PETITION FOR APPROVAL OF PROJECT DESIGN REFINEMENTS

MARSH LANDING GENERATING STATION (08-AFC-3C)

Submitted to:

The California Energy Commission

Submitted by:

GenOn Marsh Landing, LLC

Prepared by:

URS Corporation

January 2012

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDICES

ACRONYMS

ADNWR	Antioch Dunes National Wildlife Refuge
AERMOD	American Meteorological Society/Protection Agency Regulatory Model
AFC	Application for Certification
ACR	annual compliance report
ATC	Authority to Construct
BAAQMD	Bay Area Air Quality Management District
CalARP	California Accidental Release Program
CCR	California Code of Regulations
CCGS	Contra Costa Generating Station
CEC	California Energy Commission
CO	carbon monoxide
CO_2	carbon dioxide
COD	commercial operation date
CPM	Compliance Project Manager
CTG	combustion turbine generator
dBA	A-weighted decibel
DDSD	Delta Diablo Sanitation District
EPC	engineering, procurement and construction
ERCs	Emission Reduction Credits
°F	degrees Fahrenheit
GHG	greenhouse gas
gpm	gallons per minute
gr/100 scf	grain of sulfur per 100 cubic feet
HP	horsepower
IDLH	immediately dangerous to life or health
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
L_{90}	noise level equaled or exceeded during 90 percent of the measured time interval
MLGS	Marsh Landing Generating Station
MW	megawatt
$\mu g/m^3$	micrograms per cubic meter
MMBTU/hr	million British thermal units per hour
MT	metric tonnes
$MTCO_2E$	metric tonnes of carbon dioxide equivalents
$MTCO_2/MWh$	metric tonnes of carbon dioxide per megawatt-hour
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_2	oxygen
OCA	offsite consequence analysis
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
ppmv	parts per million by volume
PTC	Permit to Construct
PTO	Permit to Operate
RSA	Revised Staff Assessment
SCR	selective catalytic reduction
SF6	sulfur hexafluoride
SO_2	sulfur dioxide

TDS	total dissolved solids
tpy	tons per year
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds

1.0 INTRODUCTION

In accordance with Title 20 California Code of Regulations Section 1769 (Section 1769), GenOn Marsh Landing, LLC (formerly known as Mirant Marsh Landing, LLC) (GenOn Marsh Landing) submits this petition for approval of certain post-certification design refinements to the Marsh Landing Generating Station project (MLGS or project). In August 2010, the California Energy Commission (CEC) issued the Commission Decision approving the MLGS, adopted in Order No. 10-0825-03 in Docket 08-AFC-3C (Commission Decision). The Bay Area Air Quality Management District (BAAQMD) issued the Authority to Construct (ATC) for the MLGS in August 2010. As approved in the Commission Decision and the ATC, the MLGS is a nominal 760-megawatt (MW) electricity generating facility consisting of four simple cycle natural gas-fired combustion turbines.

During detailed project design, GenOn Marsh Landing and its engineering, procurement and construction (EPC) contractor identified certain refinements to the design of the project's fuel gas preheater system, water supply and treatment processes, and other project components, that are necessary or desirable to optimize the configuration of the project and ensure that it will be capable of performing as intended. These refinements (referred to herein collectively as the project design refinements) are all within the 27-acre project site, and in the location of the sewer line along Wilbur Avenue, and do not result in any additional disturbed areas beyond the site and sewer line location, or that were not previously evaluated in the record supporting adoption of the Commission Decision. This petition describes the project design refinements and analyzes whether they result in any environmental consequences not previously analyzed. As set forth below, the project design refinements do not materially change the environmental consequences of the MLGS and do not necessitate any changes to any of the conditions of certification in the Commission Decision, and all impacts are expected to remain less than significant.

As stated above, this petition is submitted in accordance with Section 1769. Section 1769 specifies that after the final decision approving a project is effective, the applicant must file with the CEC a petition for any modifications it proposes to the project design, operation, or performance requirements. Section 1769 specifies that the petition must contain the following information:

(A) A complete description of the proposed modifications, including new language for any conditions that will be affected.

Section 2.0 below provides a complete description of the project design refinements. No conditions of certification will be affected by these refinements.

(B) A discussion of the necessity for the proposed modifications.

The project design refinements are based on additional design work that typically occurs after a project has been approved and is nearing commencement of construction. They are necessary to ensure the most effective and efficient construction and operation of the project.

(C) If the modification is based on information that was known by the petitioner during the certification proceeding, an explanation why the issue was not raised at that time.

The project design refinements are based on additional design work that occurred after the Commission Decision was issued.

(D) If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted.

The project design refinements do not materially change or undermine the assumptions, rationale, findings, or other bases of the Commission Decision.

(E) An analysis of the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts.

The project design refinements will not have any adverse impacts on the environment, and no measures beyond those already included in the existing Conditions of Certification are required.

(F) A discussion of the impact of the modifications on the facility's ability to comply with applicable laws, ordinances, regulations, and standards.

The project design refinements will not affect the project's ability to comply with applicable laws, ordinances, regulations, and standards.

(G) A discussion of how the modification affects the public.

The project design refinements will not have any material adverse effect on the public.

(H) A list of property owners potentially affected by the modification.

The project design refinements will not have any material adverse effect on any property owners. The list of property owners within 1,000 feet of the project is provided in Appendix A. The list has been newly compiled for this petition to reflect data currently available in the public land records.

(I) A discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings.

The project design refinements will not have a material adverse effect on nearby property owners, the public or the parties to the application proceeding.

Based on the information and analysis provided in support of this petition, we believe that staff can determine that: (1) there is no possibility that the project design refinements may have a significant effect on the environment; (2) the project design refinements will not necessitate a change or deletion of a condition imposed by the CEC in the Commission Decision; and (3) the project design refinements will not make changes that would cause the project not to comply with any applicable laws, ordinances, regulations, or standards. Therefore, pursuant to Section 1769, Commission approval is not required for the project design refinements.

2.0 PROJECT DESIGN REFINEMENTS

Refinements to the project are listed below. Figure 2.0-1 shows the current plot plan for the project.

- The project design as approved in the Commission Decision includes two natural gas-fired fuel gas preheaters (also referred to as dew point heaters), each with a heat input capacity of 5 million British thermal units per hour (MMBtu/hr). As a result of the final design process, the size of these two natural gas fired fuel gas preheaters will be larger and will have a rated heat input of 8 MMBtu/hr. The preheaters will be located in the same locations as approved in the Commission Decision. Each unit will still have a rated heat input of less than 10 million British thermal units per hour (MMBTU/hr) and therefore will continue to be exempt from the BAAQMD permit requirements per

Regulation 2, Rule 1, Section 114, specifically Sections 2-1-301 and 302. As a project design feature of the proposed modification to the fuel gas preheaters, GenOn Marsh Landing will surrender Emission Reduction Credits (ERCs) to the Bay Area Air Quality Management District in the amounts of the minor increases in annual project emissions associated with the preheater design modification. Table 2.0-1 identifies the changes to the characteristics of the preheaters from those approved in the Commission Decision.

Table 2.0-1
Marsh Landing Generating Station Fuel Gas Preheaters

	Originally Planned Fuel Gas Preheater[1] (each)	Current Fuel Gas Preheater[2] (each)
Rated Heat Input (MMBtu/hr)	5	8
Stack Height (feet)	26	23.78
Stack Diameter (inches)	8	35.625
Operating hours per year at full load	1,752	1,752
Operating hours per year at idle	0	7,008

Notes:

[1] Characteristics of the original fuel gas preheaters were presented in the September 2009 Amendment to the Application for Certification (AFC Amendment) and in the related Amendment to the Application for Authority to Construct submitted to the BAAQMD (ATC Amendment).

[2] Current characteristics reflect refinements made during detailed design.

- During detailed design, various combinations of water treatment configurations were evaluated and included possible combinations of ultrafiltration, single-pass and double-pass reverse osmosis, recycling the blowdown of the evaporative coolers, and the use of portable ion-exchange polishers. As a result, the water treatment at the plant will include a single pass reverse osmosis system that will treat the water to provide a quality suitable for use in the combustion turbine generator (CTG) evaporative coolers. Ultrafiltration will be used to reduce inlet suspended solids from groundwater prior to being treated by reverse osmosis. The ion exchange polisher will be used as required to ensure compliance with potential discharge permit and water quantity requirements. The water treatment will be within a permanent building instead of trailers and separate from the control/administration building. Moving the water treatment equipment into a separate building was done to satisfy LEED accreditation for the control/administration building. The footprint of the water treatment building will be 7,922 square feet (66 feet 8 inches by 118 feet 10 inches). The maximum height of the building will be 18 feet.

- As a result of the refinements to the water treatment system, the following modifications to the water storage system as approved in the Commission Decision are:
  - The Raw Water Storage Tank will be 600,000 gallons (instead of 300,000 gallons);
  - The 300,000-gallon Service Water Storage Tank has been eliminated;
  - The 200,000-gallon Secondary Evaporative Cooler Blend Water Storage Tank has been eliminated;
  - A new 170,000-gallon Reverse Osmosis Permeate Storage Tank will be provided; and
  - The Wastewater Storage Tank will be smaller (200,000 gallons instead of 500,000 gallons).

