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STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMETN COMMISSION

In the Matter of:	)	**Docket No. 93-AFC-3C**
	)	
Campbell Cogeneration Project	)	**SPA's PETITION FOR POST-**
	)	**CERTIFICATION LICENSE**
	)	**AMENDMENT**

The Sacramento Power Authority ("SPA") hereby submits to the California Energy Commission ("CEC") this Petition for Post-certification License Amendment ("Petition") for SPA's Campbell Cogeneration Project ("Project") pursuant to Section 1769(a), Title 20, California Code of Regulations. By this Petition, SPA proposes to begin using recycled water in the Project cooling tower, install recycled water piping and requests approval to modify the CEC's Air Quality Conditions of Certification to incorporate any new permit conditions imposed by the Sacramento Metropolitan Air Quality Management District.

As an officer of SPA, I hereby attest, under penalty of perjury, under the laws of the State of California, that the contents of this Petition are truthful and accurate to the best of my knowledge and belief.

Respectfully submitted,

SACRAMENTO POWER AUTHOIRTY

LAURA LEWIS, Chief Legal Officer and General Counsel, by JOSEPH S. SCHOFIELD, Assistant General Counsel

Dated: November 19, 2015

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PETITION FOR MODIFICATION

Use of Recycled Water and Associated Facilities

for the

Sacramento Power Authority's Campbell Cogeneration Project

Sacramento, California
(93-AFC-3C)

Prepared for

Sacramento Power Authority

November 2015

With Technical Assistance by

and

Sierra Research

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Acronyms and Abbreviations

µg/m^3	microgram per cubic meter
AFC	Application for Certification
afy	acre-feet per year
CCR	California Code of Regulations
CEC	California Energy Commission
CEDD	California Employment Development Department
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
City	City of Sacramento
CO	carbon monoxide
CRM	cultural resource monitor
CRS	cultural resource specialist
CSSC	Campbell Soup Supply Company LLC
EIR	Environmental Impact Report
Fm	Formation
gpm	gallons per minute
HARP	Hotspots Analysis and Reporting Program
HRA	health risk assessment
HRIER	Historic Resources Inventory and Evaluation Report
lb	pound
LORS	laws, ordinances, regulations, and standards
mgd	million gallons per day
NCIC	North Central Information Center
NOx	oxides of nitrogen
PM_{10}	particulate matter less than 10 micrometers in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in aerodynamic diameter
ppm	parts per million
ppmw	parts per million by weight
PTA	Petition to Amend
Regional San	Sacramento Regional County Sanitation District
ROC	reactive organic compounds
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District

SOx	oxides of sulfur, or sulfur oxides
SO_2	sulfur dioxide
SPA	Sacramento Power Authority
SPAC	Sacramento Power Authority's Campbell Cogeneration Project
SRCSD	Sacramento Regional County Sanitation District
SRWTP	Sacramento Regional Wastewater Treatment Plant
TAC	toxic air contaminant
VOC	volatile organic compound
WRF	Water Reclamation Facility

Executive Summary

The Sacramento Power Authority (SPA) respectfully submits this petition to the California Energy Commission (CEC) for post-certification license modification for the Sacramento Power Authority's Campbell Cogeneration Project (SPAC) (93-AFC-3C) located in the City of Sacramento (City), California, on approximately 5.8 acres adjacent to the former Campbell Soup Supply Company LLC (CSSC) facility (now known as the Capital Commerce Center), which was the project's steam host. SPAC is located at 3215 47th Avenue, which is east of the corner of 47th Avenue and Franklin Boulevard, approximately 1 mile west of Highway 99. This petition for post-certification license amendment (Petition to Amend, or PTA) proposes the following actions:

- Provide an option to replace the use of potable water with recycled water in the cooling tower when available in suitable quantities and quality
- Construct additional water treatment facilities
- Increase discharge amounts to the City's sanitary sewer system, resulting from the use of recycled water

No additional construction activities at the SPAC site beyond what are described herein would be required as part of this PTA.

To provide recycled water, the Sacramento Regional County Sanitation District (Regional San, or SRCSD) prepared an Environmental Impact Report (EIR) analyzing the construction of a 6-mile-long pipeline that would provide recycled water to SPAC (including the water interconnection into the facility), as well as to other potential users (SRCSD, 2014b and c). Regional San's Board of Directors approved the Final EIR on November 12, 2014. The Notice of Determination was filed with the State Clearinghouse on November 13, 2014.

The environmental impact assessment, addressing potential impacts from the proposed use of recycled water, is presented in Section 3.0 and concludes there will be no significant adverse environmental impacts associated with the implementation of the actions specified in this PTA. The associated impacts to the environment would be less than significant, and in some cases—such as with the reduction in use of potable water—would provide a community benefit. Therefore, not only will no adverse effects on the environment occur because of the changes to the project as proposed in this PTA, but some minor environmental benefits will occur, especially during drought years.

The project, as modified, will comply with all applicable laws, ordinances, regulations, and standards (LORS). However, SPAC requests that the Air Quality conditions of certification (conditions) be revised to incorporate any new permit conditions imposed by the Sacramento Metropolitan Air Quality Management District (SMAQMD) as part of its review of proposed project modifications. It is not anticipated that any other existing condition will need to be revised; however, a new condition for Public Health is being proposed.

SECTION 1

Introduction

On November 30, 1994, the California Energy Commission (CEC) issued a license to Sacramento Power Authority (SPA) for the construction and operation of the Sacramento Power Authority at Campbell Cogeneration Project (SPAC). SPAC is a nominal 158-megawatt cogeneration facility consisting of a Siemens V84.2 natural-gas-fired combustion turbine generator, a steam turbine generator, and associated equipment. The facility is located in the City of Sacramento (City), California, on approximately 5.8 acres adjacent to the former Campbell Soup Supply Company LLC (CSSC) facility (now known as the Capital Commerce Center), which was the project's steam host. SPAC is located in Sacramento County at 3215 47th Avenue. It is east of the corner of 47th Avenue and Franklin Boulevard, approximately 1 mile west of Highway 99. (Figure 1; figures are located at the end of each section).

On September 27, 2012, CSSC made a public announcement that it would close its South Sacramento facility in 2013. This would result in 700 CSSC employees being laid off. On October 30, 2012, the CSSC provided official written notice to the Sacramento Municipal Utility District (SMUD) of its intent to close the CSSC's Sacramento facility and terminate the Steam Sales Agreement between SMUD and CSSC effective October 30, 2013. The termination of the SSA in turn left SPAC without a viable steam host. On May 9, 2013, CSSC shut down all steam systems and ceased receipt of steam from SPAC. On May 16, 2013, SPA filed a Petition to Amend (PTA or Petition) for modification of Condition of Certification (Condition) EFF-1, which would allow SPAC to provide steam when there is a suitable steam host. That PTA was approved by the Commission on November 14, 2013.

SPAC is the second most efficient gas fired plant (after the Cosumnes Power Plant) located in Sacramento County. Without a steam host, SPAC generates electricity more efficiently as a combined-cycle plant. Depending on atmospheric conditions, the steam not sent to the steam host is now available to generate up to an extra 5 megawatts of electricity for the same quantity of fuel previously burned.

1.1 Overview of Proposed Amendment

This PTA addresses the construction and operational impacts associated with the use of recycled water at SPAC's cooling tower. Switching from potable to recycled water in the cooling tower will provide long-term benefits to Sacramento by reducing potable water consumption. However, use of recycled water—with lower water quality standards—will change the cooling tower water treatment methods used when accepting recycled water and result in higher wastewater discharges to the sanitary sewer. A detailed description of the proposed modifications are included in Section 2.0. The approximate location of the recycled waterline and construction parking/laydown area are shown in Figure 2.

This PTA contains all of the information that is required pursuant to the CEC's Siting Regulations (Title 20, California Code of Regulations [CCR], Section 1769, Post Certification Amendments and Changes). The information necessary to fulfill the requirements of Section 1769 is contained in Sections 1.0 through 6.0, as summarized in Table 1-1.

TABLE 1-1. Informational Requirements for Post-certification Modifications

Section 1769 Requirement	Section of Petition Fulfilling Requirement
(A) A complete description of the proposed modifications, including new language for any conditions that will be affected	Section 2.0— Description of Proposed Amendment Sections 3.1 to 3.16—Proposed changes to conditions, if necessary, are located at the end of each technical section
(B) A discussion of the necessity for the proposed modifications	Section 1.3

TABLE 1-1. Informational Requirements for Post-certification Modifications

Section 1769 Requirement	Section of Petition Fulfilling Requirement
(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	Section 1.4
(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	Sections 1.5 and 1.6; 3.1 to 3.16
(E) An analysis of the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts	Section 3.1 to 3.16
(F) A discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards;	Sections 1.6; 3.1 to 3.16
(G) A discussion of how the modification affects the public	Section 4.0
(H) A list of property owners potentially affected by the modification	Section 5.0
(I) A discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings.	Section 6.0

1.2 Ownership of the Facility Property

SPAC is owned and operated by the SPA, which is a joint powers authority. It is governed by a commission composed of the seven members of the SMUD Board of Directors.

1.3 Necessity of Proposed Changes

The California Energy Commission (CEC) Siting Regulations require a discussion of the necessity for the proposed revisions to certification and whether the amendment is based on information known by the petitioner during the certification proceeding (Title 20, CCR, Sections 1769 (a)(1)(B) and (C)).

Although it is not critical for the operation of SPAC, the option to use recycled water (when available) instead of potable water will reduce the consumption of potable water in the Sacramento Area. This is particularly helpful because the State of California is in the middle of its fourth consecutive drought year. It is consistent with the Governor's Executive Order B-29-5 that proclaims a state of emergency throughout California due to severe drought conditions. This executive order also requires the CEC to "expedite the processing of all…petitions for amendments to power plant certifications…for the purpose of securing alternate water supply necessary for continued power plant operation."

1.4 Need for Modification was Not Known at the Time of Certification

In October 1993 when SPA filed its Application for Certification and in November 1994 when the license was granted to SPA to construct SPAC, recycled water was not available. At that time, the only water available for cooling was potable water.

1.5 Why the Change should be Permitted

The proposed project would allow SPA to operate SPAC and use recycled water for plant cooling, when available, rather than potable water. This change would be consistent with Executive Order B-29-5 and with SMUD's policies of reducing potable water use.

1.6 Consistency of Proposed Changes with Applicable Laws, Ordinances, Regulations, and Standards

The CEC Siting Regulations also require a discussion of the consistency of the proposed project revision with the applicable laws, ordinances, regulations, and standards (LORS) and whether the modifications are based on new information that changes or undermines the assumptions, rationale, findings, or other basis of the final decision (Title 20, CCR, Section 1769 (a)(1)(D)). If the project would no longer be consistent with the conditions as the result of requested project modifications, the PTA must provide an explanation as to why the modification should be permitted.

The proposed project modifications are consistent with all applicable LORS, as discussed in Section 3.0. This Petition is not based on new information that changes or undermines any basis for the Commission Decision (CEC, 1994). The proposed project modifications would allow SPAC to be operated in such a manner as to reduce potable water consumption in the cooling tower, while meeting environmental goals and the current demand for electricity. SPAC would continue to operate in compliance with all applicable LORS. Therefore, the findings and conclusions contained in the November 1994, Commission Decision (CEC, 1994) for SPAC would remain applicable to the project, as modified.

1.7 Summary of Environmental Impacts

The CEC Siting Regulations require that an analysis be conducted to address the potential impacts the proposed modifications may have on the environment and to propose measures to mitigate any potentially significant adverse impacts (Title 20, CCR, Section 1769 (a)(1)(E)). The regulations also require a discussion of the modification's impact on the facility's ability to comply with applicable LORS (Section 1769 (1)(a)(F)). Section 3.0 of this PTA includes a discussion of the potential environmental impacts associated with the modification as well as a discussion of the consistency of the modification with the LORS. Section 3.0 also includes updated environmental baseline information (for Air Quality, Cultural Resources, Hazardous Materials, Socioeconomics, Traffic and Transportation, Waste Management, and Water Resources) that would have a bearing on the environmental analysis of this PTA. Section 3.0 concludes that there would be no significant environmental impacts associated with implementing the actions specified in this PTA and that the project, as modified, will comply with all applicable LORS and will provide an environmental benefit from the reduction in the use of potable water for plant cooling.

1.8 Conditions of Certification

This PTA proposes to construct a recycled waterline to the cooling tower and its appurtenances. SPA requests that the Air Quality conditions be revised to incorporate any new permit conditions imposed by the Sacramento Metropolitan Air Quality Management District (SMAQMD) as part of its review of proposed project modifications. It is not anticipated that any other existing conditions will need to be revised; however, a new condition for Public Health is being proposed.

North

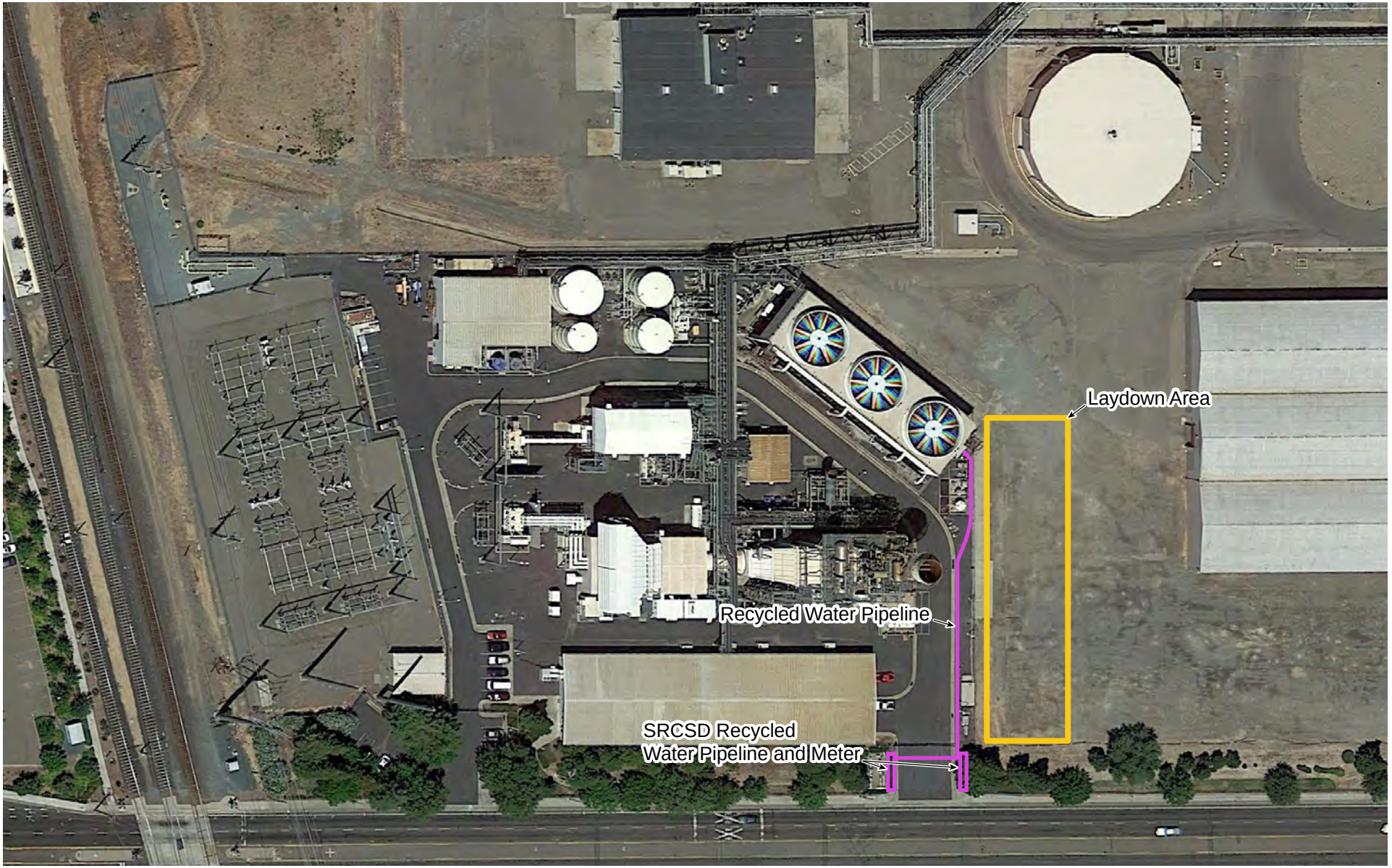
0 500 1,000

Approximate scale in feet

Figure 1. Project Vicinity Map

SPA Campbell Cogeneration Project

ch2m



Note: Locations are approximate.

North

0 50 100

Approximate scale in feet

Figure 2. Pipeline and Laydown Area

SPA Campbell Cogeneration Project

ch2m.

SECTION 2

Description of Proposed Amendment

Prior to implementing the proposed project modifications, SPA must submit a PTA to the CEC to modify its license for SPAC and assure that construction of the onsite portion of the recycled waterline and operation of the cooling tower using the new water supply would comply with applicable LORS. This section includes a description of the proposed modifications, consistent with CEC Siting Regulations (Title 20, CCR, Section 1769 (a)(1)(A)).

Sacramento Regional County Sanitation District (Regional San, or SRCSD) is proposing to construct a recycled waterline from its Water Reclamation Facility located at the Sacramento Regional Wastewater Treatment Plant to SPAC and other potential customers along the route. The Regional San project alignment contains a recycled water main, laterals, lateral structures, and equipment lay-down areas. The project's recycled water main would initially convey 1 million gallons per day (mgd) to serve SPAC on a year-round basis but would be sized to convey a maximum of 4.2 mgd to serve additional future users with recycled water laterals and lateral structures (SRCSD, 2014 a and b). The environmental impacts from construction of this recycled water main, as mitigated, were addressed in an Environmental Impact Report (EIR). Regional San's Board of Directors certified the Final EIR as compliant with the California Environmental Quality Act (CEQA) on November 12, 2014 and the Notice of Determination was filed with the State Clearinghouse on November 13, 2014. Therefore, construction of the recycled water main (including the interconnection to the site) is not included in this PTA.

