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September 15, 2011

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City of Tucson
Environmental Services Department
Price Service Center
4004 South Park Ave., Bldg. #1
Tucson, Arizona 85714

Subject: Landfill Staffing and Operations Study for the Los Reales Landfill
Tucson, Arizona

Dear Ms. Petersen:

Camp Dresser & McKee Inc. (CDM) is pleased to present to the City of Tucson (City) Environmental Services (ES) Department the results of the Landfill Staffing and Operations Study for the Los Reales Landfill.

Section 1 Introduction

1.1 Purpose of Study

This study was initiated by ES to assess existing Los Reales Landfill operations and equipment needs in order to achieve the City's goal of operating the landfill in an environmentally sound and cost-effective manner. A number of key landfill staff will be retiring. Also, the Los Reales Landfill average daily tonnage has decreased from 2,600 tons per day in 2007 to 1,500 tons per day in 2010. Therefore, this study will address current and future needs.

1.2 Scope of Work

The scope of work is divided into four tasks as outlined below:

- Task 1 – Data Acquisition and Market Analysis
- Task 2 – Heavy Equipment Needs and Transition Plan
- Task 3 – Staffing Needs Assessment
- Task 4 – Narrative Report

For Task 1, ES completed a "Project Questionnaire" prepared by CDM that provided important information about landfill operations. Also, as part of Task 1, CDM performed a market survey of two landfills mutually selected by ES and CDM which are of similar size and operations to the Los Reales Landfill.



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Tasks 2 and 3 were performed by Neal Bolton of Blue Ridge Services, Inc. Mr. Bolton visited the landfill on June 27, 2011 and met with ES staff to discuss ongoing issues and how the landfill operation compares to similar facilities. A summary of the one day site visit is included as **Attachment 1**. For Task 2, Mr. Bolton evaluated landfill equipment needs and developed an equipment transitioning plan. Similarly, for Task 3, Mr. Bolton evaluated landfill staffing needs and developed a proposed organization chart with associated job descriptions as well as a long term work schedule.

Task 4 summarizes the results of Tasks 1 through 3 in this letter report.

Section 2 Los Reales Landfill Equipment and Staffing Evaluation

2.1 Staffing

The landfill is open to receive waste from 6:00 am to 5:00 pm, Monday through Saturday. Landfill staff is onsite from 5:00 am to 6:00 pm. The thirteen hour workday is accomplished utilizing four main crews working staggered 8 and 10-hour shifts to cover the six day work schedule as shown in **Figure 1**. Several 10-hour shift workers have different work days than the main four crews. The four main crews work the following days:

- Crew 1 works Monday through Thursday (4-10's).
- Crew 2 works Monday, Tuesday, Thursday and Friday (4-10's).
- Crew 3 works Wednesday through Saturday (4-10's).
- Crew 4 works Monday through Friday (5-8's).

Overlapping work shifts occur every Thursday which is an inefficient process as a result of covering extended hours over the six day work week. Eliminating the overlapping work shifts would require reducing the landfill operating hours to 7:30 to 4:00 pm. However, reducing the operating hours may likely result in losing tonnage from specific high volume private waste haulers.



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WORKS ON	Hours per Day	MON	TUE	WED	THU	FRI	SAT
OPERATORS							
ALEXANDER	10	7:30-6:00	7:30-6:00	O	O	7:30-6:00	5:00-3:30
ALVAREZ	10	7:30-6:00	7:30-6:00	O	5:00-3:30	5:00-3:30	O
BOJORQUEZ	10	5:00-3:30	5:00-3:30	5:00-3:30	5:00-3:30	O	O
CIENFUEGOS	10	7:30-6:00	7:30-6:00	7:30-6:00	7:30-6:00	O	O
DALLARIE	10	7:30-6:00	7:30-6:00	O	O	7:30-6:00	7:00-5:30
FELIX, Filiberto	10	5:00-3:30	5:00-3:30	O	5:00-3:30	5:00-3:30	O
FELIX, Antonio	10	O	O	7:30-6:00	7:30-6:00	7:30-6:00	7:00-5:30
GARCIA, Fil	10	O	O	7:30-6:00	7:30-6:00	7:30-6:00	7:00-5:30
LEYVAS	10	7:30-6:00	7:30-6:00	7:30-6:00	7:30-6:00	O	O
NICHOLAS	10	7:30-6:00	7:30-6:00	7:30-6:00	7:30-6:00	O	O
REEVES	10	O	O	5:00-3:30	7:30-6:00	7:30-6:00	7:00-5:30
Total EOS		8	8	7	9	7	5
ES. WORKERS							
ALEGRIA^	10	5:00-3:30	5:00-3:30	5:00-3:30	5:00-3:30	O	O
SILVA^	10	O	O	6:30-5:00	6:30-5:00	6:30-5:00	6:30-5:00
CLARK	10	6:30-4:30	6:30-4:30	6:00-4:30	6:30-5:00	O	O
VARELA	10	O	O	7:30-6:00	7:30-6:00	7:30-6:00	5:00-3:30
VASQUEZ	10	7:30-6:00	7:30-6:00	O	7:30-6:00	6:00-4:30	O
PALMER	10	7:30-6:00	7:30-6:00	O	O	7:30-6:00	7:00-5:00
VILLALOBOS	10	7:30-6:00	7:30-6:00	7:30-6:00	O	O	7:00-5:00
LOPEZ	10	5:00-3:30	5:00-3:30	O	5:00-3:30	5:00-3:30	O
Total ESW & SESW		5+1	5+1	3+2	4+2	4+1	3+1
ABOP							
FLORES	10	O	O	6:30-5:00	6:30-5:00	6:30-5:00	6:30-5:00
SUPERVISORS							
DUNSON	10	7:30-6:00	7:30-6:00	7:30-6:00	7:30-6:00	O	O
FREDERICK	8	5:00-1:30	5:00-1:30	5:00-1:30	5:00-1:30	5:00-1:30	O
VECK	10	O	O	7:30-6:00	7:30-6:00	7:30-6:00	7:00-5:30
DREHER (Scale)	8	5:00-1:30	5:00-1:30	5:00-1:30	5:00-1:30	5:00-1:30	O
SCALE							
BAKER	10	5:30-4:00	6:45-5:15	6:45-5:15	5:30-4:00	O	O
MATTERS	10	O	O	5:45-4:15	6:45-5:15	6:45-5:15	5:45-4:15
WILLIAMS	10	6:45-5:15	5:30-4:00	O	O	5:30-4:00	6:45-5:15
ADMINISTRATION							
MIKOLAITIS, J.	8	8:00-5:00	8:00-5:00	8:00-5:00	8:00-5:00	8:00-5:00	O
SANCHEZ, C.	8	7:00-4:00	7:00-4:00	7:00-4:00	7:00-4:00	7:00-4:00	O
BEATY, C.	8	8:00-4:30	8:00-4:30	8:00-4:30	8:00-4:30	8:00-4:30	O
INSPECTORS							
BAKER	10	6:00-4:30	6:00-4:30	6:00-4:30	6:00-4:30	O	O
BEJARANO	10	6:00-4:30	6:00-4:30	6:00-4:30	6:00-4:30	O	O
MONTANTE	10	6:00-4:30	6:00-4:30	6:00-4:30	6:00-4:30	O	O
VIMISLIK	10	O	O	6:00-4:30	6:00-4:30	6:00-4:30	6:00-4:30

^Senior ES workers

As of 8/15/11

	Monday - Friday
	Monday - Thursday
	Monday, Tuesday, and Thursday/Friday or Friday/Saturday
	Wednesday - Sunday

Figure 1 Staffing Schedule



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The landfill has four sub-groups overseen by the landfill/ES administrator, as shown in **Figure 2**. Refer to **Attachment 2** for a complete organizational chart for the Los Reales Landfill as well as the City's ES Department.

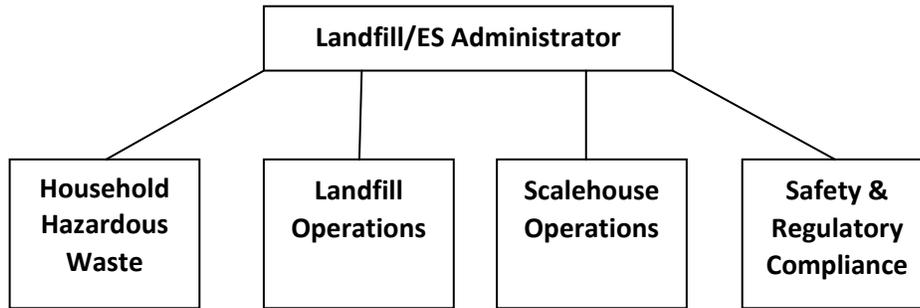


Figure 2 Landfill Hierarchy

2.2 Equipment Summary

The landfill currently has eleven pieces of equipment as depicted in **Table 1**. The Caterpillar (CAT) D10 dozer is planned to be replaced with a CAT D8 dozer and the 5,000 gallon water wagon will be replaced by a 7,000 gallon water wagon. The City also plans to purchase an excavator and a second articulated dump truck increasing the equipment total to 13.

