



# COUNTY OF LOS ANGELES

## DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

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October 20, 2011

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TO: Each Supervisor  
FROM: Gail Farber *Gail Farber*  
Director of Public Works

### BOARD MOTION OF APRIL 20, 2010, ITEM NO. 44 CONVERSION TECHNOLOGIES IN LOS ANGELES COUNTY SIX MONTH STATUS UPDATE: APRIL 2011 THROUGH OCTOBER 2011 UPDATE

On April 20, 2010, your Board unanimously approved three Memorandums of Understanding for three conversion technology demonstration projects and awarded a contract for consultant services for Phase III and Phase IV of the Southern California Conversion Technology Demonstration Project for the purpose of developing solid waste alternatives to landfills within the County of Los Angeles.

At that time, your Board also instructed the Director of Public Works, in coordination with appropriate stakeholders, to assess the feasibility of developing a conversion technology facility at one or more County landfills; to identify other potentially suitable sites within Los Angeles County; and to report back to the Board within six months. In October 2010, Public Works submitted a preliminary siting assessment in response to this request, and committed to providing your Board with a status report on our efforts every six months.

The attached Status Report summarizes the efforts Public Works has undertaken to advance conversion technology development during the period of April 2011 through October 2011. Highlights from the last six months include:

- Significant progress in one of the three approved demonstration projects located in Perris, California - This project is now well into the permitting process. Construction of the 150 ton per day facility in Perris is anticipated to start early next year, with operation beginning by 2013. This will be the first conversion technology facility using anaerobic digestion for conversion of municipal solid waste in California.
- Continued Site Evaluations - In addition to the 23 sites highlighted in our previous update, we identified an additional site in the County of Los Angeles.

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- Technology Evaluation - Our request for expressions of interest from conversion technology companies was very successful. We received 35 responses submitted from a variety of technology developers from around the world.
- Economic Modeling - We have developed several detailed economic models that will allow us to evaluate the economic viability of several potential projects utilizing different technologies at different scales. This will accelerate technology selection and the development of viable projects in the County.
- Increasing awareness and acceptance of Conversion Technologies - Our outreach and education efforts to key stakeholders, including Governor Brown's Administration, CalRecycle, the California Energy Commission, and various environmental groups, has been well received.

Public Works will continue to work with interested stakeholders to identify potential project locations within the County, evaluate the viability of new conversion technologies, and provide technical assistance to project developers. Our next status report will be submitted to your Board by April 20, 2012.

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Attach.

cc: Chief Executive Office  
County Counsel  
Los Angeles County Integrated Waste Management Task Force  
Department of Public Health  
Department of Regional Planning  
Regional Planning Commission  
Sanitation Districts of Los Angeles County

**BOARD MOTION OF APRIL 20, 2010, ITEM 44  
CONVERSION TECHNOLOGIES IN LOS ANGELES COUNTY  
SIX MONTH STATUS UPDATE: APRIL 2011 THROUGH OCTOBER 2011 UPDATE**

## **1 Introduction**

On April 20, 2010, the Los Angeles County Board of Supervisors (Board) unanimously approved three Memorandums of Understanding (MOU) for three conversion technology demonstration projects and awarded a contract for consultant services for Phase III and Phase IV of the Southern California Conversion Technology Demonstration Project for the purpose of developing solid waste alternatives to landfills within the County of Los Angeles. At that time, your Board also instructed the Director of Public Works, in coordination with appropriate stakeholders, to assess the feasibility of developing a conversion technology facility at one or more County landfills, and to identify other potentially suitable sites within the County of Los Angeles, reporting back to your Board in six months with Public Works' findings.

Since that time, to keep the Board regularly informed on these developments, Public Works committed to providing a status report every six months. This status report provides a summary of key accomplishments during the period of April 20, 2011, through October 20, 2011, in facilitating the Phase III demonstration projects and advancing the development of conversion technology projects within the County through Phase IV.

