

Transfer Station Case Studies

Houston-Galveston Area Council

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1.1 Overview

The City of Wichita Falls (City), a city with a population of approximately 107,000, owns a Class 1 landfill and transfer station. The City provides all residential solid waste collection and commercial solid waste collection for containers less than 12 cubic yards. Residential collection routes are operated four days a week (Monday, Tuesday, Thursday, Friday). Municipal solid waste is collected using the City-owned vehicles and taken to the transfer station, which is centrally located at 3200 Lawrence Road. Transfer trailers haul the waste approximately 10 miles to the landfill.

1.1.1 Transfer Station Overview

The Wichita Falls transfer station, which was built in the early 1980s, is a top-load facility with two staggered hoppers which allows for two transfer trailer lanes beneath the transfer station tipping floor. According to TCEQ records, 92,525 tons were hauled through the transfer station in FY 2007.

The transfer station was originally designed for the use of City collection vehicles. However, it is now used heavily by residents and small haulers in addition to City collection vehicles.

1.1.2 Operating Hours

The operating hours of the transfer station are as follows:

- Monday – Friday: 8:00 a.m. to 6:00 p.m.
- Saturday: 8:00 a.m. to 5:00 p.m.

1.1.3 Scale House

All incoming loads are weighed at the scale house. There is one inbound scale and one outbound scale. The tare weights for City collection vehicles are stored in the computer system and therefore City collection vehicles do not have to weigh out as they leave the transfer station. All other haulers (small haulers, residents, and other commercial haulers) must weigh in and weigh out at the scale house. These other haulers must exit their vehicles to interact with the scale house attendant.

Transfer trailer loads are not weighed leaving the transfer station or entering the landfill since all material coming into the transfer station is hauled to the landfill.

Transfer drivers periodically weigh outgoing loads to ensure they continue to keep within hauling limits (80,000 pounds gross vehicle weight).

The transfer station was designed so that the inbound scale was to the right of the scale house (entering the site) and the outbound was on the left. However, at some point in the operations of the site, this was reversed to improve traffic flow and safety for vehicles entering and exiting the site.

1.2 Site

1.2.1 Access

The transfer station is located on a four lane road with a middle turn lane into the site. There are no traffic lights at the entrance of the site. A newly built exit for the transfer trailers has a stop sign onto an existing road that runs along the northern boundary of the site. This existing road then has a traffic light at Lawrence Road.

1.2.2 Neighbors

When the transfer station was constructed in the early 1980s, there was little development around the site. Since then, the area has been subject to significant growth. There is a Wal-Mart on the northern boundary of the site and a former distribution warehouse (currently vacant) along the southern boundary. Along Lawrence Road (primarily north of the site and across the road) are various retail establishments and restaurants and there is a Home Depot, Lowe's and Sam's Club at the next major intersection.

Being in a relatively central location, the transfer station is convenient to both residents and City collection vehicles. The area surrounding the site is not zoned for industrial use, and therefore the neighbors that currently exist are more prone to complain of traffic and odor than industrial neighbors. However, the transfer station was very clean on the site visit and City staff indicated there were few complaints from the surrounding businesses and retail establishments.

1.2.3 Site Size

The entire site is approximately 18 acres.¹ However, the City is building a stormwater retention pond on western portion of the site that is unrelated to the transfer station, thereby reducing the size of the site.

The building footprint is approximately 25,000 square feet.¹

¹ Both site size and building footprint were estimates developed using aerials from Google Earth. At the time of the site visit, the engineering drawings were not available for review.

1.2.4 Expansion Capability

Although the site has adequate size to allow for additional infrastructure, the transfer station was not originally engineered with specific plans for expansion. The stormwater pond mentioned in Section 1.2.3 has limited expansion capacity of the transfer station building to the west, but there is some potential to expand the building to the south. However the internal roads would likely need to be reconfigured. A more feasible option for the City to expand the capacity of the transfer station is by making more transfer trailers available.

1.2.5 Maneuvering and Queuing Area

There is approximately 300 feet of queuing space between Lawrence Road and the inbound scale. Considering the increased amount of traffic on Lawrence Road, this is a relatively short queuing distance. City staff indicated that there is sometimes an issue with traffic backing up onto Lawrence Rd, especially on Saturdays when there is heavy residential traffic.

Maneuvering of vehicles (backing up, turning, etc.) is primarily done on the tipping floor of the transfer station. Vehicles enter the transfer station building perpendicular to the tipping floor, and then must back into the tipping floor unloading lanes to dump loads. There are a total of nine unloading stalls. When City trucks are operating, four lanes are used for unloading City collection vehicles and the other five are used for residents, small haulers and brush customers. While this provides some separation of traffic between customer types, City staff commented that they would prefer to have additional separation between these customer classes.

1.3 Equipment

1.3.1 Floor Equipment

The City uses two pieces of primary equipment on a daily basis. A wheeled front-end loader (John Deere TC 62H) is used for managing waste on the floor and pushing into the load-out hoppers. The leading edge of the loader has a rubber strip to reduce wear on the transfer station floor. There is one excavator (Komatsu PC 200 LC) for distributing and compacting waste in the transfer trailer. City staff indicated that the excavator was a larger model than needed, but was purchased to allow for use on other City projects if needed. The City maintains the previous units as back-up units.