Table 1 Landfill Equipment List

Current Equipment List	Equipment Replaced By City	City's Planned Additional Equipment	City's Planned Ultimate Equipment List
CAT 966 Wheel Loader	--	--	CAT 966 Wheel Loader
CAT 836G Compactor	--	--	CAT 836G Compactor
CAT 836G Compactor	--	--	CAT 836G Compactor
CAT D6R Dozer	--	--	CAT D6R Dozer
CAT D9 Dozer	--	--	CAT D9 Dozer
CAT D10 Dozer	CAT D8 Dozer	--	CAT D8 Dozer
CAT 627G Scraper w/Auger	--	--	
CAT 613C 5K Water Wagon	Articulated 7K Water Wagon	--	Articulated 7K Water Wagon
CAT 621G 8K Water Wagon	--	--	CAT 621G 8K Water Wagon
CAT 143H Grader	--	--	CAT 143H Grader
Volvo A40D Articulated Truck	--	--	Volvo A40D Articulated Truck
--	--	349 Excavator	349 Excavator
--	--	Articulated Dump Truck	Articulated Dump Truck



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A piece of equipment is considered fully utilized when it has a utilization rate of 85-percent (assuming 15-percent is required for repairs and scheduled maintenance). Currently, the existing equipment fleet is underutilized as shown in **Figure 3**. However, some equipment, by the nature of work it performs, is not expected to achieve high utilization rates. The motor grader, for example, is used intermittently to grade access roads or tipping pads; thus, the motor grader's utilization rate of 26-percent is reasonable. Other types of equipment with utilization rates below 85-percent were investigated which include: dozers, water wagons, scrapers and articulated trucks. A discussion of recommended uses of this equipment is included in **Section 5**.

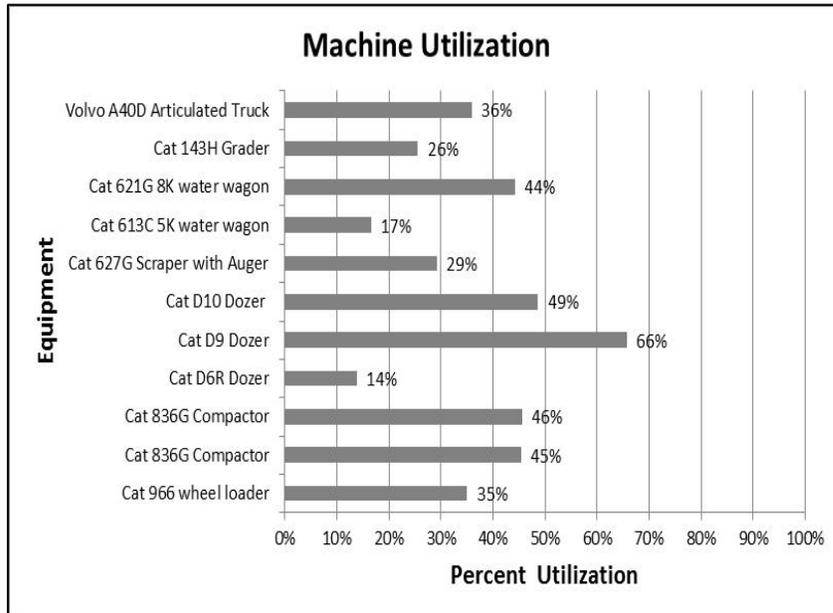


Figure 3 Equipment Utilization

Unless waste tonnages increase significantly, the proposed additional equipment listed in **Table 1** will further lower the utilization rate of the landfill equipment fleet that is already underutilized.

Landfill equipment logged 16,665 hours in the 12 month period from July, 2010 through June 2011. Assuming that ES workers operate the water wagon ½ of the time, and all other equipment is run by the operators, a total of 48.8 hours per day (weekday) of equipment time is required by the operators and four hours per day (weekday) is required by the ES workers. The number of operators scheduled each day as depicted in **Figure 1** could be reduced by one operator allowing for vacation and sick leave. Thus, the number of operators per day ranges from seven to nine throughout the work week. An average of seven operators each day would be able to provide an average of fifty hours of equipment operation. This equates to approximately seven equipment



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hours for each operator, which is considered appropriate for a 10 hour shift and considering daily breaks, lunch and 85% machine utilization (10hrs x 85% = 8.5 hours – 1 ½ hrs for lunch & breaks).

Section 3 Landfill Survey Results

A market survey was conducted of two landfills of similar size to the Los Reales Landfill. The two landfills surveyed were: Clint Landfill and Salt Lake Valley Landfill. A third landfill (Kiefer Landfill) was contacted but did not respond. Information was gathered by contacting the individual responsible for the operation of the landfill. A summary of the survey information is compared to the data collected from the Los Reales Landfill in **Table 2. Attachment 3** provides a complete compilation of all the data obtained during the market analysis.

Table 2 Landfill Market Survey Summary

	Los Reales	Clint	Salt Lake Valley
Location	Tucson, AZ	Clint, TX	Salt Lake City, UT
Owner/Operator	City of Tucson	City of EL Paso	Salt Lake County
Hours and Days of Operation	Monday – Saturday 6:00 am to 5:00 pm	Monday – Saturday 7:00 am to 4:00 pm	Monday – Saturday 7:00 am to 5:00 pm
Average Tonnage, Tons/day	1,500	1,488	1,500
Annual Tonnage, Tons/Year (2010)	483,579	457,899	468,000
Number of Residential/Commercial/Private Haulers Trips Per Year (tickets)	85,000	126,361	132,000
Number of Self Haulers Per Year (pickups)	79,000	65,028	90,000
Tipping Fees for Residential/Self Haulers (MSW)	\$15 per load (less than 2,000 pounds per load) \$32 per ton (2000 pounds or more per load)	\$8 per load (pick up trucks) \$26 per ton (trailers)	\$10 per load (pick up trucks and one axle trailers) \$30 per load (two axle trailers)
Gate Rate Fees for Commercial/Private Haulers (MSW)	\$32 per ton (pro-rated, minimum of \$15)	\$26 per ton	\$26 per ton
Separate Unloading Area for Self Haulers, Location	Yes, unloaded at an area of the working face separate from large truck unloading.	Yes, located off to side at workface.	Yes, located on concrete area separate from the working face
Number of Landfill Staff	31	26	36
Equipment	3 Dozers 2 Compactors 2 Water Wagons	2 Dozers 4 Compactors 3 Water Wagons	3 Dozers 3 Compactors 3 Water Wagons



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3.1 Los Reales Landfill

The Los Reales Landfill, located in Tucson, Arizona is owned and operated by the City of Tucson. The landfill is open six days a week, Monday through Saturday during the hours of 6:00 am to 5:00 pm. The average daily tonnage received at the landfill is 1,500 tpd. Total tonnage received in year 2010 was 483,579 tons of solid waste. The total annual number of landfill tickets for residential, commercial, and private haulers in is 85,000. The total number of self haulers per year is 79,000. Tipping fees for residential and self haulers is \$15 per load of MSW when the load size is less than 2,000 pounds and \$32 per ton when the load exceeds 2,000 pounds. Commercial and private hauler rate fees for MSW are \$32 per ton and pro-rated when less than 2,000 pounds with a minimum rate of \$15 per load. Commercial and private haulers unload at the working face while self haulers are directed to an area of the landfill off the side of the working face where solid waste is unloaded. An organizational chart for the landfill is included in **Attachment 2**.

3.2 Clint Landfill

The Clint Landfill, located in Clint, Texas is owned and operated by the City of El Paso. The landfill is open six days a week, Monday through Saturday during the hours of 7:00 am to 4:00 pm. The average daily tonnage received at the landfill is 1,500 tpd. Total tonnage received in year 2010 was 457,899 tons of solid waste. The total number of landfill tickets for residential, commercial, and private haulers in the most recent year is 126,361 with 65,028 tickets accounting for self haulers. Tipping fees for residential and self haulers is \$8 per load of MSW for pick-up trucks and \$26 per ton for self haulers pulling a trailer. Commercial and private hauler rate fees for MSW are \$26 per ton. Commercial and private haulers unload at the working face while self haulers are directed to an area of the landfill off the side of the working face where solid waste is unloaded. An organizational chart for the landfill is included in **Attachment 2**.