With these modifications, approximately 0.97 million gallons of storage will be provided by three tanks instead of the previously approved 1.3 million gallons provided by four tanks (see Table 2.0-2). The tanks would be similar in size, height and finish as described in the AFC Amendment Revised Table 2.6-1. [Note: the tank numbers and sizes were presented to and approved by the CEC Compliance Project Manager, Joe Douglas.]

Table 2.0-2
Marsh Landing Generating Station Water Storage Tanks

	Water Storage Tanks Approved in the Commission Decision		Water Storage Tanks as Modified by Detailed Design	
Tank	**Quantity**	**Volume (gallons)**	**Quantity**	**Volume (gallons)**
Raw Water Storage Tank	1	300,000	1	600,000
Service Water Storage Tank	1	300,000	0	0
Secondary Evaporative Cooler Blend Water Storage Tank	1	200,000	0	0
Reverse Osmosis Permeate Storage Tank	0	0	1	170,000
Wastewater Storage Tank	1	500,000	1	200,000
Total	**4**	**1,300,000**	**3**	**970,000**

- During discussions with the City of Antioch regarding design details for the MLGS project's wastewater connection to the city's sewer line along Wilbur Avenue, the City of Antioch requested that the project extend the existing 15-inch-diameter sewer line along the Wilbur Avenue frontage from its current terminus at existing Manhole No. 1 (just east of the railroad tracks and near the main entrance road to MLGS and CCGS) to the western edge of the GenOn Delta Property (west of the western access road to MLGS and CCGS) for a maximum length of approximately 2,200 feet. Marsh Landing agreed in its Out of Agency Agreement with the City of Antioch to permit, design, construct and install an extension of the existing 15-inch sewer line, provided however that the total aggregate cost of the extension does not exceed more than an agreed upon dollar amount. Thus, GenOn Marsh Landing proposes to install an extension that would consist of no more than 2,200 linear feet (i.e., to the western edge of the GenOn Delta property on Wilbur Avenue), but most likely less than 2,200 linear feet based on anticipated construction costs (because the agreed upon cost cap will have been met). The portion of the sewer line along Wilbur Avenue will now be a 15-inch-diameter pipe, instead of a 6-inch-diameter pipe as originally planned. The 6-inch-diameter MLGS wastewater pipeline that starts at the MLGS wastewater storage tank and runs along the access road on the CCGS property will now connect to the extended 15-inch sewer line along Wilbur Avenue near the western access road, instead of continuing as a 6-inch-diameter pipe to the existing Manhole No. 1.

- The construction warehouse, which originally was going to be removed by the contractor after the MLGS commercial operation date (COD), will be purchased by GenOn Marsh Landing and used as a machine shop. As shown on Figure 2.0-1 it is located in the

southeastern portion of the MLGS site. The footprint of the warehouse building will be 4,800 square feet (40 feet by 120 feet). The height of the building will be 17.5 feet. It will be hidden from view at Wilbur Avenue by the switchyard equipment and the 'green belt' south of the switchyard. It will be hidden from view at the river by the Contra Costa Generating Station (CCGS) power building.

- The MLGS interconnection to the PG&E switchyard has been modified to integrate with changes PG&E is making in the switchyard. PG&E is replacing the breakers in their switchyard and rebuilding their dead-end structure where the MLGS generators connect within their switchyard. As a result, the arrangement and locations of the transmission tie line poles have been adjusted as shown on Figure 2.0-1, Updated General Plot Plan. The tie line poles will still be 100 feet tall. A switchyard building (099 on the Updated General Plot Plan) is now included and will also house the switchyard metering equipment.

- The ammonia system has been revised to have single wall piping instead of double wall piping for the section of piping between the storage tank and the ammonia injection skids. The ammonia tank will have an above ground containment area and an underground sump, similar to those approved in the Commission Decision (and described in more detail in the AFC Amendment). The drain from the tank containment area into the underground sump is slightly smaller, 38 inches in diameter. The ammonia tank will be the same size and in the same location as approved in the Commission Decision (and described in more detail in the AFC Amendment). The truck unloading area will have an above ground containment area that drains into the same underground sump, similar to that approved in the Commission Decision (and described in more detail in the AFC Amendment). The drain from the truck unloading area into the underground sump is slightly larger, 30 inches in diameter.

- The main access road that approaches Marsh Landing from the east has been slightly realigned to the south to avoid the covered parking that was in place on the Marsh Landing parcel before construction began. The original plan was to eliminate this parking area, but it will now be used as an overflow/parking area by the project.

- The tempering air fans will no longer be inside a building (i.e., replaces the air blowers shown on Revised Figure 2.5-1 in the 2009 AFC Amendment) and will have silencer housing on the inlet ducts. Each unit will have two 2,000-horsepower (HP) single speed fans. Both fans will be on the west side of each unit, as shown on the updated plot plan.

As explained further below, these refinements to the project do not result in any changes to the environmental consequences of the MLGS. Furthermore, all impacts are expected to remain less than significant with implementation of Conditions of Certification set forth in the Commission Decision.

2.1 AIR QUALITY

GenOn Marsh Landing is proposing to change the specifications of the two natural gas preheaters. These preheaters were previously designed with a heat input of 5 MMBtu/hr. Project design refinements have determined that these preheaters need to have a rated heat input of 8 MMBtu/hr each. The new preheaters will remain exempt units under BAAQMD permitting requirements (Regulation 2, Rule 1) because natural gas-fired heaters with a heat input rate of less than 10 MMBtu/hr are exempt.

The new preheaters will have slightly different stack parameters, but will be located in the same location as the originally planned preheaters. The new preheaters will operate up to 1,752 hours/year at full capacity, and the remainder of the year (7,008 hours/year) at idle load. The peak heat input during idling

operations will be 0.8 MMBtu/hr. Table 2.1-1 presents the stack parameters associated with the new preheaters.

Table 2.1-1
Marsh Landing Generating Station New Fuel Gas Preheater Stack and Operation Parameters

Parameter	Normal Operations	Idle Operations
Stack temperature (°F)	676	550
Stack diameter (inches)	35.625	35.625
Stack flow rate (cubic feet per second)	123.762	11.27
Stack exit velocity (feet per second)	18.04	1.63
Annual operations per preheater (hours/year)	1752	7008
Max heat input capacity per preheater (MMBtu/hr)	8	0.8

Note
There are two preheaters, one for each pair of combustion turbines.

2.1.1 Construction Emissions

The project design refinements do not alter the expected numbers, durations, or locations of construction equipment operations associated with project construction. Therefore, the project design refinements would not change the analysis of potential air quality impacts associated with emissions during construction as described in the AFC Amendment and the Commission Decision. Construction-related air quality impacts are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.1.2 Emissions During Operations

The project design refinements do not alter the size, configuration, location or operation of the four simple cycle units consisting of four Siemens 5000 F natural gas–fired combustion turbine generators (CTGs) with ultra low NO_X combustors and inlet air evaporative coolers.

The emission factor for particulate matter for the new preheaters was provided by the EPC contractor, Kiewit. The carbon monoxide (CO) and nitrogen oxide (NO_X) emission rates are based on BAAQMD Regulation 9, Rule 7 limits for heaters this size. Per the BAAQMD Regulation 9, Rule 7, these heaters must meet a lower NO_X emissions limit of 15 parts per million by volume (ppmv) (dry at 3 percent O_2). Sulfur dioxide (SO_2) emissions are based on 1 grain of sulfur per 100 cubic feet (gr/100 scf) for short-term emissions and 0.4 gr/100 scf for annual emissions. Volatile organic compound (VOC) emissions are based on the U.S. EPA FIRE emission database for similar heaters. The SO_2 and VOC emissions factors are the same as those used in the 2009 AFC Amendment. Table 2.1-2 presents the emission factors, emission rates for each preheater and the total annual emissions for both preheaters combined.

Table 2.1-3 presents the new total project emissions including the new fuel gas preheater emissions, as well as the total project emissions presented in the Revised Staff Assessment (June 2010). The emissions from the new fuel gas preheaters of NO_X, $PM_{10}/PM_{2.5}$, and VOC would increase slightly. CO emissions increase by approximately 14 tons per year (tpy), this is due to the new emissions being estimated based on the permit limit of 400 ppmv instead of the actual operating emissions which are expected to be significantly lower.

Table 2.1-2
Marsh Landing Generating Station Fuel Gas Preheater Emission Rates

Pollutant	Emission Factors		Hourly Emission Rate		Annual Emission Rate		
	Emission Limits (ppm)	Normal Operations (lb/MMBtu fuel input/ unit)	Normal Operations (lbs/hr/unit)	Idle Operations (lbs/hr/unit)	Normal Operations (ton/yr/unit)	Idle Operations (ton/yr/unit)	Total Emissions both Preheaters (ton/yr)
CO [1]	400	0.752	6.01	0.62	5.27	2.16	14.85
CO_2 [2]		117.6	941.2	94.1	824.5	329.8	2,309
NO_X [1]	15	0.046	0.370	0.038	0.325	0.133	0.915
$PM_{10}/_{2.5}$ [3]		0.008	0.064	0.006	0.056	0.022	0.157
SO_2 [4] (0.4 gr/100 scf)		0.001	0.009	0.001	0.008	0.003	0.022
SO_2 [4] (1 gr/100 scf)		0.003	0.022	0.002			
VOC[5]		0.0027	0.022	0.0022	0.019	0.008	0.054

Notes:

[1] Emission factors for CO and NO_2 are based on BAAQMD Regulation 9, Rule 7 limits.