1.3.2 Transfer Equipment

The City has five front-line aluminum sheet-and-post style open-top transfer trailers and five tractors for hauling the trailers. They also have one additional tractor and trailer for back-up. All available units are used as needed. All tarping systems are manually operated, with some deployed from side-to-side and some front-to-back.

1.4 Customer Types

The City's transfer station accepts waste from City-operated collection vehicles, residents, and small haulers. Non-City vehicles are limited to 10,000 pounds gross vehicle weight. Residents are allowed to use the transfer station for free when hauling material from their homes. Proof of residence is required.

1.5 Capacity and Traffic Flow

1.5.1 Capacity

Within reasonable limits the capacity of the transfer station is managed by the number of transfer trailers. With current equipment and personnel, the City can move 550-600 tons per day through the transfer station, although it does not do this amount every day of the week. Each transfer trailer can make six to seven trips at most to the landfill in a given day.

1.5.2 Traffic Flow

Residential customers in the City receive twice a week curbside collection. The first collection is done on Monday and Tuesday (the second collection is Thursday and Friday). Since more waste is generally placed at the curb on the first collection day, Monday and Tuesday are typically the busiest days in terms of tonnage. Approximately 80-90 City vehicles use the site and 150-200 smaller haulers, residents, and other commercial customers (this latter amount of relatively constant Monday through Friday). On Wednesdays, when residential waste is not collected, there are fewer City-owned vehicles at the transfer station (commercial waste only). On Thursdays and Fridays, there is less City vehicle traffic than Monday and Tuesday since it the second collection day of the week for residential customers and less waste is collected from the curb. Saturday is a busy day for residents and small haulers, with as many as 300-400 customers.

1.6 Materials Accepted and Recycling

The Wichita Falls transfer station primarily accepts municipal solid waste and brush. Since non-city vehicles are limited to 10,000 pounds gross vehicle weight and the City does not collect roll-off containers, there is minimal construction and demolition (C&D) waste hauled through the transfer station.

When possible, one hopper is used for MSW and the other hopper is used for clean brush. The clean brush is hauled to the City's composting operation at the landfill.

The City pulls tires from collection vehicles and temporarily stockpiles them in the transfer station. When a sufficient number of tires are collected, the tires are split using a tire-splitter and then are pushed into a transfer trailer for disposal at the landfill. Approximately 1,000 tires per month are disposed in this manner.

Green waste, glass and newspapers are the only recyclable materials collected at the transfer station via containers located near the entrance of the site. No household hazardous waste is collected.

1.7 Staffing

Excluding supervisory staff positions, there are a total of 12 to 13 employees at the transfer station:

- 2 scale house attendants
- 5 transfer drivers
- 2 equipment operators, cross-trained to operate transfer tractors
- 3-4 laborers, some of which are cross-trained as equipment operators.

The City uses staggered shifts to span the daily operating hours of the transfer station and the cross-trained employees are used as back-up when employees miss time for vacation, sick time, etc.

1.8 Other

1.8.1 Floor Surface

A majority of the floor surface is standard reinforced concrete. The other, where the City's collection vehicles dump, was repaired and replaced with an 1½ – 2 inch thick "armor top" material, which is concrete with imbedded metal to provide additional durability.

1.8.2 Dust and Odor Suppression

The City has a misting system that was part of the original design of the transfer station. However, City staff indicated it was not effective and therefore it is not regularly used.

Chain curtains are used to span the gap from the bottom of the hopper to the top of transfer trailer. City staff indicated these were very effective since they were durable and allowed air to pass through, reducing the amount of dust "kicked back" into the transfer station when loads are pushed in the hopper.

1.8.3 Covered Loads

City Ordinance requires that all loads hauled in an open bed or trailer be covered to prevent the spread of garbage and other materials throughout the City. The fine for failure to cover a load can reach as high as \$359.00. In addition to a possible fine, uncovered loads brought to the transfer station are subject to an additional \$25.00 charge (plus regular disposal fees).



Figure 1-1. Site Aerial (Source: Google Earth)



Figure 1-2. Transfer Station Entrance



Figure 1-3. Scale House



Figure 1-4. Transfer Station Building



Figure 1-5. Transfer Station Floor

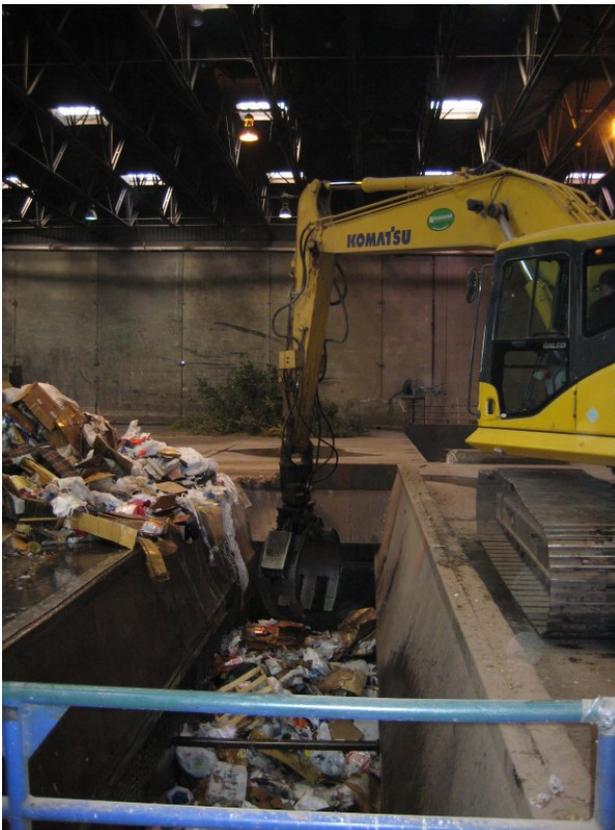


Figure 1-6. Excavator Loading Transfer Trailer



Figure 1-7. Transfer Trailer Being Loaded (chain curtain identified in picture)