3.3 Salt Lake Valley Landfill

The Salt Lake Valley Landfill, located in Salt Lake City, is owned and operated by Salt Lake County. The landfill is open six days a week, Monday through Saturday during the hours of 7:00 am to 5:00 pm. The average daily tonnage received at the landfill is 1,500 tpd. Total tonnage received in year 2010 was 468,000 tons of solid waste. The total number of landfill tickets for residential, commercial, and private haulers per year is 132,000 and 90,000 tickets for self haulers. Tipping fees for residential and self haulers is \$10 per load of MSW for pick-up trucks and one-axle trailers and \$30 per load for two-axle trailers. Commercial and private hauler rate fees for MSW are \$26 per ton. Commercial and private haulers unload at the working face of the landfill while self haulers unload in containers placed on a concrete area separate from the landfill working face. An organizational chart for the landfill is included in **Attachment 2**.



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3.4 Market Survey Summary

The Los Reales, Clint and Salt Lake Valley landfills have similar operating characteristics including comparable processing tonnages and operating hours. No two landfills are alike. It is often times difficult to perform a comparative landfill analysis due to varying soil type, site topography, permitting requirements, special waste acceptance and handling requirements, own vs lease equipment, waste minimization programs, etc. Based on review of supplied information, it appears that Los Reales staff and equipment levels are within the corresponding levels for the annual tonnage processed. The number and type of dozers and compactors is within normal industry standards to process and compact approximately 1,500 tpd of waste material. Salt Lake Valley trip data (commercial and self haul) appears to include combined data for both transfer station and landfill facilities.

Section 4 Staffing Recommendations

4.1 Key Landfill Positions and Duties

Based on interviews with landfill management staff, review of landfill operations and industry standards, reduced tonnage from previous years, the following staffing changes are recommended:

ES Administrator and ES Superintendent

The management team will lack operations experience after the landfill administrator (Mikolaitis), ES superintendent (Gallego), ES supervisor (Granillo), and environmental scientist (Sanchez) retire. To address this loss of key staff, we recommend combining the ES administrator and ES superintendent positions into a single position, referred to herein as the landfill manager (LM). The LM must have a technical background and be knowledgeable in landfill development and operations and have experience managing a heavy equipment fleet. The LM position will also require technical and practical understanding of landfill permitting, development, operations and closure. In support of the LM position, it will be necessary to have an ES supervisor for every crew (three total).

Environmental Scientist

We recommend eliminating the Environmental Scientist position since the duties of the environmental scientist can be delegated to the environmental manager (compliance reporting) and scalehouse operations (specific questions regarding manifest, CABOP, etc.).

The Environmental Scientist's current duties include both administrative and field activities.

We recommend that Environmental Scientist's duties be delegated as follows:

- Administrative tasks and technical field work (i.e., waste acceptance into landfill, random waste screening at the working face) be delegated to the Compliance Section at ESD offices located at Park and Ajo. For example, this includes producing and reviewing compliance reports to address air quality, stormwater, and permit requirements. In addition, other tasks



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such as tracking legislation that would affect landfills would be performed by staff at Park and Ajo.

- Field tasks and general questions regarding disposal of common waste types to the scalehouse and CABOP staff. This would include preliminary (Q&A) waste screening at the scalehouse. It is suggested that the CABOP and scalehouse workers receive additional training in order to handle these tasks. Any additional duties would be delegated to a customer service representative at the landfill.

When customer inquiries regarding acceptance of non-typical materials cannot be answered by scalehouse workers, customers would be directed to compliance section at Environmental Services Department offices located at Park and Ajo. Based on provided information, approximately 3 to 4 requests are currently handled per month.

As previously noted, specific training and procedures would need to be implemented in order to successfully transfer all duties. Such training will include: Waste screening, manifests for special waste, basic inspection criteria for CABOP/recycling area (i.e., "No more than 5,000 tires on-site), and knowing when/how to direct technical customer questions to the appropriate person.

Staff Offices

The operations office and the administration office at the landfill should be combined into a single building. Having separate offices for operations and administration can create communication gaps. Under the proposed management changes, a combined office allows the administrative assistant to help with some of the duties currently being handled by the ES superintendent.

4.2 Proposed Organization Chart

Based on the prescribed changes to landfill staffing positions discussed in the previous section, a proposed landfill organizational chart was created and included as **Attachment 4**. The organizational chart includes only three divisions (HHW, landfill operations and scalehouse). The environmental scientist position and the regulatory and safety compliance division of the landfill would be eliminated by distributing tasks to other staff within the landfill organization.

4.3 Proposed Job Descriptions

A proposed job description for the landfill manager position is included as **Attachment 5**.

4.4 Recommended Work Schedule

As discussed in **Section 2.1**, there are no changes being proposed to the four crew shift schedule. However, if waste tonnage received at the landfill is significantly reduced from current levels, then the current staffing schedule should be revisited.



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4.5 Long Term Work Schedule

If tonnages are significantly reduced in the future, landfill gate house hours could be reduced to 7:00 am to 3:00 pm, Monday through Friday and 8:00 am to 12:00 pm on Saturdays. These hours of operation would allow the use of a single crew utilizing an eight hour shift with some overtime. The work schedule would involve a skeleton crew arriving 30 to 60 minutes prior to gate opening to pull tarps, check machines and prepare the scalehouse. This crew would work until 3:00 pm. The main crew arrives at 7:30 am and works until 4:00 pm. This schedule also compares favorably with the tonnage values and daily loads per hour as discussed in **Section 5.1**.

Section 5 Equipment Needs Assessment and Recommendations

Selecting the appropriate size, number and type of machines for the waste-handling operation is a process that begins with an understanding of waste hauling vehicles and associated tonnage.

5.1 Inbound Tonnage

The daily tons per hour and daily loads per hour received at the landfill are shown in Figures 4 and 5, respectively. Based on the figures, it appears that route trucks make two to three rounds per weekday. Inbound weekday tonnage is fairly consistent with some opportunity to reduce weekday hours to operate from 7:30 am to 3:00 pm. Saturday hours could be reduced to operate from 8:00 am to 12:00 pm or 1:00 pm. The number of vehicles on Saturday is similar to, and in some cases exceeds, the weekday vehicle count.



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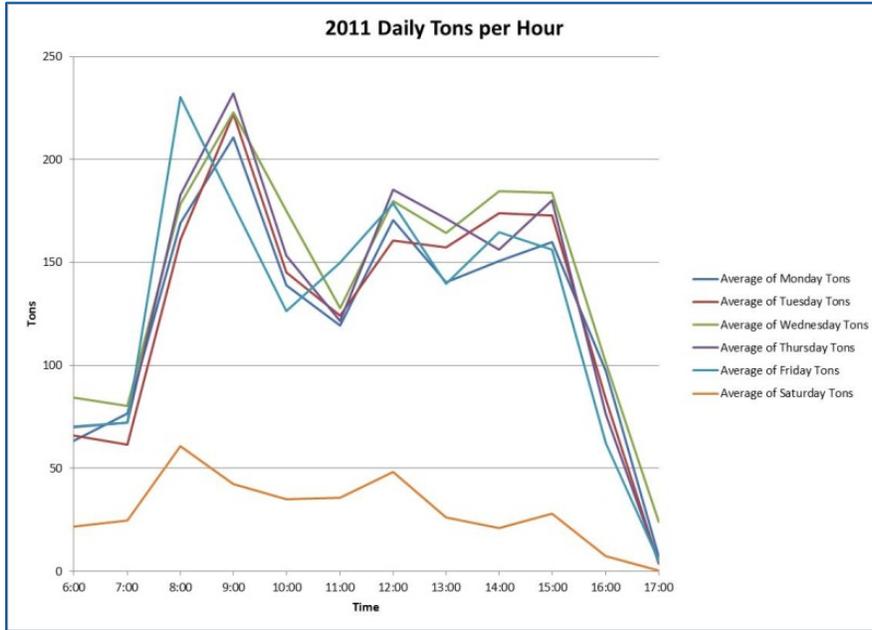


Figure 4 Daily Tonnage per Hour

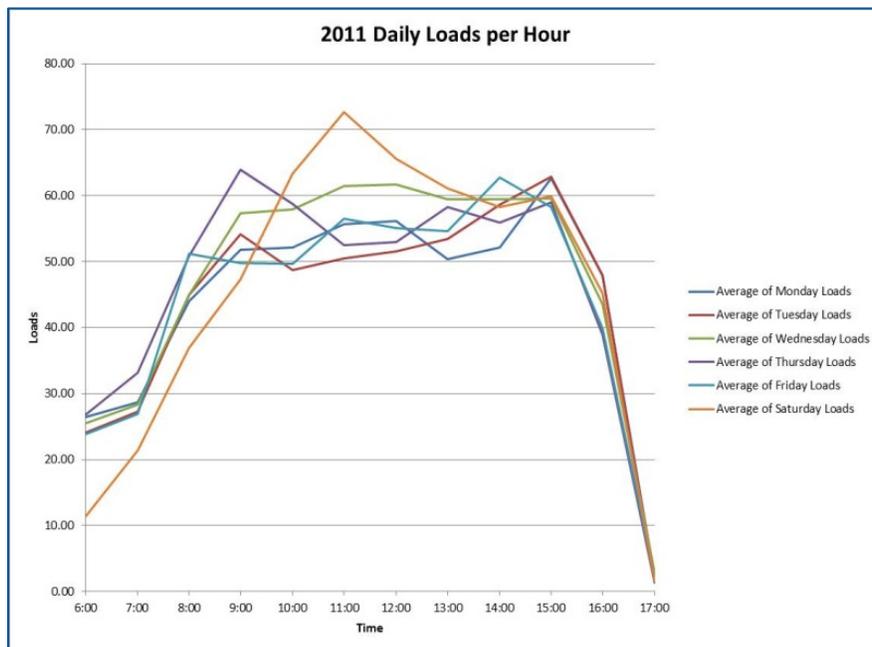


Figure 5 Daily Loads per Hour



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5.2 Equipment Needs Discussion and Waste Placement and Cover Soil Application

To make a reasonable estimate of the machine effort required to handle inbound waste and other accompanying tasks, inbound tonnage data was reviewed. From general benchmarks developed from comprehensive operational reviews of similar landfills, several assumptions and calculations have been made that address equipment needs and waste placement and cover soil application (**Table 3**).