[2] Carbon dioxide (CO_2) emission factor is from U.S. EPA, AP-42, Compilation of Air Pollutant Emission Factors, Chapter 1, Section 4, "Table 1.4-2. Emission Factors For Criteria Pollutants and Greenhouse Gases From Natural Gas Combustion"

[3] Emission factor is from Kiewit for $PM_{10}/PM_{2.5}$.

[4] SO_2 emission rates are based on sulfur content. The short-term maximum is 1 gr/100 scf, the annual average is 0.4 gr/100 scf.

[5] VOC emission factor is from U.S. EPA FIRE version 6.25 for "process heaters from natural gas" (SCC 3-10-004-04).

Table 2.1-3
Marsh Landing Generating Station, Maximum Annual Emissions
(tons per year [tpy])

Source	NO_X	VOC	PM_{10}/ $PM_{2.5}$	CO	SO_X
June 2010 Revised Staff Assessment[1]					
Total Four CTGs Maximum Annual	78.57	14.21	31.54	138.57	4.94
Fuel Gas Preheaters Total[2]	0.26	0.02	0.03	0.30	0.02
Total Maximum Annual Emissions	78.83	14.23	31.57	138.9	4.96
With New Fuel Gas Preheaters					
Total Four CTGs Maximum Annual	78.57	14.21	31.54	138.57	4.94
Fuel Gas Preheaters Total[3]	0.91	0.05	0.16	14.85	0.02
Total Maximum Annual Emissions	79.48	14.26	31.70	153.42	4.96
Increase due to new preheaters	0.65	0.03	0.13	14.52	0.0

Notes:

[1] From Air Quality Table 19, Revised Staff Assessment (June 2010).
[2] Based on each fuel gas preheater having a rated heat input of 5 MMBtu/hr.
[3] Based on each fuel gas preheater having a rated heat input of 8 MMBtu/hr and the parameters listed in Table 2.1-1.

Because the preheaters are exempt units and the emission increase from the new preheaters is very small compared to the emissions from the CTGs, the project design refinements related to the fuel gas preheaters are unlikely to significantly change the overall results of the previous modeling analyses. Therefore it is expected that MLGS will continue to have a less than significant impact on air quality and public health.

To ensure that the MLGS will continue to have a less than significant impact on air quality and public health, GenOn Marsh Landing will incorporate into the preheater modification as a project design feature the voluntary surrender of ERCs in the amounts of 0.03 tpy VOC, and 0.13 tpy PM_{10} attributable to the incremental increase in emissions associated with the preheater modification. Condition of Certification AQ-SC7 references the quantity of ERCs required for the project. Table 2.1-4 shows the quantity of ERCs already provided to offset MLGS emissions as provided in the June 2010 RSA and approved in the August 2010 Commission Decision, as well as the ERCs that GenOn Marsh Landing will surrender as part of the project design refinements described in this petition. The amount of ERCs already surrendered for the project to meet the BAAQMD requirement for NO_X (at a ratio of 1.15:1) is already more than the CEC requirement (at 1:1), so no additional mitigation for NO_X emissions is required. ERCs of CO are not required by either CEC or BAAQMD because the project is in an area that is designated attainment for CO.

As discussed above, the project design refinements include larger fuel gas preheaters and additional voluntary offsets for VOC and $PM_{10}/_{2.5}$. With these project design refinements, potential air quality impacts associated with emissions during operations are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

Table 2.1-4
Marsh Landing Generating Station Offsets

Source	NO_X	VOC	PM_{10}/ $PM_{2.5}$	CO	SO_X
Offsets required by BAAQMD (August 2010)	90.36	14.21	0.00	0.00	0.00
Offsets required by CEC (August 2010)	78.83	14.23	31.57	0.00	4.96
Offsets Surrendered	90.36	14.23	31.57	0.00	4.96
Additional Offsets to be Surrendered in Connection with the Preheater Modification	None	0.03	0.13	none	none
Total Offsets with New Preheaters	90.36	14.26	31.70	0.00	4.96

2.1.3 Greenhouse Gas Emissions

The primary sources of greenhouse gas (GHG) emissions during operation of the MLGS will be the four natural gas-fired combustion turbine generators. The MLGS is a simple-cycle facility that will be limited by the local air district permit conditions to no more than a 20 percent annual capacity factor (BAAQMD 2010). There will be no change in the size, configuration, location or operation of these units; therefore, the estimated GHG emissions associated with the CTGs as presented in the Revised Staff Assessment and approved in the Commission Decision will not change. As shown on Table 2.1-5, the new fuel gas preheaters would slightly increase the total amount of CO_2-equivalents per year if operated at the maximum permitted level (by approximately 0.2 percent). The estimated annualized greenhouse gas performance would still be approximately 0.60 $MTCO_2$/MWh. As concluded in the Commission Decision, the MLGS is not a base load plant and SB 1368 and the Greenhouse Gas Emission Performance Standard do not apply to the project.

The project design refinements do not substantially increase operational GHG emissions. The project will still be required to comply with mandatory GHG reporting requirement pursuant to the California Air Resources Board's regulations and will be consistent with AB 32 goals and requirements. The project will still foster integration of renewable energy and contribute to reducing total GHG emissions by displacing the need for coal-fired and aging generating resources. Therefore, as concluded in the Commission Decision, the Marsh Landing Project's operational GHG emissions will not cause a significant adverse environmental impact and no Conditions of Certification are required for GHG emissions.

2.2 BIOLOGICAL RESOURCES

As described in AFC Section 7.2, the AFC Amendment and the Commission Decision, no threatened or endangered plant or wildlife species have been observed during biological resource field surveys of the project site. The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not result in any additional disturbed areas beyond the site. Therefore, the project refinements would not change the analysis of potential impacts to biological resources previously analyzed by CEC Staff in Section 4.2 of the Revised Staff Assessment, and reviewed and approved by the Commission in Section VI, A of the Commission Decision. Impacts to biological resources are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision. Thus, the project design refinements do not require any changes to the Conditions of Certification to address potential impacts in the area of Biological Resources.

Table 2.1-5
Marsh Landing Generating Station, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	Operational GHG Emissions with Originally Planned Fuel Gas Preheaters ($MTCO_2E/yr$) [a]	Operational GHG Emissions with New Fuel Gas Preheaters ($MTCO_2E/yr$) [a]
Combustion Turbine Generators (Four CTGs)	756,007	756,007
Fuel Gas Preheaters	946[c]	2,099[d]
Worker Commutes (Off-Site)	143	143
Material Deliveries (Off-Site)	108	108
Equipment Leaks (SF6)	28	28
Total Project GHG Emissions, excluding Off-Site Emissions ($MTCO_2E/yr$)	756,981	758,106
Estimated Annual Energy Output (MWh/yr) [b]	1,260,000	1,260,000
Estimated Annualized GHG Performance ($MTCO_2/MWh$)	0.601	0.602

Source: Greenhouse Gas Table 3 from Revised Staff Assessment (June 2010).

Notes:

[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] Based on maximum permitted capacity of up to 20 percent annually (URS 2009b).
[c] Based on the originally planned 5 MMBTU/hr preheaters.
[d] Based on the new 8 MMBTU/hr preheaters.

As described in Section 2.1, Air Quality, there would be a small increase in annual nitrogen oxides emissions from the larger preheaters; however, the preheaters have no ammonia emissions. To assess any change in the estimated annual nitrogen deposition at the Antioch Dunes National Wildlife Refuge (ADNWR) due to the MLGS project design refinements, the nitrogen deposition modeling was updated. Ammonia and nitrogen oxides emissions and stack parameters for the MLGS CTGs remain the same as previously analyzed. Nitrogen dioxide emissions and stack parameters for the new preheaters are shown in Tables 2.1-2 and 2.1-1, respectively.

The revised nitrogen deposition analysis incorporating the new larger preheaters predicts the maximum deposition rate within ADNWR attributable to MLGS to range from 0.0362 to 0.0469 kg/ha/yr. In combination with the background level assumed by CEC to be 6.39 kg/ha/yr, the maximum direct nitrogen deposition rate at ADNWR would be approximately 6.4369 kg/ha/yr, which is slightly more than that previously estimated and presented by CEC in the Revised Staff Assessment (0.0022 kg/hr/yr or approximately 0.03 percent more than 6.4347 kg/ha/yr). Therefore, while the new preheaters may slightly increase the nitrogen deposition rate at ADNWR, the change will not modify the existing analysis or conclusions presented in the RSA or the Commission Decision. With the project design refinements, potential impacts associated with nitrogen deposition are still considered to be less than significant. Any concerns about potential impacts would be fully addressed with implementation of the Condition of Certification BIO-8 adopted in the Commission Decision that includes an annual mitigation payment of at least $2,693, and a voluntary annual payment of $20,000 for weed management efforts at the ADNWR.

