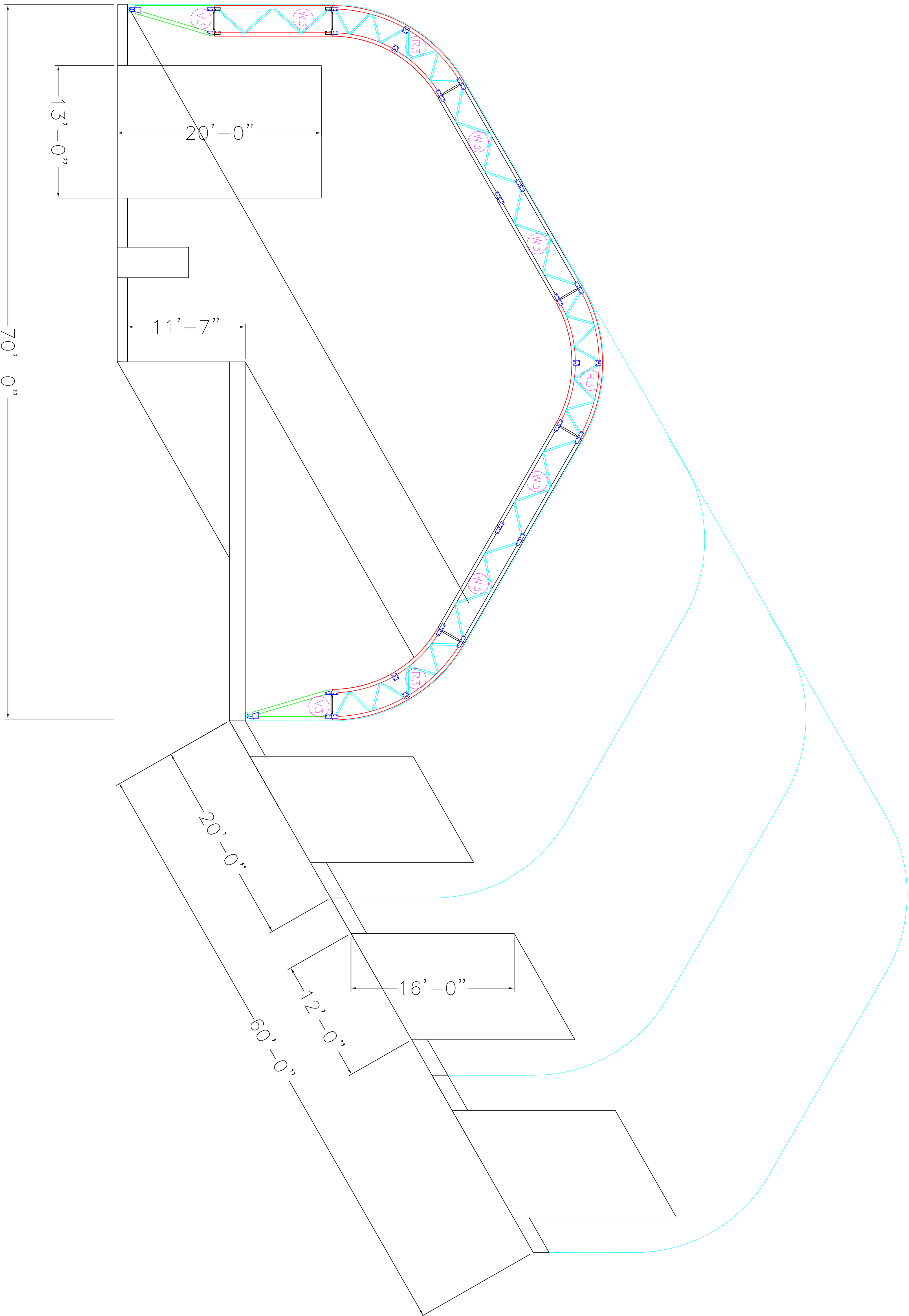
General Notes

No.	Revision/Issue	Date	



Project Name and Address
VOIIP INC.
4430 Mainway Drive
Burlington, ON L7L 5Y5
Marathon Project

Project 70' x 60' Cover-All Tilt Building with extension 15'	Sheet
Date April 24, 2008	
Scale N/S	



Appendix E

Northern Environmental Services Inc. Haulage Cost Quotation

December 04, 2008

Att: Maureen Orton
AECOM
512 Woolwich Street, Suite 2,
Guelph, ON, N1H 3X7

Re: Haul Rates.

Here are the recycle material haul rates, as requested:

- 1 - Timmins, ON to Sudbury, ON \$990.00 per load, + GST.
- 2 - Timmins, ON to Southern Ontario \$3.58 per Km + GST.
(Guelph, Markham, Brampton or Toronto (Downtown))

Please note: Northern Environmental Services Inc. operates a Material Recycling Facility in Timmins, ON. Our property is 12 acres in size, located at 740 Pine Street South, and would easily accommodate a transfer station for recycle material. Our location is ideal, as it is near/on the way to the landfill, and steps away from the City of Timmins Public Works Maintenance Shops and offices.

Should you require further assistance, please do not hesitate to contact us.

Yours truly,

Peter Ruddy

Peter B. Ruddy - President
Northern Environmental Services Inc.
740 Pine St. South, Box 903
Timmins, ON P4N 7H1
P: 705-264-8700
F: 705-264-8701
Email: nes@nt.net

