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WATER RIGHTS
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SEAA 1248

January 31, 2008 [Hand-delivered]

Lee H. Sim, P.E.,
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**Subject: Santa Clara Hydroelectric Project, FERC No. 9281
System Loss Report in Response to November 14, 2007 Utah Division of Water
Rights Letter and Quarterly Progress Report in Response to January 2, 2008
Utah Division of Water Rights Letter**

Dear Mr. Sim:

I have attached the analysis of system loss and last 10 years of data (on the accompanying CD-ROM) requested in your letter of November 14, 2007. Note that the deadline for the report was extended to January 31, 2008 by your letter of January 2, 2008.

Data Quality in System Loss Report

The data were digitized directly from the daily log and there is a significant amount of data, but not all flumes were read every day. The flume readings have not been reviewed and represent provisional data. The loss data computed from the flume readings exhibit wide variability as seen in the raw daily loss values in the spreadsheet. One cause is water travel time in the canal. False "negative loss" values (apparent reach gains) arise when flow decreases at an upstream flume before the decreased flow reaches the downstream flume. Similarly, false high loss values result when an increase in flow at an upstream flume is recorded before the increase in flow reaches the downstream flume. Another cause specific to the canal section between the flume above Upper Sand Cove and below Gunlock plant is the fluctuations in Upper and Lower Sand Cove reservoirs. Overall, the effects of the reservoir level changes on the conclusions of the report appear to be negligible due to the focus on median daily loss by month. The reservoir level fluctuations are much less than the total capacity and are not seasonal in nature. Due to these factors, to estimate system losses, this analysis relies on the median of the all daily loss values by month which allows for a robust determination of the central tendency and seasonal trend in loss rates by section and results in information PacifiCorp Energy is now using to improve the efficiency of the water conveyance system.

Quarterly Progress Report

In your letter of January 2, 2008, you requested a quarterly progress report on the work required by the November 14, 2007 letter. This letter will serve as that progress report for the first quarter of 2008 as significant progress has been made in January. The next quarterly report will be filed on or about May 10.

Currently the two lower hydro electric plants (Sand Cove and Gunlock) are offline to allow canal cleaning. The canal from Highway 18 to Upper Sand Cove reservoir has been completely

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cleaned down to Upper Sand Cove reservoir. Currently, the canal from Sand Cove plant to Lower Sand Cove reservoir is in the process of being cleaned.

The majority of the flume cleaning has been accomplished, except the "sediment" on the downstream end of the highway flume, which appears to be solid rock and not removable sediment. Despite the apparent submergence, my evaluation based on the U.S. Bureau of Reclamation Water Measurement Manual showed that the flume had submergence ratio of 66%, below the 70% submergence threshold for which a correction is needed. Further evaluation of the accuracy of this flume will be conducted when current-meter measurements are made this spring to check the calibration of this and the other flumes.

The flume above Veyo plant was recently cleaned but sandy sediment during a recent rainstorm refilled the recently cleaned area and returned it to the previous condition. Plant personnel indicate that this type of sedimentation event is a frequent occurrence. The issue will be investigated further to determine what can be done.

Work on the stairs to the flume below Gunlock tailrace has begun, but is not completed. Also, the seepage around the flume has not yet been corrected.

We plan to correct the issues with misplacement and disrepair of the staff gages by purchasing new staff gages and placing them directly in the flume at the correct location (2/3 up from the throat section of the flume).

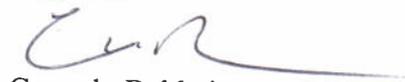
In regards to the automated data telemetry, PacifiCorp and the Washington County Water Conservancy District (WCWCD) have entered into an agreement to allow WCWCD site access to install and maintain the dataloggers and telemetry equipment for 25 years with provisions for extending the agreement. With the exception of the flume above Veyo Power Plant and the flume below Gunlock Tailrace, all other sites should be functioning correctly. The electronic water level sensors at the flume near Baker Campground and the flume below Veyo Power Plant should be calibrated to the actual water depth in the flume and not the stilling well as those changes have not been made yet.