2.3 CULTURAL RESOURCES

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not result in any additional disturbed areas beyond the site or the sewer line location. As discussed in AFC Section 7.3 and set forth in the Commission Decision, no significant archaeological or historic and architectural (built environmental) resources were identified within the project site or vicinity. Therefore, the project design refinements would not change the analysis of potential impacts to cultural resources as described in AFC Section 7.3, the AFC Amendment and the Commission Decision. Impacts to cultural resources are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.4 LAND USE

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and do not alter the analysis of potential impacts to land use resources presented in AFC Section 7.4 and set forth in the Commission Decision which found that the project would not disrupt or divide an established community; would not conflict with the established uses of the area; would be consistent with existing zoning and applicable land use plans, policies, and regulations; and would not affect farmlands. Therefore, the project design refinements would not change the analysis of potential impacts to land use as described in AFC Section 7.4, the AFC Amendment and the Commission Decision. Impacts to land use are expected to be less than significant with implementation of conditions of certification.

2.5 NOISE

2.5.1 Construction

The project design refinements would not result in significant changes to the potential noise emissions during construction that were modeled and presented in the AFC Amendment. Construction noise impacts are expected to be less than significant with implementation of the Noise Conditions of Certification adopted in the Commission Decision.

2.5.2 Operations

The project design refinements, which include the addition of the tempering air fans and other components to the selective catalytic reduction (SCR) equipment of each unit, would not result in significant changes to the potential noise emissions during operations that were modeled and presented in the AFC Amendment. Operational noise impacts are expected to be less than significant with implementation of the Noise Conditions of Certification adopted in the Commission Decision

2.6 PUBLIC HEALTH

The project design refinements do not alter the expected numbers, durations, or locations of construction equipment operations associated with project construction. Therefore, as described in AFC Section 7.6 and the AFC Amendment, the relatively short duration of the MLGS construction is not expected to result in significant long-term public health effects.

The project design refinements do not substantially increase operational emissions of toxic air contaminants. The health risk assessment was not revised to include the refinements for the fuel gas preheaters, because as described in Section 2.1 there would be a very small increase in project emissions. As a result there would be little change in the predicted criteria pollutant impacts, and likewise little change in the predicted toxic air contaminant impacts, and associated health risk impacts to those presented in the AFC Amendment. Therefore, as set forth in the Commission Decision, it is anticipated

that the construction and operation of the MLGS will pose a less-than-significant health risk to nearby populations with implementation of the Conditions of Certification adopted in the Commission Decision.

2.7 WORKER SAFETY AND HEALTH

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not change the anticipated workplace hazards or require changes to the safety programs presented in the AFC, the AFC Amendment and set forth in the Commission Decision. Potential impacts to worker safety and health are expected to be less than significant with implementation of conditions of certification.

2.8 SOCIOECONOMICS

The project design refinements include adjustments to the size and locations of covered and enclosed spaces at the MLGS. As a result, the total footprint for the four buildings/enclosures, which include the water treatment building, warehouse building, control/administration building and gas compressor enclosure has increased from the previously estimated 17,000 square feet to 22,348 square feet. The Antioch Unified School District (AUSD) has a school development impact fee that is based on the square footage of covered and enclosed space. In accordance with Condition of Certification SOCIO-1, GenOn submitted payment of the one-time statutory school development fee to AUSD and the required documentation to the CEC on February 4, 2011. To cover the larger footprint of the buildings/enclosures, on January 18, 2012, GenOn Marsh Landing made an additional payment to AUSD as part of the building/enclosure modifications.

The project design refinements to the project are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not alter the analysis of potential socioeconomic impacts presented in the 2009 AFC Amendment and in the Commission Decision. The analysis concluded the proposed project would not induce substantial growth or concentration of population; induce substantial increases in demand for public service and utilities; displace a large number of people; disrupt or divide an established community; or result in disproportionate adverse effects on minority or low-income populations. Potential socioeconomics impacts are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.9 SOILS

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not result in increased soil erosion or loss of topsoil and would not alter the analysis of potential impacts to soils as described in the AFC, the AFC Amendment and set forth in the Commission Decision. The project design measures that will be implemented during construction and operation of the MLGS would reduce soil impacts. Therefore, potential impacts to soil resources are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.10 TRAFFIC AND TRANSPORTATION

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not alter the analysis of potential traffic and transportation impacts presented in the AFC, the AFC Amendment and the Commission Decision including roadway and intersection levels of service during project construction and operation, and potential impacts to transportation networks. Therefore, potential traffic and transportation impacts are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.11 VISUAL RESOURCES

The project design refinements include relocation, addition and elimination of some structures as shown on Figure 2.0-1. However, these changes will be visually imperceptible when the project is viewed as a whole. This is because the largest features associated with the project (e.g., exhaust stacks and combustion turbine generators) will not be relocated as a result of these refinements. While the project design refinements would relocate the control/administration building, replace the water treatment trailers with a new water treatment building, relocate one of the water storage tanks and add a new warehouse, these changes would not add any visual point of interest to MLGS. Furthermore, none of these structures would visually dominate the site, nor would they create a visual point of interest due to their size and color in relation to the other plant facilities. Therefore, while the expansion, addition, and relocation of these structures will slightly alter the layout of the project as a whole, these changes will not modify the existing analysis or conclusions presented in Section 7.11 of the AFC or the AFC Amendment. Therefore, potential visual impacts at all seven key observation points are expected to remain less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.12 HAZARDOUS MATERIALS

Due to project design refinements, certain aspects of the ammonia storage and transfer system have changed. These design refinements affect certain physical dimensions of the system, but do not change the overall design or safety features. The ammonia system will still consist of one 20,000 gallon aboveground storage tank containing 19 percent aqueous ammonia. The ammonia tank will have an above ground containment area and an underground sump, similar to that approved in the Commission Decision. The concrete above ground containment area will slope steeply to a 38 inch-diameter drain centered below the tank that will feed into an underground sump enclosure, this drain was previously 42 inches in diameter. A separate enclosure for the tanker truck unloading area will be provided with a 30-inch-diameter drain leading to the same underground sump enclosure, this drain was previously 24 inches in diameter.

The underground sump is designed to hold the entire contents of a 20,000 gallon storage tank, the entire contents of an 8,000-gallon tanker truck, plus the rainfall that could collect within the containment over a 24–hour maximum recorded rainfall (3.4 inches, Antioch 1E Station Western Regional Climate Center [WRCC] 1948 1975). The dimensions of the containment areas have changed slightly, but still meet the containment goals.

The ammonia system has been revised to have single wall piping instead of double wall piping for the section of piping between the storage tank and the ammonia injection skids. The pipe will be welded stainless steel pipe.

The offsite consequence analysis (OCA) was updated to reflect these changes to the ammonia storage and transfer system to evaluate potential acute public health impacts from an accidental release of aqueous ammonia. The modeling techniques previously presented in the AFC and AFC Amendment are used in this revised analysis.

The worst-case accidental release scenario analyzed is the same as presented in the AFC Amendment, and represents the immediate release of the entire 20,000 gallons of aqueous ammonia from the failure of the storage tank. The release rate of the ammonia resulting from tank failure is estimated as the rate of evaporation from the exposed surface area of ammonia, which would be the 38 inch-diameter drain under the storage tank, plus the 30-inch-diameter drain in the truck unloading area.

The alternative scenario was revised to involve a release of aqueous ammonia from a break in the piping to the SCR. Since the piping to the SCR is now single walled, a break in this piping would not be

contained, thus the released liquid would spread to cover a greater surface area than a release into one of the containment areas.

Per the U.S. EPA RMP Guidance for Offsite Consequence Analysis (2009), the release could last 10 minutes until the flow of ammonia could be shutoff. Thus the maximum volume of ammonia released was estimated to be the quantity pumped for 10 minutes plus the volume in the section of pipe. The above ground portion of the piping between the storage tank and the ammonia injection skids is ¾" in diameter and 75 feet long. The maximum rate of ammonia required for the SCR is assumed to be 560 pounds per hour for this analysis.

Since no passive mitigation measures are in place, the liquid is assumed to form a pool one centimeter (0.033 foot) deep instantaneously. The release rate to air from the pool (the evaporation rate) is calculated incorporating this area into Equations 7.12-1 and 7.12-2 presented in the AFC.

The impacts from the hypothetical worst-case and alternative releases of aqueous ammonia were estimated using the U.S. EPA–approved atmospheric dispersion model SCREEN3. In the area source mode of SCREEN3, the ammonia source resulting from the worst-case storage tank rupture is represented as a rectangular source, the area of which is equal to the combined areas of the 38 inch-diameter drain under the storage tank plus the 30 inch-diameter drain in the tanker truck unloading area. The alternative scenario source is represented as a square equal to the area of the one centimeter thick pool created from the piping release.

Per CEC staff guidance, and as outlined in the AFC, the release temperature for the worst-case scenario is the highest average daily temperature (88.0°F) over the entire period of record at the Antioch 1E meteorological station (1971 through 2000) plus 9°F to compensate for the maximum potential increase of temperature within the tank. The release temperature for the alternative scenario used the mean air temperature for the period from 1971 through 2000 of 60.2°F (WRCC, 1971 2000). The ammonia in the piping is expected to be at approximately ambient temperature.

