

# TRANSMITTAL

To:

**THE COUNCIL**

Date: 05/04/2016

From:

**THE MAYOR**

**TRANSMITTED FOR YOUR CONSIDERATION. PLEASE SEE ATTACHED.**



(Ana Guerrero)

**ERIC GARCETTI**  
Mayor

# CITY OF LOS ANGELES

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April 29, 2016

#1 BOS

Mayor Eric Garcetti  
Room No. 305  
City Hall  
Attn: Mandy Morales

Subject: END NEGOTIATIONS FOR A PARTNERSHIP AGREEMENT WITH THE CITY OF LONG BEACH AND THE SANITATION DISTRICTS OF LOS ANGELES COUNTY OF THE OWNERSHIP AND OPERATION OF THE SOUTHEAST RESOURCE RECOVERY FACILITY

As recommended in the accompanying report of the Director of the Bureau of Sanitation, which this Board has adopted, the Board of Public Works requests approval and forwarding to the City Council for approval and authorization for the Bureau of Sanitation to terminate negotiations for a partnership with the City of Long Beach and the Sanitation Districts of Los Angeles County (LACSD) for co-ownership and operation of the Southeast Resource Recovery Facility (SERRF) for the processing of Municipal Solid Waste for the City of Los Angeles.

### FISCAL IMPACT

Concluding contract negotiations does not require any funding and does not have any financial impact to the General Fund.

Respectfully submitted,

Fernando Campos, Executive Officer  
Board of Public Works

FC:mp

## DEPARTMENT OF PUBLIC WORKS

### BUREAU OF SANITATION

#### BOARD REPORT NO. 1

April 29, 2016

CD: 15 and ALL

## END OF NEGOTIATIONS FOR A PARTNERSHIP AGREEMENT WITH THE CITY OF LONG BEACH AND THE SANITATION DISTRICTS OF LOS ANGELES COUNTY OF THE OWNERSHIP AND OPERATION THE SOUTHEAST RESOURCE RECOVERY FACILITY FOR THE PROCESSING OF MUNICIPAL SOLID WASTE FOR THE CITY OF LOS ANGELES

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### RECOMMENDATIONS

Note and file this report from the Director of the Bureau of Sanitation (LASAN) terminating negotiations for a partnership with the City of Long Beach and Sanitation Districts of Los Angeles County (LACSD) for co-ownership and operation of the Southeast Resource Recovery Facility (SERRF).

### TRANSMITTALS

1. Copy of the adopted Board Report, dated August 22, 2014, requesting authority to negotiate with the City of Long Beach and the Sanitation Districts of Los Angeles County for a Partnership in the Ownership and Operation of the Southeast Resource Recovery Facility for Processing of Municipal Solid Waste for the City of Los Angeles.

### FINANCIAL IMPACT STATEMENT

Concluding contract negotiations does not require any funding and does not have any financial impact to the General Fund.

### DISCUSSION

#### **Project Background**

LASAN is responsible for collecting and processing residential curbside solid waste. For operational purposes, the City of Los Angeles (City) is divided into six wastesheds: East Valley, West Valley, South Los Angeles, North Central, West Los Angeles, and Harbor. The City utilizes a four-bin system to collect residential curbside solid waste from over 740,000 residences: green bin (green waste), blue bin (recyclables), brown bin (horse manure), and black bin (post-source separated municipal solid waste, MSW).

Over 2,700 tons per day (tpd) of green, brown, and blue bin materials collected by LASAN are recycled. Also, LASAN collects approximately 3,300 tpd of black bin material. Most of the MSW collected by LASAN is landfilled, with approximately 100 tpd delivered to SERRF in the City of Long Beach for electricity generation.

In 2006, the Los Angeles City Council, unanimously adopted the Recovering Energy, Natural Resources, and Economic Benefits from Waste for Los Angeles (RENEW LA) Plan to reduce and eventually eliminate the City's reliance on urban landfills, specifically Sunshine Canyon landfill. The Plan calls for maximizing reuse and recycling, and utilizing conversion technologies to convert the remaining trash that would otherwise be disposed of at landfills into clean electricity, alternative fuels, and other valuable resources. RENEW LA calls for the development of seven conversion technology facilities: one facility located in each of the six collection wastesheds, and a seventh facility located in the local southern California region.

