

EXECUTIVE SUMMARY

Recent changes in air emission regulations have impacted the ability of Sacramento Suburban Water District's (SSWD) to operate its diesel powered generators. The following regulations have been changed that will cause SSWD to replace nine of its generators and re-permit three from portable to stationary:

- California Air Resources Control Board's (CARB) Portable Equipment Registration Program (PERP)
- Sacramento Metropolitan Air Quality Management District's (SMAQMD) permitting for portable and stationary generators

This plan identifies the regulations and SSWD policies that affect the operation and maintenance of SSWD's generators, and provides recommendations and opinion of probable costs for the generators that require short-term replacement.

CARB Registered Generators

Nine of SSWD's generators are immediately affected by the changed regulations. They are no longer able to be registered with CARB under their PERP program and have no current permit to operate. SMAQMD staff has stated that these generators will be able to be permitted to operate with SMAQMD portable permits. These new permits need to be completed and submitted to SMAQMD. The estimated permit fees are \$10,778. These new permits are temporary, and will be valid until January 1, 2010. After that time, SSWD will be subject to fines if these generators operate. These generators are located at the following sites:

Well	Facility Name
32A	Root / Eden
55A	Stewart / Lynndale
71	River Drive/Jacob
N3	Engle
N5	Hillsdale
N14	Orangegrove
N15	Cabana
N31	Barrett Meadows
N34	Cottage

Due to the potential fines associated with operating these generators after January 1, 2010, these generators have been classified as Priority A replacements. If SSWD is not able to replace all of these generators by January 1, 2010 then the remaining generators will be classified as Priority B. Negotiations between SSWD and SMAQMD to work out a compliance order relative to Priority B replacements should start as soon as these

generators have been identified. SMAQMD staff has stated that fines for operating these generators will be set to encourage SSWD to make air quality a priority over an economic decision to keep them in operation. Priority C generator replacements have had their hours of maintenance reduced based on their emissions. There is no current urgency to replace these generators. These generators should be replaced over time to improve air quality as funding becomes available.

The opinions of probable costs for these generator replacements are located in Appendix B. A summary of these costs are as follows:

Well No.	Location	Opinion of Probable Cost, \$ (Gas/Diesel)
32A	Root / Eden	235,000 / 115,000
55A	Stewart / Lynndale	235,000 / 115,000
71	River Drive / Jacob	235,000 / 115,000
N3	Engle	340,000 / 300,000
N5	Hillsdale	115,000 / 60,000
N14	Orangetown	(Relocated to N35)
N15	Cabana	445,000 / 345,000
N31	Barrett Meadows	340,000 / 300,000
N34	Cottage	310,000 / 130,000
N35	Antelope	310,000 / 130,000
Port. B	Auburn Blvd	(Destroyed and not replaced)

SMAQMD Portable Permitted Generators

Three existing generators have SMAQMD portable permits. Since these generators are at fixed locations, a change in their permit from portable to stationary is required. SMAQMD staff has stated that the portable permits can be changed and grandfathered into SMAQMD stationary permits. These generators are located at:

- Well 66 Eastern/Woodside Church
- Well 72 Riverwalk / NETP
- Well 60 Whitney/ Concetta

The re-permitting of these generators can be completed concurrently with the submittal of SMAQMD portable permit applications for the nine CARB registered generators.

TABLE OF CONTENTS

EXECUTIVE SUMMARYi

TABLE OF CONTENTSiii

1 INTRODUCTION1

2 SUSTAINABILITY2

3 AIR QUALITY REGULATION oVERVIEW5

4 INTERIM PERMITTING OF NON-COMPLIANT GENERATORS7

5 NATURAL GAS AND DIESEL GENERATORS FOR STANDBY AND PRIME
OPERATION9

6 GENERATOR REPLACEMENT PLAN 11

7 CONCLUSION 13

APPENDIX A: RELEVANT AIR QUALITY REGULATIONS

APPENDIX B: SITE ASSESSMENTS

APPENDIX C: GENERATOR SET CUT SHEETS

1 INTRODUCTION

Sacramento Suburban Water District (SSWD) owns twenty eight engine generators (generators) and thirteen engine driven pumps. This generator compliance plan (plan) focuses on the engines that have operation limitations due to Sacramento Metropolitan Air Quality Management District (SMAQMD) and California Air Resources Board (CARB) regulations.