The PTA addresses the potential environment impacts from construction of the onsite recycled line from the point of interconnection with the Regional San recycled water main. Because engineering design drawings have not been completed by Regional San, it is uncertain where the point of interconnection will be onsite. As shown in Figure 2, two locations were considered—one on each side of the driveway. From the point of connection, the recycled waterline will run to the SPAC cooling towers. Potable water will continue to be used in other portions of the plant (e.g., for firewater) and in case outages occur to the recycled water system. With the use of recycled water for cooling, the wastewater discharge volume will also increase because the water cannot be cycled as much in the cooling tower.

The proposed changes include:

- Construction of a buried and/or overhead recycled waterline from the point of interconnection with the Regional San waterline/meter (on the project site) to the SPAC cooling tower
- Construction of additional water treatment facilities
  - Piping to cooling tower and irrigation water
  - Increase bleach storage tank and feed capacity
  - Possible additional acid pump
  - Additional scale inhibitor tank and two pumps
  - Possibly second biocide tank and two pumps
- Increased wastewater discharge to the sanitary sewer

In addition, a temporary construction laydown and parking area will be leased from Hackman Capital Partners, LLC in the parking lot to the east of the plant, adjacent to SPAC, for use during the construction of the recycled waterline and retrofit of the cooling towers (Figure 2).

It is expected that construction would take up to 3 months. Construction would generally occur between 7:00 a.m. and 7:00 p.m. on weekdays, with noisy construction activities occurring between the hours of 7:00 a.m. and 6:00 p.m. It is expected that 10 to 12 construction workers would commute to the SPAC site on a daily basis during the construction period, and that materials deliveries would average less

than 3 trips per day on major arterial roads with four lanes that have a rated capacity of 750 vehicles per lane per hour.

Operation of the cooling tower would be performed as part of existing operations by SPAC's current operations and maintenance personnel. Therefore, no additional operations personnel are anticipated.

Under existing agreements with the City and Sacramento County Water Agency, SPAC can use up to 1,314 acre-feet per year (afy) of water supplied by the City, most of which would be used for steam cycle make-up, evaporative inlet cooling, a portion of the cooling tower make-up, combustion turbine generator injection water and potable water. If needed for cooling, an additional 295 afy of groundwater can be pumped from wells on the adjacent Capital Commerce Center site (CEC, 1994).

As shown in Table 2-1, use of potable water for makeup at the cooling tower averages 660.5 gallons per minute (gpm) peak, using 10 cycles of concentration. Using recycled water for cooling tower makeup would require about 891.5 gpm at 3 cycles of concentration. Use of recycled water will require more frequent blow-down (at 3 or 4 cycles of concentration) resulting in an increase in wastewater discharge volume. Industrial wastewater that is discharged will be returned to Regional San via the sanitary sewer system for treatment and reuse, in compliance with all discharge requirements. Currently, about 63 gpm is discharged to Regional San from the cooling towers at 10 cycles of concentration. Use of recycled water will increase the peak discharge requirements from the cooling towers to about 297.5 gpm at 3 cycles of concentration.

TABLE 2-1. Comparison of Potable and Recycled Water Use

Water Quality	Cycles of Concentration	Peak Makeup (gpm)	Peak Discharge (gpm)
Potable	10	660.5	63.0
Recycled	3	891.5	297.5

The modified cooling tower using recycled water will continue to emit PM_{10} and $PM_{2.5}$ at levels less than or equal to the current cooling tower and will also emit *de minimis* quantities of volatile organic compounds (VOCs), also called reactive organic compounds (or ROC) by SMAQMD. Small increases in ammonia and toxic air contaminant (TAC) emissions are anticipated. However, these increases will result in insignificant impacts to public health and air quality.

In addition, due to the lower quality of the recycled water compared with potable water, a greater volume of chemicals will be required for water treatment.

The potential environmental impacts associated with the use of recycled water at the SPAC facility are evaluated in Section 3.0.

SECTION 3

Environmental Analysis of Proposed Project Amendment

The proposed modifications to SPAC would include construction of a recycled waterline at SPAC, use of recycled water in the cooling tower, and associated modifications to the plant for the requisite increased use of water treatment chemicals. An increase in the amount of wastewater discharged to the sanitary sewer would also result. Potable water would continue to be used in other portions of the plant, and would be used in the cooling tower when the recycled water system does not provide enough water of sufficient quality. As a result, the impact analysis for most of the environmental disciplines would not differ significantly from what was described in the Application for Certification (AFC) and Commission Decision. As described below, the impacts associated with this PTA will be less than significant.

The following subsections present a discussion of the potential impacts that the proposed project modification may have on the environmental analysis, as presented in the AFC. More detail is provided for those areas where the potential for a significant impact exists.

3.1 Air Quality

In the 1994 Commission Decision, and the 2014 Amendment, it was determined that SPAC was in compliance with all applicable LORS. As described in this PTA, the proposed modifications for SPAC are also consistent with all applicable LORS, and this PTA will not alter the assumptions or conclusions made in the Commission Decision. However, as discussed below, the proposed modification to SPAC may result in changes to the toxic pollutant impacts due to the operation of the cooling tower with recycled water. Therefore, this section evaluates the potential toxic pollutant impacts associated with the proposed modifications.

3.1.1 Environmental Baseline Information

The project will be located in Sacramento County. Sacramento County is currently classified as "attainment" for the state and federal ambient air quality standards for all pollutants except the federal 8-hour ozone and ultra-fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) standards, and the state ozone and particulate matter less than 10 microns in diameter (PM_{10}) standards. Table 3.1-1 presents the background ambient air quality data in the project area.

TABLE 3.1-1. Maximum Background Concentrations[a], Project Area, 2012–2014 (µg/m^3)

Pollutant	Averaging Time	2012	2013	2014
NO_2 (Elk Grove – Bruceville Road)	1-hour	69.6	71.4	**101.5**
	Fed. 1-hour[b]	60.2	**62.0**	56.4
	Annual	9.4	**11.3**	9.4
SO_2 (Sacramento Del Paso Manor)	1-hour	9.2	13.1	**13.9**
	Fed. 1-hour[c]	5.2	7.8	**13.1**
	24-hour	3.4	4.2	**12.8**
CO (Sacramento El Camino and Watt)	1-hour	3,086	**3,429**	2,857
	8-hour	**2,743**	**2,743**	2,400
PM_{10} (Sacramento Health Dept., Stockton Blvd.)	24-hour (Fed)	37.2	**47.0**	39.0
	24-hour (CA)	34.0	**50.0**	41.0
	Annual (CA)	16.5	**19.8**	15.6

TABLE 3.1-1. Maximum Background Concentrations[a], Project Area, 2012–2014 (µg/m^3)

Pollutant	Averaging Time	2012	2013	2014
$PM_{2.5}$ (Sacramento Health Dept., Stockton Blvd.)	24-hour[d] (Fed)	21.0	**25.0**	24.0
	Annual (Fed)	8.2	**9.0**	8.3
	Annual (CA)	8.2	*	**8.3**

Notes:
Reported values have been rounded to the nearest tenth of a µg/m^3.
* There were insufficient data to determine the values.
[a] With the exception of federal 1-hr NO_2, federal 1-hr SO_2, and 24-hr $PM_{2.5}$, **bolded** values are the highest during the 3 years and are used to represent background concentrations.
[b] Federal 1-hour NO_2 is shown as the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations.
[c] Federal 1-hour SO_2 is shown as the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations.
[d] 24-hour average $PM_{2.5}$ concentrations shown are 3-year average 98th percentile values.

3.1.2 Potential Environmental Impacts

The cooling tower currently emits particulate matter less than 10 microns and less than 2.5 microns in diameter (PM10 and PM2.5). The modified cooling tower with recycled water will continue to emit PM10 and PM2.5 at levels less than or equal to those emitted by the cooling tower under existing operations and will also emit *de minimis* quantities of VOCs. There will also be a small increase in ammonia emissions. This section presents future potential emissions from the modified cooling tower and future potential emissions from the modified facility.

The modified cooling tower will also emit trace levels of TACs. Spreadsheets containing detailed TAC emission calculations are presented in the Public Health section of the PTA.

3.1.2.1 Future Potential Emissions from the Modified Cooling Tower

The following emissions for the modified cooling tower are summarized in Table 3.1-2:

- Maximum daily emissions
- Maximum quarterly emissions
- Maximum annual emissions

Maximum PM_{10} and $PM_{2.5}$ emissions from the modified cooling tower operating 24 hours per day were calculated based on the permitted TDS limit of 3,000 parts per million by weight (ppmw), a circulation rate of 45,000 gpm, and a drift loss of 0.0006% as per Condition #8 of the SMAQMD Permit to Operate No.13316. These reported emission rates in Table 3.1-2 are the same as the pre-project emission rates for these pollutants.

Ammonia emissions are expected to be negligible at the temperature (approximately 85°F, or 30°C) and pH (7.5 or less) of the SPAC cooling tower recycled water based on a review of technical data and previous CEC projects using recycled water in cooling towers (see SMAQMD permit application attached to this PTA as Appendix A). This is because virtually all of the ammonia in solution at a pH of 7.5 or less is present in the ionic form (NH_4^+) and cannot be stripped from solution. Instead, ionic ammonia can be emitted as a particulate in the cooling tower drift, but the quantity of ionic ammonia lost in drift is insignificant (about 0.1 lb/day) compared to amount of molecular ammonia lost through stripping.

TABLE 3.1-2. Future Potential Emissions from the Modified Cooling Tower

	Maximum Emissions					
Pollutant	Daily (lb)	1st Quarter (lb)	2nd Quarter (lb)	3rd Quarter (lb)	4th Quarter (lb)	Annual (tons)
$PM_{10}/PM_{2.5}$[a]	9.7	875	885	895	895	1.8
Ammonia[b]	24.3	2,189	2,213	2,237	2,237	4.4

Notes:

[a] $PM_{10}/PM_{2.5}$ based on 3,000 ppmw TDS, 45,000 gpm circulation rate, and 0.0006% drift loss.

[b] NH_3 emissions based on 45 ppmw NH_3 in the inlet recycled water, a water make-up rate of 900 gpm, and an assumed 5% of the ammonia available in the molecular form (NH_3) for stripping.

lb = pounds

We were only able to locate references to three projects where the CEC discussed ammonia emissions from recycled water use:

- The Palomar Power Project in San Diego County where the CEC recited the molecular ammonia stripping emission values prepared by an intervenor and noted that this emission rate only applied to a water pH above 7.5;
- The Russell City Energy Center located in Hayward where the Preliminary Determination of Compliance issued by the BAAQMD on November 15, 2002 notes that the cooling tower will have an ammonia drift loss of 5.924E-03 ton/yr (based upon a drift rate of 338 lb/hr); and
- The Cosumnes Power Plant where the AFC lists in Table 8.1B-8 (revised 03/05/07) ammonia hourly drift loss emissions from the two cooling towers of 7.75E-04 lb/hr and an annual emission of 3.39E-03 tons/yr (drift rate per tower of 387.35 lb/hr).

In all of these cases ammonia impacts were determined to be insignificant. For the SPAC project, we have conservatively assumed that 5 percent of the ammonia in solution is stripped in the cooling tower. The incoming recycled water ammonia concentration is based on recent test data plus a compliance margin (45 ppmw ammonia) and a water make-up rate of 900 gpm for 3 cycles of concentration (see SMAQMD permit application in Appendix A for recent water analyses of the recycled water stream after chlorination at SRCSD). This is a conservative assumption since SPAC will add additional chlorine to the incoming recycled water at the SPAC cooling tower, and this additional chlorine will react with ammonia in the cooling tower basin thereby reducing the total ammonia levels below the SRCSD reported data.

VOCs have been identified in the tertiary treated recycled water at the SRCSD facility in part-per-billion levels. It is assumed that this small amount of VOCs will result in negligible VOC emissions at the SPAC cooling tower for the following reasons:

- The CEC has never attributed VOC emissions to the use of recycled water in any siting cases available for review on the CEC website;
- The part-per-billion quantities of VOCs measured at the SRCSD facility will be exposed to chlorine for additional time in the pipeline from SRCSD to SPAC, thereby reducing the levels even further by the time the recycled water arrives at the SPAC site;
- SPAC will add more chlorine at the cooling tower basin, which will reduce the VOCs even further; and
- Only a fraction of any remaining VOCs will be stripped in the cooling tower at the very low concentrations present and the correspondingly low equilibrium vapor pressures.

3.1.2.2 Future Potential Emissions from the Modified Facility

The maximum quarterly and annual emissions for the modified SPAC facility are summarized in Table 3.1-3. Total facility PM_{10}/ $PM_{2.5}$ emissions will not increase as a result of the modified cooling tower

recycled water project because the TDS content of the recycled water will be less than or equal to the current permitted level of 3,000 ppmw (parts per million weight). The increase in VOC emissions from the facility will be *de minimis*. Therefore, the emission rates in Table 3 are equivalent to the total facility emission limits in the current SPAC Permits to Operate.

TABLE 3.1-3. Maximum Emissions from the Modified SPAC Facility[1]

	Maximum Emissions				
Pollutant	**1st Quarter (lb)**	**2nd Quarter (lb)**	**3rd Quarter (lb)**	**4th Quarter (lb)**	**Annual lb/year**
NOx	24,209	24,545	26,321	24,725	99,800
CO	21,265	21,601	22,803	21,708	87,377
PM_{10}/ $PM_{2.5}$	11,015	10,160	12,294	11,619	45,088
VOC/ROC	8,792	8,898	13,264	8,968	39,922
SOx	1,814	1,836	1,944	1,853	7,447

3.1.3 Mitigation Measures

The existing cooling tower is rated at 45,000 gallons per minute (gpm) circulation rate and has a TDS permit limit of 3,000 ppmw. It includes a drift eliminator system that limits water drift losses to 0.0006 percent of the circulation flow. The proposed use of recycled water in the cooling tower will result in TDS levels at or below current permitted levels. Cooling tower cycles of concentration, blowdown rate, and conductivity will be monitored to maintain TDS levels under the current permitted levels. Since TDS levels will not increase and the cooling tower circulation rate and drift eliminator efficiency will not change, the project will not result in an increase in PM_{10} or $PM_{2.5}$ emission rates above current permitted levels.

Chlorine bleach will be added to the cooling tower basin to maintain appropriate free chlorine levels to limit bacterial growth, VOCs, and ammonia in the recycled water.

Additionally, cooling tower pH will be maintained at 7.5 or less to minimize ammonia emissions. At a pH of 7.5 or less, most of the ammonia in solution remains in the ionic (NH_4^+) form, and is not emitted to the atmosphere via the air stripping effect of the cooling tower.

3.1.4 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS. As described in this PTA, the modifications proposed for SPAC are consistent with all applicable LORS, and the PTA will not alter the assumptions or conclusions made in the Commission Decision for the SPAC. A complete air quality regulatory analysis of the proposed SPAC modifications is included in the application to modify the SMAQMD permit for the SPAC facility. That application was submitted to the SMAQMD on November 13, 2015. A copy of the SMAQMD application is included as Appendix A. This regulatory analysis concluded that the project would be in compliance with the following applicable regulatory requirements:

- Rule 201: General Permit Requirements
- Rule 202: New Source Review
- Rule 203: Prevention of Significant Deterioration
- Rule 207: Title V Federal Operating Permit Program
- Rule 217: Public Notice Requirements for Permits

- Rule 301: Stationary Source Permit Fees
- Rule 401: Ringelmann Chart/Opacity
- Rule 402: Nuisance
- Rule 404: Particulate Matter
- CEQA

3.1.5 Conditions of Certification

SPAC requests that the Air Quality conditions be revised to incorporate any new permit conditions imposed by the SMAQMD as part of its review of the proposed project modifications. It is not anticipated that any existing Air Quality conditions will have to be revised.

3.2 Biological Resources

The construction of the recycled waterline, conversion to recycled water in the cooling tower, and operation of the cooling tower will have minimal effects on biological resources in the project vicinity because construction activities will occur on a portion of the project site and laydown area that has already been developed and is covered with asphalt (Figure 2). To reduce the potential to disturb nesting birds during construction activities, if construction occurs between February 1 and August 31, preconstruction nesting bird surveys will be conducted by a qualified biologist within 14 days of construction, covering a radius of 250 feet from SPAC work locations. If nesting birds are found, the biologist will evaluate whether existing screening buffers (such as buildings, trees, intervening topography) are sufficient to allow work to proceed, and determine what level of work exclusion buffers or nest monitoring is needed. This could result in work areas being reduced in size. If work cannot proceed without disturbing nesting birds, or if signs of disturbance are observed by the monitor, work may be halted or redirected to other areas until the nesting and fledging is complete, or until the nest has otherwise failed due to causes other than the project's construction.

Therefore, with preconstruction surveys for nesting birds, the construction and operational impacts of the proposed project modifications would not significantly change the biological resources impact analysis conclusions as presented in the 1994 Commission Decision for the project. The project would comply with applicable LORS and would not require any changes to the Biological Resources conditions.

3.3 Cultural Resources

3.3.1 Environmental Baseline Information

The SPAC is located on 5.8 acres adjacent to the former Campbell Soup facility, which was the project's steam host. SPAC is east of the corner of 47th Avenue and 27th Street/Otto Circle, approximately 1 mile west of Highway 99. The project site is located within the geologic deposits known as the Riverbank Formation (present to a depth of 65 feet), with underlying gravel from the Fair Oaks Formation. The site is relatively flat and is not near major or permanent water sources (Siemens et al., 1993). A considerable amount of disturbance has occurred over the entire existing SPAC facility site. Extensive excavation, grading, and deposition of fill occurred during the initial construction in the mid-1990s.

