Renewable Energy from "Waste"

US EPA Workshop / SWANA Western Regional Symposium

Seaside, California, May 16, 2011

William Merry B.C.E.
General Manager

Presentation Overview

- Innovation through partnerships.
- Small steps lead to long-term success.
- Local solutions to local problems.
- MRWMD infrastructure for “zero waste” and energy recovery.

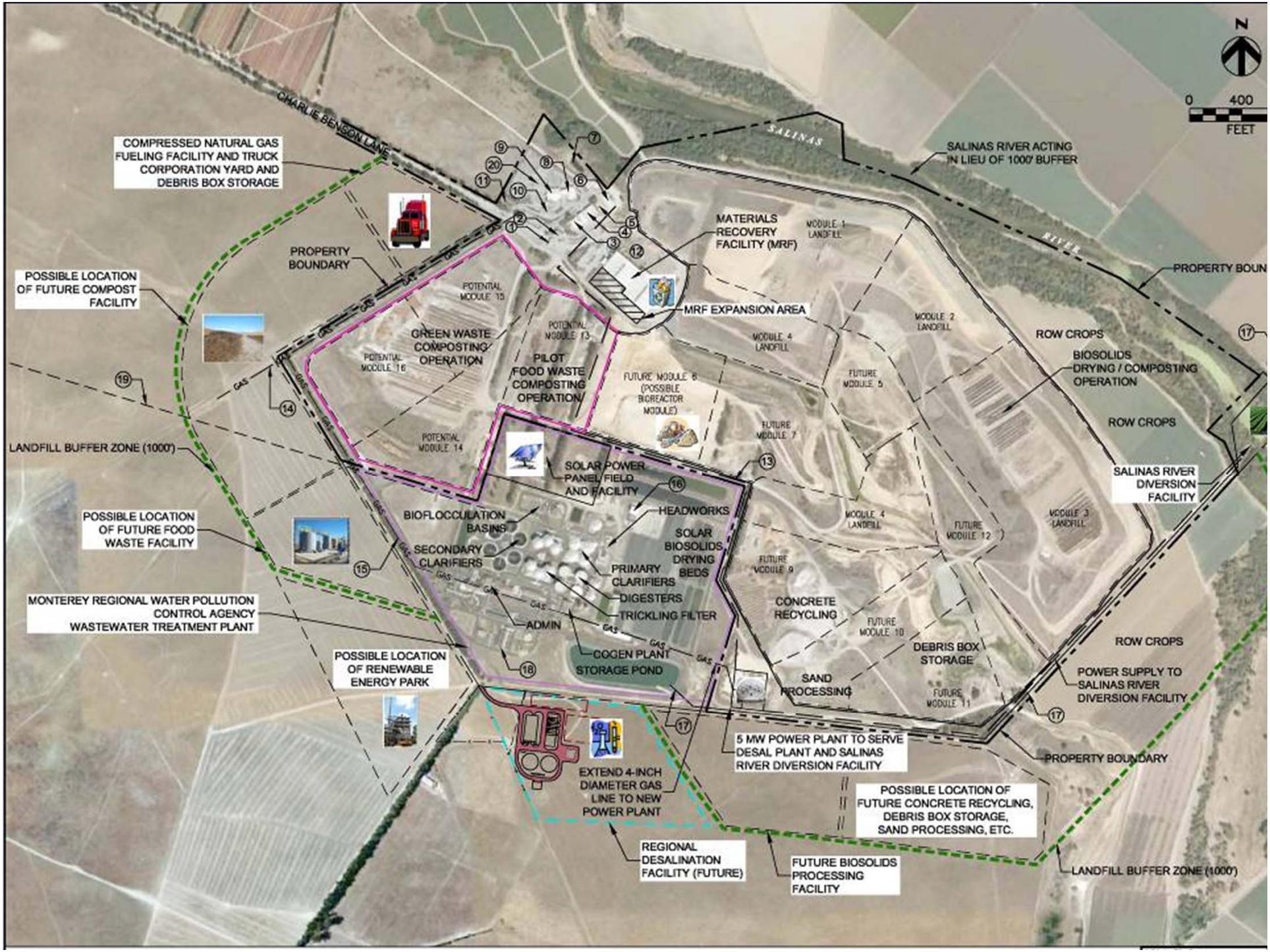
Managing Waste on the Peninsula: Early 1900s