Figure 1-8. Newspaper and Glass Recycling Collection Bins

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Section 2

Starcrest Transfer Station

2.1 Overview

Texas Disposal Systems (TDS) operates the Starcrest Transfer Station, located at 11601 Starcrest Drive in San Antonio, Texas. The transfer station property and original infrastructure belong to the City of San Antonio (City) and TDS has a long-term lease with the City for the use of the site. The City originally built the facility approximately 30 years ago and operated the facility for many years. TDS signed its lease with the City in the late 1990s.

Based on TCEQ annual reports, TDS hauled approximately 170,000 tons through the transfer station in FY 2007. TDS accepts waste from City of San Antonio, TDS collection vehicles, residents and other private haulers.

Waste from the transfer station is hauled to the TDS Landfill in Creedmoor, Texas, which is approximately 65 miles from the transfer station.

2.1.1 Transfer Station Overview

When TDS leased the transfer station from the City, the station had two compactor units. Each compactor unit loaded a transfer trailer. TDS modified the original design by removing one compactor and converting half the transfer station into a top-loading open-top facility. Collection vehicles direct dump into the open top trailers. The other compactor is still in place and is primarily used for residents and overflow for collection vehicles.

2.1.2 Operating Hours

The transfer station is open to the public during the following hours:

- Monday – Friday: 8:00 a.m. to 5:00 p.m.
- Saturday: 8:00 a.m. to 12:00 p.m.

Transfer trailer loading/hauling is not limited to these hours.

2.1.3 Scale House

All incoming loads are weighed at the scale house. There is one scale. Most collection vehicles have the tare weight stored, so they do not need to weigh out. Residents must weigh in and weigh out to determine the weight of the load.

2.2 Site

2.2.1 Access

The transfer station is located on a four lane road (Starcrest Dr) with a median. Traffic on Starcrest has a yellow flashing light at the entrance of the transfer station, but vehicles are not required to stop.

2.2.2 Neighbors

The transfer station is located on City-owned land, adjacent to the San Antonio International Airport.

2.2.3 Site Size

The area used by the transfer station is approximately 5-6 acres, not including buffers, the composting operation and vehicle maintenance.¹

The building footprint is approximately 7,000 to 8,000 square feet.¹

2.2.4 Expansion Capability

Although there is limited room to expand the transfer station building, the site could be reconfigured if TDS needed to expand the capacity of the site. One possible scenario would be to remove the second compactor, convert the area to a direct dump top-load and then add a citizens' collection station for residents.

2.2.5 Maneuvering and Queuing Area

The distance between the scale house and Starcrest Dr. is relatively short, so queuing space before the scale is limited. However, TDS paved additional areas between the scale and transfer station to provide additional queuing space after the scale. With this improvement, and since most collection vehicles have a tare weight stored in the system (quicker transactions), TDS noted that traffic backing up to Starcrest Dr. has not been an issue.

2.3 Equipment

2.3.1 Floor Equipment

TDS primarily uses a mobile crane/tamper and a wheeled front-end loader to manage, load and compact waste at the transfer station. TDS likes the mobile crane/tamper so that it may be used around the site as needed and can be moved out if down for service

¹ Both site size and building footprint were estimates developed using aerials from Google Earth. At the time of the site visit, the engineering drawings were not available for review.

to allow room for a back-up unit. TDS also has a skid steer that is used sparingly around the site.

2.3.2 Transfer Equipment

TDS uses aluminum transfer trailers, most of which are tipper trailers used in conjunction with the tipper at the TDS landfill. TDS also has several live floor trailers, but those are primarily used for hauling compost materials, etc. that will not have access to a tipper. TDS keeps about 30 trailers on site, but has a larger transfer trailer fleet (for its other transfer station operations in the state) that can be utilized if necessary. Transfer trailers have manual tarps that are deployed side-to-side.

TDS uses a yard tractor in a drop-and-hook arrangement to load transfer trailers at the transfer station. The full trailers are parked and transfer tractors returning from the landfill with an empty trailer drop the empty trailer and pick up the parked full trailer.

2.4 Customer Types

TDS accepts waste from City of San Antonio residential collection vehicles, its own collection vehicles, City residents, and other private haulers. Collection vehicles and residents are kept separate since collection vehicles unload in the direct-dump hopper and residents unload material into the compactor.

2.5 Peak Flow

TDS experiences more tonnage through the landfill during the fall when the leaves start to drop. Since the City does not collect green waste, this material is collected as MSW and dumped at the transfer station.

Four times a year, TDS allows City residents to dump for free, which results in heavy resident traffic.

2.6 Materials Accepted and Recycling

TDS accepts MSW, construction & demolition (C&D) debris, green waste, and some recycling at the transfer station. MSW is either direct-dumped by the collection vehicles into the transfer trailers or dumped into the compactor by residents. C&D is dumped on the floor and loaded by the crane to reduce damage to the trailer. TDS operates a mulching and composting operation adjacent to the transfer station, which accepts green waste. Since the City of San Antonio does not have a separate green waste collection program, most of the source material for the composting operation is from private companies. TDS also offers several carts near the entrance of the site for residents to drop-off recyclables.