As shown in Figure 2, Regional San will terminate its recycled water main either adjacent to the existing City potable water mains that enter the plant, or on the east side of the driveway. If the connection point is near the existing water mains, the 10-inch-diameter (or smaller) recycled water piping will cross the plant driveway underground to the east side of the plant access road. From that point, the recycled water piping will travel north to the cooling tower. If the connection point is on the east side of the driveway, the recycled water piping will travel north along the east side of the plant access road. It has not been determined yet whether the segment of piping running along the east side of the access road

will be overhead or underground, or a combination of both. When placed underground, the onsite portion of the recycled water piping will be buried no more than 6 feet deep.

Given the extensive disturbance to the study area from installation and operation of SPAC, combined with the lack of findings of both surface pedestrian survey and subsurface testing across the site for the original license, it is anticipated that the project has very low potential to impact intact buried cultural resources. A review of the architectural project area of analysis at the time the AFC was prepared identified one residence located across the street from SPAC, which was found to not have historical significance. Since changes to the plant site would be very minor, views of the project facilities would not affect a recorded historic property's integrity of feeling and association.

3.3.2 Potential Environmental Impacts

Studies were conducted in compliance with Section 5024.1 of the California Public Resources Code (PRC) to identify historical resources in the study area. "Historical Resource" is generally defined under CEQA as a resource eligible for listing, or listed on, the California Register of Historical Resources that is older than 50 years of age. Cultural resources include prehistoric and historic archaeological sites; standing historic structures, buildings, districts and objects; and locations of important historic events, or sites of traditional/cultural importance to various groups. This assessment includes a review of previous studies, and preliminary site evaluations of recorded resources.

3.3.2.1 Resources

The SPAC site is completely developed and in use. No visible native soils are present. The site was previously subject to a pedestrian survey as well as subsurface testing during the licensing process, which identified no historical resources (Siemens et al., 1993). Significant disturbance has occurred within the property for decades. Therefore, a field survey for archaeological resources in conjunction with this Petition was not feasible or warranted, and none was conducted.

A new search of the California Historical Resources Information System (CHRIS) North Central Information Center (NCIC) was commissioned by CH2M HILL on September 20, 2015. No previously recorded resources are located within the project area. Five previously-recorded resources are located outside the project area but within the 1-mile search radius (P-34-27, P-34-491, P-34-723, P-34-3457, P-34-4475). Eight previous studies have occurred within the 1-mile search radius (3346, 3351, 3368, 3489, 4418, 5805, 8565, 10443) (complete CHRIS data in Confidential Appendix B). All five previously-recorded resources are historic built environment resources (two rail lines, a chapel, a storage yard, and an isolated tank), and all are located well outside the project area; none will be impacted in any way by the project.

Native American consultation, and consultation with local historical societies and agencies, was completed during the original AFC process (93-AFC-3). No additional consultation was conducted for this PTA.

3.3.3 Mitigation Measures

The proposed modification will not create a significant cultural resources impact and will not require additional mitigation measures. During construction, the existing Conditions CUL-1 through CUL-3 will apply and will mitigate any potentially adverse impacts, including the unanticipated discovery of buried resources during construction. The cultural resource specialist (CRS) and cultural resource monitor (CRM) recently approved by the CEC for the SCA Procter and Gamble amendment (Clint Helton as CRS, and Michelle Kaye as CRM) will also be available for use on this project. Furthermore, no significant impacts to cultural or historical resources will occur during operation of the cooling tower. The project will comply with applicable LORS and would not require any changes to the conditions.

3.3.4 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS (CEC, 1994). The modifications proposed for SPAC are also consistent with all applicable LORS.

3.3.5 Conditions of Certification

Installation of the proposed recycled waterline and associated activities do not require changes to the conditions or the need for additional conditions for cultural resources.

3.4 Geologic Hazards and Resources

Construction of the onsite segment of the recycled waterline will be designed in accordance with current building code and seismic requirements, and the facilities will be installed on a site that was already assessed for geologic hazards. Therefore, project implementation will not be susceptible to any geologic hazards greater than those previously analyzed by the CEC during licensing of the project, and the conditions imposed in the 1994 Commission Decision are adequate to protect the environment with respect to geological resources. Hence, the project will comply with applicable LORS and will not require a change to any of the conditions.

3.5 Hazardous Materials Management

The use of recycled water in the cooling tower will require the use of new chemicals during operations and an increase in volume of chemicals beyond those already licensed and listed in Condition HAZ-1 (CEC, 1994).

HAZ-1 states:

> "The project owner shall use only those hazardous materials or their equivalent in reportable quantities listed below, unless otherwise approved by the CEC CPM:
>
> - aqueous ammonium hydroxide
> - sulfuric acid
> - erythorbic acid
> - ammonium hydroxide (10%)
> - cyclohexylamine or morholine
> - sodium hypochlorite
> - sodium hydroxide
> - tri-sodium phosphate
> - di-sodium phosphate
> - hydrochloric acid
> - ammonium bifluoride
> - 2-hydroxy-l,2,3-propanetricarboxylic acid
> - gyrolic acid
> - methanoic acid
> - sodium carbonate
> - sodium nitrate
> - tri-sodium phosphate
> - disodium phosphate
> - sodium tripolyphosphate (10%)
> - mineral insulating oil
> - lubricating oil

- detergents
- lab reagents

Verification: The project owner shall provide in the Annual Compliance Report a list of hazardous materials used at the facility in reportable quantities."

The most recent list of hazardous materials is included in Appendix C. Future additional cooling tower treatment chemicals could include:

- CL2212 cooling tower biocide
- CL4125 cooling tower corrosion inhibitor
- CL 4428 cooling tower dispersant
- CT709 cooling tower phosphate inhibitor
- RZ6630 cooling tower dispersant and corrosion inhibitor

SPAC uses sodium hypochlorite for water treatment and currently stores the material onsite in a 2,000-gallon tank. The use of recycled water will require a 230 percent increase in the amount of sodium hypochlorite that is used. To reduce the frequency of additional deliveries, the existing 2,000-gallon tank will be replaced with a 3,000-gallon tank. If needed, a second 3,000-gallon tank will be added. The maximum volume to be stored onsite is 5,000 gallons according to Table 4.6-2 in the AFC, so the maximum 6,000-gallon storage volume represented by the two tanks will require a volume increase. Deliveries of sodium hypochlorite will increase from the current level of twelve 1,500-gallon deliveries per year to fourteen 3,000-gallon deliveries per year.

Sulfuric acid use will also increase. Most of the acid is consumed in the demineralizer with smaller amounts used in the cooling tower. It is estimated that 460 percent of the amount of acid previously used in the cooling tower will be needed for cooling water treatment, once recycled water is used. Deliveries of acid will increase by up to 5 truckloads per year over the 4 deliveries per year in prior years, for a total of 9 deliveries annually.

Currently, the plant has a 550-gallon tank that contains a combined product (scale inhibitor and dispersant). A new combined dispersant and corrosion inhibitor containing 2-Phosphono-1,2,4-butane tricarboxylic acid will be used for cooling water treatment. If additional volumes are needed, the 550-gallon tank will be repurposed to contain dispersant and three 150-gallon tanks, or totes, will be added for corrosion inhibitor, phosphate, and biocide. All of these tanks, or totes, (including the sodium hypochlorite tanks) will be placed in existing secondary containment areas that are already adequately sized to handle the increase in volume of materials stored.

Despite increased quantities and changes in the types of some hazardous materials used (which will require corresponding changes to the AFC Table 4.6-2), water treatment chemicals are currently being used at the facility and the nature of materials used does not differ greatly from the types previously used.

An update to the facility's Hazardous Materials Business Plan filed with the Sacramento County Environmental Management Department will be prepared to incorporate the new materials, volumes, storage methods and locations. Hence, the project will comply with applicable LORS and will not require a change to any of the conditions.

3.5.1 Mitigation Measures

The proposed modification will not create a significant hazardous materials management impact and will not require additional mitigation measures. HAZ-1 through HAZ-7 will still apply and will mitigate any potentially adverse impacts. No significant impacts to hazardous materials management will occur during construction or operation of the plant.

3.5.2 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS (CEC, 1994). The modifications proposed for SPAC are also consistent with all applicable LORS.

3.5.3 Conditions of Certification

Installation of the proposed recycled waterline and associated activities, and use of recycled water in the cooling tower during operations, do not require changes to the conditions or the need for additional conditions for hazardous materials management.

3.6 Land Use

The proposed changes will not result in any land use impacts for construction and operation of the project beyond those analyzed in the 1994 Commission Decision. The project is consistent with Sacramento County General Plan and zoning requirements (CEC, 1994). Consequently, the project will not cause any land use impacts greater than those previously analyzed by the CEC during licensing of the project. In addition, the project will comply with applicable LORS, and will not require a change to any of the conditions.

3.7 Noise

Compared to construction of an entire gas-fired power plant, construction activity for installation of the recycled waterline onsite and associated activities (i.e., 10 to 12 workers over a 3-month period) will be substantially less in terms of the number, type, and duration of construction activities. The noise levels will vary depending on the number and type of concurrent construction activities. The noisiest construction phase will likely be construction of the recycled waterline.

No new sensitive receptors are located closer to the plant than were previously evaluated. In licensing SPAC, the CEC found that “noise levels associated with project construction are not expected to constitute a significant environmental impact.” This construction effort will be only a small part of what was experienced during the construction of the power plant, because it will have fewer pieces of noisy equipment being operated at the same time, have a substantially shorter duration, and result in lower sound levels than those addressed by the CEC when initially licensing SPAC. There will be no operational noise from the recycled waterline.

Therefore, the conditions imposed in the 1994 Commission Decision on construction and operations noise levels are adequate to protect the environment. The project will also comply with applicable LORS during construction and will not require any changes to the conditions.

3.8 Paleontological Resources

The recycled waterline will either be buried or partially located on an overhead pipe rack. Therefore, disturbance of soils will not extend more than 6 feet below ground surface. According to the 1987 geotechnical investigation, the SPAC site is overlain with 1 to 1.5 feet of fill consisting of dense to very dense silty sand with gravel. Discontinuous and interbedded layers of clayey and sandy silts, sandy clays, and silty and clayey sands underlie the fill to a depth of about 65 feet. The underlying gravel appears to correspond to the Fair Oaks Formation (Siemens et al., 1993). The AFC also states that the project is located on the Riverbank Terrace, in sediments of the Middle to Late Pleistocene Riverbank Formation (Fm). The Riverbank Fm was deposited during the Middle Pleistocene on an aggradational plain or low-angle alluvial fan that has since been uplifted and partly dissected. It consists of interbedded sand, silt, and clay, and contains buried stream channels in the form of gravel lenses (Siemens et al., 1993).

Paleontological resources literature reviews and records searches conducted by CH2M's senior paleontologist, as well as project experience (no record of paleontological resources being discovered during construction of SPAC were found), show that while the distal facies (sediments deposited farthest from the mountain front) of the Riverbank Fm, 10 to 20 miles to the west and closer to the valley bottom, have yielded paleontological resources, such is not the case here. Closer to the foothills, including in the vicinity of this project, the proximal facies of the Riverbank Fm are indurated, more altered by soil formation and generally lack paleontological materials. Since the subsurface here is not paleontologically sensitive, and much of the shallow subsurface (less than 3 feet) was previously disturbed, the probability of encountering paleontological resources within 3- to 4-foot-deep excavations is highly unlikely.

However, in the unlikely event that buried paleontological resources may be discovered during excavation of the pipe trench or recycled waterline pipe rack footings, Conditions PAL-1 through PAL-3 will apply and will mitigate potentially adverse impacts. In conformance with Condition PAL-1, SPA will submit the resume of a paleontological specialist that will be available should paleontological resources be discovered. Because no excavations of undisturbed sediments are planned during operations, no impacts to paleontological resources will occur during operations.

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS (CEC, 1994). The modifications proposed for SPAC are consistent with all applicable LORS. Therefore, the conditions imposed in the 1994 Commission Decision are adequate to protect the environment with respect to paleontological resources. The project will also comply with applicable LORS and would not require any changes to the conditions.

3.9 Public Health

3.9.1 Environmental Baseline Information

The SPAC facility was evaluated for health risks when it was originally permitted by SMAQMD in 1994 (see SMAQMD Final Determination of Compliance, August 19, 1994) and was determined not to result in significant adverse health impacts on the surrounding vicinity. Table 3.9-1, below, includes the results of the 1994 health risk assessment.

3.9.2 Potential Environmental Impacts

For the SPAC cooling tower, there are ammonia and TAC emissions associated with the use of recycled water. Recycled water analyses were used to calculate the ammonia and TAC emission increases associated with the cooling tower project. Detailed TAC emission calculations for the cooling tower project are included in the SMAQMD permit application attached to this PTA as Appendix A. Some of these compounds have both carcinogenic and non-cancer health effects.

Under the SMAQMD's toxics policy, modified projects with TAC emission increases are required to perform a screening-level health risk assessment. To determine whether the proposed cooling tower project will result in a significant increase in either the carcinogenic or non-cancer health impacts for SPAC, a screening-level health risk assessment was performed for the increase in ammonia and TAC emissions associated with the SPAC cooling tower, and this risk was added to the total SPAC facility-wide risk calculated by the SMAQMD in 1994. The cooling tower risk analysis was prepared using U.S. Environmental Protection Agency's AERMOD dispersion modeling software together with the California Air Resources Board's Hotspots Analysis and Reporting Program, Version 2 (HARP2) computer model. The HARP2 model was used to assess cancer risk as well as chronic and acute risk impacts. A risk of less than 1×10^{-6} for cancer and a Health Hazard Index of less than 1 for chronic or acute exposures are considered to be insignificant. The results of the screening-level health risk prioritization assessment are summarized in Table 3.9-1, and the detailed HARP modeling results are enclosed as part of the SMAQMD permit application included as Appendix A.

TABLE 3.9-1. Health Risk Screening Results, SPAC Recycled Water Cooling Tower Project

Risk Component	1994 Project HRA	Modified Cooling Tower	Total
Cancer Risk – Residential	1.158×10^{-7}	7.63×10^{-8}	1.92×10^{-7}
Cancer Risk – Workplace	1.158×10^{-7}	3.50×10^{-9}	1.19×10^{-7}
Acute Hazard Index	0.1693	0.154	0.323
Chronic Hazard Index	0.0111	0.0149	0.026

Table 3.9-1 shows that the Health Risk Assessment (HRA) results for the proposed modifications to the operation of the cooling tower are below the significance thresholds for cancer, acute, and chronic impacts. Additionally, the increased risks associated with the SPAC cooling tower, when added to the reported health risks for the original SPAC Project (see Appendix E, 1994 FDOC), do not result in a total cumulative health risk exceeding the respective significance thresholds. Therefore, the ammonia and TAC emission impacts for the proposed cooling tower recycled water project will not be significant, and the project is not expected to create a nuisance due to health risk.

In addition to project TAC emissions, bacterial growth in the proposed cooling water system could include the Legionella bacterium, which could present a public health risk. This risk is present for both recycled water cooling systems as well as potable water cooling systems. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in artificial water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis.

The State of California regulates recycled water for use in cooling towers in Title 22, section 60303, California Code of Regulations. This section requires that, in order to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms. SPAC will use tertiary-treated recycled water provided by SRCSD that has been pre-treated with chlorine. SPAC will supplement this treated water with additional chlorine bleach at the cooling tower basin to minimize the growth of microorganisms. Therefore, it is not expected that bacterial growth in the modified SPAC cooling tower will present a public health risk.

3.9.3 Mitigation Measures

Table 3.9-1 presents the health risk from the modified cooling tower operation as additive to the existing facility health risk. Table 3.9-1 conservatively assumes that the maximum health impacts from the cooling tower and the existing facility occur at the same location. Additionally, ammonia and TAC emissions from cooling tower are minimized through the use of chlorine bleach and good operating practices. Consequently, TAC emission impacts for the proposed recycled water project will not be significant, and the project is not expected to create a nuisance due to health risk. However, one mitigation measure is proposed to prevent the formation of Legionella in the cooling tower.

3.9.4 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS. As described in this PTA, the modifications proposed for SPAC are consistent with all applicable

LORS, and the PTA will not alter the assumptions or conclusions made in the Commission Decision for SPAC.

The SMAQMD regulates new and modified sources of TACs under Rule 402, "Nuisance," by implementing its "Risk Assessment Guidelines for New and Modified Stationary Sources," dated December 2000. These guidelines implement what is commonly known as "Toxics New Source Review." Under these guidelines, a risk of less than 1 x 10^{-6} for cancer and a Health Hazard Index of less than 1 for chronic or acute exposures are considered to be insignificant. As indicated in Table 3.9-1, the health risk impacts from the modified cooling tower operation individually as well as the cumulative impacts from the entire plant are less than these significance levels. It should also be noted that a complete public health regulatory analysis of the proposed SPAC modifications is included in the application to modify the SMAQMD air permit. That application was submitted to the SMAQMD on November 13, 2015. A copy of the SMAQMD permit application is included in Appendix A.

3.9.5 Conditions of Certification

There were no conditions for the Public Health section of the 1994 Commission Decision. The conditions for the Air Quality section provide assurance that the project will be operated consistent with the assumptions used in the HRA. The following condition, Public Health-1, is proposed to reduce the potential for growth of Legionella and other micro-organisms in the cooling tower.

Public Health-1 The project owner shall develop and implement a Biocide Use and Monitoring program to ensure that the potential for bacterial growth in cooling water is kept to a minimum. The Biocide Use and Monitoring program shall incorporate, as applicable, the Best Practices and Recommendations for Minimization of Risks Associated with Legionella as outlined in the Cooling Tower Technology Institute July 2008 publication titled "Legioellosis, Guildeline: Best Practices for Control of Legionella." The Biocide Use and Monitoring Program shall specifically address full- and part-load plant operation, and short- and long-term shutdowns.