Not addressed in this report are the thirteen SSWD natural gas or propane powered pumps and generators that are currently permitted. These units are permitted for either unrestricted operation or the maximum hours of maintenance and emergency operation (100 hrs/yr maintenance and 200 hrs/yr total) as permitted by SMAQMD.

The remaining twenty eight generators have operational restrictions. This plan presents recommendations for SSWD to meet short and long term air quality compliance for these generators and is intended to:

- Discuss how the generator compliance plan presented is consistent with SSWD's sustainability policy
- Provide an overview of the air quality regulations that impact the operation of the generators
- Address the ten generators that are currently registered with CARB as portable
- Describe natural gas and diesel powered generators for standby and prime operation
- Detail a generator replacement strategy to achieve air quality emission compliance

The plan is consistent with SSWD's sustainability policy and their commitment to the environment. This plan includes the replacement of older diesel engines with new cleaner burning engines that will reduce SSWD's generator carbon footprint and their impact on regional air quality.

2 SUSTAINABILITY

SSWD's resolve to evaluate and update its installed inventory of standby generators is consistent with the purpose of its Sustainability Policy (policy), adopted November 12, 2007, as excerpted below:

The primary purpose of this policy is to establish Sustainability as a guiding principle for daily operations and as a framework for longer term business decisions for the District. The Board of Directors of the Sacramento Suburban Water District recognizes and accepts its responsibility to support a sustainable community through plans, policies, and procedures that promote clean air and water, reduce energy consumption and air pollution, promote water use efficiency, the use of alternative energy sources, recycling and solid waste management, and provide awareness in these areas to its employees, customers, and the community.

This policy also has ten guidelines for SSWD to achieve sustainability. Each guideline is shown in bold below, and is followed by a description of how sustainability and this plan complement each other.

1. Encourage and develop connections between environmental quality and operational efficiency. This generator compliance plan offers a strategy by which SSWD can improve its operational efficiency while reducing its air emissions. One part of this strategy involves replacement of existing CARB-registered diesel generators (see section 4) with newer, cleaner natural gas powered models. This will enable district staff to maintain its generators without the need to store diesel fuel onsite, be available for deliveries of diesel fuel, maintain the stored diesel and eliminate the risk of a diesel spill at the well site. Regional air impacts are also reduced by eliminating diesel truck delivery of fuel to well sites.

2. Include long term and cumulative impacts in decision making and work to protect environmental quality in our community. With every old diesel generator replaced by SSWD, the long term cumulative effect of the resulting lower emissions will be cleaner air. Compliance with CARB and SMAQMD will help meet the overall long term goals for air quality in the region.

3. Ensure commitment to equity so environmental impacts and the costs of protecting the environment do not unfairly burden the District's ratepayers. The ten CARB-registered generators require replacement by January 1, 2010 or SSWD could be subjected to fines by SMAQMD that would adversely impact SSWD's ratepayers. SMAQMD has stated that the fines are high in order to encourage compliance.

4. Ensure environmental quality and understand environmental linkages when decisions are made regarding project development and implementation, District owned facility use, transportation needs, energy use, water conservation, and air quality impacts. The environmental linkages between cleaner and more efficient standby generators and air quality are evident. SSWD's generators have the potential to significantly impact air quality during routine maintenance and power interruptions.

5. Use resources efficiently and, when possible, reduce demand for natural resources. The District has an opportunity to utilize new natural gas generators as prime electricity sources rather than merely for standby operation. The local power utility (SMUD) has expressed an interest in evaluating the possibility of taking advantage of load shedding with SSWD's new generators. In the past this was done with SSWD's diesel generators and is no longer possible due to current air quality regulations. SMUD has stated that they may be interested in providing incentives to make this happen. This incentive by SMUD is based on their ability to delay or avoid constructing new peak sources of electricity for its system which reduces the demand on natural resources for construction and operation of the new source.