Managing Waste: 1920 - 1955

The MRWMD Today

MRWMD Public Infrastructure for Managing Waste & Resources

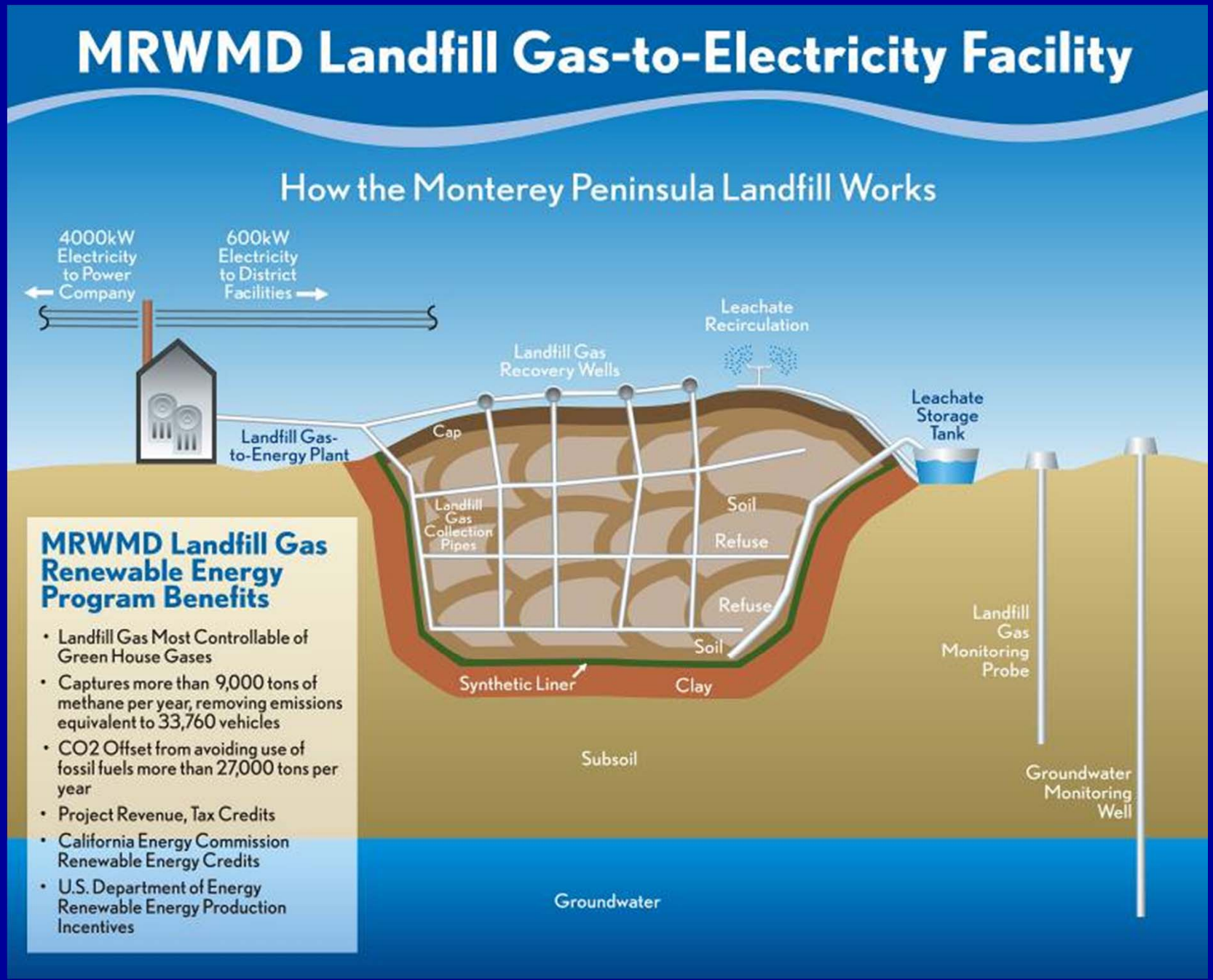
- Last Chance Mercantile Reuse Store
- Household Hazardous Waste Collection
- Drop-off Recycling Center
- Material Recovery Facility
- Monterey Peninsula Landfill
- Landfill Gas Renewable Energy
- Public Education and Outreach Program