Verification: At least 60 days prior to the commencement of modified cooling tower operations, the Biocide Use and Monitoring program shall be provided to the CPM.

3.10 Socioeconomics

3.10.1 Environmental Baseline Information

Construction of the recycled waterline and appurtenant facilities is anticipated to occur over a 3-month construction period. An expected workforce of 10 to 12 workers is all that will be required.

Most construction would occur between 7:00 a.m. and 7:00 p.m. Monday through Friday, with noisy construction activities occurring between the hours of 7:00 a.m. and 6:00 p.m. However, longer hours (including weekends and nighttime) could occur and hours are not restricted in the SPAC conditions.

The total project cost is anticipated to be about $300,000. Of that, about $125,000 would be for the purchase of materials and equipment, while the remaining $175,000 would be allocated for labor costs. The use of recycled water in the cooling tower will not require any additional operations staff.

3.10.2 Potential Environmental Impacts

In 2014, the annual average construction workforce estimates for Sacramento County and the Sacramento Arden Arcade Roseville Metropolitan Statistical Area were 28,600 and 45,500, respectively (CEDD, 2015). The peak workforce of 12 construction workers is small in comparison to the size of the construction workforce in the area. Therefore, sufficient skilled labor is available in the area to handle the project demands. In addition, due to the project's short duration and small workforce, it is expected

that a local workforce will be used. Thus, the project would not have an adverse impact on the local population, housing demand, or school population. Also, due to the small size of the project, and the fact that it is a minor modification to an existing facility, impacts to public services and utilities would be less than significant, requiring no upgrade to these services or utilities to meet a permanent increase in demand.

The capital cost of the project is estimated to be $300,000, of which about $125,000 will be for the purchase of materials and equipment. SPA was created under a joint powers agreement between SMUD and the Sacramento Municipal Utility District Financing Authority and as a result is a public entity and exempt from property taxes. However, it is subject to the payment of sales taxes. The purchase of materials for the recycled waterline and to retrofit the cooling tower will result in the payment of local sales tax of 8.5 percent, or about $10,625. Therefore, the project will result in a positive, but not significant, impact to state and local government from sales tax receipts.

Local construction salaries of approximately $175,000 will result in secondary economic impacts within Sacramento County. Secondary employment effects would include indirect employment due to the purchase of goods and services by firms involved with construction (e.g., pipe suppliers), and induced employment due to the construction workers spending their income within Sacramento County. In addition to these secondary employment impacts, there would be indirect and induced income effects arising from construction. Although these impacts would be beneficial, they would be too small to be significant.

Because there would be no change to the operational workforce, there would be no adverse impacts from use of recycled water in the cooling tower.

3.10.3 Mitigation Measures

The proposed modifications will not create a significant socioeconomic impact and will not require additional mitigation measures.

3.10.4 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS (CEC, 1994). The modifications proposed for SPAC are consistent with all applicable LORS.

3.10.5 Conditions of Certification

Construction of the recycled waterline onsite and retrofitting of the cooling tower does not require changes to the conditions or additional conditions for socioeconomics.

3.11 Soils

Soils of the Sacramento area have developed within a fluvial environment within a broad valley. The soils series for the site is classified as San Joaquin silt loam, with 0 to 3 percent slopes. Typically, the surface layer consists of about 2 feet of brown silt load. The subsoil is claypan consisting of yellowish red clay loam about 0.5-foot thick. Below this is an indurated hardpan about one foot thick over silica-cemented hardpan that is slightly more than one foot thick. To a depth of 5 feet, the substratum consists of yellowish brown loam. Permeability is slow with water perching on the claypan. The hazard of water erosion is slight (Siemens et al., 1993).

The proposed construction of the recycled waterline will not result in soils impacts for both the construction and operations of the project beyond those analyzed in the 1994 Commission Decision. Within the 5.8-acre site, construction will only expose soils in areas where the pipe trench or footings for the pipe rack will be needed. Surrounding areas are already covered with asphalt, and implementation of best management practices will be used to prevent soil erosion into nearby

drainages. Construction will comply with all applicable LORS. There will be no impacts to soils from the operation of the new recycled waterline. No changes to the conditions are required to address soils.

3.12 Traffic and Transportation

3.12.1 Environmental Baseline Information

As described in the AFC, 47th Avenue is the major arterial road that provides direct access to SPAC. It consists of four, 12-foot-wide lanes, a 10-foot-wide center turn lane, and 8-foot-wide shoulders. It has a rated capacity of 750 vehicles/lane/hour. Traffic signals are located at all major intersections along 47th Avenue. An interchange with Highway 99 is also located on 47th Avenue about 1 mile west of SPAC (Siemens et al., 1993). At the time the AFC was prepared, 47th Avenue had a level-of-service rating of A or B. The AFC analyzed a peak construction workforce of 199 workers, with construction occurring over a 24-month period.

The Campbell Soup facility employed 700 full-time workers when it announced its closure in September 2012 (Sacramento Business Journal). Earlier this year, KCRA announced that by the end of the summer 2015 a total of up to 700 new jobs could be located at the former Campbell Soup plant site—now referred to as the Capital Commerce Center (KCRA, 2015). Thus, during construction, traffic levels on nearby streets could be similar to what was experienced prior to the closure of the Campbell Soup facility.

3.12.2 Potential Environmental Impacts

Construction of the recycled waterline onsite and retrofit of the cooling tower is expected to take 3 months, with a peak workforce of 12 workers. It is estimated that truck deliveries of materials and supplies during the peak month will average less than 3 per day.

In comparison with the initial construction of the power plant—which projected a peak workforce of 199 workers—significantly fewer construction vehicles, equipment, and workers would be needed for the construction of the proposed modifications. Similarly, the initial construction was planned to take 2 years; whereas, the installation of the recycled waterline and cooling tower retrofit would only require 3 months.

3.12.3 Mitigation Measures

The proposed modifications will not create a significant traffic and transportation impact and will not require additional mitigation measures.

3.12.4 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS (CEC, 1994). The modifications proposed for SPAC are consistent with all applicable LORS.

3.12.5 Conditions of Certification

Due to the small workforce and short construction duration, Conditions TRANS-3, TRANS-4, and TRANS-7 are not needed and will not apply. No additional conditions are needed.

3.13 Visual Resources

The proposed changes will not result in any visual impacts from construction or operation of the plant beyond those analyzed in the 1994 Commission Decision. The addition of the recycled water piping, even if installed overhead, will not be a significant change to the industrial nature of the area and will

not be visible to traffic on 47th Avenue due to existing landscape screening. Views of an overhead waterline from 47th Avenue would also be partially blocked due to existing landscape screening.

Consequently, the project will not cause any visual resources impacts greater than those previously analyzed by the CEC during licensing of the project (CEC, 1994). In addition, the project will comply with applicable LORS and will not require a change to any of the conditions.

3.14 Waste Management

The installation of the new recycled waterline and associated appurtenances will not significantly affect waste management because the construction work will be minor and construction waste materials will be disposed of as required by current laws and regulations as well as the conditions. Operation of the plant using recycled water will result in an increase of wastewater discharge to the sanitary sewer because the water cannot be cycled as much in the cooling tower (see Section 3.15, Water Resources). Any waste products resulting from construction and operations will be handled as required by current LORS and impacts from both the construction and operation of the project will not exceed those analyzed in the 1994 Commission Decision. Therefore, the project will comply with applicable LORS and will not require any changes to the conditions.

3.15 Water Resources

3.15.1 Environmental Baseline Information

As stated in the Commission Decision, under existing agreements with the City and Sacramento County Water Agency, SPAC can use up to 1,314 afy of potable water supplied by the City, most of which would be used for steam cycle make-up, evaporative inlet cooling, a portion of the cooling tower make-up, combustion turbine generator injection water and potable water. An additional 295 afy of groundwater can be acquired from wells on the Capital Commerce Center (former Campbell Soup) site that would be used for cooling (CEC, 1994).

Within the next decade, Regional San's Sacramento Regional Wastewater Treatment Plant (SRWTP) will be improved to produce tertiary effluent meeting Title 22 tertiary recycled water or equivalent effluent standards through Regional San's EchoWater Project. The SRWTP currently houses Regional San's Water Reclamation Facility (WRF), which consists of a tertiary treatment plant, pump station, and storage reservoir. The WRF was originally designed to produce up to 5 mgd of tertiary effluent, but is permitted up to 10 mgd (State Water Resources Control Board, 1996). The proposed Water Recycling Pipeline Project would convey recycled water from Regional San's WRF, and the future advanced wastewater treatment plant located at the SRWTP, to SPAC and other potential customers (SRCSD, 2014).

The recycled water main would start at the WRF and terminate at SPAC. The recycled water would be used by SPAC, consistent with the quantities listed in Table 2-1 (i.e., up to peak make-up supply of 891.5 gpm). As part of this recycled water pipeline project, Regional San prepared an Environmental Impact Report analyzing the construction of a pipeline that would provide recycled water to SPAC, among other potential users. Regional San's Board of Directors approved the Final EIR on November 12, 2014. The Notice of Determination was filed with the State Clearinghouse on November 13, 2014.

3.15.2 Potential Environmental Impacts

This petition proposes that SPAC be permitted to use recycled water for cooling to the degree that is it available from Regional San. During periods when insufficient recycled water of the required quality is available, potable water supplied by the City of Sacramento would continue to be used. Potable water would also be used for other plant processes such as steam cycle make-up, evaporative inlet cooling, combustion turbine generator injection water, and general potable water uses. Changing the cooling

towers so that they use recycled water will not affect the quality of potable water used by the balance of the plant.

Table 2-1 shows the current potable water use for cooling and resulting wastewater discharge to the sanitary sewer from the cooling tower. As proposed by the petition, potable water use for cooling purposes would be reduced from 660.5 gpm to zero, except under emergency conditions when recycled water is not available. This would be a beneficial effect.

Due to the lower quality of the recycled water, blowdown will need to occur more frequently. The cycles of concentration will drop from 10 cycles down to 3 or 4 cycles. As shown in Table 2-1, peak discharge quantity from the cooling system would increase from 60 gpm to 297.5 gpm. Under the petition, the recycled water provider – Regional San – also would ultimately receive SPAC cooling system discharges. With the EchoWater upgrades occurring at the Regional San treatment facility, overall plant capacity would be 181 mgd, which equals over 125,000 gpm. Current wastewater inflows are approximately 141 mgd, or approximately 98,000 gpm (SRCSD, 2014a). The proposed increase in discharges from SPAC would be minor in the context of overall plant capacity, and would not result in a significant impact.

Other than construction of the new recycled water piping and minor process equipment changes, the SPAC site would not be substantially changed or affected by construction activities. Therefore, no change to surface runoff or stormwater quality is anticipated.

3.15.3 Mitigation Measures

The proposed modifications will not create significant water resource impacts and will not require additional mitigation measures.

3.15.4 Consistency with LORS

The 1994 Commission Decision approving SPAC found the project to be in compliance with all applicable LORS (CEC, 1994). The modifications proposed for SPAC are consistent with all applicable LORS. This action is also consistent with the Governor's Executive Order B-29-15, which calls for use of alternative water supplies at power plants as well as an overall reduction in potable water use due to ongoing drought conditions.

3.15.5 Conditions of Certification

Construction of the recycled waterline and use of recycled water for cooling (in place of potable water) do not require changes to the conditions or additional conditions for water resources.

3.16 Worker Safety and Health

As during the construction of SPAC, safe work practices will be followed to reduce the potential of recordable work incidents. Due to the reduced construction workforce, construction proposed modifications will not create any worker safety and health impacts for either the construction or operation of the project beyond those analyzed in the 1994 Commission Decision. Therefore, the project will comply with applicable LORS and will not require any changes to the conditions.

SECTION 4

Potential Effects on the Public

In accordance with CEC Siting Regulations (Title 20, CCR, Section 1769(a)(1)(G)), this section discusses the potential effects on the public that may result from the modifications proposed in this PTA.

With the implementation of the modifications proposed, the use of recycled water for cooling would have no adverse effect on the public. As previously mentioned, the construction activity associated with the proposed modification would be of short duration and minor in scope resulting in minimal disturbance to traffic flow. Air quality/public health impacts from the use of recycled water would not create a significant adverse impact to the public. The other associated impacts to the environment would be less than significant. Not only will no adverse effects on the public occur because of the changes to the project as proposed in this PTA, but the public will benefit by having more potable water available for consumption.

SECTION 5

List of Property Owners

Consistent with the CEC Siting Regulations Section 1769(a)(1)(H), a list of property owners adjacent or near the proposed project is provided as Appendix D.

SECTION 6

Potential Effects on Property Owners, the Public, and Parties in the Proceeding

This section addresses potential effects of the project modifications proposed in this PTA on nearby property owners, the public, and parties in the application proceeding, in accordance with CEC Siting Regulations (Title 20, CCR, Section 1769 (a)(1)(I)).

The proposed modifications' effects on adjacent land owners would not differ significantly compared with the project as previously certified and amended. As previously mentioned, the construction activity associated with the proposed modification would be short-term (only 3 months) and use a small construction crew (10 to 12 workers); thus disturbance of normal traffic flow in the project vicinity would be minimal and the associated impacts to the environment would be less than significant. Overall, the project would have no adverse effects on nearby property owners, the public, or other parties in the application proceeding. However, the project would comply with Governor Brown's Executive Order B-29-15 declaring a State of Emergency resulting from severe drought conditions by substituting use of recycled water for use of potable water in the plant's cooling tower.

SECTION 7

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Appendix A
SMAQMD Permit Application

S A C R A M E N T O
POWER AUTHORITY
P.O. Box 15830 - Sacramento, CA - 95852-1830 - SPA Company

November 12, 2015
SPA 15-013

Larry Greene
Air Pollution Control Officer
Sacramento Metropolitan Air Quality Management District
777 12th Street, 3rd Floor
Sacramento, CA 95814-1908

SACRAMENTO POWER AUTHORITY (SPA) APPLICATION TO MODIFY THE PERMIT TO OPERATE FOR A COOLING TOWER

Dear Mr. Greene:

Please find the enclosed the Authority to Construct (ATC) and Title V Permit modification applications and filing fees with associate with the proposed modification of a cooling tower to receive recycled water at the SPA facility (located at 3215 47th Avenue in Sacramento, California).

SPA requests that the enclosed minor Title V permit modification be processed under the Enhanced New Source Review (Enhanced NSR) provisions. The SMUD Check No. 824705 in the quantity of $3,128.00 represents: 50% of the initial ATC application filing fee for miscellaneous equipment; and the minor Title V permit modification fee for a single permit being processed under Enhanced NSR.

Please feel free to contact René Toledo at (916) 732-7452 with any questions you may have on this matter.

Sincerely,

Ross Gould
Manager, Thermal Generation and Gas Pipeline Assets

Encl.: SMAQMD ATC Application, SMAQMD Title V Permit Modification Application, SMUD Check No. 824705

cc: Frank Miller, EthosEnergy
Joe Brown, Power Plant Consultants
Jeff Adkins, Sierra Research

sierra research

Application to the Sacramento Metropolitan Air Quality Management District to Utilize Recycled Water at the Sacramento Power Authority Cooling Tower

Prepared for:

The Sacramento Power Authority

November 2015

Prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95811
(916) 444-6666

APPLICATION TO THE
SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

for an

AUTHORITY TO CONSTRUCT AND PERMIT TO OPERATE

for

UTILIZING RECYCLED WATER AT THE SACRAMENTO POWER AUTHORITY COOLING TOWER

Submitted by:

Sacramento Power Authority
P.O. Box 15830, Mail Stop EA405
Sacramento, California 95852

November 2015

Prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95811
(916) 444-6666

SUMMARY

The Sacramento Power Authority (SPA) operates one Siemens Model V84.2 combined-cycle gas turbine which produces electricity and steam at its facility on 47th Avenue in Sacramento. This steam is currently used to power a steam turbine for additional electricity production. Some of this steam formerly supplied the adjacent Campbell Soup Supply Company for its production needs. The Campbell Soup facility was shut down in 2013, leaving SPA without a cogeneration steam host. Without a steam host, SPA generates electricity more efficiently as a combined-cycle plant. SPA also operates a 3-cell wet Cooling Tower that provides cooling water to the steam turbine condenser.

The proposed project includes the use of treated municipal effluent water (recycled water) in the SPA Cooling Tower. The Sacramento Regional County Sanitation District (SRCSD) has proposed the construction of a 6-mile-long pipeline that would provide recycled water to SPA, among other potential users. Switching from potable water use to recycled water in the Cooling Tower will provide long-term benefits to Sacramento by reducing potable water consumption.

However, the use of recycled water—with lower water quality standards than potable water—will result in higher wastewater discharges to the sanitary sewer and potentially higher emissions of air toxics. The level of total dissolved solids in the recycled water will remain at or below current levels, so there will be no increase in particulate matter emissions from water drift losses at the Cooling Tower.

The use of recycled water in the Cooling Tower will not trigger Best Available Control Technology (BACT) requirements because criteria pollutant emissions will not increase above currently permitted levels and there will be no changes required to the existing permit conditions or permit emission limits. Emission offsets will not be triggered under Sacramento Metropolitan Air Quality Management District (SMAQMD) regulations because the project does not result in an increase in criteria pollutant emissions.