In 2007, LASAN commenced the development of the Solid Waste Integrated Resources Plan (SWIRP), a stakeholder-driven process to move the City towards Zero Waste by 2025. One of the twelve guiding principles established by the stakeholders in 2008 called for investing in proven and safe alternative technologies that help accomplish the Zero Waste goals of SWIRP.

#### **LASAN's Alternative Technologies Project Development:**

On February 5, 2007, LASAN released a Request for Proposals (RFP) seeking one or more Development Partner(s) for both commercial facilities capable of processing 200 to 1,000 tpd of residual MSW, and emerging facilities capable of processing up to 200 tpd of residual MSW.

On August 22, 2007, LASAN received seven proposals under the commercial technology category from across the globe. Proposed technologies included mechanical, biological, and thermal technologies employing automated and manual sorting, anaerobic digestion, composting, advanced thermal recycling (second generation waste-to-energy technology), and gasification.

On May 25, 2011, the Board authorized LASAN to begin contract negotiations with the highest ranked proposer under the commercial technology category. The ranking of the commercial technology category proposals are provided in Table 1 below.

**Table 1- Commercial Technology Category Ranking**

<b>Proposer (Vendor)</b>	<b>Rank</b>
Green Conversion Systems (GCS)	1
Urbaser & Keppel Seghers	2
Wheelabrator Technologies Inc. (WTI)	3

In 2012, LASAN commenced contract negotiations with GCS. After nearly a year, the negotiations were not fruitful, in part due to the challenge of identifying a potential facility site. Siting was critical to identifying the cost associated with facility construction and operations, permitting, environmental clearance, distribution of power, air emissions credits, and other project specific factors.

**LASAN Authorized to Negotiate with SERRF:**

On August 22, 2014, the Board of Public Works, City Council, and Mayor authorized LASAN to discuss and negotiate for a partnership in the ownership and operation of the Southeast Resource Recovery Facility (SERRF), integrating GCS and its best available control technology (BACT) emissions control system into the proposed partnership, as appropriate. The City and GCS were under contract negotiations for the development of the first commercial alternative technology facility for the City. SERRF provided an excellent opportunity for the City to divert MSW from the local landfill, reduce greenhouse gas (GHG) and generate electricity.

SERRF is located on a 10-acre parcel in a highly industrial zone, and it is in close proximity to the City. SERRF is permitted by CalRecycle to operate as a waste-to-energy facility and is in full compliance with the South Coast Air Quality Management District's (SCAQMD's) air emissions requirement, and all other applicable federal, state, and local environmental regulations. SERRF also has a direct connection to the power distribution grid. These attributes were all favorable in further exploring a potential partnership with regards to SERRF.

**Background on Southeast Resource Recovery Facility (SERRF):**

SERRF is co-owned by the City of Long Beach and LACSD. It is located in a heavy industrial zone, at 120 Pier S. Avenue, Long Beach, CA 90802, near the City's boundary in Council District 15. The City of Long Beach is the majority and operating owner with 61.5% ownership, and Sanitation Districts of Los Angeles County owns 38.5%. The governance of the partnership is via a Joint Power Agreement (JPA) with a Board of Directors. The facility began operations in the late 1980 to harvest power from solid waste. SERRF currently operates at 1,300 tpd of solid waste and generates 36 megawatts, providing electricity for approximately 35,000 City of Long Beach residents. SERRF is permitted for a daily throughput of 2,220 tons of solid waste. Solid waste is received for thermal processing in high temperature furnaces to generate super-heated-steam to propel a generator for the production of electricity and recoverable ash.

The electricity generated meets the electricity demand of the SERRF facility, and the ash is recycled as road base material. The flue gas is discharged through a 265-foot tri-flue stack where emissions are continuously monitored. In addition, at the back-end of the process, approximately 825 tons of metal are recovered and recycled monthly.

Approximately 100 tpd of City collected MSW from the Harbor wasteshed has been delivered to SERRF, which would otherwise be trans-loaded and transported across the City to Sunshine Canyon Landfill. SERRF and the City do not have a contract since SERRF operates on a first come, first service basis.