CHARLIE BENSON LANE
COMPRESSED NATURAL GAS FUELING FACILITY AND TRUCK CORPORATION YARD AND DEBRIS BOX STORAGE
PROPERTY BOUNDARY
POSSIBLE LOCATION OF FUTURE COMPOST FACILITY
LANDFILL BUFFER ZONE (1000')
POSSIBLE LOCATION OF FUTURE FOOD WASTE FACILITY
MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY WASTEWATER TREATMENT PLANT
POSSIBLE LOCATION OF RENEWABLE ENERGY PARK
SALINAS
SALINAS RIVER ACTING IN LIEU OF 1000' BUFFER
MATERIALS RECOVERY FACILITY (MRF)
MRF EXPANSION AREA
GREEN WASTE COMPOSTING OPERATION
PILOT FOOD WASTE COMPOSTING OPERATION
POTENTIAL MODULE 15
POTENTIAL MODULE 13
POTENTIAL MODULE 16
POTENTIAL MODULE 14
FUTURE MODULE 6 (POSSIBLE BIOREACTOR MODULE)
SOLAR POWER PANEL FIELD AND FACILITY
BIOFLOCCULATION BASINS
SECONDARY CLARIFIERS
HEADWORKS
SOLAR BIOSOLIDS DRYING BEDS
PRIMARY CLARIFIERS
DIGESTERS
TRICKLING FILTER
ADMIN
COGEN PLANT
STORAGE POND
GAS
EXTEND 4-INCH DIAMETER GAS LINE TO NEW POWER PLANT
5 MW POWER PLANT TO SERVE DESAL PLANT AND SALINAS RIVER DIVERSION FACILITY
REGIONAL DESALINATION FACILITY (FUTURE)
FUTURE BIOSOLIDS PROCESSING FACILITY
POSSIBLE LOCATION OF FUTURE CONCRETE RECYCLING, DEBRIS BOX STORAGE, SAND PROCESSING, ETC.
MODULE 1 LANDFILL
MODULE 2 LANDFILL
MODULE 3 LANDFILL
MODULE 4 LANDFILL
FUTURE MODULE 5
FUTURE MODULE 7
FUTURE MODULE 9
FUTURE MODULE 10
FUTURE MODULE 11
FUTURE MODULE 12
CONCRETE RECYCLING
SAND PROCESSING
DEBRIS BOX STORAGE
ROW CROPS
BIOSOLIDS DRYING / COMPOSTING OPERATION
SALINAS RIVER DIVERSION FACILITY
POWER SUPPLY TO SALINAS RIVER DIVERSION FACILITY
PROPERTY BOUNDARY
LANDFILL BUFFER ZONE (1000')
N
0
400
FEET

What's in your trash?

Source: California Integrated Waste Management Board Waste Characterization Study, 1999.