APPLICATION TO THE
SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
for an
AUTHORITY TO CONSTRUCT AND PERMIT TO OPERATE
for
UTILIZING RECYCLED WATER AT THE
SACRAMENTO POWER AUTHORITY COOLING TOWER

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SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
for an
AUTHORITY TO CONSTRUCT AND PERMIT TO OPERATE
for
UTILIZING RECYCLED WATER AT THE
SACRAMENTO POWER AUTHORITY COOLING TOWER

I. PROJECT DESCRIPTION

A. Applicant's Name and Business Description

Name of Applicant:	Sacramento Power Authority (SPA)
Mailing Address:	P.O. Box 15830; Mail Stop EA405 Sacramento, CA 95852
Facility Address:	3215 47th Avenue Sacramento, CA
SIC Code:	4911
General Business:	Operation of combined cycle power plant supplying electricity to SMUD.
Submitting Officer:	Frankie McDermott, Chief Generation and Grid Asset Supervisor Sacramento Power Authority (916) 732-5303
Project Contact:	René Toledo Environmental Specialist III (916) 732-7452
Consultant:	Sierra Research, Inc. 1801 J Street Sacramento, California 95811 Contact: Jeff Adkins (916) 444-6666
Type of Use Entitlement:	SPA owns the equipment described in this application.
Estimated Construction Date:	2nd Quarter 2016

B. Type of Application

SPA is applying for an Authority to Construct and Permit to Operate to allow for the use of recycled water in the Cooling Tower at its facility on 47th Avenue in Sacramento. SRCSD has proposed the construction of a 6-mile-long pipeline that would provide recycled water to SPA, among other potential users. Switching from potable water to recycled water use in the Cooling Tower will provide long-term benefits to Sacramento by reducing potable water consumption. Figure 1 shows the location of the existing Cooling Tower at the existing SPA site.

The appropriate SMAQMD application forms are included in Appendix A.

C. Facility Description

The SPA facility is comprised of one Siemens Model V84.2 combined-cycle gas turbine which produces electricity and steam. The facility also includes a Cooling Tower that provides cooling water to the steam turbine condenser. The steam produced by the combined cycle turbine is used to power a steam turbine for additional electricity production, and was formerly used to provide steam to the adjacent Campbell Soup Supply Company for its production operations before the plant shut down in 2013. Without a steam host, SPA generates electricity more efficiently as a combined-cycle plant.

D. Equipment and Process Description

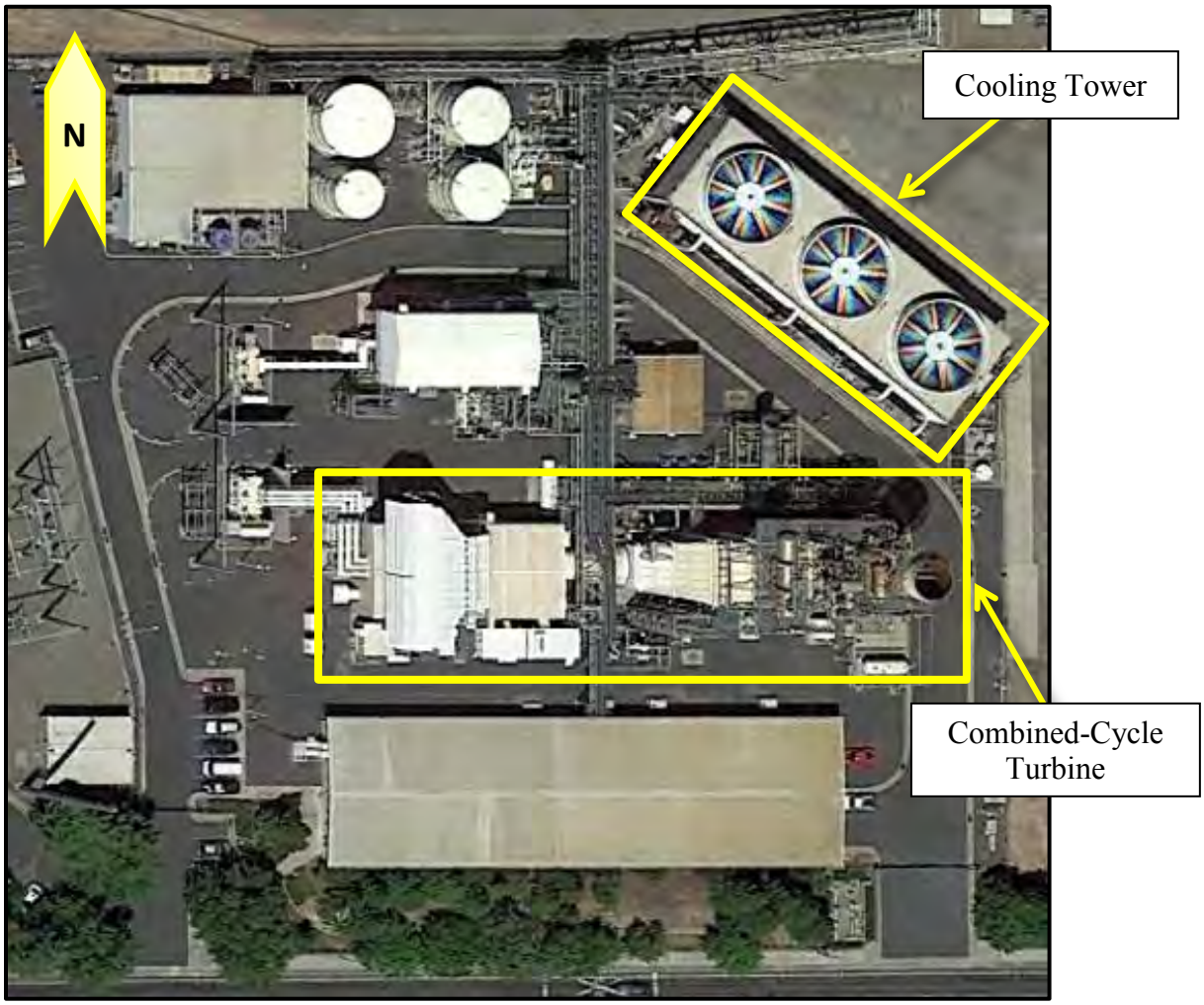
The existing Cooling Tower is rated at 45,000 gallons per minute (gpm) circulation rate and has a permit limit of 3,000 ppmw total dissolved solids. It includes a drift eliminator system that limits water drift losses to 0.0006% of the circulation flow. SMAQMD Permit No. 13316 for the Cooling Tower does not mention the type of water (potable or recycled) allowed in the tower, but the operational change to recycled water nonetheless requires a permit application under SMAQMD Rule 201 (see discussion in Section III below).

Table 1 includes the design specifications for the existing Cooling Tower.

Table 1
SPA Cooling Tower Design Specifications

Manufacturer	GEA Thermal-Dynamics Towers, Inc.
Model	TD4854-3-4034CF
Rated Capacity	45,000 gpm
Design	3-Cell Counterflow
Dimensions	54’ x 48’ per cell; 162’ x 48’ overall
Drift Eliminator Emission Control	Brentwood PVC CDX080; 0.0006% Drift Loss

Figure 1.
Cooling Tower Location Diagram



E. Facility Operations

While actual operation will vary, the SPA combined-cycle turbine and Cooling Tower have the potential to operate on a full-time basis (24-hours/day, 365 days/year). Consequently, in the following sections regarding emissions and regulatory applicability, full-time Cooling Tower operation is assumed.

II. EMISSION ASSESSMENT

The Cooling Tower currently emits particulate matter less than 10 microns and less than 2.5 microns in diameter (PM_{10} and $PM_{2.5}$). The modified Cooling Tower with recycled water will continue to emit PM_{10} and $PM_{2.5}$ at levels less than or equal to the current Cooling Tower and will also emit de minimis quantities of volatile organic compounds (VOC; also called reactive organic compounds or ROC by the SMAQMD). There will also be a small increase in ammonia emissions. This section presents future potential emissions from the modified Cooling Tower and future potential emissions from the modified facility.

The modified Cooling Tower will also emit trace levels of toxic air contaminants (TACs). Spreadsheets containing detailed TAC emission calculations are presented in Appendix B.

Future Potential Emissions from the Modified Cooling Tower – The following emissions for the modified Cooling Tower are summarized in Table 2:

- Maximum daily emissions;
- Maximum quarterly emissions to determine the maximum emissions for the modified facility and the emission increase for the modified Cooling Tower; and
- Maximum annual emissions to determine the maximum emissions for the modified facility.

Maximum PM_{10} and $PM_{2.5}$ emissions from the modified Cooling Tower operating 24 hours per day were calculated based on the permitted total dissolved solid (TDS) limit of 3,000 ppmw, a circulation rate of 45,000 gpm, and a drift loss of 0.0006% as per Condition #8 of SMAQMD Permit to Operate No.13316. These reported emission rates in Table 2 are the same as the pre-project emission rates for these pollutants.

Ammonia emissions are expected to be negligible at the temperature (approximately 85°F or 30°C) and pH (7.5 or less) of the SPA Cooling Tower recycled water based on a review of technical data and previous California Energy Commission (CEC) projects utilizing recycled water in cooling towers (see Appendix E). This is because virtually all of the ammonia in solution at a pH of 7.5 or less is present in the ionic form (NH_4^+) and cannot be stripped from solution. Instead, ionic ammonia can be emitted as a particulate in the cooling tower drift, but the quantity of ionic ammonia lost in drift is insignificant (about 0.1 lb/day) compared to amount of molecular ammonia lost through stripping.

We were only able to locate three projects where the CEC discussed ammonia emissions from recycled water use:

- The Palomar Power Project in San Diego County where the CEC recited the molecular ammonia stripping emission values prepared by an intervenor and noted that this emission rate only applied to a water pH above 7.5;
- The Russell City Energy Center located in Hayward where the Preliminary Determination of Compliance issued by the BAAQMD on November 15, 2002 notes that the cooling tower will have an ammonia drift loss of 5.924E-03 ton/yr (based upon a drift rate of 338 lb/hr); and
- The Cosumnes Power Plant where the Application for Certification lists in Table 8.1B-8 ammonia hourly drift loss emissions from the cooling tower of 3.15E-04 lb/hr and an annual emission of 1.38E-03 tons/yr (drift rate per tower of 315.07 lb/hr).

In all of these cases ammonia impacts were determined to be insignificant. For the SPAC project, we have conservatively assumed that 5% of the ammonia in solution is stripped in the cooling tower. The incoming recycled water ammonia concentration is based on recent test data plus a compliance margin (45 ppmw ammonia) and a water make-up rate of 900 gpm for 3 cycles of concentration (see Appendix D for recent water analyses of the recycled water stream after chlorination at SRCSD). This is a conservative assumption since SPA will add additional chlorine to the incoming recycled water at the SPA Cooling Tower, and this additional chlorine will react with ammonia in the Cooling Tower basin thereby reducing the total ammonia levels below the SRCSD reported data.

VOCs have been identified at the SRCSD facility in part per billion levels. It is assumed that this small amount of VOCs will result in negligible VOC emissions at the SPA Cooling Tower for the following reasons:

- The CEC has never attributed VOC emissions to the use of recycled water in any siting cases we could find on the CEC website;
- The part per billion quantities of VOCs measured at the SRCSD facility will be exposed to chlorine for additional time in the pipeline from SRCSD to SPA, thereby reducing the levels even further by the time the recycled water arrives at the SPA site;
- SPA will add more chlorine at the Cooling Tower basin, which will reduce the VOCs even further; and
- Only a fraction of any remaining VOCs will be stripped in the Cooling Tower at the very low concentrations present and the correspondingly low equilibrium vapor pressures.

Table 2 Future Potential Emissions from the Modified Cooling Tower						
	Maximum Emissions					
Pollutant	Daily (lb)	1st Quarter (lb)	2nd Quarter (lb)	3rd Quarter (lb)	4th Quarter (lb)	Annual (tons)
$PM_{10}/PM_{2.5}$[1]	9.7	875	885	895	895	1.8
Ammonia[2]	24.3	2,189	2,213	2,237	2,237	4.4

Notes:

1. $PM_{10}/PM_{2.5}$ based on 3,000 ppmw TDS, 45,000 gpm circulation rate, and 0.0006% drift loss.
2. NH_3 emissions based on 45 ppmw NH_3 in the inlet recycled water, a water make-up rate of 900 gpm, and an assumed 5% of the ammonia available in the molecular form (NH_3) for stripping.

Future Potential Emissions from the Modified Facility – The maximum quarterly and annual emissions for the modified SPA facility are summarized in Table 3. Total facility PM_{10}/ $PM_{2.5}$ emissions will not increase as a result of the modified Cooling Tower recycled water project because the TDS content of the recycled water will be less than or equal to the current permitted level of 3,000 ppmw. There will be a de minimis increase in VOC emissions from the facility. Therefore, the emission rates in Table 3 are equivalent to the total facility emission limits in the current SPA Permits to Operate.

Table 3 Maximum Emissions from the Modified SPA Facility[1]					
	Maximum Emissions				
Pollutant	1st Quarter (lb)	2nd Quarter (lb)	3rd Quarter (lb)	4th Quarter (lb)	Annual lb/year
NOx	24,209	24,545	26,321	24,725	99,800
CO	21,265	21,601	22,803	21,708	87,377
PM_{10}/ $PM_{2.5}$	11,015	10,160	12,294	11,619	45,088
VOC/ROC	8,792	8,898	13,264	8,968	39,922
SOx	1,814	1,836	1,944	1,853	7,447

III. COMPLIANCE WITH APPLICABLE RULES AND REGULATIONS

Rule 201, Section 303 requires that an applicant demonstrate compliance with applicable SMAQMD, state, and federal requirements before an Authority to Construct or Permit to Operate can be granted. The rules and regulations applicable to the affected equipment are listed below and discussed thereafter.

- Rule 201: General Permit Requirements
- Rule 202: New Source Review
- Rule 203: Prevention of Significant Deterioration
- Rule 207: Title V Federal Operating Permit Program
- Rule 217: Public Notice Requirements for Permits
- Rule 301: Stationary Source Permit Fees
- Rule 401: Ringelmann Chart/Opacity
- Rule 402: Nuisance
- Rule 404: Particulate Matter
- CEQA

A. Rule 201: General Permit Requirements

Section 300 of Rule 201 specifies that "any person building, erecting, altering or replacing any article, machine, equipment or other contrivance, the use of which may cause, eliminate, reduce, or control the issuance of air contaminants, shall first obtain authorization for such construction from the Air Pollution Control Officer." This Authority to Construct application satisfies this requirement for the SPA Cooling Tower.

B. Rule 202: New Source Review

The SMAQMD adopted Rule 202 to provide for preconstruction review of new or modified facilities to ensure that affected sources do not interfere with the attainment or maintenance of ambient air quality standards. Rule 202 applies to all modifications to existing stationary sources and emissions units which are subject to Rule 201. Section 229 defines the term "modification" in relevant part as:

> ***MODIFICATION:*** *Any physical change, change in method of operation (including change in fuel), or addition, which:*
>
> *229.1 For an emissions unit would necessitate a change in a permit condition or result in the potential to emit being higher than the historic potential emissions as defined in Section 225.*
>
> . . .

Section 225 states that the "historic potential emissions" for existing emissions units that are not part of a "major modification" are equal to the unit's potential to emit prior to the modification. The recycled water Cooling Tower project is not a "major modification" as defined in Section 227 because the project: 1) does not result in an increase in VOC emissions of 25 tons per year; and 2) ammonia emissions increases do not exceed the significance level established in the $PM_{2.5}$ attainment demonstration (ammonia was not

determined to be a necessary part of the $PM_{2.5}$ control strategy in the SMAQMD attainment demonstration.)

As noted in Table 3, $PM_{10}/PM_{2.5}$ emissions will not exceed historic potential emissions levels and thus do not trigger the requirements of Rule 202. However, the de minimis increase in VOC emissions nonetheless will be reviewed for compliance with Rule 202.

In general, Rule 202 contains three separate elements, as listed and discussed below.

- Best Available Control Technology (BACT)
- Emission Offsets
- Air Quality Impact Analysis

1. Best Available Control Technology

Rule 202, Section 301 requires that an applicant apply BACT on a pollutant-by-pollutant basis to new or modified emissions units resulting in any daily emissions increase of NOx, SOx, PM_{10}, $PM_{2.5}$, or VOC. The only pollutant with a potential emissions increase for the recycled water Cooling Tower project is VOC, and that increase is de minimis.

BACT for VOC is the treatment of the recycled water with chlorine bleach to oxidize organic compounds into organic salts and CO_2. Chlorine bleach is added to the recycled water stream at both the SRCSD treatment plant and at the Cooling Tower basin. It is expected that this bleach will remove essentially all of the VOC before it is emitted to atmosphere.

2. Emission Offsets

Rule 201, Section 302 requires that emission offsets be provided on a per-pollutant basis for increases in quarterly emissions from a new or modified emissions unit if the stationary source's post-project potential to emit exceeds the levels specified in Rule 202, Section 302.1. VOC is the only pollutant which potentially has a de minimis quarterly emissions increase. The SPA facility exceeds the offset trigger level in Section 302.1 for VOC.

Table 4
Offsets Applicability

Pollutant	Maximum Emissions (lb/quarter) [1]	Offsets Threshold (lb/quarter)	Above Offsets Threshold?
VOC/ROC	13,264	5,000	Yes

Note:
1. Presented previously in Table 3.

The SMAQMD has a policy of accumulating quarterly offsets obligations until the total obligation exceeds 46 lb/quarter (0.5 lb/day for 92 days). The maximum quarterly increase in VOC from the SPA recycled water Cooling Tower project is de minimis and well below SMAQMD's 46 lb/quarter threshold. Therefore, offsets are not required for the recycled water project.

3. Ambient Air Quality Impact Analysis

Rule 202, Section 305 prohibits a new or modified stationary source from interfering with the attainment or maintenance of an applicable ambient air quality standard. An ambient air quality impact analysis is required only for a new major source or major modification, and the proposed SPA Cooling Tower recycled water project is neither a new major source nor a major modification. Therefore, an ambient air quality impacts analysis is not required.

C. Rule 203: Prevention of Significant Deterioration

Rule 203 incorporates the Federal Prevention of Significant Deterioration (PSD) Program by reference (40 CFR 52.21). The PSD program requires pre-construction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding National Ambient Air Quality Standards (i.e., attainment pollutants). For the proposed Cooling Tower project, the emitted pollutants are $PM_{10}/PM_{2.5}$. While the SMAQMD is classified as an attainment area for NOx, SOx, CO, and PM_{10}, the SMAQMD is a nonattainment area with respect to the $PM_{2.5}$ and ozone National Ambient Air Quality Standards. Consequently, the PSD regulations do not apply to $PM_{2.5}$ emissions from the project.