## **2 Phase III Demonstration Projects**

The purpose of the County's involvement in three Phase III projects is to obtain operating and emissions data that can be used for future educational purposes and to help create a permitting pathway for future commercial development in Los Angeles County. Each project represents a different solid waste conversion technology, including thermal gasification and anaerobic digestion systems. These facilities will be privately financed, owned, and operated.

### **2.1 CR&R, Inc.**

CR&R, Inc., a local solid waste management company, is developing a 150 ton per day anaerobic digestion project at its material recovery facility (MRF) and transfer station (TS) in Perris, CA. This project is now well into the permitting process. The City of Perris issued the CEQA document for comment at the end of September. A public hearing before the City of Perris Planning Commission is scheduled for November 16, 2011, for certification of a mitigated negative declaration and for a proposed major modification to the existing conditional use permit. This is a landmark event, as it is expected to be the very first municipal solid waste (MSW) anaerobic digestion conversion technology project developed in California. On a parallel track, CR&R, Inc., is working with the Local Enforcement Agency for a solid waste facility permit modification and with the South Coast Air Quality Management District. CR&R, Inc., anticipates all entitlements will be obtained by November 2011. The facility is expected to be in construction in 2012 and in operation in 2013.

Since the April 2011 status update to your Board, CR&R, Inc., has informed the County of their decision to pursue the project with a different anaerobic digestion technology vendor than the one that was originally specified in the MOU with the County.

This decision does not change the scope or schedule of CR&R's, Inc., proposed project. Public Works is currently conducting an analysis of the proposed technology to determine if it meets the minimum criteria established during the Phase II technology evaluation. If the technology meets the criteria, Public Works will return to your Board for approval of a revised MOU, so that the County can continue in a facilitation role for this project.

## ***2.2 Rainbow Disposal Company, Inc***

As proposed in the MOU, Rainbow Disposal will build a 360 ton per day gasification facility at their MRF/TS in Huntington Beach. In order to enhance the financial viability of this project, Rainbow is currently considering additional technology options. If it is determined that another technology, other than the one listed in the MOU, would make this project more economically feasible, Public Works will take the appropriate steps to analyze the technology and submit a MOU revision request to your Board.

## ***2.3 International Environmental Solutions (IES)***

As outlined in IES's MOU with the County, the proposed pyrolysis facility would be designed with an initial capacity of 184 tons per day of post-recycled MSW, which could be expanded in the future, and would be located at the Robert A. Nelson MRF and TS (RAN) in Riverside County. Prior to building this facility, IES planned to conduct an initial testing period with their pyrolysis system at their company location in Menifee, CA. This testing phase has not been completed because the system was relocated and leased to a private developer in Mecca, California shortly after IES entered into the MOU.

On June 28, 2011, Public Works prepared a summary of options for conducting a Testing Phase to accomplish the objectives envisioned in IES' offer and MOU. Further consideration of these options would require input from Burrtec and Riverside County, including cooperative development of an implementation plan that addresses logistical aspects and scheduling. Public Works has had preliminary discussions with Riverside County and is awaiting final comment from Burrtec and Riverside County. Preliminary indications, however, are that the logistics of a project at RAN may no longer be viable. Public Works is working with IES to identify other interested sites in the County of Los Angeles for this project. Discussions are ongoing.

## **3 Phase IV Commercial Projects**

### ***3.1 Technology Evaluation***

On June 22, 2011, Public Works released two Requests for Expressions of Interest (RFEI) to technology vendors and potential project financial partners. The RFEIs were widely distributed and responded to favorably. Companies that meet the County's list of

minimum criteria will be included in a County database that will be used by Public Works and will be made available to public and private project developers, specifically those who have expressed interest in developing a project and submitted a site to Public Works for evaluation.

A similar evaluation process was completed by Public Works in 2007; however, the marketplace of technologies has expanded and advanced since that time warranting additional review.