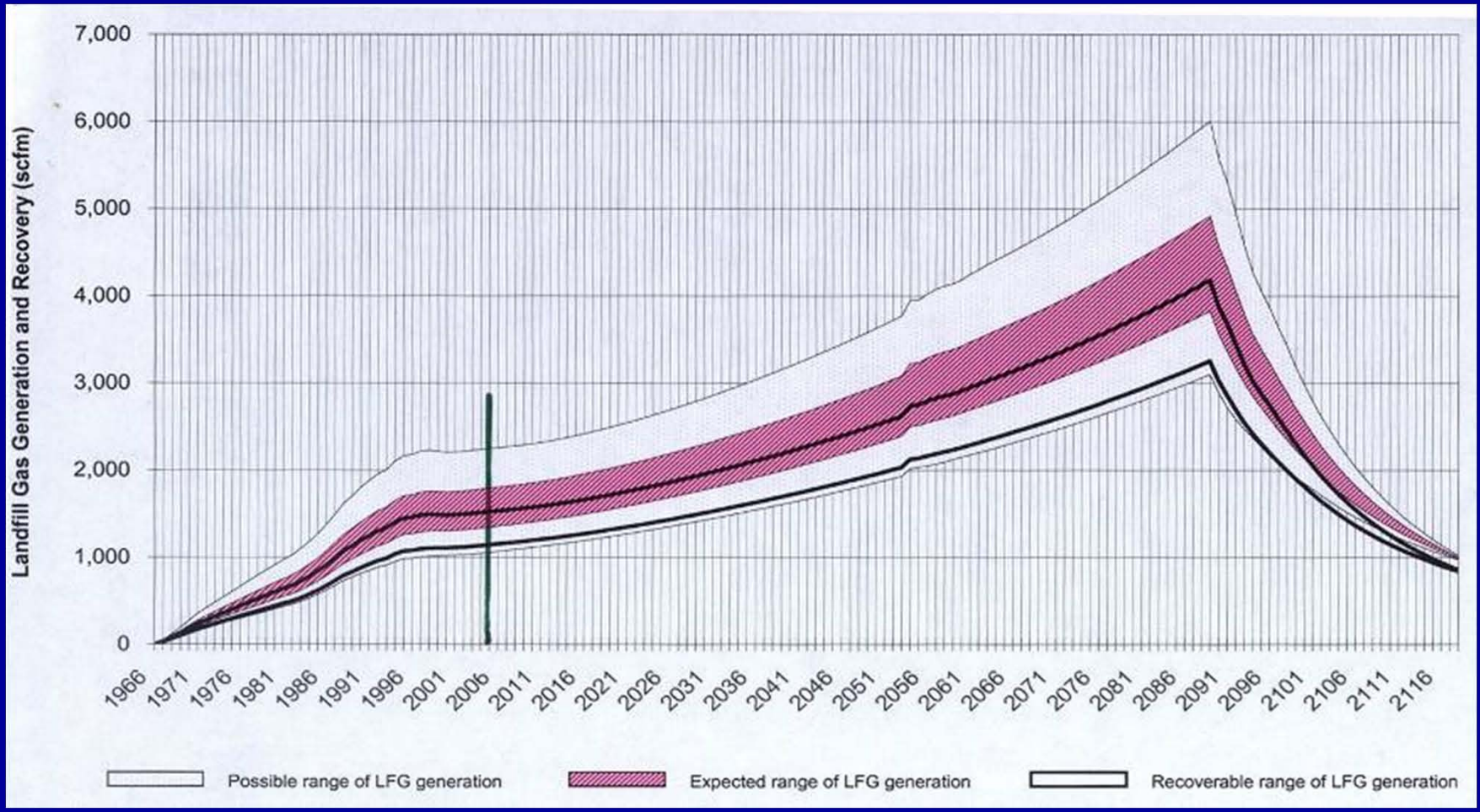
MRWMD Landfill Gas-to-Electricity Facility



MRWMD Landfill Gas Renewable Energy Program Benefits

- Landfill Gas Most Controllable of Green House Gases
- Captures more than 9,000 tons of methane per year, removing emissions equivalent to 33,760 vehicles
- CO2 Offset from avoiding use of fossil fuels more than 27,000 tons per year
- Project Revenue, Tax Credits
- California Energy Commission Renewable Energy Credits
- U.S. Department of Energy Renewable Energy Production Incentives

Landfill Gas Generation



The four engine generators now consume 10,000 tons of methane gas annually.

