

Executive Summary: Draft PA No. 13 – Hydropower Project at Lake Nacimiento

Description

This project would purchase the renewable energy output from the Lake Nacimiento (LN) small hydro power project.

Amount of GHG Reduction

Since this is an existing project and does not include expansion or acceleration, it cannot be considered additional and would not be a valid GHG reduction project for the **scwd**² Desalination Program. This is a fatal flaw; therefore, the LN project has been withdrawn at this time from further consideration as a GHG reduction project. However, SCWD or SqCWD may choose to consider this project as a separate renewable energy investment opportunity in the future.

Project Life and Sustainability

A power purchase agreement (PPA) for the energy from the Lake Nacimiento hydropower project most likely would last for 15 to 25 years. The PPA could be renewed and could be a long-term, sustainable energy source.

Project Cost

The project cost is unknown at this time. MCWRA issued an RFP for this project but did not provide any cost information. Creation of a Load Serving Entity for direct access price would be expensive, and the potential “bidding war” for the RFP could make purchase price uneconomical for **scwd**².

Table ES-1: Lake Nacimiento Hydropower Project Summary

Project Life	Annualized GHG Reduction (MT CO ₂ e/yr)	Capital/Setup Cost (\$)	Average Annual Cost (\$/year)	Lifecycle GHG Cost (\$/MT CO ₂ e)	Space Requirements
30+ years (sustainable)	None – this project is not additional (fatal flaw)	Unknown. Creation of a Load Serving Entity for direct access could be expensive.	Unknown. Potential “bidding war” environment could make purchase price uneconomical.	N/A	None

Draft Project Assessment No. 13 – Hydropower Project at Lake Nacimiento

Description

This assessment estimates the energy generation and GHG reduction potential from the purchase of the renewable energy output from the Lake Nacimiento small hydro power project.

Hydroelectric power is a renewable resource generated by converting the energy of falling or flowing water to mechanical energy, which can then be used to perform work, such as turning a generator. The Monterey County Water Resources Agency (MCWRA) owns and operates an existing 4 megawatt (MW) hydropower facility on Lake Nacimiento (LN) in northern San Luis Obispo County, California. The LN hydropower project was built in 1987 and has been operating continuously ever since. The electricity was sold to Pacific Gas and Electric (PG&E) under a 20-year power purchase agreement (PPA) and, since 2007, under a temporary purchase contract. MCWRA issued a Request for Proposal (RFP) in May 2011 to find a new buyer for the electricity and its associated environmental benefits under a 15 to 25 year PPA.

At first glance, the LN hydropower project appeared to be a potential greenhouse gas (GHG) reduction project for the **scwd**² Desalination Program. However, the following fatal flaw and additional concerns have been identified, and it is recommended that **scwd**² withdraw the LN project at this time from further consideration as a GHG reduction project.

History and Technical Maturity

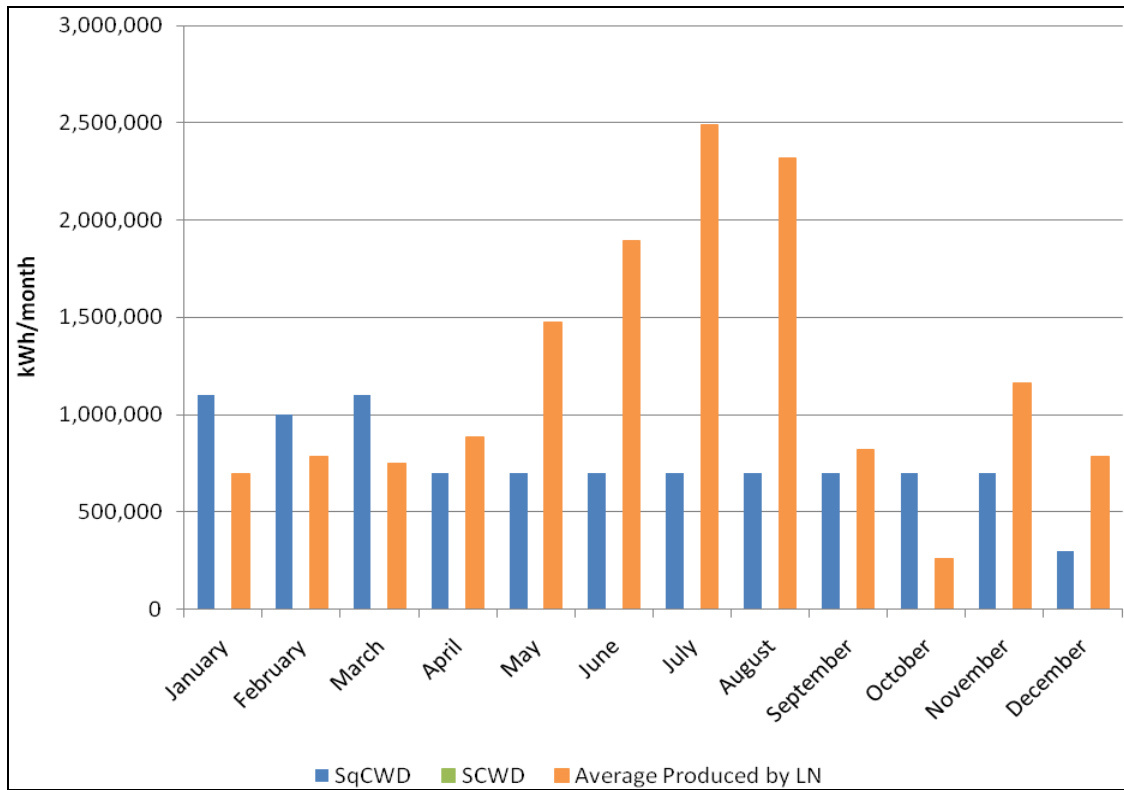
The LN hydropower project was built in 1987 and has been operating continuously ever since.