### ***3.1.1 Technology RFEI***

The objective of the technology RFEI was to solicit information on conversion technologies that are available for development in the U.S. market and would be available for application for one or more projects in the County of Los Angeles. The sole interest of the RFEI is for the use of conversion technologies that manage post-recycled MSW, food waste, and green waste. Also of interest, but to a lesser extent and at a lower priority, is the potential use of conversion technologies for management of other waste feedstock such as medical waste or biosolids. Through this RFEI, the County requested from conversion technology providers and/or project developers representing such providers, information on their technology, as well as qualifications and resources of their company.

By August 11, 2011, Public Works had received 35 responses from a variety of technology vendors including biological, thermal, mechanical, and chemical technologies. Please see attached Table 1 for a listing of those companies. Public Works is reviewing and evaluating the responses, and has begun tabulating the key information for qualified respondents into a database. The responses and tabulated database include information on the technology (e.g., a description and status of development), and identification of the respondent's concept for an optimum project(s) for commercial application of the technology, considering ideal project size and feedstock. As necessary, Public Works is confirming information with respondents, particularly for circumstances where qualification is uncertain. Public Works will provide your Board with additional information on the technology database in the next status report.

### ***3.1.2 Financial RFEI***

The objective of the financial RFEI was to identify financial services firms who are active in California and are interested in participating in a project within the County of Los Angeles. The RFEI specifically requested information on their experience, qualifications, and resources with respect to financial advisory services to public and private project developers and/or investment banking and similar transaction structuring, underwriting, and placement services. Eleven responses were received from the firms listed in the attached Table 2. Public Works is currently evaluating each submittal and has begun tabulating the key information into a database. Public Works anticipates that the available information will serve as an initial database resource that will be expanded over time with information from additional firms. Public Works will provide your Board with additional information on the financial services database in the next status report.

### **3.2 Site Evaluation**

Phase IV of the County's Conversion Technology Project focuses on facilitating the development of commercial-scale conversion technology facilities in the County of Los Angeles for the purpose of providing alternatives to landfill disposal of post-recycled MSW. As previously described, an important component of Phase IV activities includes identifying and evaluating potential sites. Phase IV also includes working with stakeholders, including cities, solid waste facility owners and operators, and conversion technology companies, to encourage and facilitate the development of mutually beneficial projects within the County.

Sites previously identified in the Preliminary Siting Assessment and the subsequent April 2011 Status Update have remained under consideration. For a list of these sites and interested stakeholders, please see the attached Table 3. In addition, ongoing outreach efforts by Public Works have resulted in the identification of an additional candidate site, located at the Interior Removal Specialist, Inc. recycling facility in South Gate, California. An introduction to this new site is provided below. In our next status report, Public Works will include a comprehensive summary of developments on all the sites currently under consideration.

#### ***3.2.1 Interior Removal Specialist, Inc., South Gate, California***

Interior Removal Specialist, Inc. (IRS Demo) is a full-service tenant improvement demolition company that specializes in commercial interior demolition as well as recycling of the resulting construction and demolition (C&D) debris. IRS Demo owns and operates its own recycling facility, Construction & Demolition Recycling, Inc., in South Gate, California. The facility provides diversion by commodity of tenant improvement C&D debris, including drywall, carpet, ceiling tile, steel, wood, and other materials. IRS Demo also operates a donation program, whereby it works with charitable organizations to divert reusable material from disposal.

IRS Demo has expressed interest in developing a conversion technology project at its facility in South Gate. The County met with IRS Demo and toured its facility. On August 31, 2011, prepared a document summarizing key background information for the site and suggested next steps for consideration to evaluate project feasibility.

### **3.3 Economic Modeling**

Public Works is currently developing a set of economic models that will enable the County and Stakeholders to estimate tipping fees of various conversion technologies/facility sizes. The models will generate planning-level economic estimates and projections, and will include certain built-in assumptions as well as about a dozen user-specified variables that can be changed to reflect a community's particular project or circumstances (e.g., project size, public or private ownership, sale price of energy and other products, disposal price for residue, and other key factors). The models are being developed for both anaerobic digestion and thermal technologies, for project sizes ranging from approximately 100 tons per day up to 1,200 tons per day. Initial models have been loaded onto a website and are currently being tested and debugged for general application.