**SERRF Challenges:**

SERRF in the near term may face a shortfall of revenue to pay for all of its rising operating costs. The revenue shortfall is attributed to the ending of the Power Purchase Agreement (PPA) with Southern California Edison (SCE) in December 2018. In addition, there is a potential escalation of operational costs, mainly due to the need to purchase emission credits as mandated under AB32, increased cost for equipment maintenance and upgrades, and competing lower costs for MSW tonnages being disposed at landfills compared to the rates charged by SERRF. It is likely that SERRF will need to increase its gate fees by 2018 in order to generate enough revenue to cover its operating cost while also needing to secure a steady stream of MSW to continue normal operations.

**Benefits of a Partnership of City of Los Angeles, City of Long Beach, and LACSD:**

The Partnership amongst the three agencies could foster an opportunity for modernization of SERRF by implementing the latest, most-advanced BACT in future equipment replacement cycles to achieve greater air emission reductions. For the City, diverting MSW from landfill disposal to SERRF for electricity and other resources recovery also aligns with the City's sustainability goals. Co-partnership of SERRF also offered a more cost-effective strategy than construction of an entirely new Alternative Technology facility. The capital cost of SERRF was estimated at \$108 million (1980 dollars), which included SCAQMD required air emissions control. The capital cost to develop a new Advanced Thermal Recycling facility with the most-advanced BACT equipment; is estimated in the range of \$250 to \$400 million (2015 dollars).

**Negotiation Meetings of SERRF's Partnership:**

During a period of four (4) months, the City of Los Angeles, City of Long Beach and LACSD participated in three (3) negotiation meetings to discuss the roles of each agency in the event the City of Los Angeles would become co-owner of SERRF. The meetings focused on addressing the challenges SERRF faced in the short and long term recognizing its continued operation beyond 2018.

The City of Los Angeles indicated that as a co-owner, the City could provide support and assistance in: 1) modernization of SERRF by implementing the latest, most-advanced BACT in future equipment replacement cycles, to achieve greater air emission reductions; 2) securing steady MSW tonnages for processing at SERRF for electricity and other resources recovery in alignment with the City's sustainability goals, and diverting MSW from landfilling; 3) assisting in securing a long term contract for the Power Purchase Agreement for the electricity generated at SERRF, 4) assisting with legislation on renewable energy and diversion credit; and 5) assisting in compliance with the AB 32 Cap-and-Trade Program regarding air emission credits.

On November 17, 2014, the first negotiation meeting was held with representatives from each of the three agencies. The City of Long Beach and LACSD discussed the financial challenge after the PPA with SCE expires in 2018, since approximately 50 percent of SERRF's revenue is achieved from the sale of electricity. Also, purchase of air emissions credits for compliance with AB 32's Cap-and-Trade program and future equipment retrofits will have additional financial impacts on SERRF's gate rates. SERRF's future gate rates might be too costly to compete with landfill gate rates. It was mentioned by the potential partners that the City of Los Angeles contribution to the partnership might include securing a long-term contract for MSW supply to SERRF, and assisting with contract negotiations with the City's Department of Water and Power for a long term Power Purchase Agreement. It was agreed by the three agencies to meet within a month to take a tentative position on the issues discussed.

On December 17, 2014, the second meeting took place with representatives from the three agencies. The City of Los Angeles discussed the integration of GCS and its most advanced BACT emissions control system in the proposed partnership as appropriate. The City proposed the preparation of a feasibility report on SERRF to determine the short and long-term infrastructure and equipment upgrades with associated cost estimates. The City proposed to partially cover the cost of the report. It was also mentioned that Covanta, SERRF's operator, has been retained for more than a decade, and their existing contract will expire in 2018. However, the City of Long Beach and LACSD indicated that Covanta's operating contract is being extended for an additional five years. Covanta's responsibilities include determining the schedule for equipment replacement, upgrades, facility maintenance, and operations. Furthermore, the City of Long Beach and LACSD indicated that a Request for Proposal (RFP) will be required in order to select an operator for SERRF, as part of incorporating GCS' proprietary equipment. Covanta's lack of experience operating GCS' equipment might pose a level of risk and liability to SERRF operations. Since it has been anticipated that adding GCS proprietary equipment to an existing operating SERRF would be challenging, LASAN proposed to the City of Long Beach and LACSD to integrate GCS as a potential technical sub-consultant to assist with the development of the feasibility report and future technical support as the SERRF partnership developed.