2.7 Staffing

TDS uses the following type of personnel at the Starcrest transfer station:

- Equipment operators – operate the wheel loader and crane
- Spotters – direct traffic and serve as back-up operators
- Yard tractor operators – operate the yard tractors for the drop-and-hook operation
- Laborers – perform duties around site including tarping the trailers and daily litter pick-up within the site and on Starcrest Dr.

TDS staff indicated that cross-training of staff was an important part of their operation.

2.8 Other

2.8.1 Dust and Odor Suppression

Dust and odor have not generally been an issue at the site. TDS will irrigate areas of the site as needed to keep grass in place and reduce dust around the site.

2.8.2 Covered Loads

TDS requires that all loads be contained or covered. They charge a \$15 fee for uncovered loads. The posted gate rate for use of the transfer station is \$17 per cubic yard.



Figure 2-1. Site Aerial with Approximate Transfer Station Boundary, Excluding Buffers (Source: MapQuest)



Figure 2-2. Transfer Station Overview from Entrance (scale house on left)

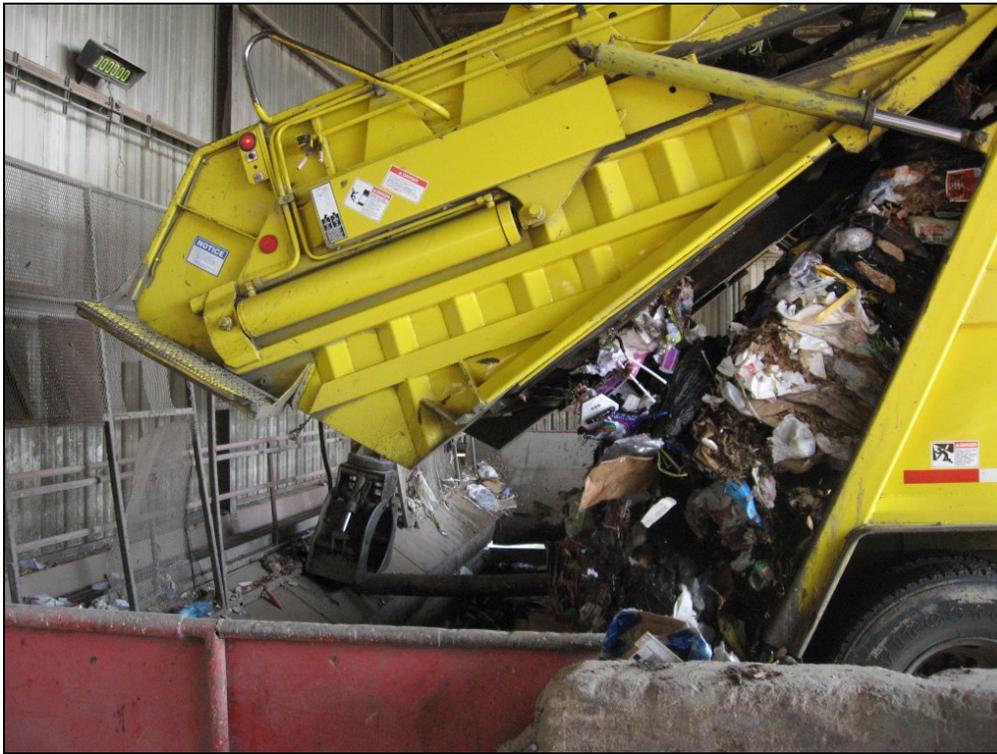


Figure 2-3. Collection Vehicle Direct Dumping into Transfer Trailer



Figure 2-4. Crane Compacting and Managing Waste in Open Top Trailer



Figure 2-5. Residents Unloading Waste into Compactor



Figure 2-6. Smooth-Sided Aluminum Transfer Trailer



Figure 2-7. Yard Tractor in Use (Loading Trailers)

Section 3

IESI Blanco Transfer Station

3.1 Overview

IESI owns and operates the Blanco Transfer Station, located off of US Highway 281 on Transfer Road (private) in Blanco County, Texas; approximately 3 miles south of Johnson City, Texas. The property belongs to the County. IESI owns the transfer station and other buildings but is under a long-term property lease with the County. The property where the transfer station sits is adjacent to the closed Blanco County Landfill. The current transfer station building was built in the early 1990's. IESI has operated the transfer station continuously since 1994.

Based on information provided during site personnel interviews, IESI can manage a maximum of approximately 25,000 tons per calendar year through the transfer station in its current configuration and staffing level. According to information obtained through the TCEQ website, the Blanco County transfer station handled approximately 16,000 tons of MSW in fiscal year 2007 (9/1/06 through 8/31/07). IESI accepts waste from IESI collection vehicles, residents and other private haulers.

Waste from the transfer station is hauled to the Waste Management Comal County Landfill in New Braunfels, Texas, which is a driving distance of approximately 65 miles southeast of the transfer station.

3.1.1 Transfer Station Overview

Collection vehicles dump into an open top hopper. A hydraulic ram transfers the waste from the hopper into a 40 cubic yard (cy) roll-off compactor container. The Blanco transfer station has a single hopper and compactor setup. IESI modified the original compactor design to increase the size and horsepower of the hydraulic ram loading the 40 cy containers. Residents and small haulers can dump construction and demolition (C&D) debris into a separate 40 cy open-top roll-off container.