Origin of the LFG Energy Project

1983

Trailer mounted engine generators

The LFG Yesterday & Today

Gas Production & Project Revenue

1983:

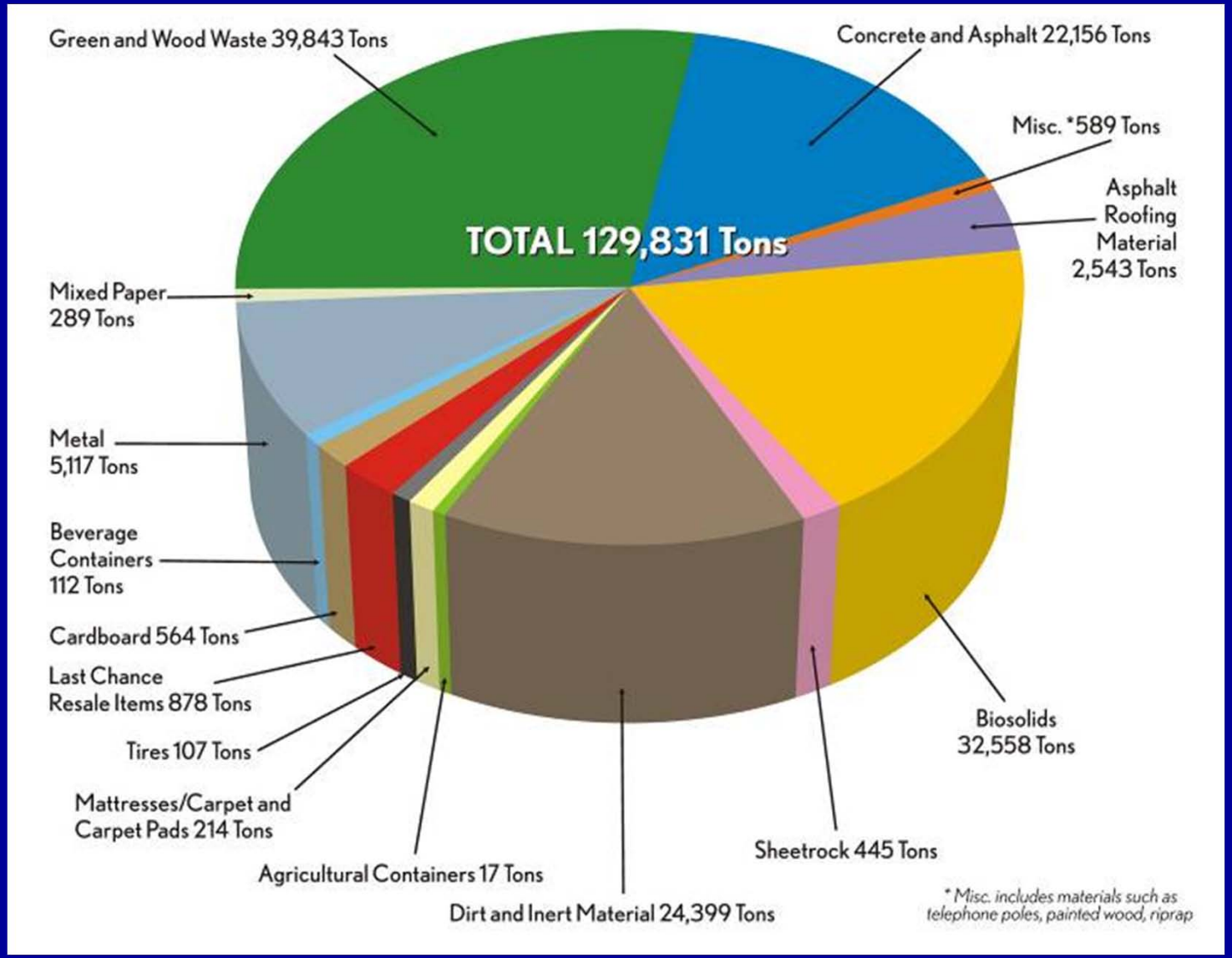
- 1.3 MW, 2 units, 9,000 MW generated / yr
- Power sales at 1-2 cents / kw-hr
- $180,000 / yr in project revenue

Gas Production & Project Revenue

FY 2012 Budget:

- 5 MW, 4 units, 37,300 MW generated / yr
- Power sales at 10 cents / kw-hr
- $3.5 M/yr (16.5% of Operating Revenue),
- 2,200 MW used onsite

MRWMD Operations Have Diverted > 1.1 Million Tons from Disposal Since 1996



New Diversion Frontier: Food Scraps

Food Scrap Composting

- Program began in October 2008, 20 tons per month.
- Now 175 tons per month including collection routes from Monterey, Pacific Grove, Pebble Beach, Santa Cruz County, UCSC and special events.