Table 3 Equipment and Waste Placement and Soil Cover Operational Benchmarks

Criteria	Current Operations and Benchmarks
Weekday Tonnage ¹	1,888 tons/day
Large Dozer Productivity ²	240 tons (waste) per hour = 7.9 hours per day + 3 hours per day of cleanup, ripping and support, place/remove tarps, other. Total (large) dozer time is 10.9 hours per day. A second dozer is required during peak periods of inbound waste (i.e. over 200 tons per hour).
Compactor Productivity ²	125 tons per hour = 15.1 hours per day. This required two compactors during peak periods of inbound waste (i.e. over 125 tons per hour).
Effective Density ³	1,200 pounds of trash per cubic yards of airspace consumed. (includes waste + soil + construction material + other)
Cover Ratio ⁴	The current cover ratio is calculated at 3.1 to 1. This ratio equates to 768 cubic yards of soil per day for daily and immediate cover, which is calculated based on 1,888 tons/day x 2,000 / 1,200 / (3.1 + 1) = 768 cubic yards/day. A 5 to 1 cover ratio is achievable ² . Based on the same formula, this equates to 524 cubic yards per day.
Scraper Loads	524 cubic yards of soil per day divided by 21 cubic yards per load (per CAT) = 25 loads per day. At 7 minutes per load, this equals 3 hour of scraper time per day. With additional construction and road maintenance projects this would increase to 5 hours per day. There is little justification to have articulated haul trucks in addition to the scraper.

Table Notes:

1. Based on existing Los Reales Landfill data provided in "Project Questionnaire".
2. Based on comprehensive operations review at other Landfills (Bolton).
3. Based on tonnage received between 2/20/2009 and 6/30/2010 and divided by volume filled during that time using airspace utilization data provided in "Project Questionnaire".
4. Based on existing landfill tonnage data (01/11 through 05/11) at an estimated waste density of 1,300 pounds per cubic yard (Bolton) and number of dirt loads provided in the "Project Questionnaire".

5.3 Recommended Equipment

Based on information provided in **Table 3**, a conservative equipment fleet size is being proposed. This recommended fleet size is largely based on comparing operational reviews at other landfills to what is required by the Los Reales Landfill.



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Bulldozers

Two large (CAT D8) bulldozers are recommended to handle the waste operation and provide ripping, tarp placement and other supporting activities. It is estimated that the two large dozers would log approximately 10.9 hours of operation per day. Also recommended is the use of one smaller sized dozer (CAT D5 or D6) with 6-way blade for stripping and placing cover soil. It is estimated that the smaller dozer would log approximately one to two hours of operation per day. Recommended hours for dozer operation presented herein are near the actual dozer hours currently logged at the landfill. Therefore, it is suggested that current dozer usage is appropriate, albeit the CAT D9 and CAT D10 dozers are over-sized. It is suggested that the CAT D6 be available to work in the working face to provide some level of backup. A third dozer for back up is not recommended. It is estimated that 7.9 large dozer hours per day to handle the waste. In the event one of the large dozers is inoperable, the landfill could operate with the remaining large dozer. In the event both large dozers are inoperable, the landfill would have to push direct with the compactors and the smaller D6 dozer, until a large dozer could be obtained. It is noted, that often times, it may be difficult in locating a rental dozer that can be used for solid waste operations.

Landfill Compactors

Two large (CAT 836) landfill compactors are required to process the inbound waste stream. It is estimated that 15.1 compactor hours per weekday are required to effectively handle the inbound waste. This represents an increase in compactor time of approximately 15-percent. It should be noted that the increased compactor hours represent bringing their use up to an "optimum" level. It is feasible for a single compactor to keep up with the incoming waste stream if one compactor were out of service, however this would result in a lower compaction rate.

Scrapers and Articulated Haul Trucks

It is recommended that the landfill either utilize one scraper or one haul truck for hauling daily and intermediate cover soil. The use of both is unnecessary. Thus, it is also recommended that the scraper be eliminated and a single articulated haul truck be utilized for transporting soil from the borrow area and waste from the temporary wet disposal area. Based on the "scraper vs. articulated truck" analysis performed by the landfill administrator, the articulated haul truck is the most economical option. However, before this selection is implemented, an analysis should be performed which considers a three to five year outlook of large earth-moving projects at the landfill (i.e. cell construction and closure). Changes in staffing, additional excavation, or other operational changes could make the scraper the more economical option. It should also be confirmed that the selection of the articulated haul truck consider the required prep work for the loading process (i.e. ripping prior to loading). To minimize the impact of the articulated truck being inoperable due to mechanical issues, operational soil could be stockpiled one to two weeks in advance at the active face. In the event the truck is inoperable, the landfill will draw from the stockpiled soil until the unit is repaired or a rental is obtained.



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Motor Grader

Current motor grader hours are sufficient and appropriate for landfill operations.

Water Wagons

On average, the water wagons operate a combined total of 8.5 hours per day. These hours represent the equivalent of one machine working full time. Even though one water truck may be able to manage dust control needs for the site, two trucks are required during the summer months to minimize dust along haul roads. The second water truck also serves as a backup for fire control. In order to reduce capital and operating costs, we suggest that the older 7,000 gal. Water Wagon be replaced with a traditional 4,000 gal. water truck.

5.4 Equipment Transition Plan

Based on this study, the purchase of an additional articulated haul truck is not required. Rather, from an operations standpoint it is recommended that soil be excavated with a single haul unit. We recommend the City purchase an excavator for loading the articulated haul truck. The selection of the excavator/bucket should be based on the primary goal of using it for mass excavation and loading trucks. Specific sizing of excavator and bucket should be performed by local equipment dealer – who has best understanding of local soil conditions.

It is also recommended that the CAT D9 and CAT D10 dozers be replaced with small units, such as CAT D8 units. The size of the waste stream and relatively short push do not justify the use of larger dozers. It is noted that longer pushes are required for Saturday operations. However, the tonnage is much lower so the CAT D8 dozers will be able to manage the waste flow. **Table 4** summarizes recommended equipment.

Table 4 Recommended Landfill Equipment List

Equipment Type	Number
CAT D8 Dozer	2
CAT D6R Dozer w/6-way blade	1
CAT 836G Compactor	2
Volvo A40D Articulated Truck	1
CAT 966 Wheel Loader	1
CAT 143H Grader	1
Articulated 7K Water Wagon	1
Traditional 4k Water Truck (10-wheeler)	1
Excavator - sized appropriately for mass excavation	1

Currently, some machines are scheduled to be replaced/rebuilt at 7,500 hours. Because it is more cost effective to use a machine for 10,000 to 12,000 hours before replacement or performing a certified rebuild, we recommend that the City perform a cost comparative analysis of performing a



Nancy Petersen
September 15, 2011
Page 15

full certified rebuild versus rebuilding major equipment components (engine, transmission, and undercarriage).

5.5 Recommendations

The following summarizes staffing and equipment recommendations for the Los Reales landfill:

1. Combine the ES administrator and ES superintendent positions into a single position, referred to as the landfill manager (LM).
2. The landfill manager job description is detailed in Attachment 5.
3. To support the LM position, it will be necessary to have an ES supervisor for every crew (three total).
4. Eliminate the Environmental Scientist (ES) position.
5. Delegate ES compliance reporting duties to the environmental manager.
6. Delegate ES manifest, CABOP, and special waste questions to scalehouse operators.
7. Provide additional training to scalehouse staff, CABOP workers, and landfill inspectors.
8. Combine landfill administrative and operations offices.
9. If tonnages are significantly reduced in the future, landfill gate house hours could be reduced to 7:00 am to 3:00 pm, Monday through Friday and 8:00 am to 12:00 pm on Saturdays. These hours of operation would allow the use of a single crew utilizing an eight hour shift with some overtime.