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On February 27, 2015, the third meeting took place with representatives from each of the three agencies. LASAN reported that GCS had decided not to participate in the partnership as a sub-consultant. City of Long Beach and LASCD reiterated LASAN's contribution to the partnership with a commitment of MSW tonnages at a gate rate that would allow SERRF to continue operating for the short and long-term, and a capital investment for the next 25 years for future upgrades. Also, it was discussed that after 2018 SERRF's PPA expires, the unknown future of electricity prices might impact SERRF's gate rate. Furthermore, new legislation had been introduced to exclude Waste to Energy facilities (WTEs) from qualifying for renewable energy credits that will further impact the future gate rates. There were also some concerns that WTE facilities might lose landfill diversion credit (10%) that will discourage customers from disposing at SERRF, impacting SERRF gate rates. The meeting concluded with the parties acknowledging the financial, environmental, and legislation challenges that SERRF faced.

It should be noted that on October 2015 the Governor signed Senate Bill 350 (SB-350): "Clean Energy and Pollution Reduction Act 2015", which excluded WTE facilities from qualifying for renewable energy credits for produced electricity. As a result, any future PPA for electricity produced by SERRF will be priced as "brown energy" and thus likely impact the SERRF gate rates, which are already higher than landfilling of MSW.

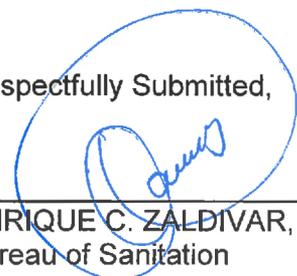
**Recommendation:**

LASAN recommends concluding negotiations for a partnership until SERRF secures a PPA to better understand the costs to continue operating SERRF for the short and long-terms. To become a partner in SERRF the City must consider the following: commitment of City MSW tonnages dedicated to SERRF at a negotiable gate rate, a capital investment for the next 25 years, and a purchase the power at a premium rate or assist to secure a PPA with the Department of Water and Power. The above terms will definitely have a financial impact to the City that cannot be speculated at this point.

**FUTURE ACTION**

No further action required.

Respectfully Submitted,



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ENRIQUE C. ZALDIVAR, Director  
Bureau of Sanitation

Prepared by:  
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DEPARTMENT OF PUBLIC WORKS

BUREAU OF SANITATION  
BOARD REPORT NO. 1

August 22, 2014

CD: CD 15 and ALL

AUTHORITY TO NEGOTIATE AN AGREEMENT WITH THE CITY OF LONG BEACH AND THE SANITATION DISTRICTS OF LOS ANGELES COUNTY FOR A PARTNERSHIP IN THE OWNERSHIP AND OPERATION OF THE SOUTHEAST RESOURCE RECOVERY FACILITY (SERRF) FOR THE PROCESSING OF MUNICIPAL SOLID WASTE FOR THE CITY OF LOS ANGELES

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RECOMMENDATIONS

Upon Board, Mayor, and City Council approval, authorize the Director of the Bureau of Sanitation (LASAN) to:

1. Pursue negotiations for a partnership with the City of Long Beach and Sanitation Districts of Los Angeles County (LACSD) for co-ownership and operation of SERRF.
2. Integrate Green Conversion Systems Inc. (GCS) and its best available control technology (BACT) emissions control system in the proposed partnership as appropriate. The City and GCS are currently under contract negotiations for the development of the first commercial alternative technology facility for the City.
3. Return to the Board, City Council, and Mayor within six months with update on the status of the negotiations.

TRANSMITTALS

1. Copy of the Board Report dated May 20, 2011, from Bureau of Sanitation requesting authority to negotiate a contract with Green Conversion Systems (GCS) for a commercial technology category facility for the processing of municipal solid waste utilizing Alternative Technologies premised on resource recovery for the City of Los Angeles.
2. Copy of the adopted Board Report, dated May 7, 2010, requesting authority to request the Best and Final offers from the three (3) short-listed proposers deemed viable under the Alternative Technology commercial scale category for processing municipal solid waste utilizing Alternative Technologies premised on resource recovery for the City.
3. Copy of the adopted Board Report, dated June 1, 2009, requesting authority to negotiate with the short-listed proposers for Development Partner(s) for processing municipal solid waste utilizing Alternative Technologies premised on resource recovery for the City.

## FINANCIAL IMPACT STATEMENT

Conducting contract negotiations does not require any funding and does not have any financial impact to the General Fund.