The federal PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing major stationary source (these terms are defined in the PSD regulations at 40 CFR 52.21). SPA is not an existing major source because its emissions are limited to less than 100 tons per year for all pollutants (see Table 3), and the modified Cooling Tower will not cause the SPA facility to become a new major stationary source. Therefore, PSD does not apply to the project.

D. Rule 207: Title V Federal Operating Permit Program

SPA is an existing Title V facility with Permit No. TV2007-14-02B (effective March 1, 2009). The requested use of recycled water at the SPA Cooling Tower will require a minor modification to SPA's Title V permit. In order to expedite the Title V permit modification process, SPA requests that the SMAQMD process this application and Title V permit modification under the Enhanced New Source Review process allowed under Rule 202 (Sections 101 and 404). This permit application package includes the SMAQMD application forms necessary for this modification to the SPA Title V permit (see Appendix A).

E. Rule 217: Public Notice Requirements for Permits

Rule 217, Section 102 notes that notification requirements shall not apply if the application is for any new or modified emissions unit where the combined potential to emit from the project would have an increase in potential to emit less than the amounts listed below (and provided that offsets are not required).

Pollutant	
Volatile organic compounds	*5,000 pounds per quarter*
Nitrogen oxides	*5,000 pounds per quarter*
Sulfur oxides	*9,200 pounds per quarter*
PM_{10}	*7,300 pounds per quarter*
$PM_{2.5}$	*10 tons per year*
Carbon monoxide	*49,500 pounds per quarter*

Per Table 2 above, there is no increase in potential to emit from the Cooling Tower project. Therefore, the emissions increase is less than the listed exemption levels, and the SPA Cooling Tower project does not trigger public notice requirements per Rule 217.

In addition to the notification requirements of Rule 217, California Health and Safety Code Section 42301.6 requires that an additional public notice be distributed whenever an Authority to Construct is issued that would allow increased toxic air contaminant emissions within 1,000 feet of the outer boundary of a school site. However, the project is not within 1,000 feet of the outer boundary of a school site; therefore, notification is not required under Section 42301.6.

F. Rule 301: Stationary Source Permit Fees

This permit application is subject to the permit fees established by this Rule 301. For the proposed Cooling Tower, the initial filing fee was determined in accordance with SMAQMD Rule 301 based on one half of the estimated initial permit fee for the Cooling Tower ($1,620 per Section 308.10 for Schedule 9, Miscellaneous Equipment) plus a Title V permit amendment processing fee ($2,310 plus $963 per Section 313.1 for application amendments processed under Enhanced New Source Review). Therefore, a check in the amount of $3,128.00 payable to the SMAQMD is included as part of this permit application package.

G. Rule 401: Ringelmann Chart/Opacity

Rule 401 prohibits the emission of air contaminants that are darker than Ringelmann No. 1 or 20% opacity for more than three minutes in a one-hour period. Water vapor is not included in an opacity determination. The Cooling Tower will not create visible emissions in excess of the limits of this rule.

H. Rule 402: Nuisance

This rule prohibits the discharge of air contaminants in quantities that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. The SMAQMD regulates new and modified sources of toxic air contaminants (TACs) under this rule by implementing its "Risk Assessment Guidelines for New and Modified Stationary Sources," dated December 2000. These guidelines implement what is commonly known as "Toxics New Source Review."

For the SPA Cooling Tower, there are TAC emissions associated with the use of recycled water. Recycled water analyses were used to calculate the TAC emission increase associated with the Cooling Tower project. Detailed TAC emission calculations for the Cooling Tower project are included in Appendix B. Some of these compounds have both carcinogenic and non-cancer health effects.

Under the SMAQMD's toxics policy, modified projects with TAC emission increases are required to perform a screening-level health risk assessment. The SPA Power Plant Project was evaluated for health risk when it was originally permitted by the SMAQMD in 1994 (see SMAQMD Final Determination of Compliance, August 19, 1994). To determine whether the proposed Cooling Tower project will result in a significant increase in either the carcinogenic or non-cancer health impacts for the SPA facility, a screening-level health risk assessment was performed for the increase in TAC emissions associated with the SPA Cooling Tower, and this risk was added to the total SPA facility wide risk calculated by the SMAQMD in 1994. The Cooling Tower risk analysis was prepared using EPA's AERMOD dispersion modeling software together with CARB's Hotspots Analysis and Reporting Program (HARP) computer model (Version 1.4f, Build 23.11.01). The HARP model was used to assess cancer risk as well as chronic and acute risk impacts. A risk of less than 1×10^{-6} for cancer and a Health Hazard Index of less than 1 for chronic or acute exposures are considered to be insignificant. The results of the screening-level health risk prioritization assessment are summarized in Table 5, and the detailed HARP modeling results are enclosed as Appendix C.

Table 5 Health Risk Screening Results SPA Recycled Water Cooling Tower Project			
Risk Component	1994 Project HRA	Modified Cooling Tower	Total
Cancer Risk - Residential	1.158×10^{-7}	7.63×10^{-8}	1.92×10^{-7}
Cancer Risk - Workplace	1.158×10^{-7}	3.50×10^{-9}	1.19×10^{-7}
Acute Hazard Index	0.1693	0.154	0.323
Chronic Hazard Index	0.0111	0.0149	0.026

Table 5 shows that the HRA results for Cooling Tower are below the significance thresholds for cancer, acute, and chronic impacts. Additionally, the increased risks associated with the SPA Cooling Tower, when added to the reported health risks for the original SPA Project (see Appendix E, 1994 FDOC), do not result in a total cumulative health risk exceeding the respective significance thresholds. Therefore, the TAC emission impacts for the proposed Cooling Tower recycled water project will not be significant, and the project is not expected to create a nuisance due to health risk.

In addition to project TAC emissions, bacterial growth in the proposed cooling water system could include the Legionella bacterium which could present a public health risk. This risk is present for both recycled water cooling systems as well as potable water cooling systems. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis.

The State of California regulates recycled water for use in cooling towers in Title 22, section 60303, California Code of Regulations. This section requires that, in order to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms. SPA will use tertiary-treated recycled water provided by SRCSD which has been pre-treated with chlorine. SPA will also add additional chlorine bleach at the cooling tower basin to minimize the growth of microorganisms. Therefore, it is not expected that bacterial growth in the modified SPA Cooling Tower will present a public health risk.

I. Rule 404: Particulate Matter

Rule 404 prohibits emissions of particulate matter (PM) in excess of 0.1 gr/dscf. The PM drift loss from the Cooling Tower will be much less than this emission limit. Therefore, the Cooling Tower will comply with the Rule 404 PM emission limit.

J. California Environmental Quality Act (CEQA)

Under Rule 202 (Section 307), the Air Pollution Control Officer shall deny an Authority to Construct or Permit to Operate if the Air Pollution Control Officer finds that the project which is the subject of an application would not comply with CEQA. Because the SPA Project underwent review/approval by the CEC in its Application for Certification (AFC) process, the CEC is responsible for the CEQA-like review of the Cooling Tower project. As a CEC-approved project, all subsequent SPA modifications go through the CEC amendment process. This CEC amendment process includes a review to confirm that a proposed project modification complies with applicable CEQA requirements. The applicant is in the process of preparing the petition to the CEC to amend the AFC for the SPA Project to allow the proposed changes discussed in this permit application package. Therefore, the CEQA review of the proposed Cooling Tower Recycled Water Project will be covered by the CEC amendment process. Normally under this process, the SMAQMD issues a preliminary and final determination of compliance (PDOC/FDOC) for a requested permit change. Once the FDOC is issued, the CEC staff will finish its analysis and bring the amendment to the Commission for approval. Once the CEC approves the amendment the CEQA process is complete, and the FDOC acts like an authority to construct.

APPENDIX A
SMAQMD APPLICATION FORMS

777 12th Street, 3rd Floor
Sacramento, CA 95814-1908

Sacramento Metropolitan
Air Quality Management District

(916) 874-4800
Fax (916) 874-4899

FORM G100
APPLICATION FOR AUTHORITY TO CONSTRUCT AND/OR PERMIT TO OPERATE

A SEPARATE APPLICATION AND FORM(S) SPECIFIC TO THE PROCESS
OR EQUIPMENT MUST BE COMPLETED FOR **EACH** PROCESS OR PIECE OF EQUIPMENT

A. Both pages of this application must be completed; an original signature (not a facsimile or copy) is required.
B. The appropriate permit fee must be submitted with the application (refer to SMAQMD Rule 301 or 310 for fee schedule).

1. Name of business or organization that is to receive the permit: Sacramento Power Authority

Business type: ☐ Sole Proprietorship ☐ Limited Liability Company ☐ Partnership ☐ Corporation ☐ Wholly-owned Subsidiary ☐ Government ■ Other

2. Employer Identification Number (E.I.N.): 3 8 - 3 6 8 3 1 5 2

3. Number of Employees: 18 4. NAICS Classification No.: 2 2 1 1 1 2

5. Does this business (including its affiliates) have annual receipts in excess of $750,000? ■ Yes ☐ No

6. Mailing address: PO Box 15380, Mail Stop EA405 (NUMBER STREET) Sacramento, (CITY) CA (STATE) 95852-0830 (ZIP CODE) 916-732-5303 (PHONE NO.)

7. Location Address (where the equipment will be operated, if different than above)
3215 47th Avenue; (NUMBER STREET) Sacramento, (CITY) CA (STATE) 95824 (ZIP CODE) 916-391-2993 (PHONE NO.)

8. Name of Facility that will Operate the Equipment (if different than above):

DBA: _____

9. Description of equipment/process to be permitted: Change in cooling tower method of operation to allow for the use of treated municipal effluent water (reclaimed water) from the Sacramento Regional County Sanitation District.

■ Constructing/installing new equipment
Estimated startup date for new equipment: April 1, 2016

☐ Initial permit for existing equipment
Date Operation First Commenced: _____

☐ Modification of existing permitted equipment or permit conditions
Estimated completion date for modification: _____ Previous Permit No.: _____

☐ Change of Ownership
Change of ownership date: _____ Previous Permit No.: _____

10. Is this permit application being submitted in response to a Notice of Violation (NOV) or Notice to Correct (NTC) issued by the SMAQMD? ☐ Yes ■ No If Yes, NOV or NTC #: _____

DO NOT WRITE BELOW (SMAQMD USE ONLY)

DATE STAMP	PERMIT NUMBER	A/C FEE	A/C RECEIPT
	PREVIOUS P/O	P/O FEE	P/O RECEIPT

777 12th Street, 3rd Floor
Sacramento, CA 95814-1908

Sacramento Metropolitan Air Quality Management District

(916) 874-4800
Fax(916)874-4899

APPLICATION FOR AUTHORITY TO CONSTRUCT AND/OR PERMIT TO OPERATE

A SEPARATE APPLICATION AND FORM(S) SPECIFIC TO THE PROCESS OR EQUIPMENT MUST BE COMPLETED FOR **EACH** PROCESS OR PIECE OF EQUIPMENT

A. Both pages of this application must be completed; an original signature (not a facsimile or copy) is required.
B. The appropriate permit fee must be submitted with the application (refer to the SMAQMD Rules or fee schedule).

11. All information submitted to obtain an Authority to Construct/Permit to Operate is considered public information as defined by section 6254.7 of the California Government Code unless specifically marked as trade secret by the applicant. Each document containing trade secrets must be separated from all non-privileged documents. Each document which is claimed to contain trade secrets must indicate each section or paragraph that contains trade secret information and must have attached a declaration stating with specificity the reason this document contains trade secret information. All emission data is subject to disclosure regardless of any claim of trade secret.

Acknowledgement [ ] (Please initial) Trade secret documents are included with this application: ☐ Yes ■ No

12. Pursuant to Section 42301.6(f) of the Health and Safety Code, I hereby certify that emission sources in this permit application:

(*Initial appropriate box*) [ ] **ARE** OR [ ] **ARE NOT** within 1,000 feet of the outer boundary of a school

Pursuant to section 42301.9(a) of the Health and Safety Code, "School" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.

13. Required information, analyses, plans and/or specifications needed to complete this application are being collected under authority granted by California Health & Safety Code (CH&SC) section 42303. In addition, CH&SC section 42303.5 states that *No person shall knowingly make any false statements in any application for a permit, or in any information, plans, or specifications submitted in conjunction with the application or at the request of the Air Pollution Control Officer.* Violations of the CH&SC may result in criminal or civil penalties, as specified in CH&SC sections 42400 through 42402.3. By signing below, I certify that all information is true and accurate and complete, to the best of my knowledge and ability.

Please be advised that constructing, installing, or operating air pollutant emitting equipment prior to receiving an Authority to Construct from the Air District is a violation of air pollution regulations and is subject to civil or criminal penalties prescribed in the California Health and Safety Code.

Signature of responsible officer, partner or proprietor of firm _____

Printed Name: Frankie McDermott Title: Chief Generation & Grid Assets Officer Date: 10/20/2015

Phone number: 916-732-5303 Fax number: _____ E-mail address: Frankie.McDermott@smud.org

14. Contact person for information submitted with this application (if different from above):

Name: René Toledo Title: Environmental Specialist

Phone number: 916-732-7452 Fax number: _____ E-mail address: Rene.Toledo@smud.org

15. Receipt of future rules and planning notices affecting your permit and facility; check one box:

☐ Please send e-mail notices to _____

☐ I will sign up myself at www.airquality.org/listserve/ to receive e-mailed notices.

☐ I want the District to mail notices to the address on this application.

■ I am already subscribed.

777 12th Street, 3rd Floor
Sacramento, CA 95814-1908

Sacramento Metropolitan
Air Quality Management District

(916) 874-4800
Fax: (916) 874-4899

APPLICATION TO MODIFY TITLE V PERMIT

I. FACILITY IDENTIFICATION

1. Facility Name: Sacramento Power Authority

2. Parent Company: _____
(if different from Facility name)

3. Mailing Address: PO Box 15830; MS-EA405; Sacramento, CA 95852-0830

4. Facility Location: 3215 47th Street; Sacramento, CA 95824

5. Type of Organization:

[ ] Corporation [ ] Sole Ownership [ ] Government [ ] Partnership [✓] Utility Company

6. Responsible Official: Frankie McDermott Phone No.: 916-732-5303

Title: Chief Generation & Grid Assets Officer

7. Plant Site Contact: Frank Miller Phone No.: 916-391-2993 ext. 6

Title: Plant Manager

II. TYPE OF PERMIT ACTION

	Current Permit Number	Permit Expiration Date
☐ Significant Permit Modification		
☑ Minor Permit Modification	TV2007-14-02B	03/01/2014
☐ Administrative Amendment		

777 12th Street, 3rd Floor
Sacramento, CA 95814-1908

Sacramento Metropolitan
Air Quality Management District

(916) 874-4800
Fax: (916) 874-4899

APPLICATION TO MODIFY TITLE V PERMIT

III. DESCRIPTION OF PERMIT ACTION

1. Does the permit action involve?: [ ] Temporary Source [ ] Voluntary Emissions Caps
   [✓] Acid Rain Source [ ] Alternative Operating Scenarios
   [ ] MACT Requirements

2. Provide a general description of the proposed permit modification. Reference any Authority to Construct that is requested to be incorporated. Attach any additional information that is relevant to the request.

This application requests that the modified provisions of the facility's amended cooling tower Permit to Operate be incorporated in the Title V Permit. The Authority to Construct application also requests that this application be processed under the Enhanced New Source Review provisions of Rule 202 (New Source Review).

Under penalty of perjury, I certify that based on information and belief formed after reasonable inquiry, the answers, statements and information contained in this application (and supplemental attachments thereto) are true, accurate and complete. This application consists of the application forms provided by the SMAQMD, information required pursuant to the List and Criteria and any supplemental information and/or attachments submitted with the application. I also certify that I am the responsible official as defined in SMAQMD Rule 207.

Signature of Responsible Official — Date: 10/20/15

Frankie McDermott, Chief Generation & Grid Assets Officer

Print Name of Responsible Official

Sacramento Municipal Utility District
6201 S Street, P.O. BOX 15830, Sacramento CA 95817-1899 Tel: (916) 452-3211

VENDOR NO. 301336 CHECK NO. 00000824705
VENDOR / CUSTOMER NAME
SACRAMENTO

INVOICE NO.	DATE	GROSS	DEDUCTIONS	DISCOUNT	NET
2015 SPA FEES	10/02/2015	3,128.00	0.00	0.00	3,128.00
	Filing fees for SPA air quality permit apps				

Check Amount :

DETACH BEFORE DEPOSITING CHECK

SMUD-0279 8/10

SMUD™
Sacramento Municipal Utility District
6201 S Street P.O. BOX 15830 Sacramento CA 95817-1899

00000824705
70-2328/0719

Bank America Illinois
Northbrook, Illinois

VOID 6 MONTHS AFTER ISSUE

VENDOR NO.	DATE
301336	10/16/2015

PAY EXACTLY *****$3,128.00*

*** THREE THOUSAND ONE HUNDRED TWENTY-EIGHT USD***

SMUD Commercial Disbursement Account

PAY TO THE ORDER OF
SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
777 12TH STREET, 3RD FLOOR
SACRAMENTO CA 95814-1908

⑈00000824705⑈ ⑆071923284⑆ 87650⑈02383⑈

Sacramento Metropolitan Air Quality Management District Receipt for Fees and Payments

Date: 11/13/2015 **Receipt No:** 3908

Company Name SMUD **Total:** $3,128.00

Description: 1 PERMIT APP/ 1 TITLE V

Invoice No:

Payment Method Check **Check No** 0000824705

777 12th Street, Sacramento, CA 95814-1908
Phone: (916) 874-4800 Fax: (916) 874-4899 www. airquality.org

APPENDIX B
EMISSION CALCULATIONS

Drift Loss

Circulation Rate (GPM)	Density (lb/gal)	Drift Loss (%)	TDS (PPM)	PM10 (lb/hr)	PM10 (lb/day)	Q1	Q2	Q3	Q4	Annual
45000	8.34	0.0006	3000	0.41	9.7	875	885	895	895	1.78

Ammonia Emissions

	Inlet Flow (GPM)	Water lb/gal	PPB (wt)	PPM (wt)	lb/hr	lb/day	Q1	Q2	Q3	Q4	tons/yr
Ammonia	900	8.34		45	1.01	24.3	2,189	2,213	2,237	2,237	4.44

Emission rates assume 5% of ammonia is available for stripping as NH3.