Reliability and Operational Complexity

The complexity of direct access, the lack of certification by California ISO, and the mismatched supply and demand create reliability issues and operational complexities for this potential project.

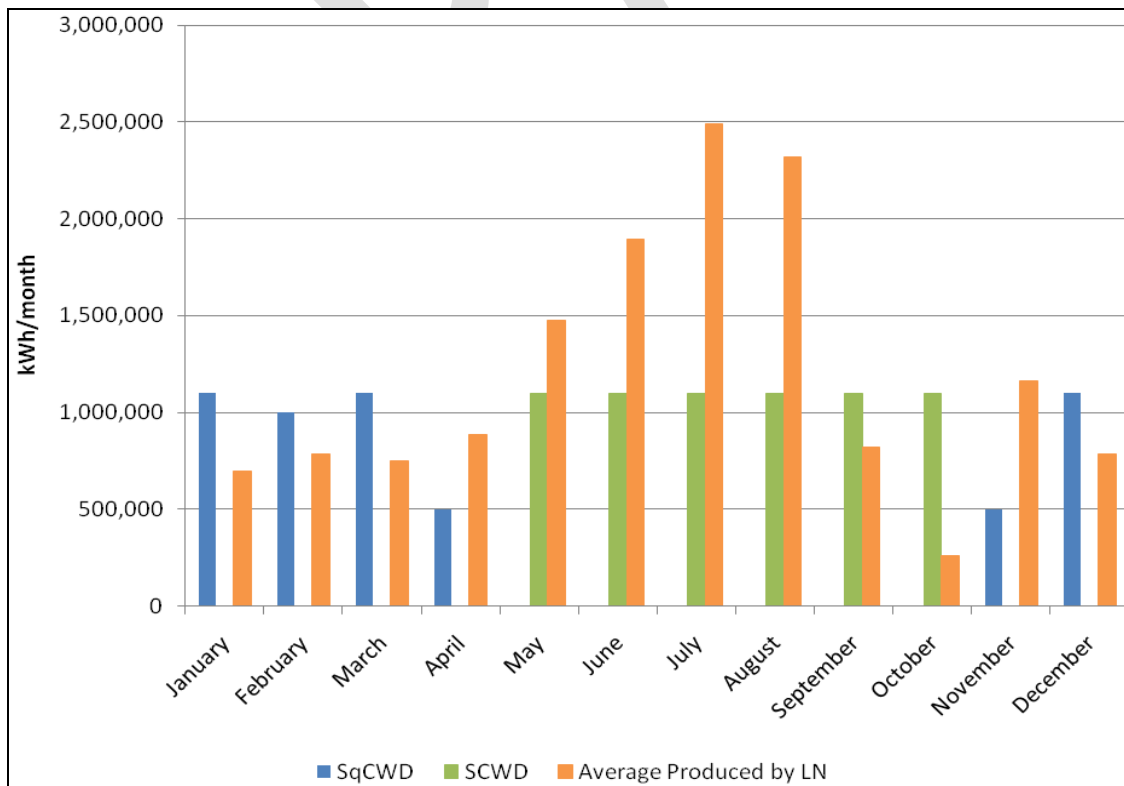
Mismatched Supply and Demand: As shown in Figures 1 and 2, the load profile of LN does not match well with the estimated load profile of the desalination plant. In several winter months, the LN project would not serve the full electricity demand of the desalination plant; **scwd**² would have to purchase additional electricity from the grid. In summer months, LN would produce electricity in excess of the **scwd**² demand. **scwd**² would have to find additional customers or partners so as not to lose money paying for unused electricity. This adds complexity and cost to the LN project.