## DISCUSSION

### **Project Background**

LASAN is responsible for collecting and processing residential curbside solid waste. For operational purposes, the City is divided into six wastesheds: East Valley, West Valley, South Los Angeles, North Central, West Los Angeles, and Harbor. The City utilizes a four-bin system to collect residential curbside solid waste from over 740,000 residences: green bin (green waste), blue bin (recyclables), brown bin (horse manure), and black bin (post-source separated municipal solid waste, MSW).

Over 2,700 tons per day (tpd) of green, brown, and blue bin materials collected by LASAN are recycled. Also, LASAN collects approximately 3,300 tpd of black bin material. Most of the residual MSW collected by LASAN is landfilled, with approximately 100 tpd delivered to the Southeast Resource Recovery Facility (SERRF) in the City of Long Beach for power generation.

To reduce and eventually eliminate the City's reliance on urban landfills, specifically Sunshine Canyon landfill, the Los Angeles City Council, under the leadership of Council President Eric Garcetti, unanimously adopted the Recovering Energy, Natural Resources, and Economic Benefits from Waste for Los Angeles (RENEW LA) Plan authored by Councilmember Greig Smith. The Plan calls for maximizing recycling and reuse and converting the remaining trash that would otherwise be disposed of at landfills into clean electricity, alternative fuels, and other valuable resources. RENEW LA calls for the establishment of seven conversion technology facilities; one facility located in each of the six wastesheds, and a seventh facility located in the local southern California region.

Additionally, LASAN commenced the Solid Waste Integrated Resources Plan (SWIRP) in 2007, a stakeholder driven process to move the City towards zero waste by 2025. One of the twelve guiding principles established by the stakeholders in 2008 called for investing in new, proven and safe alternative technologies that help accomplish the zero waste goals of SWIRP.

On February 5, 2007, LASAN released a Request for Proposals (RFP) seeking one or more Development Partner(s) for both commercial facilities capable of processing 200 to 1,000 tpd of residual MSW, and emerging facilities capable of processing up to 200 tpd of residual MSW.

On August 22, 2007, LASAN received seven proposals under the commercial technology category from across the globe. Proposed technologies included mechanical, biological, and thermal technologies employing automated and manual sorting, anaerobic digestion, composting, advanced thermal recycling (second generation waste-to-energy technology), and gasification. The Evaluation Panel was comprised of experts from academia, industry, technical consultants, and City staff.

In the summer of 2008, a City delegation including Councilmember Greig Smith (CD 12); Council Deputies from CD 6, CD 11 and CD 12, Mayor's Office staff, LASAN staff and consultant staff from HDR Engineering Inc. (HDR) visited several reference facilities in Europe, Japan, Israel, Canada, and the United States, to evaluate and determine the applicability of available technologies to the City's black bin waste stream.

On June 1, 2009, the Board deemed one of the seven commercial technology proposers that failed the Good Faith Effort (GFE) to be non-responsive (Transmittal #3). The Board also authorized LASAN to continue with further evaluation concerning the financial impacts to the short-listed proposals in light of the Permit Moratorium by the South Coast Air Quality Management District (SCAQMD), and the current global financial and credit crisis, including a reassessment of the impacts on the proposed service fee.

On May 7, 2010, the Board approved the LASAN's recommendations to request the Best and Final Offer (BAFO) Proposals as well as the cost associated with the addition of an upfront pre-processing system to maximize recovery of recyclables including the impact to the service fee and overall output production from three (3) out of the four (4) short-listed proposers under the commercial technology category, namely, GCS, Urbaser & Keppel Seghers, and WTI (Transmittal #2).

On February 17, 2011 and March 11, 2011, HDR and the Evaluation Panel reconvened to evaluate the BAFO responses from the three (3) short-listed commercial proposals. The Evaluation Panel proceeded with the scoring and ranking of the proposals. The Evaluation Panel decided to only score and rank the BAFO responses that provided the highest diversion, best financial options for the City, and a maximum facility throughput of 1,000 (tpd) as specified, under the commercial category of the RFP. The individual Evaluation Panel scores for each proposal were used to determine the final score and ranking order (Transmittal #1).

On May 25, 2011, the Board authorized LASAN to begin contract negotiations with the highest ranked proposer under the commercial technology category. The ranking of the commercial technology category proposals are provided in the table below.