3.1.2 Operating Hours

The transfer station is open to the public during the following hours:

- Monday – Friday: 8:00 a.m. to 5:00 p.m.
- Saturday: Open as needed to cover to recover a lost operating day when a holiday occurs during the week.

3.1.3 Gate Rates

The posted gate rate for refuse disposal is \$25 per cy, loose or compacted. The posted minimum charge is \$25 per load.

3.1.4 Incoming Transactions

Incoming loads are tracked at the transfer station office. There is no scale, and all loads are determined based on the approximate size of the collection vehicle. IESI utilizes modular buildings for administrative and managerial office space, and is in the process of replacing their current building with a larger one.

3.1.5 Access

The transfer station is located on Transfer Road, immediately off of a four lane divided highway (US Hwy 281). Transfer Road is a private, gravel road providing access to the transfer station, IESI maintenance shop, and County glass recycling operations. Vehicular access to Transfer Road is limited by a gate controlled by IESI.

Traffic entering the property must do so from the north-bound lanes of Hwy 281. Traffic coming from north of the transfer station must make a U-turn on Hwy 281 immediately south of the transfer station. There are no traffic controls (i.e., stop light or stop sign) on Hwy 281 at the entrance to the property, so vehicles entering or exiting the property must compete with traffic traveling at highway speeds (posted 65 mph).

3.1.6 Neighbors

The transfer station is located on County-owned land. The parcel of land is on the southern boundary of the closed Blanco County landfill and one acre the site occupies was never used as a landfill. The closed landfill and transfer station site is surrounded by private ranchland except for the western boundary, which is US Hwy 281.

3.1.7 Site Size

The entire property, including the closed landfill, is approximately 20 acres¹. The area used by IESI specifically for the transfer station is approximately one acre.

3.1.8 Expansion Capability

Although there is limited room to expand the transfer station building, the site could be reconfigured if IESI needed to expand the capacity of the site. One possible scenario mentioned by site staff involves adding a second hopper and hydraulic ram to effectively double the capacity of the station. IESI could also convert the transfer station from a compactor-based transfer station to an open-top transfer station.

¹ Site size was estimated using aerials from Google Earth.

3.1.9 Maneuvering and Queuing Area

The distance between the transfer station office and Hwy 281 is approximately 1,600 feet, so queuing space prior to the office is more than adequate. However, the apron leading up to the transfer station building is relatively small, as is the actual hopper where the MSW is dumped. This means that only one refuse hauler at a time can dump their load, all of which could lead to slightly longer queuing times during busier times of the year.

3.2 Equipment

3.2.1 Floor Equipment

IESI primarily uses a dedicated hydraulic ram to load and compact the waste at the transfer station. A wheeled front-end loader (John Deere Model 410C, or equivalent) is used to clean up the waste in the vicinity of the bin and the compactor.

3.2.2 Transfer Equipment

IESI uses 40 cy roll-off compactor containers for transfer of the waste to the landfill. The transfer station on average hauls four containers per day, which are hauled using semi tractors provided from IESI's Seguin offices. Two drivers are dedicated to the transfer station operations, and each normally makes four trips to the landfill for a daily total of eight loads disposed per day.

IESI uses a yard roll-off truck to maneuver the 40 cy containers around the site. This arrangement allows the full containers to be ready to be picked up as soon as the semi tractor returns from the landfill with an empty container.

3.3 Customer Types

IESI accepts waste from its own collection vehicles and County residents. Residents hauling C&D waste unload into a separate 40 cy open-top container.

3.4 Peak Flow

Because the refuse collection vehicles generally make only one trip to the transfer station, waste entering the transfer station reaches its peak at the mid to late afternoon.

3.5 Materials Accepted and Recycling

IESI accepts MSW and C&D debris, at the transfer station for disposal. MSW is direct-dumped by the collection vehicles into the compactor. Scrap metals may be left at the station for no fee. The scrap metals are dumped into a separate 40 cy open top roll-off container for hauling to Hill Country Recycling (Marble Falls, Texas). Blanco

County operates a glass crushing operation adjacent to the transfer station. The glass operations are maintained and operated completely separate from the transfer station operation.

3.6 Staffing

IESI uses the following type of personnel at the Blanco transfer station:

- 1 equipment operator – operates the compactor and loader and collects fees from residents and small haulers.
- 1 yard operator – maneuvers the collection vehicles into the transfer station and dumps the MSW into the compactor.
- 2 transfer drivers – haul roll-offs to and from landfill.
- Shared supervisor and administrative staff – these positions are shared with the collection operation IESI operates from the transfer station.
- Laborers (as needed) – used daily primarily for litter control on site as well as along Hwy 281.

As the collection drivers return to the site, they park their truck and allow the on-site yard operator to unload the trucks at the compactor.

3.7 Other

3.7.1 Dust and Odor Suppression

IESI utilizes crushed glass (from County operations on site) mixed with aggregate to minimize the dust generated from vehicular traffic at the site.

3.7.2 Covered Loads

IESI requires that all loads be contained or covered. They charge an additional \$2.50 per cy for uncovered loads.