Model results for the worst-case scenario and the alternative scenario are summarized in Table 2.12-1, for both the previously proposed and currently proposed ammonia storage and transfer systems. As demonstrated by comparing the results of the revised OCA to the previous results presented in the RSA, the distances to the benchmark criteria concentrations would be slightly less for the worst case scenario and slightly more for the alternative scenario. There are no substantial changes to the 2009 AFC Amendment Revised Figures 7.12-2 and 7.12-3, which show the predicted ammonia concentrations for the worst case and alternative scenarios, respectively. Similar to the results previously analyzed by CEC, concentrations exceeding CEC's level of significance of 75 ppm would still extend slightly beyond the facility fenceline to the north (within the CCGS boundary) and west (vacant industrial space that does not contain any public receptors) of the MLGS site for both the worst-case and alternative scenarios. The project design refinements for the ammonia storage and transfer system do not change the finding that the impacts from hazardous materials at MLGS are less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

Furthermore, the project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not result in changes to the hazardous materials that would be used during construction or operation of the MLGS. Therefore, as described in AFC Section 7.12, the AFC Amendment and set forth in the Commission Decision, potential hazardous materials handling impacts are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

Table 2.12-1
Distance to EPA/CalArp and CEC Toxic Endpoints

Scenario	Distance in Feet to Lethal Concentration (2,000 ppm)	Distance in Feet to IDLH (300 ppm)	Distance in Feet to CalARP Toxic Endpoint (200 ppm)	Distance in Feet to CEC Significance level (75 ppm)
OCA presented in RSA[1]				
Worst Case	56	169	214	375
Alternative	34	101	127	221
Revised OCA[2]				
Worst Case	46	138	177	308
Alternative	36	112	141	246

Notes:

1 From June 2010 RSA, Hazardous Materials Management Table 2.
2 Revised OCA reflects the changes in the ammonia storage and transfer system described in this petition. See Appendix B for modeling results.

CalARP = California Accidental Release Program
IDLH = immediately dangerous to life or health
ppm = parts per million

2.13 WASTE MANAGEMENT

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and there would be no increases in the types, quantities or frequencies of wastes generated by the project during construction or operation of the MLGS. AFC Section 7.13, the AFC Amendment and the Commission Decision include best management practices that will be implemented during construction and operation of the MLGS to manage and minimize the amount of waste generated. Therefore, potential waste management impacts are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.14 WATER RESOURCES

Based on detailed design, the permanent water treatment equipment at the plant will include a reverse osmosis system that will treat the water to provide a quality suitable for use in the CTG evaporative coolers. Ultrafiltration is used to reduce inlet suspended solids from groundwater prior to being treated by reverse osmosis. The ion exchange polisher would be used as required to ensure compliance with potential discharge permit and water quantity requirements. Water makeup to the evaporative coolers must have low suspended solids, relatively low dissolved solids, low hardness, and neutral pH. The scaling indices for water must remain within scale-forming and scale-dissolving limits. The MLGS water treatment system is being designed to meet these requirements while ensuring compliance with the current and anticipated process water quantity and quality restrictions, for both brackish groundwater and City Water. Design constraints include process water use of no more than 50 acre-feet per year, as stipulated by Condition of Certification Soil &Water-6, and potential future limitation on total dissolved solids (TDS) in the wastewater discharge stream. Delta Diablo Sanitation District (DDSD) currently does not have a limit on TDS; however, DDSD is contemplating setting a limit on TDS sometime in the future. Because this limit has not yet been established, a limit of 3,000 parts per million (ppm) TDS has been assumed for this analysis. This assumed limit reflects discussions with DDSD.

Process wastewater will be stored in the wastewater storage tank, processed through the use of the ion-exchange polishers as needed, and then discharged to the City of Antioch's main sewer line. Process wastewater will be conveyed via the sewer line and ultimately discharged to DDSD in accordance with an industrial wastewater discharge permit. Based on the preliminary design presented in the AFC Amendment and additional information provided in GenOn Marsh Landing's comments on the Staff Assessment, the peak wastewater discharge was estimated to be approximately 118 gallons per minute (gpm). Condition of Certification Soil &Water-5 stipulates that the peak wastewater discharge be less than or equal to 118 gpm. Based on the detailed design of the water treatment system, the peak wastewater discharge will be considerably less than the 118 gpm previously estimated; therefore, the project design refinements will still comply with the conditions.

Due to the refinement of the water treatment system and to make room for other project modifications, refinements to the water storage requirements were also made as summarized on Table 2.0-2. A 600,000-gallon Raw Water Storage Tank will replace the previously proposed 300,000-gallon Raw Water Storage Tank and 300,000-gallon Service Water Storage Tank. The 200,000-gallon Secondary Evaporative Cooler Blend Water Storage Tank will no longer be needed. There will be a new 170,000-gallon Reverse Osmosis Permeate Storage Tank. The Wastewater Storage Tank will be smaller (200,000 gallons instead of 500,000 gallons). As shown on Figure 2.0-1, the three tanks will be in the northwest portion of the 27-acre site, where two tanks were previously planned to be located.

The project design refinements would not result in changes to the analysis of water resources, water quality or flood hazards as described in AFC Section 7.14, the AFC Amendment, Section 4.9 of the Revised Staff Assessment and the Commission Decision. Impacts to water resources are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision. No changes to the Conditions of Certification are needed to reflect the project design refinements.

2.15 GEOLOGIC HAZARDS AND RESOURCES

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and would not result in changes to the analysis of geologic hazards or result in significant adverse impacts to the geologic environment. Therefore, as described in AFC Section 7.15, the AFC Amendment and set forth in the Commission Decision, impacts to geologic hazards and resources are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

2.16 PALEONTOLOGICAL RESOURCES

The project design refinements are within the 27-acre project site and along the portion of the sewer line along Wilbur Avenue and do not result in any additional disturbed areas beyond the site. Therefore, these refinements would not change the analysis of impacts to paleontological resources as described in AFC Section 7.16, the AFC Amendment and set forth in the Commission Decision. Impacts to paleontological resources are expected to be less than significant with implementation of the Conditions of Certification adopted in the Commission Decision.

3.0 REFERENCES

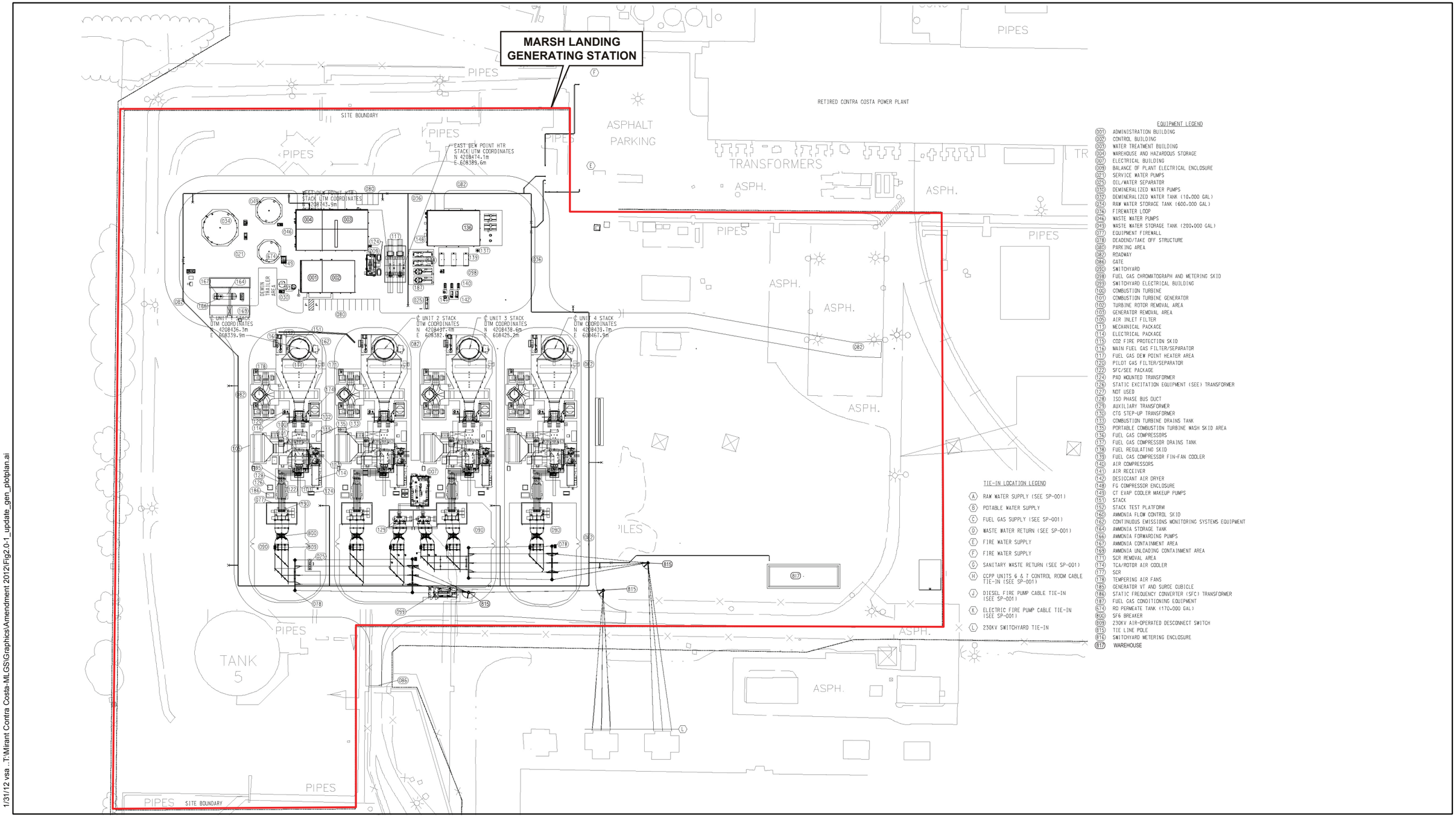
BAAQMD (Bay Area Air Quality Management District), 2010. Authority to Construct. August.