**Table - Commercial Technology Category Ranking**

<b>Proposer (Vendor)</b>	<b>Rank</b>
Green Conversion Systems (GCS)	1
Urbaser & Keppel Seghers	2
Wheelabrator Technologies Inc. (WTI)	3

**Green Conversion Systems (GCS)**

Green Conversion Systems proposed to process 1,100 tons per day (tpd) of post-source separated municipal solid waste (MSW) through an upfront pre-processing system and a back-end Advanced Thermal Recycling (ATR) system.

ATR is a second generation advancement of waste-to-energy technology in which MSW is converted in an oxygen-rich environment, to a hot exhaust gas composed primarily of carbon dioxide and water vapor leaving only inorganic material to be converted to bottom ash and fly ash, which can be beneficially used. The hot exhaust gas can then be used to generate heat or steam to produce electricity. ATR proposed by GCS is equipped with advanced air pollution control technologies and consists of a combination of Selective Non-Catalytic Reduction (SNCR) and Selective Catalytic Reduction (SCR) units, wet scrubbers, baghouses, and activated carbon injection to mitigate air emissions. In addition, it had the lowest guaranteed nitrogen oxides (NOx) emissions at 5 parts per million by volume (ppmv). Low levels of nitrogen oxides (NOx) emissions have been achieved at two facilities located in Sweden, one in Halmstad and the other in Uddevalla. Particulate matter (PM10) and volatile organic compounds (VOCs); emissions are 1.5 tons per year (tpy), and 2.1 tpy, respectively. GCS technology would achieve a greenhouse gas (GHG) emissions reduction of 145,348 metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>) annually as compared to landfill disposal, based on the U.S. EPA Waste Reduction Model (WARM). The GHG reduction is equivalent to removing approximately 28,500 vehicles from the road per year. ATR is commonly applied in Europe, and for more than three decades, has been used to produce energy from MSW. This technology is supported by European environmental groups as it provides better means to handle the non-recyclable waste than landfilling.

#### **LASAN Development of Commercial Alternative Technology Update:**

The City has a goal to achieve zero waste by 2025 through implementation of various policies, programs and infrastructure development. This goal follows the EPA's Waste Management Hierarchy of achieving between 80-85% diversion from landfill through producer responsibility, source reduction, and reuse, followed by recycling and composting, with the remaining 15-20% to be processed through alternative technology, and only the residual waste from alternative technology going to landfill.

Since 2012, LASAN and GCS have been in contract negotiations. The negotiations are progressing slowly due to multiple contract terms that must be agreed upon requiring a series of in-person meetings, conference calls, and term-sheet reviews. Negotiations currently are hinging on identifying a potential facility site so that cost associated with facility construction and operations, permitting, environmental clearance, distribution of power, air emissions credits, and other factors can all be addressed.

#### **Background on Southeast Resource Recovery Facility (SERRF):**

SERRF is co-owned by the City of Long Beach and LACSD and is located in a heavy industrial zone in the Long Beach harbor. The City of Long Beach is the majority and operating owner with 61.5% ownership and Sanitation Districts of Los Angeles County owns 38.5%. The governance of the partnership is via a joint power agreement (JPA) with a Board of Directors. The facility began operations in the late 1980 to harvest power from solid waste. SERRF currently operates at 1,300 tpd of solid waste and generates 36 megawatts, providing electricity for approximately 35,000 Long Beach residents. SERRF is permitted for a daily throughput of 2,220 tons of solid waste. Solid waste is received for thermal processing in high temperature furnaces to generate super-heated-steam to propel generator for the production of energy and recoverable solids. The energy generated from steam produces enough electrical power to

operate the SERRF facility, and ash being an end-product of the process is recycled as road base material. SERRF is equipped with the best available control technology (BACT) to eliminate potentially harmful particulates that are generated during the thermal process and the boilers were designed to minimize the formation of trace toxic air contaminants. SERRF uses ammonia to control nitrogen oxides, lime slurry to control sulfur oxides and acid gases, and a multi-chamber fabric filter baghouse for removal of particulate matter. The flue gas is finally ready to exit the baghouse, is discharged through a 265-foot tri-flue stack where emissions are monitored by a combination of continuous monitors and periodic stack sampling. In addition, SERRF performs "front-end" and "back-end" recycling by recovering white goods and other materials prior to combustion and collection metals removed from the boilers after combustion. Each month, an average 825 tons of metal are recycled rather than being sent to a landfill.