6. Use cost effective measures to mitigate additional pollution through planned, proactive measures rather than only corrective action. The replacement of older generators with cleaner burning models will reduce SSWD's overall generator pollution; this enables the addition of new generators in the future without exceeding SSWD's current emission levels.

7. Act locally to reduce adverse global impacts by supporting and implementing innovative programs that maintain and promote the District as a sustainable business. The plan enables SSWD to reduce unhealthy air and may offer regional and state benefits by reducing the need to construct and operate new peak energy facilities. This plan demonstrates social, financial, and environmental responsibility; each of which is an important element of sustainability.

8. Purchase products based on long term environmental and operating costs and find ways to include environmental and social costs in short term prices. Purchase products that are durable, reusable, biodegradable, made of recycle materials and non-toxic. Much of the metal used in manufacturing new generators is recycled metal; which will be recycled again at the end of the generator's life. The existing SSWD generators that are replaced will be destroyed and their metal recycled.

9. Educate customers and employees about the District sustainable programs. Work with other entities not directly related to water, to implement Best Management Practices and take advantage of community resources. The plan is intended to provide information to educate SSWD as to how the generators may be

replaced in a sustainable manner. Additionally, the plan supports a discussion with SMUD to investigate potential of load shedding.

10. Solicit customer input on solutions. Encourage customer participation in District policy decisions. Encourage individuals and businesses to take responsibility for their actions that impact water and the environment. This plan will be submitted to the SSWD's Board of Directors for their review and discussion at their board meeting which creates an opportunity for public review and comment.

3 AIR QUALITY REGULATION OVERVIEW

This section presents an overview of air regulations that are relevant to SSWD. California Air Resources Board (CARB) is the state agency that regulates the emissions of internal combustion engines at the state level. CARB's Portable Equipment Registration Program (PERP) and portable Airborne Toxic Control Measure (ACTM) have immediate and short term impacts on SSWD's generators. Sacramento Metropolitan Air Quality Management District (SMAQMD) is the local regulator that oversees and enforces state and local air quality regulations. All new permits for operating generators in Sacramento County are filed with SMAQMD.

PERP is a statewide program to register and regulate portable engines. The program applies to portable equipment with engines that are designed and capable of being carried or moved from one location to another. SSWD entered the program to take advantage of being able to operate their portable generators without restriction. Recent changes to the program have limited the definition of portable equipment in such a way that SSWD's CARB generators are no longer eligible for this program. Since they are effectively not registered with PERP and are not permitted with SMAQMD, these CARB generators are currently operating without a permit and could be subjected to fines when they are operated.

CARB has declared diesel particulate matter to be the number one contributor to the adverse health impacts of toxic air contaminants. They have stated that exposure to diesel particulate matter (PM) may result in both cancer and non-cancer health effects. As a result, CARB created an ATCM that focuses on minimizing the adverse health effects of diesel PM.

A portable generator permit from SMAQMD is an interim solution to bring these PERP generators into compliance. Obtaining these permits follows the typical SMAQMD application process. These permits will be valid until January 1, 2010 when the ATCM goes into effect. At that time, all SSWD portable generators (the ten PERP generators and three existing generators with portable permits from SMAQMD) will not have permits, if operated, could be subjected to fines.

In addition to meeting the ATCM, SMAQMD has created local permit conditions which must be met. One such SMAQMD permit condition is that any diesel powered generator within 1,000 feet of a K-12 school is prohibited from operating for maintenance between 7:30 am and 4:30 pm or during school sponsored activities. Currently, this permit condition affects three SSWD diesel generators.

These permit conditions can be retroactively applied to an existing permit if a K-12 school is built within 1,000 feet of an existing diesel generator; as in the case of SSWD's N34 Cottage Well site. This permit condition does not apply to natural gas powered generators.

See Appendix A for CARB and SMAQMD guidelines and policies that are relevant to SSWD's generators.