Figure 1 – Estimated LN Supply vs. Desalination Demand in a Non-Drought Year



Note: Average LN monthly data from January 1997 through March 2008, provided by FMY Associates, Inc.

Figure 2 – Estimated LN Supply vs. Desalination Demand in a Drought Year



Note: Average LN monthly data from January 1997 through March 2008, provided by FMY Associates, Inc.

Complexity of direct access: Participation in the LN hydro project would require **scwd**² to purchase the output via a direct access arrangement. However, the requirements for direct access are highly complex. For instance, serving existing meters requires the creation of a Load Serving Entity (LSE), which would be expensive, difficult, and time-consuming to create. Even if the cost of the hydropower generation was low, **scwd**² could lose money for a number of years due to the set-up costs associated with the LSE contract.

Lack of certification by California ISO: An electricity generation project has to be certified by California Independent System Operator (ISO) to deliver the electricity from LN to **scwd**². LN has been certified in the past under its contract with PG&E but would have to be recertified under a new contract. **scwd**² may be required to lead this process, which would be a complex and time-consuming endeavor.

Timing: MCWRA is interested in entering into a long-term contract in the next few months, but **scwd**² is not interested in entering into a long-term contract at this time, since the **scwd**² desalination plant is currently in the environmental review process and, if constructed, is not expected to be in operation until 2015.

Sustainability

A power purchase agreement (PPA) for the energy from the Lake Nacimiento hydropower project most likely would last for 15 to 25 years. The PPA could be renewed and could be a long-term, sustainable energy source.

Local Considerations

This project would use renewable energy from a fairly local resource. As a renewable energy investment opportunity, this project could allow **scwd**² and/or the communities of Santa Cruz and Soquel creek to serve their energy load with renewable energy.

Energy Savings and GHG Reduction

Eligibility criteria for renewable energy projects have been developed by the US Department of Energy and state agencies such as the California Energy Commission (CEC) Emerging Renewables Program. GHG reduction projects pursued by **scwd**² should meet these eligibility criteria in order to be recognized by regulatory agencies.

One of the evaluation criteria for a GHG reduction project is additionality. The concept of additionality was introduced in the Kyoto Protocol in Article 12.5, which states that “emission reductions resulting from each project activity shall be certified by DOEs (Designated Operational Entities) on the basis of ... reductions in emissions that are additional to any that would occur in the absence of the certified project activity.” In other words, new emissions reductions have to be created by a project.

If **scwd**² were to directly purchase LN hydropower-generated electricity (rather than purchasing energy from the grid or a new renewable energy project), the amount of indirect GHGs created would not necessarily change for the following reasons:

- The LN project has been creating emissions-free energy since 1987, so no new emissions reductions would occur if **scwd**² were to purchase this energy.
- Although **scwd**²'s power load would be served by LN, PG&E may have to serve fossil fuel-generated electricity to users that were formerly supplied by LN power. (Note that

this scenario oversimplifies the resource portfolio of PG&E's energy and is for demonstration purposes only.)

- Removing the LN hydropower resource from PG&E's portfolio would not necessarily force PG&E to replace LN with another renewable resource to meet its RPS requirement.

Therefore, the LN project cannot be considered additional and would not be considered a valid GHG reduction project (in accordance with the Kyoto Protocol) for the **scwd**² Desalination Program.

Cost

The project cost is unknown at this time. MCWRA issued an RFP for this project but did not provide any cost information. MCWRA appears to be actively soliciting offers for the purchase of the LN project output. This may create a "bidding war" environment that is likely to increase the purchase price of energy, which could make this option uneconomic for **scwd**². In addition, creation of a Load Serving Entity for direct access would be expensive.

Summary of Advantages and Disadvantages

Advantages:

- For several months during the year, the LN project could provide enough energy to meet the load of the proposed **scwd**² desalination plant
- Could provide SCWD or SqCWD with renewable energy for overall operations, other than just the desalination project.

Disadvantages:

- Lack of additionality – **Fatal Flaw** as GHG reduction project
- Mismatched supply and demand
- Complexity of direct access
- Lack of certification by California ISO
- Poor timing
- Potentially inflated cost

Although this project will no longer be considered as a potential GHG reduction project for the **scwd**² Desalination Program, the Santa Cruz Water Department and Soquel Creek Water District may consider this project as a separate renewable energy investment opportunity in the future.