Figure 3-1. Site Aerial with Approximate Site Boundary, Including Closed Landfill
(Source: Google Earth)



Figure 3-2. Collection Vehicle Direct Dumping into Compactor



Figure 3-3. Compactor Receiving Unit



Figure 3-4. Roll-off Container with C&D Material



Figure 3-5. Transfer Station Compactor Unit

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Section 4

City of Brenham Transfer Station

4.1 Overview

The City of Brenham, Texas (City) owns and operates the Brenham Transfer Station, located on Old Chappell Hill Road, approximately 1.2 miles east of downtown Brenham. The transfer station property and infrastructure belong to the City and City staff operate the transfer station. The transfer station property is adjacent to the City's wastewater treatment facility. The site also includes a citizens' collection station, vehicle maintenance facility for solid waste vehicles and green waste composting. The current transfer station was built in the early 1990's, and has been in operation continuously to this date.

Based on information provided during R. W. Beck's site visit, the City managed approximately 15,200 tons of MSW through the transfer station between September 1, 2007 and August 31, 2008 (Texas state fiscal year 2008). The transfer station accepts waste from City MSW collection trucks, private haulers, and residents.

Waste from the transfer station is hauled approximately 90 miles each way to the Waste Management Austin Community Landfill located in Austin, Texas.

4.1.1 Transfer Station Overview

Collection vehicles direct dump into the open top transfer trailers. The City transfer station has a single bay / single trailer setup. The direct dump bay is under cover of roof, and partial walls reduce windblown litter. Pickup trucks hauling construction and demolition (C&D) debris and recyclable metals can dump into separate 40 cy open-top containers located at the on-site citizens' collection station.

4.1.2 Operating Hours

The transfer station is open to the public during the following hours:

- Monday – Friday: 8:00 a.m. to 5:00 p.m.
- Saturday: 8:00 a.m. to 4:00 p.m.

Transfer trailer loading/hauling typically occurs between 5 am and 5 pm.

4.1.3 Scale House

All loads are tracked at the scale house. There is a single scale, and it is located on the left side of the scale house (entering the station). All City vehicles which utilize the transfer station have their tare weights verified quarterly and therefore only need to weigh in full upon arrival at the transfer station. Private haulers or pickup trucks need

to weigh in full and empty to determine the load weight. With the single scale, this can cause traffic flow issues as both incoming and outgoing vehicles need to use the same scale. This is more of an issue during peak operation times when vehicle traffic is at its heaviest. According to information obtained during our site visit, the City is looking at potentially adding in a second scale to be located on the right side of the scale house to serve as the inbound scale (the existing scale would be the outbound scale).

4.1.4 Access

The transfer station is located immediately off of a two lane city street (Old Chappell Road which becomes Alamo Street approximately 1,000 feet west of the site). Access to the property is limited by a gate controlled by City personnel.

4.1.5 Neighbors

The transfer station is located on City-owned land, with the wastewater treatment facility located to the west, green waste processing to the north. Rural residential property lies immediately east of the transfer station as well as approximately 500 feet north of the green waste processing area. Old Chappell Road runs east to west along the site's southern boundary.

4.1.6 Site Size

The area used by the transfer station is approximately 2.2 acres, not including the City's other operations that take place on the property.

4.1.7 Expansion Capability

There is very limited space surrounding the current transfer station building, therefore any substantial expansion will be difficult without significant alteration of the property, including the construction of a new transfer station building. However, the City could increase the throughput of the site by purchasing additional transfer tractors and trailers. The relatively short queuing and maneuvering area between the scale house and transfer station could also be a limiting factor if there was a significant increase in customer traffic.

4.1.8 Maneuvering and Queuing Area

The distance between the transfer station scale and Old Chappell Road is approximately 200 feet, so queuing space before the scale is relative short, especially given that traffic entering and leaving the site must use the same scale. This could lead to vehicles queuing up on the street during peak use.

At an estimated 150 feet, the distance between the scale house and the transfer station building is also relatively short. According to site staff, however, it is adequate for the

collection vehicles to turn around and back into the transfer station building based on current traffic and waste volumes.

4.2 Equipment

4.2.1 Floor Equipment

The City uses wheeled loader/hoes (Case Model 580) to tamp the waste into the transfer trailers and to clean up the area in front of the direct dump bay. A second, similar loader is used as a backup, and for general work and maintenance of the site. However, staff noted that one loader was likely sufficient for its needs.

4.2.2 Transfer Equipment

The City currently uses one 125 cy and three 113 cy walking floor trailers to transport the waste to the landfill. The 113 cy trailers have a steel body and the 125 cy trailer is a smooth-sided aluminum trailer. City staff prefer the aluminum trailers as they experience less corrosion than the steel trailers, and they hope to replace the steel trailers with aluminum ones as they are scheduled to be replaced. The City also has three tractors to haul the trailers. Typically two of the tractors and trailers are between the transfer station and the landfill, with the third tractor dedicated as a yard tractor to pull an empty trailer under the direct dump bay when the other two are in transit to/from the landfill. The City makes three trips to the landfill (total) on a typical day, sometimes four on busy days.

4.3 Customer Types

The City accepts waste from its own collection vehicles, City residents and other private haulers. The City uses two 20 cy rear packer trucks for residential waste collection, with a third as a spare. Each truck normally dumps one load per day at the transfer station, sometimes making two on Tuesdays and/or Fridays, depending on need.

Residents hauling recyclable metals or C&D debris unload into a separate 40 cy open-top containers located on-site and adjacent to the transfer station.

4.4 Peak Flow

From a review of the monthly transfer amounts, waste amounts handled are consistent from month to month, with no clear peak month. During the typical day, however, site staff says their peak operational time is between 11 a.m. and 1 p.m.