4 INTERIM PERMITTING OF NON-COMPLIANT GENERATORS

As discussed in Section 3, SSWD has ten PERP registered portable diesel generators which currently have no permit to operate. At a recent meeting with SMAQMD, it was determined that these generators could obtain portable generator permits from SMAQMD. These permits would bring the generators into compliance until January 1, 2010 when the portable ATCM goes into effect. After that date, these generators will again not have a permit to operate.

FA recommends that nine of the ten PERP generators obtain portable generator permits from SMAQMD and that the generator referred to as 'Portable B' be destroyed and recycled. The nine PERP generators that require permitting are:

Well	Facility Name
32A	Root / Eden
55A	Stewart / Lynndale
71	River Drive/Jacob
N3	Engle
N5	Hillsdale
N14	Orangetown
N15	Cabana
N31	Barrett Meadows
N34	Cottage

Additionally, after follow-up conversations with Brian Krebs of SMAQMD, it was learned that the existing SMAQMD portable permitted generators at Well 66 Eastern/Woodside Church, Well 72 Riverwalk/NETP, and Well 60 Whitney/Concetta will be able to have their portable permits changed and grandfathered into SMAQMD stationary permits. These generators will not require replacement.

The procedures under which to comply with SMAQMD permitting requirements for generators are relatively straight-forward. The permit application consists of three (3) documents:

Form G100 requests general information related to the applicant's name, place of business, location of the proposed equipment; a description of the equipment; and the signature of a responsible official.

Form G101 requests specific engine details including engine type, fuel type, loads, manufacturer's emission data, stack data, and external factors of interest such as distances to nearest receptors.

Form ICE101 requests technical information on the generator installation. It is the primary documentation by which the regulating authority (SMAQMD) determines whether proposed equipment will comply with applicable rules. It generally includes a:

- drawing depicting location of the equipment,
- description of the equipment,
- description of the process that will enable the agency to understand the nature, volume, particle sizes, weights, and concentrations of all potential air, contaminants and the procedures to control those emissions,
- description of the use of this equipment,
- operating schedule, and
- fuels.

SMAQMD's Rule 301 lists various requirements and fees for initially permitting a stationary source. Each SSWD application for an Authorization to Construct (permit) an internal combustion engine will require payment of a fee according to Schedule 7, the Internal Combustion Engine Horsepower Schedule. That fee is based upon rated engine horsepower and is \$2536 for engines over 500 BHP (one SSWD generator), \$1268 for engines between 250 and 499 BHP (five SSWD generators), and \$634 for engines between 50 and 249 BHP (three SSWD generators).

Total application fees for the nine generators would be \$10,778, of which one-half must be submitted with the application.

5 NATURAL GAS AND DIESEL GENERATORS FOR STANDBY AND PRIME OPERATION

This section describes the two types of fuel available for new generators and the two ways operating them: standby or prime. New generators are powered with either natural gas or diesel fuel. The primary factors for selecting the fuel are:

- Sustainability,
- Cost,
- Standby or prime operation, and
- Permitting

Sustainability: Both the natural gas and diesel engines will be required to meet SMAQMD emission requirements and will reduce the air pollution emissions from the operating of the engines. The natural gas engines burn cleaner than the diesel engines. Both types of engines are made of recycled metal and the older generators that are being replaced will be destroyed and recycled.

Converting from diesel standby to natural gas prime generation offers other perhaps less obvious benefits. These primarily involve the realities of diesel fuel and the potential for groundwater and surface water contamination. Onsite storage of diesel offers the potential for fuel spills during delivery as well as during fuelling.

Cost: Currently, the cost of a natural gas powered generator is more than a comparable diesel powered generator. For 150 kW, the price difference is approximately 50% more for natural gas. For 350 kW generators the price difference is over 200%. After talking to the OEM, the reason for the price difference is that natural gas generators require a larger engine and the engine would have to be custom. They said that due to the increasingly strict regulations, the demand for natural gas generators should increase resulting in a narrowing in the cost differential.

Standby or Prime Operation: Currently, SSWD has thirty-two standby and nine prime permitted engines. The definitions of the two types of permits are as follows:

Standby permitted engines can operate for a maximum of 200 hours per year for power outages. The operating hours of these engines for maintenance is limited to a maximum of 100 hours and may be lower based on their emissions. The times the diesel engine can operate for maintenance will be limited if within 1,000 feet of a K-12 school.