Renewable Energy at the MRWMD

Converting Waste to Energy

Challenges

- Political
- Technological
- Financial
- Regulatory

Opportunities

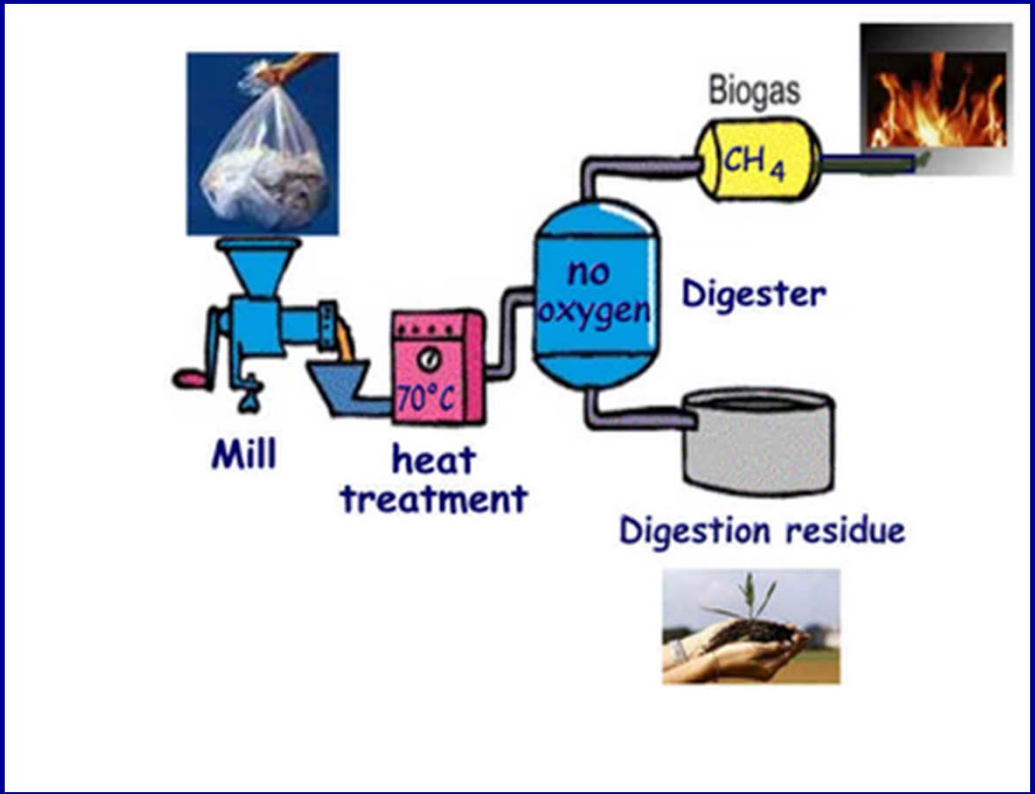
- Permits
- Land
- Location
- Track record of success
- Supply Regional Water Project with Renewable Energy

Looking to the Future: “AD”

- The process of anaerobic digestion consists of three steps:
- The first step is the decomposition (hydrolysis) of plant or animal matter. This step breaks down the organic material to usable-sized molecules such as sugar.
- The second step is the conversion of decomposed matter to organic acids.
- Finally, the acids are converted to methane gas.

Organics Diversion: the Next Frontier

- Anaerobic Digestion pilot project to launch at MRWMD in FY 2011-12.



Recipient of the 2007 SWANA 2007 *"Gold Landfill Gas Utilization Award"*

MONTEREY COUNTY WEEKLY
READERS POLL
2008
WINNER
Best Environmental Business
MRWMD


Helping create and maintain
a sustainable community
BEST SOLID WASTE SYSTEM IN NORTH AMERICA
MRWMD