10. Recommended Equipment List

Type	No.
CAT D8 Dozer	2
CAT D6R Dozer w/6-way blade	1
CAT 836G Compactor	2
Volvo A40D Articulated Truck	1
CAT 966 Wheel Loader	1
CAT 143H Grader	1
Articulated 7K Water Wagon	1
Traditional 4k Water Truck (10-wheeler)	1
Excavator - sized appropriately for mass excavation	1



Nancy Petersen
September 15, 2011
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CDM appreciates the opportunity to provide environmental services to the City of Tucson. Please contact CDM at 1-800-880-3077 if you have any questions or comments regarding the contents of this summary report.

Sincerely,

A handwritten signature in blue ink that reads 'Thomas D. Parker'.

Thomas D. Parker, P.E., BCEE
Associate, Project Manager
Camp Dresser & McKee Inc.

A handwritten signature in blue ink that reads 'Neal Bolton'.

Neal Bolton, P.E.
President
Blue Ridge Services, Inc.

Attachments

cc: Jim Mikolaitis
Greg Larson
File

ATTACHMENT 1
SITE VISIT SUMMARY

Los Reales Landfill Site Visit Summary
Conducted by: Neal Bolton of Blue Ridge Services, Inc.
Conducted: June 27, 2011

Site Visit Summary Notes:

Neal Bolton conducted an on-site review of the landfill on June 27th, 2011. Below is a summary of the site visit.

Arrived at landfill at 6:50am and initially met with Catalina Sanchez, the Environmental Scientist. Discussed some of her roles and reviewed her organization and filing system. For example, she has a binder – called a Compliance Files Location Notebook which lists the location of all pertinent regulatory documents at the landfill. Catalina is very organized and currently uses an email-based tickler system to track dates for regulatory reports, permits, etc.

Met with Jim Mikolaitis, the ES Administrator. Jim performs as a high-level manager, but has little interaction with the day-to-day equipment issues or Empire CAT, relying mostly on Delbert Gallego, the ES Superintendent. He does provide guidance regarding the fill sequence planning – and uses a large plotter in the operations office to produce interim fill sequence plans. From these plans, they utilize a consultant (mostly as a CAD) resource, to upload those sequence plans to the GPS system. Met with Nancy and Neal discussed project goals, reviewed organization chart and then toured the entire landfill including: the active face, excavation area, perimeter, recycling areas, upper completed decks and the leachate & methane systems.

During the site tour, Neal also met George Frederick. George directed operations at the face along with Javier Montante(sp). He was preparing to conduct load check on a vehicle from the military base. The load contained insulation from fuel tanks resulting from some aircraft upgrades.

Neal and Jim then met with Delbert and discussed his role: interface with Empire CAT, monitor landfill operator staffing and recordkeeping. We met in the separate operations office. Delbert explained the process of the walk-around inspections, chain of communication and general activities of the operators.

Met with Jim, Neal met with Nancy Peterson at the landfill and reviewed the overall goals of the project (i.e., to take this opportunity – with many mid-level managers leaving – to streamline and re-organize the operation).

Met again with Catalina to better understand her role. Because of her willingness to take on additional responsibility, she has become very much the “Go To” person at the landfill. She has a good knowledge of how everything works.

Met with Casandra Beatty. She is the secretary, but is actually working in more of an administrative assistant role. She handles much of the data input for landfill operations and equipment, and has actually created several tracking forms, using Excel® - the most significant of which is the Performance Information Tracking System (PITS) form. The PITS form contains a good “pool” of data, but the information is underutilized in terms of providing real-time operational feedback and change.

Casandra also has a good working knowledge of the scale facility, and sometimes fills in to cover sick leave/vacation. She even works as the quasi-supervisor in the scalehouse when Chris Dreher is gone.

Later in the afternoon, drove to main office at Park and Aho, where a meeting with Nancy Peterson, Lynne Birkinbine (compliance) and Jeff Drumm (engineering) was conducted. Discussed possible configurations of the organizational chart, along with redistribution of tasks and responsibilities. It became evident that Lynne's group could handle the compliance tasks (i.e., reporting, permits, etc.) that are currently being handled by Catalina. It was also apparent that Jeff is handling design/project management effectively. However, Jeff will not be able to provide the day-to-day on-site technical guidance that Jim is currently providing at the landfill. For that reason recommending that Jim's replacement have a strong technical background (See Key Landfill Positions and Duties section).

ATTACHMENT 2

LANDFILL MARKET SURVEY ORGANIZATIONAL CHARTS

Environmental Services Department

Los Reales Landfill / HHW

May, 2011



Director
1331 / Andrew Quigley

Deputy Director
3597 / Nancy Petersen

ES Administrator
5933 / J. Mikolaitis

Household Hazardous Waste

ES Superintendent
6674 / Frank Bonillas

ES Supervisor
5927 / Fernando Valencia

Equipment Operator
Specialists

1408 / A. Diaz
0604 / D. Zygel
0651 / D. Campbell

Sr. ES Workers

4226 / J. Foley
5775 / D. Maxey

ES Worker

5285 / E. Hart

Landfill Operations

ES Superintendent
3313 / Delbert Gallego

ES Supervisors
1084 / Frank Granillo
3861 / Perry Dunson

Equipment Operator
Specialists

4448 / J.P. Alexander
3462 / M. Alvarez
5002 / A. Borjorquez
0653 / I. Cienfuegos
4633 / S. Dallaire
3840 / A. Felix
1650 / F. Felix
4450 / G. Frederick
1678 / F. Garcia
6569 / H. Leyvas
5675 / J. Nicholas
4293 / R. Reeves

Landfill Senior ES
Workers

1655 / C. Alegria
3968 / J. Silva

Landfill ES Workers

4707 / L. Clark
7047 / G. Vasquez
7048 / O. Palmer
4624 / F. Varela
7046 / J. Lopez

Scalehouse Operations

Office Supervisor
1845 / Chris Dreher

Customer Service
Representatives

5054 / C. Baker
4113 / C. Beaty
2360 / R. Matters
5089 / P. Williams

Safety & Regulatory Compliance

Environmental Scientist
5937 / Catalina Sanchez

CABOP Sr. ES Worker
4292 / A. Flores

CABOP ES Worker
5938 / C. Villalobos

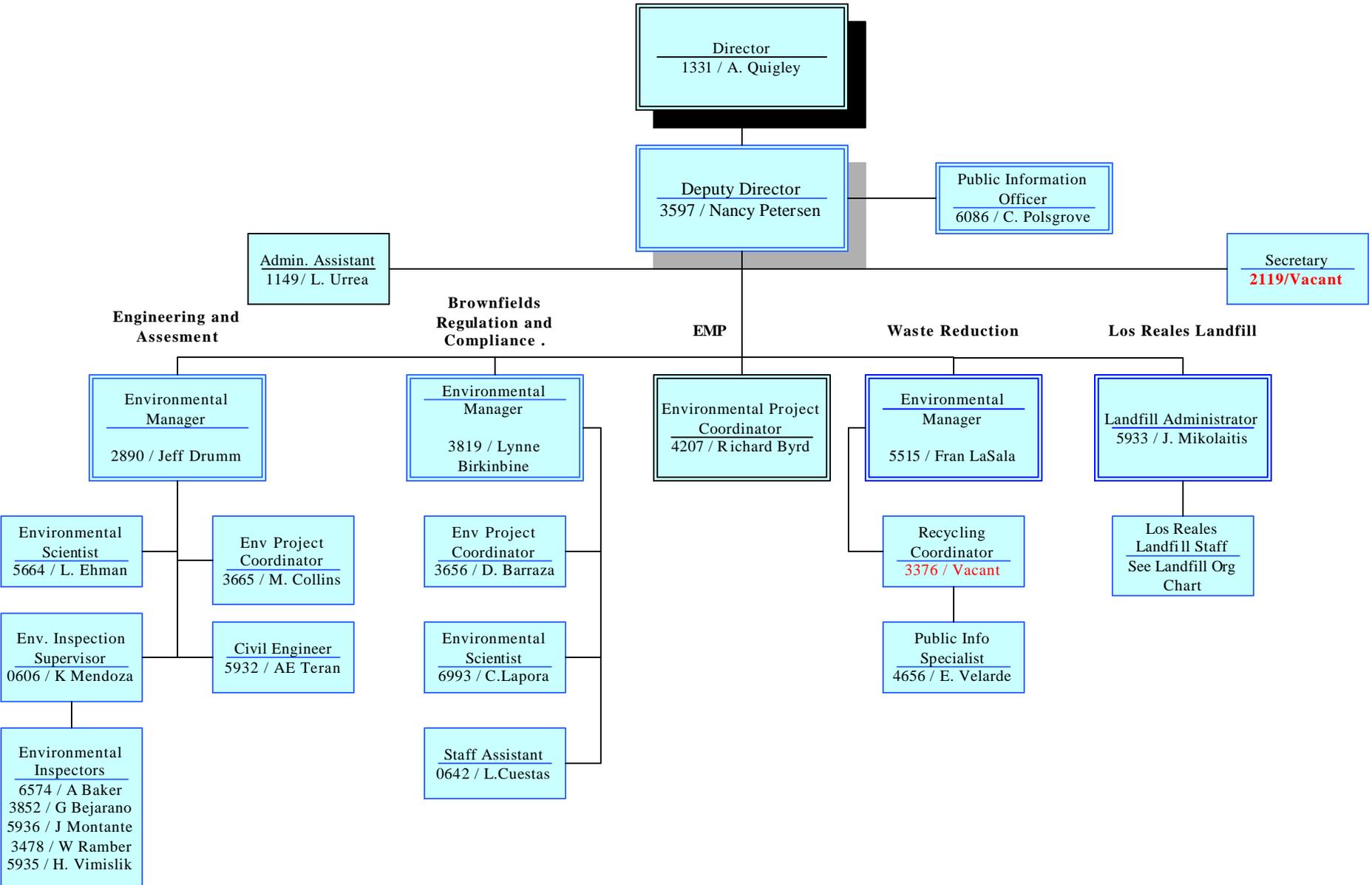
*PCN 1084 - Incumbent has entered End of Service program
will retire effective June 2011