The City has been using SERRF to process approximately 100 tpd of the City's MSW from the Harbor wasteshed, which would otherwise be trans-loaded and transported across the City to Sunshine landfill. SERRF and the City do not have long-term contract since SERRF operates on a first come first service basis. SERRF is located in the City of Long Beach at 120 Pier S. Avenue, Long Beach, CA 90802, near the City's boundary in Council District 15.

#### **SERRF Challenges:**

SERRF in the near term could face shortfall of revenue to pay for all of its rising operating costs. The revenue shortfall is attributed to the ending of the power purchase agreement with Southern California Edison (SCE) in 2017. The potential rising of operational cost is mainly due to the need to purchase emissions credit under AB32, future cost for equipment maintenance and upgrades and MSW tonnages being disposed at landfills for having lower tipping fees than the rates charged by SERRF. It is estimated that SERRF by 2017 will need to increase its gate fees in order to generate enough revenue to cover its operating cost while securing a waste stream of MSW to continue normal operations.

#### **Benefits of a Partnership of City of Los Angeles, LACSD, and City of Long Beach:**

SERRF with its permitted daily capacity does provide a unique opportunity for the City of Los Angeles in the development of the City's Alternative Technologies Program. Located on a 10-acre parcel in a highly industrial zone, SERRF is at a close proximity to the City of Los Angeles. Permitted by CalRecycle to operate as a waste-to-energy facility, SERRF is in full compliance with the South Coast Air Quality Management District's air emission requirements, and all other applicable federal, state, and local environmental regulations. SERRF also has direct connection to the power distribution grid. These attributes facilitate the City's implementation of an Alternative Technology Facility proposed by GCS.

The opportunity for three agencies to foster a partnership will enable the modernization of SERRF by implementing the latest, most-advanced BACT in future equipment replacement cycles to achieve greater air emission reductions. Diverting MSW from landfill disposal to SERRF for energy and other resources recovery also aligns with the City's sustainability goals. Co-partnership of SERRF also offers a more cost-effective strategy than construction of an entirely new Alternative Technology facility. The capital cost of SERRF was \$108 million (1980 dollars), which included AQMD required air control emissions. The capital cost to develop a new Advanced Thermal Recycling facility with the most-advanced BACT equipment, it is estimated in the range of \$250 to \$400 million.

**Air Emission Reduction Benefits:**

Currently, LASAN delivers approximately 100 tpd of MSW from its Harbor collection district to SERRF. As part of the partnership agreements, LASAN will increase its MSW tonnage delivered to SERRF to 1,100 tpd. This MSW tonnage will be collected from the South Los Angeles watershed and delivered to the Central Los Angeles Recycling and Transfer Station (C.L.A.R.T.) located at 2201 E. Washington Blvd., Los Angeles, CA 90021. At C.L.A.R.T.S., the MSW will be transloaded into transfer trucks and taken to SERRF for energy and other resources recovery instead to Sunshine Canyon Landfill for disposal. The relatively shorter transport distance from C.L.A.R.T.S. to SERRF as compared to from C.L.A.R.T.S. to Sunshine Canyon Landfill result in the potential air emission reduction benefits as shown below:

- Emission reduction benefit NOx: 4,100 lbs/year
- Emission reduction benefit SOx: 10 lbs/year
- Emission reduction benefit Reactive Organic Gases (ROG): 140 lbs/year
- Emission reduction benefit PM10: 90 lbs/year
- Emission reduction benefit CO<sub>2</sub>: 320 MTCO<sub>2</sub>/year

**Greenhouse Gas Emission Reduction Benefits:**

Increase the tonnage of MSW sent to SERRF for energy and other resources recovery will also help reduce greenhouse gas emissions as compared to landfilling of the material. Several published greenhouse gas emission studies have found that diverting solid waste to waste-to-energy (WTE) facilities resulted in net avoided methane emissions as compared to landfilling. The greenhouse gas emission reductions were due mainly to:

- Portion of the electricity generated by WTE facilities derived from biogenic materials offsets the electricity that would otherwise be produced by combustion of fossil fuels such as coal or natural gas.
- Recovery of ferrous and other metals from WTE facilities for recycling reduces the energy needed to mine and process virgin materials for metals.
- Diversion of MSW with organics to WTE facilities for energy recovery eliminates methane emissions that would occur if the materials are landfilled.