Prime permitted engines do not have any restrictions to their operation but may be subjected to annual emission verifications. Currently, none of SSWD prime engines have been subjected to this verification.

Historically, SSWD has mainly used their diesel and natural gas generators for standby power. In the late 1990's, SSWD and other local water purveyors partnered with the electric utility (SMUD) and utilized their generators and engine driven pumps to take their electric loads off of SMUD power. This planned removal of electric loads is called load shedding. This partnership worked successfully and benefited both the water utilities and SMUD. In the early 2000s, the enforcement of air quality permit conditions by SMAQMD ended the partnership. No load shedding between the water utilities and SMUD exist today.

An opportunity for SSWD to restart their load shedding program is available by using its existing prime engines. A hydraulic analysis is required to determine if this is possible. Existing or new diesel generators cannot be permitted as prime because they cannot meet SMAQMD prime emission requirements. New natural gas generators may be permitted as prime. SMAQMD stated that the annual emission verification may cost as much as \$5,000 per year per generator.

Permitting: SMAQMD has stated they would prefer natural gas powered generators over diesel powered generators because of the natural gas engine burns cleaner than diesel engines. However, they are also not in favor of permitting prime generators for load shedding. SMAQMD has stated that large utility power plants produce lower overall emissions than equivalent power produced from multiple smaller generators; such as the generators that SSWD would install as prime.

6 GENERATOR REPLACEMENT PLAN

SSWD has 41 standby generators that provide power to its water supply facilities in the event that utility power by SMUD is interrupted. Historically, these utility power interruptions have been localized or District wide and have lasted from several minutes to several hours. During these interruptions, the district must rely on these generators for alternate power in order to maintain water supply so that water pressure and fire protection are available to its customers.

Due to increasingly restrictive state and local air quality regulations, the district must replace existing generators with cleaner burning engines. This replacement plan identifies the generators that are impacted by air quality regulations and recommends a priority for replacement. The priority of replacement is based on criteria that are relative to air quality emission requirements and not financial considerations, generator age, efficiency or hydraulic impacts from power interruptions. Each generator has been assigned a priority A, B or C as defined below.

Priority A:

Priority A generators are the CARB registered generators that will be either removed from operation or replaced before January 1, 2010. These generators will immediately require SMAQMD portable generator permits as discussed in section 4 (see list below).

Priority B:

Priority B generators are CARB registered generators that are not replaced before January 1, 2010 and will remain in operation. These generators will require SMAQMD portable generator permits as discussed in section 4.

At a meeting with SMAQMD, it was recommended that a compliance order between SSWD and SMAQMD be negotiated for all Priority B generators that are still in operation after January 1, 2010. According to SMAQMD, this compliance order would demonstrate a good faith effort by SSWD to bring their generators into compliance and could possibly limit the amount of fines. These negotiations should take place as soon as SSWD determines which generators will be priority B (see list below).

Priority C:

Priority C generators are all other SSWD generators that have had their maintenance hours of operation limited due to their air emissions or their proximity to K- 12 schools. These generators are currently permitted by SMAQMD and there is no urgency for replacement. These generators should be budgeted for replacement after all Priority A and B generators are replaced or taken out of operation and funding is available. The

replacement of these generators is consistent with SSWD's sustainability policy as stated in section 3 (see list below).

Priority A and B Generators

The following list of Priority A and B generators include an opinion of probable cost for each replacement. See appendix B for a detailed analysis of each site excluding Well 72 Riverwalk which could not be accessed.