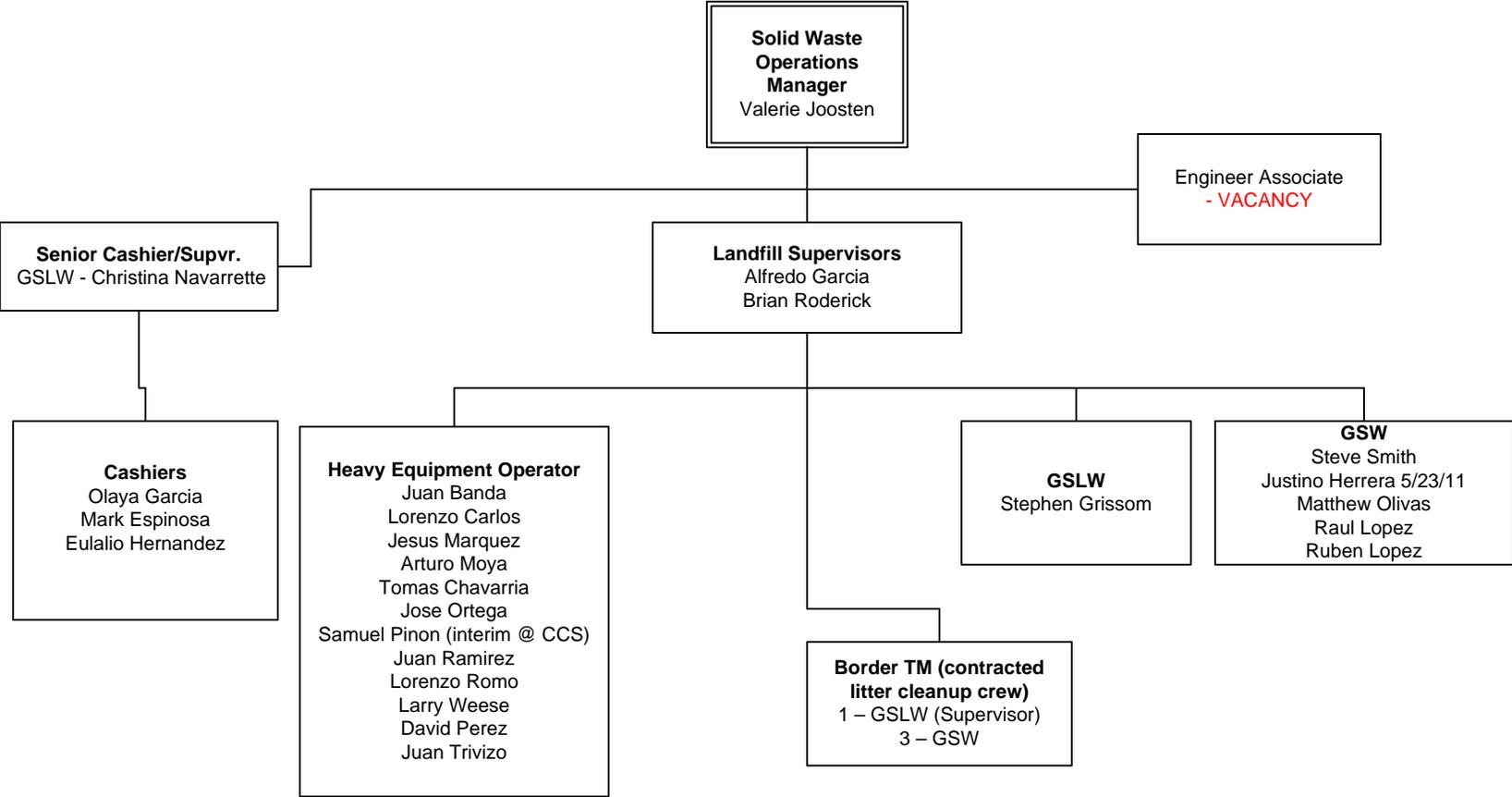
Environmental Services Department

Engineering and Technical Support

May, 2011



Clint Landfill



Salt Lake Valley Solid Waste Management Council

Peter Corroon - Mayor, Salt Lake County

Ralph Becker - Mayor, Salt Lake City

Gary Edwards - Director, Salt Lake Valley Health Department

Mike Winder - Mayor, West Valley City

Dr. Ryan Dupont - Utah State University School of Engineering

LF Safety Coordinator
Kevin Williams

Executive Director
John Ioannou

TS Safety Coordinator
Dave Fontana

Fiscal Manager
Larry Hansen

Environmental Manager
Tom Burrup

Landfill Manager
Jeff Wolf

Transfer Station Manager
Daniel Bauer

Contracts & A /R
Dan Davies

Accounting Spec. & A/P
Debbie Haggard

Scalehouse Operators
Veronica Barabino
Betty Hauptman
Kitty Ogden
Tresia Whipple
Raymond Fernandez

Lead-Litter Control
Thad Christensen

Env. Specialists
Leon Ford
Louis Pavlos
Jeff Kendall

Equipment Operators
Rick Cleverly

Recycling Coordinator
Ashlee Yoder

Lead Operators
Ben Overdiek
Wendel McClure
Hal Walton

Equipment Oper.
Ken Wabel
Larry Kight
Randy Lucero
Damon Cornish
Jose Martinez
Bob Wisdom
Oscar Cuevas
Alan Peterson
Rod Butterfield
Mike Cummings
Dennis Wilson

Traffic Controllers
Jack Gilbert
Fred Cordero
Van Sisson
Lisa Blanke
George Bell

Lead Operator
Kevin Miles

Scalehouse Operator
Ingrid Edinger

Equipment Operators
J. J. Velasquez
Brian Stiles
Don Cooper
Todd Grambow
Chad Wilson
Tedd Prokopis
Tom Olsen
Rob Brown
John Cook