CEC (California Energy Commission), 2010. Revised Staff Assessment, Marsh Landing Generating Station. June.

CEC (California Energy Commission), 2010. Commission Decision, Marsh Landing Generating Station. August.

URS (URS Corporation), 2008. Application for Certification. Marsh Landing Generating Station. May.

URS (URS Corporation), 2009. Application for Certification Amendment. Marsh Landing Generating Station. September.



EQUIPMENT LEGEND

001 ADMINISTRATION BUILDING
002 CONTROL BUILDING
003 WATER TREATMENT BUILDING
004 WAREHOUSE AND HAZARDOUS STORAGE
007 ELECTRICAL BUILDING
009 BALANCE OF PLANT ELECTRICAL ENCLOSURE
021 SERVICE WATER PUMPS
025 OIL/WATER SEPARATOR
030 DEMINERALIZED WATER PUMPS
032 DEMINERALIZED WATER TANK (10,000 GAL)
034 RAW WATER STORAGE TANK (600,000 GAL)
036 FIREWATER LOOP
046 WASTE WATER PUMPS
049 WASTE WATER STORAGE TANK (200,000 GAL)
077 EQUIPMENT FIREWALL
078 DEADEND/TAKE OFF STRUCTURE
080 PARKING AREA
082 ROADWAY
086 GATE
090 SWITCHYARD
098 FUEL GAS CHROMATOGRAPH AND METERING SKID
099 SWITCHYARD ELECTRICAL BUILDING
100 COMBUSTION TURBINE
101 COMBUSTION TURBINE GENERATOR
102 TURBINE ROTOR REMOVAL AREA
103 GENERATOR REMOVAL AREA
105 AIR INLET FILTER
113 MECHANICAL PACKAGE
114 ELECTRICAL PACKAGE
115 CO2 FIRE PROTECTION SKID
116 MAIN FUEL GAS FILTER/SEPARATOR
117 FUEL GAS DEW POINT HEATER AREA
120 PILOT GAS FILTER/SEPARATOR
122 SFC/SEE PACKAGE
124 PAD MOUNTED TRANSFORMER
126 STATIC EXCITATION EQUIPMENT (SEE) TRANSFORMER
127 NOT USED
128 ISO PHASE BUS DUCT
129 AUXILIARY TRANSFORMER
130 CTG STEP-UP TRANSFORMER
133 COMBUSTION TURBINE DRAINS TANK
135 PORTABLE COMBUSTION TURBINE WASH SKID AREA
136 FUEL GAS COMPRESSORS
137 FUEL GAS COMPRESSOR DRAINS TANK
138 FUEL REGULATING SKID
139 FUEL GAS COMPRESSOR FIN-FAN COOLER
140 AIR COMPRESSORS
141 AIR RECEIVER
142 DESICCANT AIR DRYER
148 FG COMPRESSOR ENCLOSURE
149 CT EVAP COOLER MAKEUP PUMPS
151 STACK
152 STACK TEST PLATFORM
160 AMMONIA FLOW CONTROL SKID
162 CONTINUOUS EMISSIONS MONITORING SYSTEMS EQUIPMENT
164 AMMONIA STORAGE TANK
166 AMMONIA FORWARDING PUMPS
167 AMMONIA CONTAINMENT AREA
169 AMMONIA UNLOADING CONTAINMENT AREA
171 SCR REMOVAL AREA
174 TCA/ROTOR AIR COOLER
177 SCR
178 TEMPERING AIR FANS
185 GENERATOR VT AND SURGE CUBICLE
186 STATIC FREQUENCY CONVERTER (SFC) TRANSFORMER
187 FUEL GAS CONDITIONING EQUIPMENT
674 RO PERMEATE TANK (170,000 GAL)
800 SF6 BREAKER
809 230KV AIR-OPERATED DESCONNECT SWITCH
815 TIE LINE POLE
816 SWITCHYARD METERING ENCLOSURE
817 WAREHOUSE

TIE-IN LOCATION LEGEND

(A) RAW WATER SUPPLY (SEE SP-001)
(B) POTABLE WATER SUPPLY
(C) FUEL GAS SUPPLY (SEE SP-001)
(D) WASTE WATER RETURN (SEE SP-001)
(E) FIRE WATER SUPPLY
(F) FIRE WATER SUPPLY
(G) SANITARY WASTE RETURN (SEE SP-001)
(H) CCPP UNITS 6 & 7 CONTROL ROOM CABLE TIE-IN (SEE SP-001)
(J) DIESEL FIRE PUMP CABLE TIE-IN (SEE SP-001)
(K) ELECTRIC FIRE PUMP CABLE TIE-IN (SEE SP-001)
(L) 230KV SWITCHYARD TIE-IN

1/31/12 vsa ..T:\Mirant Contra Costa-MLGS\Graphics\Amendment 2012\Fig2.0-1_update_gen_plotplan.ai

Source:
Kiewit; Genon Marsh Landing LLC, Marsh Landing Generating Station;
Plot Plan; Drawing No. 2009-019-PP-001 (Rev. B, 06-16-11)

Preliminary - Not for Construction

0 50 100 150 FEET

UPDATED GENERAL PLOT PLAN

Marsh Landing Generating Station
January 2012 Mirant Marsh Landing, LLC
28067344 Contra Costa County, California

URS

FIGURE 2.0-1

APPENDIX A
LIST OF PROPERTY OWNERS

Assessor's Parcel Numbers/Ownership Information
Property Within 1,000 Feet of the MLGS Project Site

APN	Owner Name	Address	City	State	Zip Code
051-031-005-5	FORESTAR (USA) REAL ESTATE C/0 DENISE E ORSBORN	6300 BEE CAVE RD RD BLDG 2-500	AUSTIN	TX	78746
051-031-015-4	PACIFIC GAS & ELECTRIC CO C/O TAX DEPT B8E	PO BOX 770000	SAN FRANCISCO	CA	94177
051-031-016-2	PACIFIC GAS & ELECTRIC CO C/O SUPERVISOR OF HYDRO SUPPORT	5555 FLORIN PERKINS RD	SACRAMENTO	CA	95826
051-031-018-8	GenOn DELTA LLC C/O RICHARD LAI	1350 TREAT BLVD #500	WALNUT CREEK	CA	94597
051-031-019-6	GenOn DELTA LLC C/O RICHARD LAI	1350 TREAT BLVD #500	WALNUT CREEK	CA	94597
051-032-004-7	TONY CUTINO C/O FRANK BELLECCI	4030 ST MARYS ST	MARTINEZ	CA	94553
051-032-005-4	TONY CUTINO C/O FRANK BELLECCI	4030 ST MARYS ST	MARTINEZ	CA	94553
051-032-006-2	TONY CUTINO C/O FRANK BELLECCI	4030 ST MARYS ST	MARTINEZ	CA	94553
051-032-007-0	TONY CUTINO C/O FRANK BELLECCI	4030 ST MARYS ST	MARTINEZ	CA	94553
051-032-008-8	PACIFIC GAS & ELECTRIC CO	PO BOX 770000	SAN FRANCISCO	CA	94177
051-032-011-2	JOHN A AND LANA S MARTINEZ	3904 CAPLES CT	ANTIOCH	CA	94531
051-032-013-8	RANDY W AND CANI L TRE CHRIST	PO BOX 1163	BRENTWOOD	CA	94513
051-040-019-5	INTEREST INCOME PARTNERS	PO BOX 11087	SAN RAFAEL	CA	94912
051-040-073-2	KIEWIT CONSTRUCTION GROUP INC	1000 KIEWIT PLZ	OMAHA	NE	68131
051-051-019-1	FRANK C SR AND HELEN TRE ALEGRE	1140 VIENNA DR	LODI	CA	95242
051-051-021-7	GWF POWER SYSTEMS COMPANY C/O CATHERINE L EDWARDS	4300 RAILROAD AVE	PITTSBURG	CA	94565
051-052-007-5	FRANK D & JO ANN TRE EVANGELHO	897 OAK PARK BLVD	PISMO BEACH	CA	93449
051-052-008-3	CITY OF ANTIOCH C/O CITY CLERK	PO BOX 5007	ANTIOCH	CA	94531
051-052-053-9	SANDY LANE PROPERTIES C/O NORMA J GONSALVES	361 SANDY LN	OAKLEY	CA	94561
051-052-056-2	FORESTAR (USA) REAL ESTATE C/0 DENISE E ORSBORN	6300 BEE CAVE RD	AUSTIN	TX	78746
051-052-110-7	ROBERT C MARKSTEIN FLP C/O ROBERT MARKSTEIN	1645 DRIVE IN WAY	ANTIOCH	CA	94509
051-250-001-8	STATE OF CALIFORNIA	7791 RINCON ANNEX	SAN FRANCISCO	CA	94120
705-103-001-8	NORMA JEAN GONSALVES	361 SANDY LN	OAKLEY	CA	94561
Source: Contra Costa County Assessor, Janaury 19, 2012					