Toxic Emissions

Stripping Emissions	Make-up GPM	lb/gal	PPB	PPM	lb/hr	g/sec
NH3	900	8.34		40	18.01	2.27E+00
Bromodichloromethane	900	8.34	0.62		2.79E-04	3.52E-05
Chloroethane	900	8.34	0.77		3.47E-04	4.37E-05
Chloroform	900	8.34	12		5.40E-03	6.81E-04
Chloromethane	900	8.34	1.2		5.40E-04	6.81E-05
Ethylbenzene	900	8.34	0.13		5.85E-05	7.38E-06
Toluene	900	8.34	0.11		4.95E-05	6.24E-06
Total Xylenes	900	8.34	0.53		2.39E-04	3.01E-05
Drift Loss Emissions	**Tower Circ Rate**	**lb/gal**	**% Drift**	**PPM**	**lb/hr**	**g/sec**
Iron, Fe,	45000	8.34	0.0006	0.04	5.40E-06	6.81E-07
Copper, Cu,	45000	8.34	0.0006	0.01	1.35E-06	1.70E-07
Zinc, Zn,	45000	8.34	0.0006	0.03	4.05E-06	5.11E-07
Sodium, Na,	45000	8.34	0.0006	102	1.38E-02	1.74E-03
Potassium, K,	45000	8.34	0.0006	16	2.16E-03	2.72E-04
Chloride, Cl,	45000	8.34	0.0006	132	1.78E-02	2.25E-03
Sulfate, SO4,	45000	8.34	0.0006	52	7.03E-03	8.85E-04
Nitrate, NO3,	45000	8.34	0.0006	4	5.40E-04	6.81E-05
Ortho−Phosphate, PO4,	45000	8.34	0.0006	8.7	1.18E-03	1.48E-04
Silica, SiO2,	45000	8.34	0.0006	48	6.49E-03	8.17E-04
Aluminum, Al,	45000	8.34	0.0006	0.05	6.76E-06	8.51E-07
Boron, B,	45000	8.34	0.0006	0.32	4.32E-05	5.45E-06
Barium, Ba,	45000	8.34	0.0006	0.02	2.70E-06	3.40E-07
Cadmium, Cd,	45000	8.34	0.0006	0.005	6.76E-07	8.51E-08
Cobalt, Co,	45000	8.34	0.0006	0.005	6.76E-07	8.51E-08
Chromium, Cr,	45000	8.34	0.0006	0.005	6.76E-07	8.51E-08
Lithium, Li,	45000	8.34	0.0006	0.005	6.76E-07	8.51E-08
Manganese, Mn,	45000	8.34	0.0006	0.05	6.76E-06	8.51E-07
Molybdenum, Mo,	45000	8.34	0.0006	4.1	5.54E-04	6.98E-05
Nickel, Ni,	45000	8.34	0.0006	0.005	6.76E-07	8.51E-08
Lead, Pb,	45000	8.34	0.0006	0.005	6.76E-07	8.51E-08
Strontium, Sr,	45000	8.34	0.0006	0.24	3.24E-05	4.09E-06
Vanadium, V,	45000	8.34	0.0006	0.025	3.38E-06	4.26E-07
Arsenic, As,	45000	8.34	0.0006	0.05	6.76E-06	8.51E-07
Titanium, Ti,	45000	8.34	0.0006	0.025	3.38E-06	4.26E-07
Silver, Ag,	45000	8.34	0.0006	0.05	6.76E-06	8.51E-07
Fluoride, F,	45000	8.34	0.0006	0.82	1.11E-04	1.40E-05

APPENDIX C
HARP MODEL DATA

Cooling Tower Data

		Velocity		Height		Diameter		Exhaust Temp	
		ft/sec	m/sec	feet	meters	feet	meters	F	K
Per Cell	(3 cells)	27.9	8.50	43.5	13.3	40	12.2	85	302.6

Table 1. Modeling Results with Standard AERMET Data (Sacramento Executive Airport data, 2010 - 2014)

HRA results for (HARP2)	5 year Combined Run		Individual Run		
PMI	Receptor no.	Risk Value	Receptor no.	Risk Value	Max year
Cancer Risk Residence (PMI)	6845	6.38E-08	6845	7.63E-08	2013
Chronic HHI (PMI)	6845	1.25E-02	6845	1.49E-02	2013
Cancer Risk Worker (PMI)	6845	2.93E-09	6845	3.50E-09	2013
Acute (PMI)	7009	1.54E-01	7009	1.54E-01	2014
8 Hour Chronic	6845	4.64E-05	6845	5.54E-05	2013

Notes:

(1). Cancer risk was evaluated with inhalation, soil, dermal, mother's milk, and home grown produce pathways.

Nearest residence receptors cancer risk value

	5 year Combined Run				Individual Run	
Nearest residence receptors	Receptor no.	UTM East	UTM North	Cancer Risk	Cancer Risk	Max Year
1	7138	632598	4263502	1.74E-09	1.99E-09	2014
2	7139	632598	4263502	1.47E-09	1.73E-09	2013
3	7140	632914	4263195	3.50E-09	4.28E-09	2014
4	7141	633713	4263631	4.30E-09	4.76E-09	2011
5	7142	633729	4263781	5.25E-09	5.76E-09	2013
6	7143	633687	4263781	5.90E-09	6.49E-09	2013
Maximum nearest residence risk	5.90E-09				6.49E-09	

Nearest worker receptors cancer risk value

	5 year Combined Run				Individual Run	
Nearest residence receptors	Receptor no.	UTM East	UTM North	Cancer Risk	Cancer Risk	Max Year
1	7133	633042	4263504	2.16E-10	3.35E-10	2014
2	7134	632822	4263814	1.41E-10	1.67E-10	2014
3	7135	633169	4263659	1.89E-10	2.29E-10	2014
4	7136	633096	4264019	1.78E-09	2.31E-09	2014
5	7137	633293	4263710	5.51E-10	6.20E-10	2014
Maximum Worker Cancer Risk	1.78E-09				2.31E-09	

SPA Cogen Modeling Setup

APPENDIX D
WATER ANALYSES

Date of Report: 09/24/2015

Brad Gacke

SMUD
6201 S Street/P.O. Box 15830
Sacramento, CA 95852-0830

Client Project:	SPA Reclaim Water Supply
BCL Project:	Waste Water
BCL Work Order:	1524304
Invoice ID:	B214631

Enclosed are the results of analyses for samples received by the laboratory on 9/24/2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Misty Orton
Client Service Rep

Authorized Signature

Table of Contents

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

BC LABORATORIES

4100 Atlas Court Bakersfield, Ca. 93308
(661) 327-4911 • FAX (661) 327-1918 • www.bclabs.com

RUSH! **Chain of Custody**

* Required Fields 15-24304 TEMP: _____

Client/Company Name *:	Report Attention *:	Phone * #:	FAX * #:
Sacramento Municipal Utility District	Brad Gacke	209-327-1982	
		E-mail: Brad.Gacke	

Address *	City *	State *	Zip *
PO Box 15830, MS H201	Sacramento	CA	95852

Carbon Copies: CDHS ☐ Fresno Co ☐ EPA ☐ Merced Co ☐ Tulare Co ☐ Other:

Project Information: SPA Reclaim Water supply | PO # | BCL Quote #

How would you like your completed results sent? ☑ E-Mail ☐ Fax ☐ EDD ☐ Mail Only

Regulatory Compliance Electronic Data Transfer: Y☐ N☑ System No. *

Sampler Name Printed / Signature: Brad Gacke/ | QC Request ☐STD ☐ Level II | Result Request ** Surcharge ☐STD ☐5 Day** ☐2 Day** ☑1 Day**

Matrix Types: RSW = Raw Surface Water CFW = Clorinated Finished Water CWW = Chorinated Waste Water BW = Bottled Water RGW = Raw Ground Water FW = Finished Water WW = Waste Water SW = Storm Water DW = Drinking Water SO = Solid

ANALYSIS REQUESTED: VOC 8260

Sample #	# Bottles	Sampled Date	Sampled Time	Sample Description / Location *	Matrix *	Comments / Station Code
1		9-23-15	1210	SRCSD storage tank Eff (3032)	CWW	✓

CHK BY DISTRIBUTION SUB-OUT

Relinquished by: (Signature and Printed Name)	Company	Date	Time	Received by: (Signature and Print Name)	Company
B. Gacke	SMUD	9-23-15	1335	Mark Ellis	BC Labs
Mark Ellis	BC Labs	9/24/15	1440	Jazmin Dimas	BC Labs 9.24.15 8:45
Received for Lab by: (Signature and Printed Name)		Date	Time	Payment Received at Delivery: Date: Amount: Check/Cash/Card PIA # Init.	

Shipping Method: CAO UPS GSO WALK-IN SJVC FED EX OTHER

Cooling Method: WET BLUE NONE

Packing Material:

SR-FL-0012-00 (Analytical)

Chain of Custody and Cooler Receipt Form for 1524304 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 15-24304

SHIPPING INFORMATION	SHIPPING CONTAINER	FREE LIQUID
Fed Ex ☐ UPS ☐ Ontrac ☑ Hand Delivery ☐	Ice Chest ☑ None ☐ Box ☐	YES ☐ NO ☐
BC Lab Field Service ☐ Other ☐ (Specify)_____	Other ☐ (Specify)_____	

Refrigerant: Ice ☑ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☑ Comments:

All samples received? Yes ☑ No ☐ All samples containers intact? Yes ☑ No ☐ Description(s) match COC? Yes ☑ No ☐

COC Received ☑ YES ☐ NO

Emissivity: 0.95 Container: VOA Thermometer ID: 208 Date/Time 9.24.15 8:45

Temperature: (A) 2.0 °C / (C) 2.1 °C Analyst Init JD

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr^{+6}										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL 096	ABC									
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: JDL Date/Time: 9/24/15 0845

A = Actual / C = Corrected

Rev 20 07/24/2015

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SMUD
6201 S Street/P.O. Box 15830
Sacramento, CA 95852-0830

Reported: 09/24/2015 15:09
Project: Waste Water
Project Number: SPA Reclaim Water Supply
Project Manager: Brad Gacke

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1524304-01	**COC Number:**	---	**Receive Date:**	09/24/2015 08:45
	Project Number:	---	**Sampling Date:**	09/23/2015 12:10
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SRCSD Storage tank Eff (3032)	**Lab Matrix:**	Water
	Sampled By:	Brad Gacke	**Sample Type:**	Wastewater

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Reported: 09/24/2015 15:09
Project: Waste Water
Project Number: SPA Reclaim Water Supply
Project Manager: Brad Gacke

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 1524304-01 | **Client Sample Name:** SRCSD Storage tank Eff (3032), 9/23/2015 12:10:00PM, Brad Gacke

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.083	EPA-8260B	ND		1
Bromobenzene	ND	ug/L	0.50	0.13	EPA-8260B	ND		1
Bromochloromethane	ND	ug/L	0.50	0.24	EPA-8260B	ND		1
Bromodichloromethane	**0.62**	**ug/L**	**0.50**	**0.14**	**EPA-8260B**	ND		1
Bromoform	ND	ug/L	0.50	0.27	EPA-8260B	ND		1
Bromomethane	ND	ug/L	1.0	0.25	EPA-8260B	ND		1
n-Butylbenzene	ND	ug/L	0.50	0.11	EPA-8260B	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.15	EPA-8260B	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.13	EPA-8260B	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.18	EPA-8260B	ND		1
Chlorobenzene	ND	ug/L	0.50	0.093	EPA-8260B	ND		1
Chloroethane	**0.77**	**ug/L**	**0.50**	**0.14**	**EPA-8260B**	ND		1
Chloroform	**12**	**ug/L**	**0.50**	**0.12**	**EPA-8260B**	ND		1
Chloromethane	**1.2**	**ug/L**	**0.50**	**0.14**	**EPA-8260B**	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.20	EPA-8260B	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.15	EPA-8260B	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.13	EPA-8260B	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.44	EPA-8260B	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.16	EPA-8260B	ND		1
Dibromomethane	ND	ug/L	0.50	0.24	EPA-8260B	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.072	EPA-8260B	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-8260B	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.062	EPA-8260B	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.099	EPA-8260B	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.11	EPA-8260B	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-8260B	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.18	EPA-8260B	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.085	EPA-8260B	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.15	EPA-8260B	ND		1
Total 1,2-Dichloroethene	ND	ug/L	1.0	0.23	EPA-8260B	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.13	EPA-8260B	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.086	EPA-8260B	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.13	EPA-8260B	ND		1

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Reported: 09/24/2015 15:09
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Project Number: SPA Reclaim Water Supply
Project Manager: Brad Gacke

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 1524304-01 | **Client Sample Name:** SRCSD Storage tank Eff (3032), 9/23/2015 12:10:00PM, Brad Gacke

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
1,1-Dichloropropene	ND	ug/L	0.50	0.085	EPA-8260B	ND		1
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-8260B	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.079	EPA-8260B	ND		1
Total 1,3-Dichloropropene	ND	ug/L	1.0	0.21	EPA-8260B	ND		1
Ethylbenzene	**0.13**	**ug/L**	**0.50**	**0.098**	**EPA-8260B**	ND	**J**	1
Hexachlorobutadiene	ND	ug/L	0.50	0.17	EPA-8260B	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-8260B	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.12	EPA-8260B	ND		1
Methylene chloride	ND	ug/L	1.0	0.48	EPA-8260B	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.11	EPA-8260B	ND		1
Naphthalene	ND	ug/L	0.50	0.36	EPA-8260B	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.11	EPA-8260B	ND		1
Styrene	ND	ug/L	0.50	0.068	EPA-8260B	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.18	EPA-8260B	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-8260B	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.13	EPA-8260B	ND		1
Toluene	**0.11**	**ug/L**	**0.50**	**0.093**	**EPA-8260B**	ND	**J**	1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.16	EPA-8260B	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-8260B	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.11	EPA-8260B	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.16	EPA-8260B	ND		1
Trichloroethene	ND	ug/L	0.50	0.085	EPA-8260B	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.13	EPA-8260B	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.24	EPA-8260B	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.15	EPA-8260B	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.12	EPA-8260B	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.12	EPA-8260B	ND		1
Vinyl chloride	ND	ug/L	0.50	0.12	EPA-8260B	ND		1
Total Xylenes	**0.53**	**ug/L**	**1.0**	**0.36**	**EPA-8260B**	ND	**J**	1
p- & m-Xylenes	**0.42**	**ug/L**	**0.50**	**0.28**	**EPA-8260B**	ND	**J**	1
o-Xylene	**0.11**	**ug/L**	**0.50**	**0.082**	**EPA-8260B**	ND	**J**	1
Total Purgeable Petroleum Hydrocarbons	**23**	**ug/L**	**50**	**7.2**	**Luft-GC/MS**	ND	**J**	1
1,2-Dichloroethane-d4 (Surrogate)	88.6	%	75 - 125 (LCL - UCL)		EPA-8260B			1

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Project Manager: Brad Gacke

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 1524304-01 | **Client Sample Name:** SRCSD Storage tank Eff (3032), 9/23/2015 12:10:00PM, Brad Gacke

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Toluene-d8 (Surrogate)	98.3	%	80 - 120 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	99.1	%	80 - 120 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	09/24/15	09/24/15 12:04	MGC	MS-V5	1	BYI2315

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Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BYI2315						
Benzene	BYI2315-BLK1	ND	ug/L	0.50	0.083	
Bromobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.13	
Bromochloromethane	BYI2315-BLK1	ND	ug/L	0.50	0.24	
Bromodichloromethane	BYI2315-BLK1	ND	ug/L	0.50	0.14	
Bromoform	BYI2315-BLK1	ND	ug/L	0.50	0.27	
Bromomethane	BYI2315-BLK1	ND	ug/L	1.0	0.25	
n-Butylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.11	
sec-Butylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.15	
tert-Butylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.13	
Carbon tetrachloride	BYI2315-BLK1	ND	ug/L	0.50	0.18	
Chlorobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.093	
Chloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.14	
Chloroform	BYI2315-BLK1	ND	ug/L	0.50	0.12	
Chloromethane	BYI2315-BLK1	ND	ug/L	0.50	0.14	
2-Chlorotoluene	BYI2315-BLK1	ND	ug/L	0.50	0.20	
4-Chlorotoluene	BYI2315-BLK1	ND	ug/L	0.50	0.15	
Dibromochloromethane	BYI2315-BLK1	ND	ug/L	0.50	0.13	
1,2-Dibromo-3-chloropropane	BYI2315-BLK1	ND	ug/L	1.0	0.44	
1,2-Dibromoethane	BYI2315-BLK1	ND	ug/L	0.50	0.16	
Dibromomethane	BYI2315-BLK1	ND	ug/L	0.50	0.24	
1,2-Dichlorobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.072	
1,3-Dichlorobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.15	
1,4-Dichlorobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.062	
Dichlorodifluoromethane	BYI2315-BLK1	ND	ug/L	0.50	0.099	
1,1-Dichloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.11	
1,2-Dichloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.17	
1,1-Dichloroethene	BYI2315-BLK1	ND	ug/L	0.50	0.18	
cis-1,2-Dichloroethene	BYI2315-BLK1	ND	ug/L	0.50	0.085	
trans-1,2-Dichloroethene	BYI2315-BLK1	ND	ug/L	0.50	0.15	
Total 1,2-Dichloroethene	BYI2315-BLK1	ND	ug/L	1.0	0.23	
1,2-Dichloropropane	BYI2315-BLK1	ND	ug/L	0.50	0.13	
1,3-Dichloropropane	BYI2315-BLK1	ND	ug/L	0.50	0.086	
2,2-Dichloropropane	BYI2315-BLK1	ND	ug/L	0.50	0.13	
1,1-Dichloropropene	BYI2315-BLK1	ND	ug/L	0.50	0.085	