ATTACHMENT 3

LANDFILL MARKET SURVEY MATRIX

Landfill	Los Reales	Clint	Salt Lake Valley	Keifer (Sacramento)
Contact	Andrew Quigley Environmental Services Director	Valerie Joosten Solid Waste Operations Manager	John Iannou Solid Waste Executive Director	Wendy Nelson (916) 875-5117
Location	Tucson, AZ	Clint, TX	Salt Lake City, UT	Sloughouse, CA
Owner/Operator	City of Tucson, AZ	City of El Paso, TX	Salt Lake County, UT	Sacramento County, CA
Hours and Days of Operation	Monday - Saturday 6 am to 5 pm	Monday - Saturday 7 am to 4 pm	Monday - Saturday 7 am to 5 pm	Monday through Friday 6:30 am to 4:30 pm Saturday and Sunday 8:30 am to 4:30 pm
Average Tonnage, Tons/day	1,500	1,488	1,500	(data not yet recived from Kiefer Landfill)
Annual Tonnage, Tons/Year - 2010	483,579	457,899	468,000	
Annual Tonnage, Tons/Year - 2009	403,621	416,167	485,000	
Annual Tonnage, Tons/Year - 2008	589,989	436,185	468,000	
Number of Residential/Commercial/Private Haulers Trips Per Year (tickets)	85,000	126,361 (All tickets)	132,000	
Number of Transfer Trailer Trips per year	n/a	0	10,000	
Number of Self Haulers (pickups)	79,000	65,028 (All Residential Customers)	90,000	
Separate Unloading Area for Self Haulers, Location	Yes, unloaded at an area of the working face separate from large truck unloading.	Yes, located off to side at workplace. In FY11/12, a public drop-off area will be constructed to remove from unloading from workplace area.	Yes, located on concrete area for the separate from the working face	
Separate Unloading Area for HHW	Yes, handled at an onsite facility.	Yes, currently receive used oil, antifreeze, filters, and batteries.	Yes	
Separate Unloading Area for Recyclables	Yes	Yes	Yes	
Separate Unloading Area for Green Waste	No	No	Yes	
Separate C&D Disposal Area	No	No	No	
Total Budget	\$4,699,230	\$5,988,037	14.4 M (Rev.) 12.7 M (Exp). Note: 75% of listed budget allocated to landfill operations and 25% to transfer station which is located off site.	
Annual Labor Costs	\$2,138,218	\$1,170,393	\$3,500,000 (75% LF : 25% TS)	
Annual Equipment Maintenance Costs	\$1,045,737	\$531,476	\$1,500,000 (75% LF : 25% TS)	
Annual Fuel Costs (Gas & Diesel)	\$457,157	\$384,343	\$900,000 (75% LF : 25% TS)	
Annual Overtime Cost	\$55,366	\$3,000	\$50,000 (75% LF : 25% TS)	
Annual Contract Services (temporary labor, equipment service, engineering, compliance)	\$400,329	\$125,945 - contracted litter crew. Contracted services for engineering are project specific/varies. Equipment service included in equipment maintenance costs.	\$150,000 (75% LF : 25% TS)	
Tipping Fees (MSW)				
Residential/Self Haulers	\$15 per load (less than 2,000 pounds per load) \$32 per ton (2000 pounds or more per load)	\$8 per load (pick up trucks) \$26 per ton (trailers)	\$10 per load (pick up trucks and one axle trailers) \$30 per load (two axle trailers)	
Commercial/Private Hauler	\$32 per ton (pro-rated, minimum of \$15)	\$26 per ton	\$26 per ton	
Annual Manhours (Landfill staff)	81,000	47,840	75,000	
Total Landfill Staff	31	26	36	
Organizational Chart	Yes	Yes	Yes	
Staff Type (Number)	Landfill Administrator (1) Landfill Operations (22) includes: Superintendent (1), Supervisors (2), Equipment Operator Specialists (12), Senior Landfill Workers (2), Landfill Workers (5). HHW (8) includes: Superintendent (1), Supervisor (1), Equipment Operator Specialists (3), Senior ES workers (2), ES workers (1). Scalehouse Operations (5) includes: Office Supervisor (1), Customer Service Representatives (4). Safety & Regulatory (3) includes: Environmental Scientist (1), Senior CABOP ES Worker (1), CABOP ES Worker (1).	Solid Waste Operations Manager (1) Senior Cashier/Supervisor (1) Cashiers (3) Landfill Supervisors (2) Heavy Equipment Operators (11) General Services Lead Worker (2) General Services Worker (8)	Landfill Safety Coordinator (1) Fiscal Manager (1) Contracts & Accounts Representative (1) Accounting Specialist (1) Scalehouse Operators (5) Environmental Manager (1) Lead-Litter Control (1) Environmental Specialists (3) Equipment Operators (12) Recycling Coordinator (1) Landfill Manager (1) Lead Operators (3)	
Staffing Descriptions & Salaries				
Management (annual salary range)	Administrator (\$64,397 - \$108,160) Superintendent (\$48,006 - \$80,662) ES Supervisor (\$38,106 - \$59,238) Office Supervisor (\$34,570 - \$53,726)	Operations Manager (\$54,000) Landfill Supervisors (\$35,388 - \$35,967)	(\$61,296 - \$84,024)	
Administrative (annual salary range)	Customer Service Representative (\$26,894 - \$41,787)	Cashiers and Cashier Supervisor (\$23,914 - \$25,118)	(\$32,088 - \$49,968)	
Heavy Equipment Operators (annual salary range)	Equipment Operator Specialist (\$31,554 - \$49,088)	Heavy Equipment Operators (\$29,902 - \$34,391)	(\$32,784 - \$48,192)	
Laborers (annual salary range)	Senior ES Worker (\$26,894 - \$41,787) ES Worker (\$22,256 - \$34,590)	General Service Worker and Lead Worker (\$21,421 - \$28,676)	(\$23,496 - \$35,376)	
Maintenance (annual salary range)	Equipment maintenance contracted with Empire Machinery for maintenance and repairs up to 7,500 operation hours (3 years) on each piece of equipment. Empire Machinery performs fueling of heavy equipment.	Maintenance performed by Fleet Services Department	n/a	
Compliance (annual salary range)	Environmental Scientist (\$48,006 - \$80,662) CABOP Senior ES Worker (\$26,894 - \$41,787) CABOP ES Worker (\$22,256 - \$34,590)	Compliance performed by engineering division personnel	(\$32,784 - \$42,048)	
Engineering (annual salary range)	Engineering performed by engineering division personnel.	Engineering performed by engineering division personnel. Engineering support staff not included in landfill budget	n/a	