In addition to the development of the public-use economic models, Public Works has been conducting more detailed economic modeling for potential project development at the Calabasas Landfill. This more detailed modeling was the basis for development of the public-use models. Preliminary models have been run for 350 tpd, 700 tpd, and 1200 tpd facilities utilizing anaerobic digestion, pyrolysis, plasma, high and low temperature gasification; as well as an anaerobic digestion/gasification hybrid plant. Optimization analysis is being conducted for a small subset of the "best case" scenarios, incorporating the following aspects:

- a focused analysis of two facility sizes, 350 TPD and 700 TPD;
- the potential to reduce costs by the use of existing infrastructure, such as on-site electric generation equipment, the scale house and civil infrastructure already in place;
- a case considering potential cost savings with public ownership and financing;
- the use of grants to defray capital costs;
- the use of low interest loans (as examples, through the USDOE loan guarantee program, US Department of Agriculture programs and the California I-Bank) to lower borrowing costs when compared to the conventional debt scenarios assumed for the base case models;
- sensitivities regarding varying prices for recycled and recovered materials; and potentially,
- the availability and value of carbon credit revenues.

## 4 Additional Conversion Technology Updates

### 4.1 Conversion Technology Briefing to the White House

In June 2011, Dr. Eugene Tseng, a professor at UCLA and member of the County's Alternative Technology Advisory Subcommittee, met with the White House Council on Environmental Quality to brief them on various conversion technology projects across the Country. Dr. Tseng highlighted the efforts of the County in his briefing and discussed how key actions on the part of the Federal Government would benefit projects under development, especially:

- Acknowledging MSW as a renewable resource at the Federal level since many technologies exist to recover energy, fuels, and other beneficial products from this waste stream in an environmentally protective manner. This distinction would help spur the developments of these sophisticated technologies already proven and successfully operating for many years throughout Europe and Japan, and in the United States.
- Clearly defining and distinguishing between "waste-to-energy" and "non-combustion conversion technologies."
- Providing additional funding opportunities and/or financing assistance, such as the Department of Energy Loan Guarantee Program.

#### ***4.2 Gasification Determinations Issued by CalRecycle***

In November 2010, Chief Counsel for the California Department of Resources Recycling and Recovery (CalRecycle) made the legal determination that two proposed conversion technology projects, being developed by the companies Rentech and Plasco, meet the definition of "gasification" as defined in California State Statute. These determinations are critical to the projects' development because if classified as gasification, waste processed by the facility would not be counted as disposal in measuring compliance with the state's waste diversion mandate; and energy generated by the facility would be considered renewable and thus eligible for higher pricing which would lower the waste disposal tip fee.

It is important that the County of Los Angeles continue to support CalRecycle in their decision, as it could potentially impact the development of future projects in the County of Los Angeles. As such, Public Works is currently identifying opportunities through our existing conversion technology outreach contract that would enable the County to focus outreach and education in this area.

#### ***4.3 Other Conversion Technology Projects in California***

Numerous other conversion technology projects are in various stages of development in California. Many of these projects are still in the study phase or conducting preliminary planning activities. For example, the US Navy San Diego Naval Shipyard has identified a site for a conversion technology project and has formed a committee within the Navy for continuing project development activities. Currently, the Navy is looking to secure additional wastestream from the surrounding community for the project. Other public projects outside of Los Angeles County that are in the study phase include MSW projects in Orange County, and source-separated organic waste projects in Humboldt County and Palo Alto. San Jose has recently completed contract negotiations for a source-separated organic waste facility. Public Works is continuing to monitor the progress of development of these and other conversion technology projects within California.