Well No.	Location	Opinion of Probable Cost, \$1,000 (Gas/Diesel)	Remarks
32A	Root / Eden	235 / 115	K-12 school located within 1,000 feet
55A	Stewart / Lynndale	235 / 115	Currently limited operation due to sound issues with generator
71	River Drive / Jacob	235 / 115	K-12 school located within 1,000 feet
N3	Engle	340 / 300	Complete facility upgrade required
N5	Hillsdale	115 / 60	Additional property required
N14	Orangegrove	--	Removed from operation (new generator planned at N35)
N15	Cabana	445 / 345	Complete facility upgrade required
N31	Barrett Meadows	340 / 300	Complete facility upgrade required
N34	Cottage	310 / 130	K-12 school located within 1,000 feet
N35	Antelope	310 / 130	Added in lieu of Orangegrove
Port. B	Auburn Blvd	--	Removed from operation

7 CONCLUSION

All the SSWD generators were reviewed. Based on this review, ten generators currently have no permit to operate. To obtain a permit to operate, it is recommended that nine of these generators be immediately permitted with SMAQMD and one destroyed and recycled.

Furthermore, these nine generators plus two existing SMAQMD permitted portable generators must be replaced by January 1, 2010 in order to be in compliance and avoid fines. It is also recommended that one additional SMAQMD portable permitted generator will be destroyed and recycled. These eleven generators have been given a Priority A. In the event SSWD determines that it cannot replace all of these generators and they must remain in service, a compliance order should be negotiated with SMAQMD to minimize financial impact to SSWD from operating fines.

The decision to replace the generators should be based on need, regulatory climate, opportunities for load shedding, SSWD's sustainability policy, and cost:

Need: A master plan for SSWD is currently being developed. It is recommended that SSWD include in its master plan an evaluation of whether or not all eleven Priority A replacements are appropriate at this time. This evaluation should include a hydraulic analysis that considers typical power interruptions during an average day demand as well as a review of historical power outages and their impacts on operations. Based on this analysis, the number of Priority A generators might be reduced.

Regulatory: In 2008, the EPA adopted the Tier 4 requirements for stationary diesel engines. These new emission requirements will be phased in by 2015 and will place further emission restriction on new stationary diesel engines. These new rules are anticipated to increase the capital cost for these types of engines, thereby narrowing the cost differential between natural gas and diesel powered generators.

These new regulatory requirement illustrate the focus of federal, state and local air quality regulators on diesel fuel. They will continue to increase restrictions on diesel engines with the goal of making owners consider cleaner alternative power sources. For SSWD, these restrictions are causing early replacement of generators and limited hours of maintenance operations.

Natural gas engines offer many advantages over diesel engines such as:

- Cleaner burning engines with lower air emissions
- Reduced engine maintenance
- Eliminated fuel deliveries and fuel maintenance
- Eliminated potential fuel spills
- Fewer restrictions on generator operation for maintenance

The disadvantage of natural gas powered generators is the higher capital cost from 50% (150 kW) to over 200% (350 kW) than same size diesel powered generators.

Load Shedding: Currently the air quality regulators are not in favor of using new natural gas generators for load shedding. However there is no prohibition of permitting a natural gas generator for a prime operation which would allow load shedding. Additionally, SSWD should consider using its existing natural gas engine driving pumps that are permitted as prime for load shedding. Talks between SSWD and SMUD should take place to explore incentives that may be available from SMUD such as rebates to offset the capital cost of the generators and/or lower power consumption rates.

Sustainability: As discussed in section 2, the replacement of older diesel powered generators with cleaner diesel or natural gas generators is consistent with the objectives in SSWD's sustainability policy. The replacement with natural gas powered generators over diesel powered generators further reduces the environmental impacts because natural gas is a cleaner fuel.

Cost: The costs for generator replacement may not be limited to the cost of the generator. In order to install a generator at some facilities, upgrades may be required. The upgrades may include: new electrical panel, relocation of plant piping, removal of hydropneumatic tanks, a pump to waste system, upgraded starter (reduced voltage or VFD) and an automatic transfer switch. Additionally, SSWD must consider the cost of natural gas powered generators compared with diesel.

SSWD needs to evaluate the affordability of replacing eleven generators within the next year to avoid operating generators without a valid SMAQMD operating permit. Opinions of probable cost are presented in section 6. A balance needs to be established between the costs of replace all of these generators versus operating generators without a permit. SMAQMD will not establish fixed fine schedules because they want to discourage owners from operating air pollution sources based on an economic decision. SMAQMD has stated that the fines will be substantial enough to provide a disincentive to operating without a permit and are determined on a case by case basis.