The California Air Resources Board (ARB) staff has estimated that the average net avoided greenhouse gas emissions were in the range of -0.19 to -0.48 MTCO<sub>2</sub>e per short ton of waste processed at the Long Beach SERRF facility instead of being landfilled (CalRecycle, (September 2013), Municipal Solid Waste Thermal Technologies, available at: <http://www.calrecycle.ca.gov/Actions/Documents/77/20132013/935/MSW%20Thermal%20Technologies%20FINAL.pdf>). Published Life-Cycle Analysis studies conducted by US EPA also support the ARB's findings (Kaplan, P. O.; Decarolis, J.; Thorneloe, S. Is It Better To Burn or Bury Waste for Clean Electricity Generation? *Environ. Sci. Technol.* **2009**, 43 (6), 1711-1717).

### **Emerging Technologies in the City Los Angeles**

LASAN stands committed to shaping the future of emerging technologies in Los Angeles as an alternative to landfill disposal. In a separate front the City continues to pursue emerging technologies such as Anaerobic Digestion (AD) and Gasification under a pilot scale category for the development and maturing of emerging technologies to secure the best future technologies for the City's management of solid waste. LASAN has found that Urbaser Inc. (Urbaser) unique and innovative combinations emerging technologies can process the City's MSW for resource recovery through the application of several combinations of unit process train technologies of upfront pre-processing, AD, composting, and gasification.

Urbaser's emerging technologies is intended to process the organic and non-organic MSW fractions separately to maximize the beneficial use of each. Urbaser application of an anaerobic digestion process for the organic content in MSW (e.g., food discards, soiled and non-recyclable paper, etc.) produces biogas and compost. Likewise, a gasification treatment process applied to carbon-based materials produces synthesis gas (syngas), renewable energy and a more inert vitrified ash product.

Anaerobic Digestion is a biological treatment process in which biodegradable organic content in MSW (e.g., food discards, soiled and non-recyclable paper, etc.) is converted (in an environment absent of oxygen) into biogas consisting mainly of methane and carbon dioxide. The biogas is a renewable energy source that can be used to generate electricity, heat, or converted into an alternative transportation fuel. In addition to biogas, digestate (a processed stream residue) comprised of inorganics, non-degradable organics, etc. is a by-product of the AD process and has the potential to be marketed as compost. Following dehydration, digestate is subjected to an aerobic process to produce compost through a combination of windrow and aerobic static pile conditioning methods.

Gasification is a thermal treatment process in which carbon-based materials are converted, in an environment with limited oxygen, to synthesis gas (syngas) that is composed primarily of hydrogen and carbon monoxide. The syngas can be used to produce electricity or instead be converted into a renewable fuel. The inorganic materials remaining are converted to bottom ash or a vitrified glassy inert material reserved for beneficial use.

LASAN and Urbaser are in negotiations for the development of a pilot scale project that will include AD and Gasification processing units. In a stand-alone report LASAN will provide the status on the ongoing negotiations.

**Sustainability:**

This new business venture for three agencies provides a great opportunity for the City and the region to further its sustainability goals. Increased diversion of MSW to SERRF will lessen the City's reliance on urban landfilling and reduce the City's carbon footprint, including methane generated from anaerobic decomposition of organics in landfills and carbon dioxide emission due to transport of MSW. In addition, the City will be able to tap directly into this valuable resource for electricity production and thus lessen our dependence on fossil fuels.

**City Attorney Review**

The Board Report has been reviewed as to form by the Office of the City Attorney.

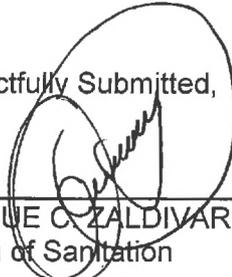
**STATUS OF FINANCING**

Funding will not be necessary for the contract negotiations as there is no transfer of funds from the City at this juncture.

**FUTURE ACTION**

LASAN will return to the Board, City Council, and Mayor with the results of the contract negotiations with LACSD and the City of Long Beach and recommendations for future action.

Respectfully Submitted,



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