APPENDIX B
REVISED OFFSITE CONSEQUENCES ANALYSIS

Calculation of Model Parameters

19.1% aqueous ammonia

Equation Used to Determine the Emission Rate of Ammonia:

$$QR = \frac{0.284 U^{0.78} MW^{2/3} A \times VP}{82.05 T}$$

where:

QR = emission rate of ammonia (pounds per minute)
U = wind speed (meters per second)
MW = molecular weight of ammonia (grams per gram-mole)
A = surface area of spilled liquid pool (square feet)
VP = vapor pressure of ammonia above solution (millimeters of mercury)
T = temperature of liquid (degrees Kelvin)

Worst-Case Scenario:

stability =	F	
U =	1.5	m/s
T =	97	F
MW =	17.03	grams/gram-mol
A =	9.36	ft^2
VP =	296	mm Hg
T =	309.3	K

highest maximum daily temperature for the previous three years at Antioch 1971-2000 (WRCC) or at process temperature, whichever is higher.

Drain diameter	38	inches
Unloading drain diam	24	inches

Note:
1 20,000 gallon tanks with a drain hole below each tank and a drain hole in the unloading area
* area assumes 15% covered by grating

Effective spill dimensions

Area	0.870	m2

Model input

Effective Length	1.319	m
Effective Width	0.660	m

Emission Rate

QR = 0.282 lbs ammonia / min
2.133 g ammonia / s

Alternative Scenario piping break

stability =	D	
U =	3	m/s
T =	77	F
MW =	17.03	grams/gram-mol
A =	54.43	ft^2
VP =	148	mm Hg
T =	298.2	K
density of ammonia	7.967	lb/gal

released at ambient temperature of 25C

Pipe Diam	0.06	feet	0.75	inch	
Pipe length	75.00	feet	pipe length - above ground to SCR		
Volume of pipe	0.23	ft3			
Volume pumped in 10 mi	11.72	gallons	560	lb/hr	ammonia flow rate
total volume spilled	**1.80**	ft3	70.29	gal/hr	

ammonia spilled directly on ground, no containment

length	75.00	feet
thickness	0.03	feet
spread	0.7257	feet

Model input

Effective Length	2.249	m
Effective Width	2.249	m

QR = 1.458 lbs ammonia / min
11.024 g ammonia / s

Equation Used to Determine the Emission Rate Per Area:

(parameter required for dispersion model)

$$E = \frac{QR}{A}$$

where:

E = emission rate of ammonia (g / s*m^2)
QR = emission rate of ammonia (g/s)
A = surface area of spilled liquid pool (m^2)

E = 2.451 g / s*m^2

E = 2.180 g / s*m^2

Marsh Landing Generating Station

Offsite Consequences Analysis – Worst-case Scenario

01/17/12

17:29:42
  *** SCREEN3 MODEL RUN ***
  *** VERSION DATED 96043 ***

 MLGS Worst-case entire 20,000 gal tank spills scenario

 SIMPLE TERRAIN INPUTS:
    SOURCE TYPE   =   AREA
    EMISSION RATE (G/(S-M**2)) =   2.45100
    SOURCE HEIGHT (M)   =   0.0000
    LENGTH OF LARGER SIDE (M)   =   1.3190
    LENGTH OF SMALLER SIDE (M) =   0.6600
    RECEPTOR HEIGHT (M)   =   0.0000
    URBAN/RURAL OPTION   =   RURAL
 THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

    MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

 BUOY. FLUX =   0.000 M**4/S**3; MOM. FLUX =   0.000 M**4/S**2.

 *** STABILITY CLASS 6 ONLY ***
 *** ANEMOMETER HEIGHT WIND SPEED OF   1.50 M/S ONLY ***

 ****
 *** SCREEN AUTOMATED DISTANCES ***
 ****

 *** TERRAIN HEIGHT OF   0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	0.1255E+08	6	1.5	1.5	10000.0	0.00	25.
100.	0.4774E+05	6	1.5	1.5	10000.0	0.00	0.
200.	0.1428E+05	6	1.5	1.5	10000.0	0.00	0.
300.	7149.	6	1.5	1.5	10000.0	0.00	0.
400.	4379.	6	1.5	1.5	10000.0	0.00	0.
500.	2995.	6	1.5	1.5	10000.0	0.00	0.
600.	2196.	6	1.5	1.5	10000.0	0.00	0.
700.	1690.	6	1.5	1.5	10000.0	0.00	0.
800.	1365.	6	1.5	1.5	10000.0	0.00	0.
900.	1131.	6	1.5	1.5	10000.0	0.00	0.
1000.	955.4	6	1.5	1.5	10000.0	0.00	0.
1100.	824.6	6	1.5	1.5	10000.0	0.00	0.

1200.	720.9	6	1.5	1.5	10000.0	0.00	0.
1300.	637.1	6	1.5	1.5	10000.0	0.00	0.
1400.	568.3	6	1.5	1.5	10000.0	0.00	0.
1500.	510.9	6	1.5	1.5	10000.0	0.00	0.
1600.	462.6	6	1.5	1.5	10000.0	0.00	0.
1700.	421.3	6	1.5	1.5	10000.0	0.00	0.
1800.	385.8	6	1.5	1.5	10000.0	0.00	0.
1900.	355.0	6	1.5	1.5	10000.0	0.00	0.
2000.	328.0	6	1.5	1.5	10000.0	0.00	0.
2100.	305.6	6	1.5	1.5	10000.0	0.00	0.
2200.	285.6	6	1.5	1.5	10000.0	0.00	0.
2300.	267.8	6	1.5	1.5	10000.0	0.00	0.
2400.	251.7	6	1.5	1.5	10000.0	0.00	0.
2500.	237.3	6	1.5	1.5	10000.0	0.00	0.
2600.	224.1	6	1.5	1.5	10000.0	0.00	0.
2700.	212.2	6	1.5	1.5	10000.0	0.00	0.
2800.	201.3	6	1.5	1.5	10000.0	0.00	0.
2900.	191.3	6	1.5	1.5	10000.0	0.00	0.
3000.	182.1	6	1.5	1.5	10000.0	0.00	0.
3500.	147.5	6	1.5	1.5	10000.0	0.00	0.
4000.	122.9	6	1.5	1.5	10000.0	0.00	0.
4500.	104.7	6	1.5	1.5	10000.0	0.00	0.
5000.	90.65	6	1.5	1.5	10000.0	0.00	0.
5500.	79.60	6	1.5	1.5	10000.0	0.00	0.
6000.	70.71	6	1.5	1.5	10000.0	0.00	0.
6500.	63.41	6	1.5	1.5	10000.0	0.00	0.
7000.	57.32	6	1.5	1.5	10000.0	0.00	0.
7500.	52.37	6	1.5	1.5	10000.0	0.00	0.
8000.	48.14	6	1.5	1.5	10000.0	0.00	0.
8500.	44.49	6	1.5	1.5	10000.0	0.00	0.
9000.	41.28	6	1.5	1.5	10000.0	0.00	0.
9500.	38.47	6	1.5	1.5	10000.0	0.00	0.
10000.	35.97	6	1.5	1.5	10000.0	0.00	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

2.	0.2148E+08	6	1.5	1.5	10000.0	0.00	24.

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
2.	0.1878E+08	6	1.5	1.5	10000.0	0.00	20.
3.	0.1254E+08	6	1.5	1.5	10000.0	0.00	14.
4.	0.9258E+07	6	1.5	1.5	10000.0	0.00	0.
5.	0.6999E+07	6	1.5	1.5	10000.0	0.00	0.
10.	0.2484E+07	6	1.5	1.5	10000.0	0.00	0.