Two publicly-sponsored conversion technology projects in California that have progressed beyond the study phase and into permitting and/or late-stage procurement/negotiation are the Salinas Valley Solid Waste Authority (SVSWA) project and the Santa Barbara project. A brief update on these two projects is provided below:

- On September 15, 2011, the SVSWA Board voted to proceed into the CEQA process for a 300 ton per day plasma arc gasification project to be located at the Authority's Johnson Canyon Landfill. This is the first commercial thermal conversion technology project to go into permitting in California. The SVSWA Board has authorized a professional services agreement for preparation of the Environmental Impact Report (EIR), and has entered into a funding agreement with Plasco Energy Group as the technology provider for reimbursement of costs associated with preparation of the EIR.

- The City and County of Santa Barbara, together with the jurisdictions of Goleta, Solvang, and Buellton, have substantially completed their procurement process for a conversion technology project to process approximately 600 tons per day of post-recycled municipal waste at the County's Tajiguas Landfill. Following a detailed review and evaluation of proposals, two companies have been chosen as finalists: Mustang Renewable Power Ventures for an anaerobic digestion project, either with or without a companion gasifier, and Plasco Energy Group for a plasma gasification project. Both companies would provide front-end processing systems to recover additional recyclables. A committee of elected officials is in the process of obtaining public input on the proposals, with selection of a preferred project anticipated later this year.

#### ***4.4 Funding to Support Future Conversion Technology Research and Evaluation***

Public Works continues the State and Federal efforts on potential funding support for the three demonstration projects. In 2010, Public Works supported CR&R, Inc., as it was firming up its project arrangements, including financing. CR&R, Inc., was awarded a grant by the California Energy Commission (CEC) and is in the process of arranging the balance of the financing needed for its project. As the Rainbow and IES projects become more finalized, project-specific funding support will be pursued for these projects. Currently, Public Works is focusing on pursuing funding support for its on-going conversion technology program planning activities, and is developing a plan specifically for this. In addition to pursuing specific planning task funding, Public Works is contemplating a broader program that would enable the County to serve as a project information and planning resource for the State, as well as supporting County-specific activities. This concept is in the early stages of development.

### **5 Next Steps**

- Continue to monitor permitting activities of the CR&R, Inc., project, including the upcoming public hearing for certification of a mitigated negative declaration, and continue to monitor progress of development of this project.
- Complete review of the alternative technology for anaerobic digestion currently being pursued by CR&R, Inc.
- Continue discussions with Rainbow and IES regarding their demonstration projects, including, as applicable, review of alternate technologies or sites, if proposed.
- Determine if revised MOUs are necessary for one or more of the demonstration projects. If necessary, submit those revised MOUs to your Board for approval.
- Complete the review and evaluation of the technology and financial RFEI responses, and continue with development of the on-line database for the technology companies and financial firms who meet the minimum criteria outlined in the RFEIs.
- Complete the on-line economic model template for use by the County's stakeholders.
- Complete the economic model for Calabasas Landfill and meet with County CEO and Sanitation Districts to discuss next steps.

- Continue to work with stakeholders interested in developing a project at a site identified in the 2010 Preliminary Siting Assessment or the subsequent status updates. Evaluate status of project development activities for the identified stakeholders and prioritize those that offer the greatest potential for bringing a project forward in the near future.
- Continue to track both State and Federal project funding opportunities while simultaneously developing a short-term plan to obtain support for the County's ongoing planning activities; analyze State priorities and resources available for planning support, and maintain contacts to stay current on potential Federal support.
- Closely follow and support the progress of other conversion technology projects in the permitting process in California such as the Plasco Salinas Valley plasma gasification project.