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Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BYI2315						
cis-1,3-Dichloropropene	BYI2315-BLK1	ND	ug/L	0.50	0.14	
trans-1,3-Dichloropropene	BYI2315-BLK1	ND	ug/L	0.50	0.079	
Total 1,3-Dichloropropene	BYI2315-BLK1	ND	ug/L	1.0	0.21	
Ethylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.098	
Hexachlorobutadiene	BYI2315-BLK1	ND	ug/L	0.50	0.17	
Isopropylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.14	
p-Isopropyltoluene	BYI2315-BLK1	ND	ug/L	0.50	0.12	
Methylene chloride	BYI2315-BLK1	ND	ug/L	1.0	0.48	
Methyl t-butyl ether	BYI2315-BLK1	ND	ug/L	0.50	0.11	
Naphthalene	BYI2315-BLK1	ND	ug/L	0.50	0.36	
n-Propylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.11	
Styrene	BYI2315-BLK1	ND	ug/L	0.50	0.068	
1,1,1,2-Tetrachloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.18	
1,1,2,2-Tetrachloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.17	
Tetrachloroethene	BYI2315-BLK1	ND	ug/L	0.50	0.13	
Toluene	BYI2315-BLK1	ND	ug/L	0.50	0.093	
1,2,3-Trichlorobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.16	
1,2,4-Trichlorobenzene	BYI2315-BLK1	ND	ug/L	0.50	0.19	
1,1,1-Trichloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.11	
1,1,2-Trichloroethane	BYI2315-BLK1	ND	ug/L	0.50	0.16	
Trichloroethene	BYI2315-BLK1	ND	ug/L	0.50	0.085	
Trichlorofluoromethane	BYI2315-BLK1	ND	ug/L	0.50	0.13	
1,2,3-Trichloropropane	BYI2315-BLK1	ND	ug/L	1.0	0.24	
1,1,2-Trichloro-1,2,2-trifluoroethane	BYI2315-BLK1	ND	ug/L	0.50	0.15	
1,2,4-Trimethylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.12	
1,3,5-Trimethylbenzene	BYI2315-BLK1	ND	ug/L	0.50	0.12	
Vinyl chloride	BYI2315-BLK1	ND	ug/L	0.50	0.12	
Total Xylenes	BYI2315-BLK1	ND	ug/L	1.0	0.36	
p- & m-Xylenes	BYI2315-BLK1	ND	ug/L	0.50	0.28	
o-Xylene	BYI2315-BLK1	ND	ug/L	0.50	0.082	
Total Purgeable Petroleum Hydrocarbons	BYI2315-BLK1	ND	ug/L	50	7.2	
1,2-Dichloroethane-d4 (Surrogate)	**BYI2315-BLK1**	**88.5**	%	**75 - 125 (LCL - UCL)**		
Toluene-d8 (Surrogate)	**BYI2315-BLK1**	**98.6**	%	**80 - 120 (LCL - UCL)**		
4-Bromofluorobenzene (Surrogate)	**BYI2315-BLK1**	**98.7**	%	**80 - 120 (LCL - UCL)**		

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Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BYI2315										
Benzene	BYI2315-BS1	LCS	26.260	25.000	ug/L	105		70 - 130		
Bromodichloromethane	BYI2315-BS1	LCS	22.450	25.000	ug/L	89.8		70 - 130		
Chlorobenzene	BYI2315-BS1	LCS	22.660	25.000	ug/L	90.6		70 - 130		
Chloroethane	BYI2315-BS1	LCS	28.010	25.000	ug/L	112		70 - 130		
1,4-Dichlorobenzene	BYI2315-BS1	LCS	23.500	25.000	ug/L	94.0		70 - 130		
1,1-Dichloroethane	BYI2315-BS1	LCS	25.190	25.000	ug/L	101		70 - 130		
1,1-Dichloroethene	BYI2315-BS1	LCS	24.070	25.000	ug/L	96.3		70 - 130		
Toluene	BYI2315-BS1	LCS	23.610	25.000	ug/L	94.4		70 - 130		
Trichloroethene	BYI2315-BS1	LCS	22.920	25.000	ug/L	91.7		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BYI2315-BS1	LCS	8.7100	10.000	ug/L	87.1		75 - 125		
Toluene-d8 (Surrogate)	BYI2315-BS1	LCS	10.010	10.000	ug/L	100		80 - 120		
4-Bromofluorobenzene (Surrogate)	BYI2315-BS1	LCS	9.7500	10.000	ug/L	97.5		80 - 120		

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Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BYI2315	Used client sample: N										
Benzene	MS	1523654-04	ND	25.510	25.000	ug/L		102		70 - 130	
	MSD	1523654-04	ND	26.440	25.000	ug/L	3.6	106	20	70 - 130	
Bromodichloromethane	MS	1523654-04	ND	22.940	25.000	ug/L		91.8		70 - 130	
	MSD	1523654-04	ND	22.860	25.000	ug/L	0.3	91.4	20	70 - 130	
Chlorobenzene	MS	1523654-04	ND	22.770	25.000	ug/L		91.1		70 - 130	
	MSD	1523654-04	ND	22.530	25.000	ug/L	1.1	90.1	20	70 - 130	
Chloroethane	MS	1523654-04	ND	26.300	25.000	ug/L		105		70 - 130	
	MSD	1523654-04	ND	27.380	25.000	ug/L	4.0	110	20	70 - 130	
1,4-Dichlorobenzene	MS	1523654-04	ND	23.290	25.000	ug/L		93.2		70 - 130	
	MSD	1523654-04	ND	23.280	25.000	ug/L	0.0	93.1	20	70 - 130	
1,1-Dichloroethane	MS	1523654-04	ND	24.120	25.000	ug/L		96.5		70 - 130	
	MSD	1523654-04	ND	25.160	25.000	ug/L	4.2	101	20	70 - 130	
1,1-Dichloroethene	MS	1523654-04	ND	23.000	25.000	ug/L		92.0		70 - 130	
	MSD	1523654-04	ND	23.280	25.000	ug/L	1.2	93.1	20	70 - 130	
Toluene	MS	1523654-04	ND	23.750	25.000	ug/L		95.0		70 - 130	
	MSD	1523654-04	ND	23.680	25.000	ug/L	0.3	94.7	20	70 - 130	
Trichloroethene	MS	1523654-04	ND	22.260	25.000	ug/L		89.0		70 - 130	
	MSD	1523654-04	ND	22.010	25.000	ug/L	1.1	88.0	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1523654-04	ND	8.3900	10.000	ug/L		83.9		75 - 125	
	MSD	1523654-04	ND	8.6400	10.000	ug/L	2.9	86.4		75 - 125	
Toluene-d8 (Surrogate)	MS	1523654-04	ND	9.7300	10.000	ug/L		97.3		80 - 120	
	MSD	1523654-04	ND	9.9000	10.000	ug/L	1.7	99.0		80 - 120	
4-Bromofluorobenzene (Surrogate)	MS	1523654-04	ND	9.5600	10.000	ug/L		95.6		80 - 120	
	MSD	1523654-04	ND	9.4100	10.000	ug/L	1.6	94.1		80 - 120	

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Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit

ChemTreat
ANALYTICAL LAB
10040 Lickinghole Road | Ashland, Virginia 23005
(804) 935-2418 | www.chemtreat.com

Certificate of Analysis

September 29, 2015

Laboratory No.	15−09−30−27
Company	ETHOS ENERGY GROUP
Address	3215 47TH AVENUE, SACRAMENTO, CA
Engineer	KARL WOLFF
Sample Date	September 23, 2015
Sample Class	Waters

Analysis	RECLAIMED WATER
pH	7.38
Total Dissolved Solids, by wt, mg/L	701
Conductivity, µmho	989
"M"−Alkalinity, as $CaCO_3$, mg/L	221
Calcium Hardness, as $CaCO_3$, mg/L	85
Magnesium Hardness, as $CaCO_3$, mg/L	54
Iron, as Fe, mg/L	0.04
Copper, as Cu, mg/L	0.01
Zinc, as Zn, mg/L	0.03
Sodium, as Na, mg/L	102
Potassium, as K, mg/L	16
Chloride, as Cl, mg/L	132
Sulfate, as SO_4, mg/L	52
Nitrate, as NO_3, mg/L	4.0
Ortho−Phosphate, as PO_4, mg/L	8.7
Silica, as SiO_2, mg/L	48
Aluminum, as Al, mg/L	0.05
Boron, as B, mg/L	0.32
Ammonia, as NH_3, mg/L	40
Barium, as Ba, mg/L	0.02
Cadmium, as Cd, mg/L	<0.01
Cobalt, as Co, mg/L	<0.01
Chromium, as Cr, mg/L	<0.01

Comments BROMINE DEMAND RESULTS = 1.17PPM

Respectfully Submitted,

J O. Phillips

Joel Phillips
Manager Applied Technology Analytical Lab
ChemTreat, Inc.

CC: KARL WOLFF

ChemTreat
ANALYTICAL LAB
10040 Lickinghole Road | Ashland, Virginia 23005
(804) 935-2418 | www.chemtreat.com

Certificate of Analysis

September 29, 2015

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Address	3215 47TH AVENUE, SACRAMENTO, CA
Engineer	KARL WOLFF
Sample Date	September 23, 2015
Sample Class	Waters

Analysis	RECLAIMED WATER
Lithium, as Li, mg/L	<0.01
Manganese, as Mn, mg/L	0.05
Molybdenum, as Mo, mg/L	4.1
Nickel, as Ni, mg/L	<0.01
Chlorine Demand, mg/L	11
Chlorine Dioxide Demand, mg/L	1.37
Lead, as Pb, mg/L	<0.01
Strontium, as Sr, mg/L	0.24
Vanadium, as V, mg/L	<0.05
Arsenic, as As, mg/L	<0.10
Titanium, as Ti, mg/L	<0.05
Silver, as Ag, mg/L	<0.10
Fluoride, as F, mg/L	0.82
Total Inorganic Phosphate, as PO_4, mg/L	8.7
Total Organic Carbon, mg/L	15
Total Suspended Solids, mg/L	3.2
Reactive Silica, as SiO_2, mg/L	18

Appendix B
Confidential Cultural Resources Report

Due to confidentiality, this appendix is being provided to the California Energy Commission under separate cover

Appendix C
Recent List of Hazardous Materials

SACRAMENTO COUNTY **Environmental Management**

Protecting Public Health and the Environment

Form Name	#	Form Contents
Business Activities	1	Facility Name: SACTO POWER AUTHORITY COGENERATION
Business Owner Operator	1	Owner Name: SACRAMENTO POWER AUTHORITY
Chemical Description	22	

Chemical Name (can be same as common name)	Common Name	Chemical location
Acetylene	Compressed Acetylene Gas	Water Treatment Building
Ammonium Hydroxide	Aqueous Ammonia	Near HRSG Stack
ARGON	COMPRESSED ARGON GAS	Water Treatment Building
Batteries	Batteries, Lead Acid	MCC/PCC/Plant Vehicles
BL1555	Boiler pH Control boiler water	Boiler Chemical Building
BL1794	Phosphate for boiler water	Boiler Chemical Building
Carbon Dioxide	Liquid Carbon Dioxide	North Side of CTG
Carbon Monoxide	CO Span Gas	CHEMS Bottle Rack
CL1432	Corrosion Inhibitor for cooling tower	Cooling Tower
CL2250	Biocide for cooling tower	Cooling Tower
CL2874	Closed Loop Corrosion Inhibitor	Boiler Chemical Building
Ethylene Glycol	Anti Freeze	Various
Nitric Oxide Mixture	Nox Span Gas	CEMS Bottle Rack
Nitrogen	Compressed Nitrogen Gas	I&E shop, Aux. Transformers, Gas Bottle Rack
Oxygen	Compressed Oxygen Gas	Water Treatment Building, Warehouse

	Shell Didla Oil Ax	Transformer Oil	T1,T2, and UAT Transformers
	Sodium Hydroxide	Caustic or Liquid Caustic Soda	Water Treatment Building
	Sodium Hypochlorite	Bleach	Cooling Tower Water Treatment Area
	Sulfuric Acid	Sulfuric Acid	Water Treatment Building
	Turbine Oils	Lubricating Oil	Various
	Used Oil	Used Oil	Water Treatment Building
	ZOK27	Gas Turbine Compressor Cleaner	Water Treatment Building

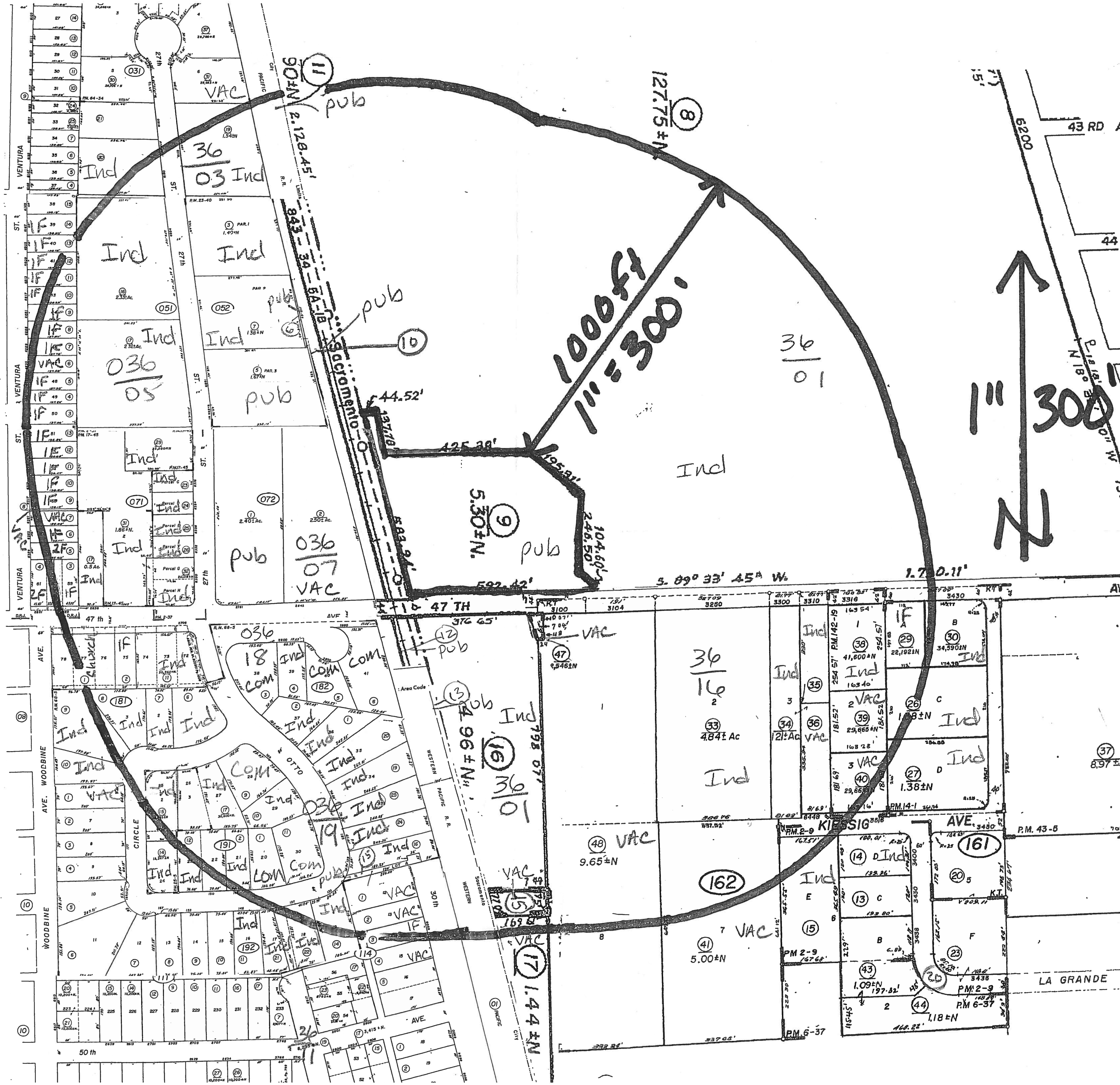
Consolidated Emergency Response/Contingency Plan	1	Date of Plan Preparation/Revision 10/02/2015
Employee Training Plan	1	Personnel Training
Facility Maps	1	Map Name Site Map 2015

Last Submitted 10/29/15

Status ACCEPTED

Appendix D
List of Property Owners

A map of the parcels within 1,000 feet of SPAC is attached. To maintain confidentiality of the property owner information, ownership data is being provided to the Commission under separate cover.


1000 ft
1" = 300'
1" 300'
N
Sacramento
47 TH
47 th
KIESSIG AVE.
LA GRANDE
VENTURA
WOODBINE
CIRCLE
OTTO
43 RD AV
50th
36/01
36/16
036/05
036/07
036/19
36/03
Ind
pub
VAC
Com
S. 89° 33' 45" W.
5.30±N.
4.84± Ac
9.65±N
5.00±N
8.97±
1.38±N
1.18±N
1.09±N
1.44±N
127.75±N
PM 2-9
P.M. 43-5
PM 6-37
PM 14-1