11.	0.2127E+07	6	1.5	1.5	10000.0	0.00	0.
12.	0.1844E+07	6	1.5	1.5	10000.0	0.00	0.
13.	0.1614E+07	6	1.5	1.5	10000.0	0.00	0.
14.	0.1427E+07	6	1.5	1.5	10000.0	0.00	0.
15.	0.1270E+07	6	1.5	1.5	10000.0	0.00	0.
16.	0.1139E+07	6	1.5	1.5	10000.0	0.00	0.
17.	0.1028E+07	6	1.5	1.5	10000.0	0.00	0.
18.	0.9330E+06	6	1.5	1.5	10000.0	0.00	0.
20.	0.7787E+06	6	1.5	1.5	10000.0	0.00	0.
25.	0.5309E+06	6	1.5	1.5	10000.0	0.00	0.
27.	0.4647E+06	6	1.5	1.5	10000.0	0.00	0.
28.	0.4363E+06	6	1.5	1.5	10000.0	0.00	0.
29.	0.4106E+06	6	1.5	1.5	10000.0	0.00	0.
30.	0.3872E+06	6	1.5	1.5	10000.0	0.00	0.
33.	0.3284E+06	6	1.5	1.5	10000.0	0.00	0.
34.	0.3119E+06	6	1.5	1.5	10000.0	0.00	0.
35.	0.2967E+06	6	1.5	1.5	10000.0	0.00	0.
40.	0.2354E+06	6	1.5	1.5	10000.0	0.00	0.
42.	0.2162E+06	6	1.5	1.5	10000.0	0.00	0.
45.	0.1917E+06	6	1.5	1.5	10000.0	0.00	0.
50.	0.1596E+06	6	1.5	1.5	10000.0	0.00	0.
51.	0.1541E+06	6	1.5	1.5	10000.0	0.00	0.
52.	0.1490E+06	6	1.5	1.5	10000.0	0.00	0.
53.	0.1442E+06	6	1.5	1.5	10000.0	0.00	0.
54.	0.1395E+06	6	1.5	1.5	10000.0	0.00	0.
55.	0.1351E+06	6	1.5	1.5	10000.0	0.00	0.
56.	0.1294E+06	6	1.5	1.5	10000.0	0.00	0.
58.	0.1235E+06	6	1.5	1.5	10000.0	0.00	0.
61.	0.1130E+06	6	1.5	1.5	10000.0	0.00	0.
70.	0.8884E+05	6	1.5	1.5	10000.0	0.00	0.
76.	0.7665E+05	6	1.5	1.5	10000.0	0.00	0.
91.	0.5579E+05	6	1.5	1.5	10000.0	0.00	0.
92.	0.5520E+05	6	1.5	1.5	10000.0	0.00	0.
93.	0.5417E+05	6	1.5	1.5	10000.0	0.00	0.
94.	0.5317E+05	6	1.5	1.5	10000.0	0.00	0.
95.	0.5220E+05	6	1.5	1.5	10000.0	0.00	0.
600.	2197.	6	1.5	1.5	10000.0	0.00	0.
701.	1686.	6	1.5	1.5	10000.0	0.00	0.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.2148E+08	2.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

Marsh Landing Generating Station

Offsite Consequences Analysis – Alternative Scenario

01/17/12

17:07:30
  *** SCREEN3 MODEL RUN ***
  *** VERSION DATED 96043 ***

 MLGS Alternative piping to SCR break scenario

 SIMPLE TERRAIN INPUTS:
    SOURCE TYPE   =   AREA
    EMISSION RATE (G/(S-M**2)) =   2.18000
    SOURCE HEIGHT (M)   =   0.0000
    LENGTH OF LARGER SIDE (M)   =   2.2490
    LENGTH OF SMALLER SIDE (M) =   2.2490
    RECEPTOR HEIGHT (M)   =   0.0000
    URBAN/RURAL OPTION   =   RURAL
 THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

    MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

 BUOY. FLUX =   0.000 M**4/S**3; MOM. FLUX =   0.000 M**4/S**2.

 *** STABILITY CLASS 4 ONLY ***
 *** ANEMOMETER HEIGHT WIND SPEED OF   3.00 M/S ONLY ***

 ****
 *** SCREEN AUTOMATED DISTANCES ***
 ****

 *** TERRAIN HEIGHT OF   0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	0.6258E+07	4	3.0	3.0	960.0	0.00	45.
100.	0.3055E+05	4	3.0	3.0	960.0	0.00	31.
200.	8824.	4	3.0	3.0	960.0	0.00	31.
300.	4269.	4	3.0	3.0	960.0	0.00	24.
400.	2595.	4	3.0	3.0	960.0	0.00	23.
500.	1765.	4	3.0	3.0	960.0	0.00	23.
600.	1288.	4	3.0	3.0	960.0	0.00	22.
700.	987.3	4	3.0	3.0	960.0	0.00	22.
800.	784.2	4	3.0	3.0	960.0	0.00	22.
900.	640.1	4	3.0	3.0	960.0	0.00	22.
1000.	533.9	4	3.0	3.0	960.0	0.00	22.
1100.	460.3	4	3.0	3.0	960.0	0.00	17.

1200.	402.1	4	3.0	3.0	960.0	0.00	10.
1300.	355.0	4	3.0	3.0	960.0	0.00	10.
1400.	316.4	4	3.0	3.0	960.0	0.00	17.
1500.	284.3	4	3.0	3.0	960.0	0.00	10.
1600.	257.2	4	3.0	3.0	960.0	0.00	17.
1700.	234.1	4	3.0	3.0	960.0	0.00	10.
1800.	214.2	4	3.0	3.0	960.0	0.00	10.
1900.	197.0	4	3.0	3.0	960.0	0.00	17.
2000.	181.9	4	3.0	3.0	960.0	0.00	22.
2100.	168.7	4	3.0	3.0	960.0	0.00	22.
2200.	157.0	4	3.0	3.0	960.0	0.00	10.
2300.	146.5	4	3.0	3.0	960.0	0.00	10.
2400.	137.2	4	3.0	3.0	960.0	0.00	22.
2500.	128.8	4	3.0	3.0	960.0	0.00	22.
2600.	121.2	4	3.0	3.0	960.0	0.00	22.
2700.	114.3	4	3.0	3.0	960.0	0.00	10.
2800.	108.0	4	3.0	3.0	960.0	0.00	10.
2900.	102.3	4	3.0	3.0	960.0	0.00	22.
3000.	97.10	4	3.0	3.0	960.0	0.00	22.
3500.	76.97	4	3.0	3.0	960.0	0.00	22.
4000.	62.95	4	3.0	3.0	960.0	0.00	22.
4500.	52.73	4	3.0	3.0	960.0	0.00	24.
5000.	45.01	4	3.0	3.0	960.0	0.00	24.
5500.	39.00	4	3.0	3.0	960.0	0.00	24.
6000.	34.23	4	3.0	3.0	960.0	0.00	24.
6500.	30.35	4	3.0	3.0	960.0	0.00	24.
7000.	27.16	4	3.0	3.0	960.0	0.00	24.
7500.	24.49	4	3.0	3.0	960.0	0.00	24.
8000.	22.24	4	3.0	3.0	960.0	0.00	7.
8500.	20.31	4	3.0	3.0	960.0	0.00	33.
9000.	18.65	4	3.0	3.0	960.0	0.00	33.
9500.	17.20	4	3.0	3.0	960.0	0.00	33.
10000.	15.93	4	3.0	3.0	960.0	0.00	33.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

2.	0.8827E+07	4	3.0	3.0	960.0	0.00	45.

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
3.	0.7679E+07	4	3.0	3.0	960.0	0.00	45.
10.	0.1610E+07	4	3.0	3.0	960.0	0.00	45.
11.	0.1392E+07	4	3.0	3.0	960.0	0.00	45.
12.	0.1215E+07	4	3.0	3.0	960.0	0.00	45.
15.	0.8264E+06	4	3.0	3.0	960.0	0.00	42.

18.	0.6265E+06	4	3.0	3.0	960.0	0.00	43.
20.	0.5242E+06	4	3.0	3.0	960.0	0.00	39.
25.	0.3573E+06	4	3.0	3.0	960.0	0.00	36.
30.	0.2601E+06	4	3.0	3.0	960.0	0.00	32.
33.	0.2200E+06	4	3.0	3.0	960.0	0.00	28.
34.	0.2087E+06	4	3.0	3.0	960.0	0.00	27.
35.	0.1983E+06	4	3.0	3.0	960.0	0.00	26.
40.	0.1567E+06	4	3.0	3.0	960.0	0.00	39.
42.	0.1437E+06	4	3.0	3.0	960.0	0.00	36.
45.	0.1271E+06	4	3.0	3.0	960.0	0.00	33.
50.	0.1054E+06	4	3.0	3.0	960.0	0.00	15.
56.	0.8509E+05	4	3.0	3.0	960.0	0.00	11.
58.	0.8115E+05	4	3.0	3.0	960.0	0.00	9.
61.	0.7407E+05	4	3.0	3.0	960.0	0.00	7.
64.	0.6790E+05	4	3.0	3.0	960.0	0.00	7.
67.	0.6249E+05	4	3.0	3.0	960.0	0.00	7.
70.	0.5787E+05	4	3.0	3.0	960.0	0.00	7.
72.	0.5503E+05	4	3.0	3.0	960.0	0.00	7.
73.	0.5369E+05	4	3.0	3.0	960.0	0.00	7.
74.	0.5239E+05	4	3.0	3.0	960.0	0.00	7.
76.	0.4971E+05	4	3.0	3.0	960.0	0.00	9.
80.	0.4571E+05	4	3.0	3.0	960.0	0.00	19.
91.	0.3586E+05	4	3.0	3.0	960.0	0.00	27.
576.	1381.	4	3.0	3.0	960.0	0.00	22.
678.	1044.	4	3.0	3.0	960.0	0.00	22.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.8827E+07	2.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****