**Table 1: Technology RFEI Respondents**

<b>Respondent Name</b>	<b>Technology Type</b>
Alter NRG Corporation	Plasma Gasification (Westinghouse)
Biogas Energy, Inc.	Anaerobic Digestion
BioGold Fuels Corporation	Plasma Gasification (Alter NRG) (Westinghouse)
CBES Global, LLC	Gasification
CCI BioEnergy	Anaerobic Digestion
Clean World Partners	Anaerobic Digestion
CR&R, Inc., with Organic Waste Systems	Anaerobic Digestion (DRANCO)
EcoTech Fuels, LLC	Waste-to-Synfuel
Environmental Energy Resources/SNC-Lavalin	Plasma Gasification
Envirepel Energy, Inc.	Combustion-gasification
Harvest Power	Anaerobic Digestion
Holloway Environmental/Entech	Gasification
Innovative Energy Solutions, Inc.	Thermocatalytic Cracking (Catalyst-Assisted Waste Hydrocarbon to Fuel)
Interstate Waste Technologies	Gasification (Thermoselect)
MaxWest Environmental Systems	Gasification
Mustang Renewable Power Ventures	AD (Bekon) with Gasification (Waste 2 Energy)
NRG Energy, Inc.	Plasma Gasification (Westinghouse)
Orgaworld	Anaerobic Digestion
Plasco Energy Group	Plasma Gasification
Primenergy	Gasification
Princeton Environmental Group	Gasification
Pyrogenesis Canada, Inc.	Pyrolysis
RCR International	Thermal Hydrolysis (Autoclave)/Combustion
Renewable Energy Resources, Inc.	Pyrolysis/Steam Reformer
Ros Roca Envirotec	MBT (MSW) or AD (food waste)
Strategic Management Group w/Entec biogas USA	Anaerobic Digestion
Taylor Biomass	Gasification
Technip USA, Inc.	Plasma Gasification (Westinghouse)
Terrabon, Inc., w/Waste Management California	Acid Fermentation/Chemical Proc. (MixAlco)
Urbaser, Inc.	Anaerobic Digestion (Valorga)
Urbaser, Inc.	Gasification (Energos AS)
Vorus Biopower	Mechanical Proc./Fluid Bed Combustion

Waste to Energy, LLC/BioEnergy Design, LLC	Gasification
WSI Management, LLC	Autoclave/Mechanical Proc./Gasification
Zero Waste Energy, LLC	Anaerobic Digestion (Kompoferm)
Arrow Bio (vetted through Phase II process)	Anaerobic Digestion
IES (vetted through Phase II process)	Pyrolysis

**Table 2: Financial RFEI Respondents**

Backstrom McCarley Berry & Co., LLC
Cooperman Associates
De La Rose & Co.
Government Financial Strategies, Inc
KNN Public Finance
Morgan Stanley
Public Financial Management, Inc
SNW: Innovative Financing and Investment Strategies
Stern Brothers & Co.
Wells Fargo Securities
William Blair & Company

**Table 3: Stakeholders Who Have Expressed Interest in Siting a Conversion Technology Facility or Partnering on a Project**

<b>Municipal Interest</b>	<b>Site Identified</b>
Avalon	Pebbly Beach Landfill
Beverly Hills	To be determined
Calabasas	Calabasas Landfill
Carson	Four sites including the city corporate yard currently used for their public works operations.
Glendale	Scholl Canyon Landfill
Lancaster	Two sites including Lancaster Landfill
Long Beach	Site to be determined in the Long Beach Port
Los Angeles	To be determined
Pico Rivera	To be determined
Santa Clarita	To be determined
Torrance	To be determined
Vernon	To be determined
<b>Private Interest</b>	
BLT Enterprises	To be determined
Calmet Services	Material Recovery Facility (MRF) in Paramount
Green City Development, Inc	Site in Santa Clarita
Interior Removal Specialists	MRF in South Gate
Mustang Power (The Dewey Group)	Site in Sylmar
New Generation Technology	Site in Palmdale
Pacific Coast Waste & Recycling	Four sites located in unincorporated County of Los Angeles, Inglewood & Compton
Southland Disposal	MRF in City Terrace
Waste Resources Recovery	MRF in unincorporated area near Gardena