4.5 Materials Accepted and Recycling

The City accepts MSW, C&D debris, and some metals recycling at the transfer station. MSW is direct-dumped by the collection vehicles into the transfer trailers. C&D is dumped into a separate 40 cy open top roll-off container for hauling to Brazos Valley Solid Waste Management Authority Landfill (Brazos County, Texas). Mixed metals are dumped in a 40 cy open top roll-off container for recycling off-site.

The City operates a separate recycling drop-off center, located just over one mile to the west of the transfer station.

4.6 Staffing

Aside from the site supervisor, the City uses the following type of personnel at the transfer station:

- 2 Transfer drivers – drive transfer tractors/trailers between the transfer station and the landfill. They also help maintain the site and load waste when waiting for the trailer to be loaded.
- 0.5 Equipment operator – operates the loader, and acts as spare driver. The other half of his time is spent with the collection operation.
- 1 Scale house attendant – weighs in trucks and other administrative duties.

4.7 Other

4.7.1 Dust and Odor Suppression

According to City staff, dust and odor have not generally been an issue at the site. The City utilizes a granular odor neutralizing agent which can be spread around the site, as needed.

4.7.2 Covered Loads

The City requires that all loads be contained or covered. They charge a fee of between \$5 and \$10 for uncovered loads (depending on vehicle size). The posted gate rate for use of the transfer station is \$70 per ton for non-City vehicles.



Figure 4-1. Site Aerial with Approximate Transfer Station Boundary (Source: Google Earth)



Figure 4-2. Transfer Station Entrance



Figure 4-3. Wheeled Loader/Backhoe Compacting Waste



Figure 4-4. Collection Vehicle Direct Dumping into Transfer Trailer



Figure 4-5. Roll-off Containers for C&D Material



Figure 4-6. Mulching Operation Adjacent to Transfer Station



Figure 4-7. Rear view of Transfer Station



Figure 4-8. Tractor Used for Moving Trailers On-site

Section 5

City of Killeen Transfer Station

5.1 Overview

The City of Killeen, Texas (City) owns and operates the Killeen Transfer Station, located on Texas State Highway 195, approximately 6.5 miles south of the US Highway 190 / State Highway 195 intersection. Constructed on property shared with the now-closed City of Killeen Municipal Solid Waste (MSW) Landfill, the transfer station property and buildings belong to the City. The current transfer station was opened in March 2007, and has been in operation continuously to this date.

Based on information provided during our site visit, the City managed approximately 98,000 tons of MSW through the transfer station in fiscal year 2007/2008. The City accepts waste from City MSW collection trucks, private haulers, and residents.

Waste from the transfer station is hauled to the City of Temple Landfill located in Temple, Texas, which is approximately 38 miles east of the transfer station.

5.1.1 Transfer Station Overview

Collection vehicles dump their payloads on the tipping floor, and rubber-tired loaders push load the materials into the open top transfer trailers. The City transfer station has two bays, each open to a single open-top trailer. Currently, only one bay is used on a regular basis.

The tipping floor is completely under cover of roof and walls, with overhead doors that can be closed. There are a total of eight entrances/exits to the TS building, with four reserved for City and commercial collection vehicles, and four used for non-commercial (residential) vehicles.

5.1.2 Operating Hours

The transfer station is open to the public during the following hours:

- Monday, Tuesday, Thursday, and Friday: 8:00 a.m. to 5:00 p.m.
- Wednesday and Saturday: 8:00 a.m. to 3:00 p.m.

Transfer trailer loading/hauling is not limited to these hours.

5.1.3 Scale House

All loads are tracked at the scale house. There are two scales; one located each on the incoming and outgoing traffic lanes next to the scale house. All City collection vehicles which utilize the transfer station have their tare weights stored in the scale's

computer, and therefore only need to weigh in full upon arrival at the transfer station. The tare weights are updated annually for each City Solid Waste collection vehicle. Private haulers or residents need to weigh in full and empty to determine the load weight.

5.1.4 Access

The transfer station is located immediately off of a four lane divided highway (Texas State Highway 195). There are no traffic controls (stop signs or stop lights) located at the entrance to the property; other than a stop sign for vehicles exiting the property. Access to the property is limited by a gate controlled by City personnel.

5.1.5 Neighbors

The transfer station is situated on a relatively large parcel of City-owned land (418 acres), with closed landfill space located on the west, north and east of the building. Residential property lies immediately north of the landfilled areas, and there is rural residential property east of the site. Texas State Highway 195 runs north-south along the sites western boundary.

5.1.6 Site Size

The transfer station is located on approximately 15 acres, which includes the scale house, administration building, and the recycling drop-off facility.

The transfer station building footprint is approximately 33,000 square feet.

In addition to the closed landfill and current transfer station, the previous MSW transfer station sits in the northwest corner of the property. A building housing the transfer station manager and administration is located approximately 200 feet north of the current transfer station.

The City is leasing a 20-acre site adjacent to the new transfer station to Water Control Improvement District No. 1 for the construction and operation of a regional sludge/composting facility. TCEQ has approved the registration application. Construction is expected to begin in spring/summer of 2009. The facility will accept the City's brush and yard waste for composting.

5.1.7 Expansion Capability

Due to the relatively large size of property where the transfer station is sited, there is room to expand the transfer station operations. In fact, the City has already developed a specific plan should expansion be necessary. The City could add onto the southern side of the building to provide additional tipping floor space.