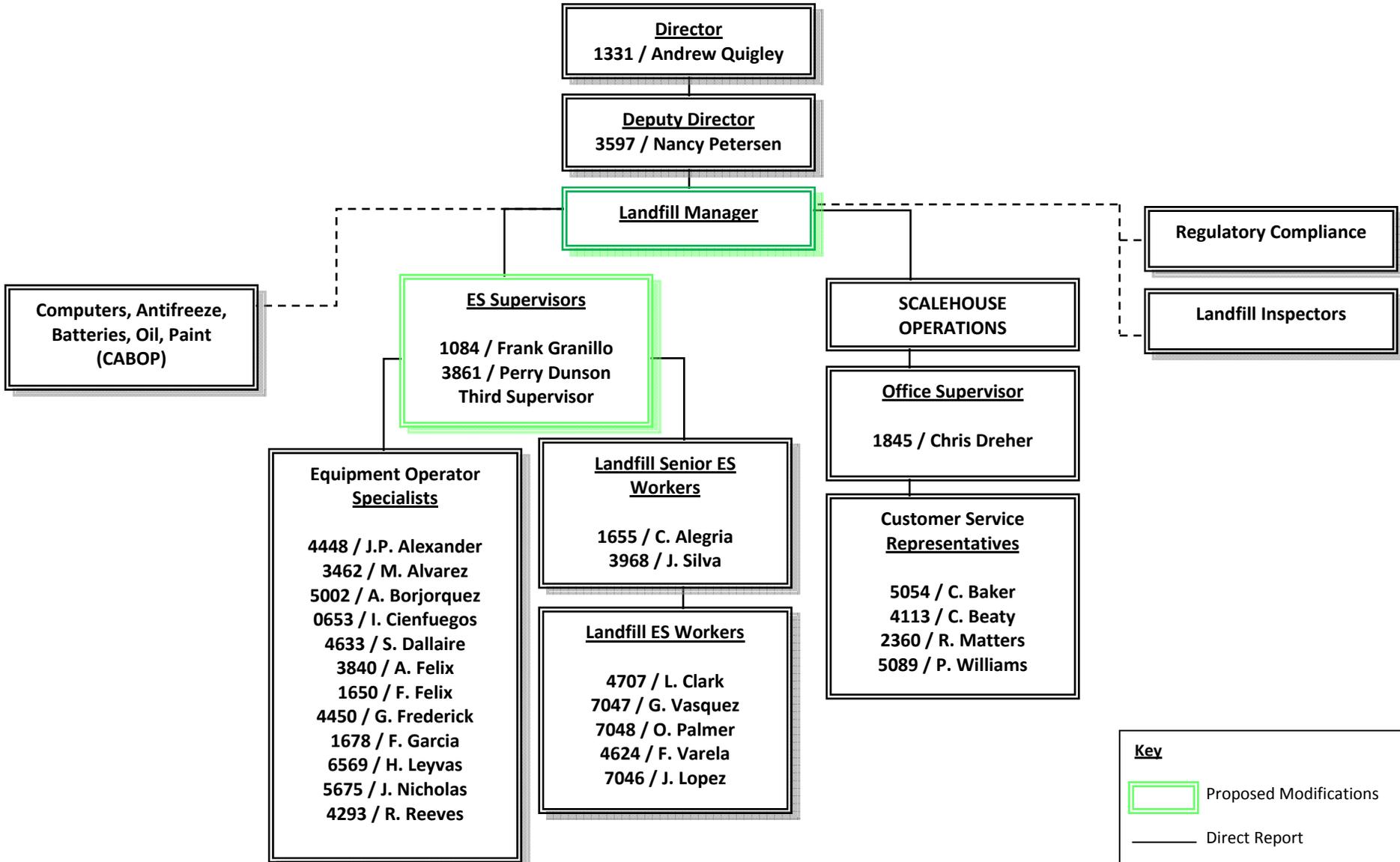
Landfill	Los Reales	Clint	Salt Lake Valley	Keifer (Sacramento)
Staggered Staff Shift Scheduling	Yes	Yes	Yes	
Equipment				
Own or Lease Equipment?	Leased equipment: CAT D10 Dozer, CAT 627G Scraper, CAT 836G Compactors (x2), CAT 966 front end loader, Chevy 1/2 ton silverados (x2) Remaining landfill equipment owned by the City of Tucson	Own	Own	
Dozer (total)	3	2	3	
Model (number of units)	2000 CAT D6R (1), 2008 CAT D9 (1), 2006, CAT D10 (1)	CAT 2001 D8 (1), Komatsu 2009 (1)	CAT D9	
Useful Life per unit	3 years (7,500 hrs)	n/a	10 years	
Total Capital Costs (Net Cost)	\$2,537,000 (\$1,766,000)	n/a	\$3,000,000	
Compactor (total)	2	4	3	
Model (number of units)	2008 836G Cat (2)	2008 CAT 836 (1), 2004 CAT 836C (1), 2002 CAT 836G (1), 2000 CAT 826 (1)	CAT 836	
Useful Life per unit	3 years (7,500 hrs)	n/a	10 years	
Total Capital Costs (Net Cost)	\$1,524,000 (\$924,000)	n/a	\$3,000,000	
Water Wagon (total)	2	3	3	
Model (number of units)	2003 613C CAT 5K (1), 2004 621G 8K (1)	2009 CAT 5,000 gal (1), 2003 CAT 613C (1), 1997 CAT 5,000 gal (1)	CAT	
Useful Life per unit	5 years	n/a	10 years	
Total Capital Costs (Net Cost)	\$992,657 (\$842,657)	n/a	\$2,000,000	
Front End Loader (total)	1	4 (1-track loader, 3-wheel loaders)	10	
Model (number of units)	2006 CAT 966 (1)	2009 Bobcat T320 (1), 2010 Volvo L70C (1), 2000 Volvo L60F (2)	John Deere and CAT	
Useful Life per unit	5	n/a	10 years	
Total Capital Costs (Net Cost)	\$241,292 (\$241,292)	n/a	\$2,500,000	
Articulated Truck (total)	1	1	n/a	
Model (number of units)	2006 Volvo A40D (1)	2005 Volvo A30D (2)	n/a	
Useful Life per unit	10	n/a	n/a	
Total Capital Costs (Net Cost)	\$423,846 (\$423,846)	n/a	n/a	
Grader (total)	1	2	1	
Model (number of units)	2008 14M CAT (1)	1987 CAT (1), 2000 Champion 710A (1)	John Deere	
Useful Life per unit	3 years (7,500 hrs)	n/a	10 years	
Total Capital Costs (Net Cost)	\$369,001 (\$204,001)	n/a	\$3,000,000	
Scraper (total)	1	2	3	
Model (number of units)	2008 CAT 627G Scraper	2000 CAT 623 (1), 2008 CAT 631G (1)	CAT (double engine)	
Useful Life per unit	3 years (7,500 hrs)	n/a	10 years	
Total Capital Costs (Net Cost)	\$714,997 (\$529,997)	n/a	\$3,000,000	
Pick up Truck (total)	2	6	12	
Model (number of units)	Chevy 1/2 Ton Silverado (2)	2008 Ford F-150 (2), 1999 Ford F-150 (1), 2008 Ford F-350 (1), 2009 Ford Ranger - 4x4 (1), 2002 Ford Ranger (1)	Ford 150	
Useful Life per unit	9-12 years	n/a	10 years	
Total Capital Costs	\$53,393	n/a	\$150,000	
Other Equipment	n/a	2005 John Deer excavator 330C LC 370C (1) 1995 International rear loader (1) 2001 Peterbuilt front loader (1) 2007 Econoline transport van (1)	n/a	
Who performs GW, LFG, Stormwater, Air Compliance Monitoring? Is it in-house or contracted?	Landfill staff performs the following regulatory compliance requirements: semi-annual NSPS reports (Title V), semi-annual compliance certification reports (Title V), annual emissions inventory, annual stormwater report, quarterly special waste report, quarterly tonnage fee report, annual subtitle D operating record report, annual financial assurance report, annual GASB18 report. Engineering and Technical Support Division prepares annual groundwater and remediation reports.	GW & LFG is performed by engineering personnel within the Environmental Services Dept (same Dept.). LF staff perform stormwater and air compliance monitoring. All is done in house.	Contracted	
Customer service procedures (Handled by LF staff or other department?)	Department customer service handles and scalehouse staff handle general questions about landfill disposal services. Landfill administration staff answer questions regarding	Handled by landfill staff: Supervisors, Operations Manager, and Cashier Supervisor. Accounts handled by Finance Division of Environmental Services.	Staff	
Does landfill handle special waste? If so, who performs administrative tasks?	Yes, landfill staff handles special waste administration tasks.	Yes, operations manager handles review and approvals.	Yes. Environmental Manager	

ATTACHMENT 4

PROPOSED LOS REALES LANDFILL ORGANIZATIONAL CHART



**Environmental Services Department
Los Reales Landfill
Proposed Landfill Organizational Chart (September 2011)**



Key

- Proposed Modifications
- Direct Report
- - - - - Shared Report

ATTACHMENT 5

JOB DESCRIPTION FOR NEW POSITION OF LANDFILL MANAGER

Job Description

LANDFILL MANAGER

Manage the day to day operation of a 1,500 tons per day (tpd) municipal solid waste (MSW) landfill in accordance with local, state, and federal environmental regulations.

ESSENTIAL FUNCTIONS:

- Ensures landfill operations are in compliance with local, state, and federal regulations, the Operating Plan, and ADEQ Permits.
- Oversee compliance of landfill leachate treatment and disposal system, landfill gas collection system, and recycling/collection facilities with local, state, and federal regulations.
- Oversee acquisition, operation, maintenance and repair of heavy equipment and regulate performance of maintenance contractor.
- Coordinate solid waste projects with engineering consultants in developing plans, specifications, reports, designs, and permits.
- Works closely with landfill supervisors to develop fill sequencing plans, identify areas for dumping solid waste, and oversees daily cell construction.
- Monitors equipment maintenance schedules and procedures to ensure that equipment is properly maintained.
- Perform post-closure inspections of landfill; coordinate remedial action as necessary to ensure compliance with state regulations.
- Interpret sampling/laboratory results of storm water, groundwater, and landfill gas data, ensuring compliance with state regulations.
- Performs or directs landfill related surveying, including continual surveying control if needed for cell construction and closure projects.
- Prepares fill sequencing plans and oversees translation and export to machine-mounted GPS system. Coordinate projects between engineering management and operations.
- Perform or oversee development and presentation of employee training programs and sessions.
- Develop, update and maintain landfill safety program.
- Develop opportunities for landfill facility to improve customer service through additional programs, types of waste accepted, methods of operations, etc.
- Communicate with department director/deputy director, customers, neighboring land owners, elected officials, and media as needed

Required Knowledge and Abilities

Knowledge:

- Requires bachelor's degree with major course work in Civil Engineering or related field and a minimum 5 years of experience in landfill construction and management, or an equivalent combination of education, training and experience.
- Holds Solid Waste of North America (SWANA) Manager of Landfill Operations (MOLO) certification and/or equivalent understanding of landfill operations.
- Principles and practices of supervision and training.
- Applicable sections of Arizona municipal codes related to solid waste landfills regulations.
- Thorough knowledge of maintenance requirements and capabilities of heavy earth moving equipment.
- City organization, operations, policies and objectives.
- Budget preparation and control.
- Oral and written communication skills.
- Considerable knowledge of road construction and excavation using heavy equipment.
- Familiarity with of recycling programs, procedures, and techniques as applied to landfills.
- Health and safety regulations.

Abilities:

- Work cooperatively with other City employees and the public.
- Apply and explain federal, state and local laws, rules and regulations.
- Plan, coordinate, direct and supervise the day-to-day operations and maintenance activities of landfill facilities.
- Direct the day to day activities of landfill employees.
- Select and train new employees.
- Train, supervise and evaluate the performance of assigned staff.
- Direct and review the work of the landfill operations.
- Prepare narrative and technical reports.
- Read and interpret landfill laboratory reports.
- Read and interpret relevant laws, regulations, ordinances, and policies.
- Communicate effectively, both orally and in writing.
- Thorough knowledge of state and federal regulations governing solid waste landfills.
- Maintain current knowledge of program rules, regulations, requirements and restrictions.
- Analyze situations accurately and adopt an effective course of action.
- Observe health and safety regulations.
- Observe legal and defensive driving practices.
- Work courteously and tactfully with customers and employees.