5.1.8 Maneuvering and Queuing Area

The distance between the transfer station scale house and Highway 195 is approximately one mile, so queuing space before the scale is not an issue. The transfer station building is approximately 500 feet away from the scale, and has a large concrete apron on the north and west sides of the building which allows ample room for maneuvering before entering the building. According to site staff, both maneuvering and queuing space are ample.

5.2 Equipment

5.2.1 Floor Equipment

The City uses two stationary Prentice cranes to load and tamp the waste into the transfer trailers. There is one crane per loading bay, and both are controlled from an elevated, fixed position control room which sits above the tipping floor. This location gives the operator a complete view of all MSW handling activities in the building. There are scales located under the axles of the transfer trailer which gives the operator data regarding the overall load weight, as well as balance between the axles. During peak times (when waste is stored on the tipping floor and available for loading), City staff say it takes approximately 15 minutes to load one transfer trailer.

There are also three rubber-tired loaders (Caterpillar 938H, or similar) which are used to process the trash after it is dumped from the collection vehicles, and move it into the transfer trailers. According to City staff, they use one loader full-time to maneuver the trash from the tipping floor to the transfer bay, with another used around the site, as needed. The third is maintained as a spare. The City prefers using solid rubber tires which prevents the need for puncture repairs. There is also one small skid-steer with a broom attachment that the City uses for maintenance.

The tipping floor is cleaned weekly with a steam pressure washer. The wash water is collected and piped to a holding tank, which is emptied by a qualified contractor as needed.

Along the southern building wall, there is a free-standing steel plated push wall approximately 20 feet tall which allows the operators push waste against the wall for temporary storage.

5.2.2 Transfer Equipment

The City contracts the waste hauling operations to Comal Transportation, who is responsible for providing and maintaining the transfer trailers. Comal Transportation uses 110 cy open-top, aluminum walking floor trailers (sheet and post style) to transport the waste between the transfer station and the landfill. The transfer trailers have a manual tarp deployment system which employees use to cover the trailer shortly after it is filled and moved from the transfer station building; all loads are tarped before the transfer trailers leave the property.

The contractor has a yard tractor which is used to move loaded and empty trailers between the transfer station and staging locations. This allows the Comal Transportation tractors to unhook their empty trailers upon return, hook up to a full trailer and head back to the landfill for disposal (i.e., a drop and hook operation).

According to City staff, Comal Transportation makes a total of approximately 15 to 20 trips to the landfill, per day. The average payload is approximately 22 tons.

5.3 Customer Types

The City accepts waste from its own collection vehicles, City residents and citizens and businesses in the surrounding rural areas. City residents are authorized to dispose of up to 300 pounds of MSW per calendar month for free at the transfer station when presenting a current city utility bill at the scale.

For safety reasons, non-commercial vehicles enter and exit the transfer station building from doors on the north side of the building, and are kept separate from City and commercial vehicles throughout the unloading process.

5.4 Peak Flow

From a review of the monthly transfer amounts in 2007 and 2008, waste amounts handled appear consistent from month to month, with no clear peak month. Site staff say that during a typical day, their peak operational time is between late morning and late afternoon.

5.5 Materials Accepted and Recycling

The City accepts MSW, C&D debris, whole car and light truck tires. On the day of R. W. Beck's visit, metals were being dumped in a separate container for recycling. MSW is dumped on the tipping floor by the collection vehicles and push loaded by rubber-tired loaders into the transfer trailers.

The City accepts whole car and light truck tires. Whole tires are prohibited from landfilling, but the City has a tire shredding system on-site which allows them to process the tires to make them acceptable for disposal.

The City has a recycling drop-off area immediately west of the scale house. At the time of the site visit, this area was temporarily closed. The City plans to install closed circuit cameras, and a 2-way audio connected to the scale house. This will allow the scale attendants to observe activity on the site, and the ability to communicate with customers as needed. The facility is expected to re-open in spring 2009.

5.6 Staffing

The City uses the following type of personnel at the Killeen transfer station:

- 1 Superintendent and 1 Supervisor – provides day-to-day management of the transfer station.
- 1 Crew Leader and 4 Equipment operators – operate the cranes and loaders.
- 3 Scale house attendants– weigh vehicles and other administrative duties.
- 3 full-time, 1 part-time Laborers – used as needed to maintain the buildings and grounds and perform daily litter pick-up within the site and on the highway two miles north and south of the property.
- 1 Secretary for handling all administration pertaining to transfer station operations.

5.7 Other

5.7.1 Dust and Odor Suppression

Dust and odor have not been an issue at the site. All traffic ways are paved, and City staff maintains the grassed areas of the site on a scheduled basis as needed to additionally reduce dust. The tipping floor, push walls, and transfer trailer tunnel are washed down on a weekly basis which adequately controls odors.

5.7.2 Covered Loads

The City requires that all loads be contained or covered, and can charge a surcharge for loads that are not. All transfer trailer loads are tarped before the transfer trailers reach the highway.



Figure 4-1. Transfer Station Building



Figure 4-2. Scale House



Figure 4-3. Transfer Station Tipping Floor



Figure 4-4. Stationary Crane Loading Transfer Trailer



Figure 4-5. Transfer Trailer Scale Read-out and Crane Controls



Figure 4-6. Front-end Loader Managing Waste



Figure 4-7. Below Grade Tunnel for Transfers



Figure 4-8. Structural Push Wall on South End of Tipping Floor

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