A daily measurement log sheet will be provided to operators for daily readings of the flumes without automated data telemetry. Periodic readings will be made at all flumes to ensure that the water level sensors are calibrated to the correct level.

Also, as an outcome of our inspections which is supported by the system loss report, canal liners have been purchased and are on site and will be installed in the next month in the canal upstream of Lower Sand Cove reservoir.

If you have any questions concerning this matter, please contact me at 801-220-4636.

Regards,



Connely Baldwin

Hydrologist

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Lee H. Sim, P.E., Assistant State Engineer
January 31, 2008
Page 3

cc: Kurt Vest, Regional Engineer
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RODNEY E LEAVITT, Water Commissioner
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Lee H. Sim, P.E., Assistant State Engineer
January 31, 2008
Page 4

*Santa Clara Hydroelectric Project, FERC No. 9281
System Loss Report in Response to November 14, 2007 Utah Division of Water Rights Letter and
Quarterly Progress Report in Response to January 2, 2008 Utah Division of Water Rights Letter*

Internal Distribution

icc: Baldwin, Connely; Davies, Eve; deTar, Diana; Edelman, Frank; Hydro Document
Services; Jewkes, Roy; Kolkman, Jack; Wazlaw, James

DMS: Santa Clara, Veyo, Sand Cove, Gunlock, Compliance, Utah Division of Water Resources,
water rights, msf, water conveyance, maintenance, hydrology

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Santa Clara Hydroelectric Project Water Conveyance System Loss Analysis
PacifiCorp Energy
January 31, 2008

This report was prepared in response to the State of Utah Division of Water Rights letter dated November 14, 2007 which requested "an evaluation of system losses by canal section."

The Santa Clara Hydroelectric Project was installed in 1919 and uses a 16.8 mile long water conveyance system that is mostly open canal and includes two small reservoirs. Water rights for the hydroelectric project allow up to 37.77 cfs under water rights numbers 81-66, 81-80 and 81-102 and an additional 500 acre-feet under 81-134. The section below Veyo plant to the highway was originally a single-purpose irrigation canal that was expanded to convey additional water further to two additional hydroelectric plants. PacifiCorp Energy has made regular efforts to keep the water conveyance system in good repair including quarterly inspections (see Appendix A) and a regular budget for maintenance. Recent efforts to repair leaks in the piped sections of the system have resulted in improved efficiency that have been noted by the Santa Clara Water Commissioner as reported by Larry Staheli. After the receipt of the November 14, 2007 letter, the Utah production manager accompanied the operator on an inspection of the water conveyance system. His conclusions confirmed the accuracy of the quarterly inspections performed by the operator and support the loss analysis below and lead to the conclusions and next actions summarized at the end of this report.

In addition to the system losses, the November 14, 2007 letter also requested:

"the measurement data gathered at the following locations for the past 10 years:

- 1. Flume near Baker Campground*
- 2. Flume above Veyo Power Plant*
- 3. Flume below Veyo Power Plant*
- 4. Highway Flume*
- 5. Flume above Upper Sand Cove Reservoir*
- 6. Flume below Gunlock Tailrace*

The data available for each of these measuring points as well as computations of loss and percent loss for the past 10 years is included on the attached CD in Microsoft Excel format (see the additional documentation in Appendix B). In this report, these locations will be referred to as *measuring points* 1 through 6 using the numbering scheme above and abbreviated as MP1 through MP6 (the relative locations are shown in Figure 1). These measuring points are each equipped with a 3-foot Parshall flume and staff gage (with or without a stilling well) installed. The data were recorded as flows, using the standard 3-foot Parshall flume table. Your letter noted that the staff gage in the stilling wells at the MP1 and MP3 were not consistent with the true water level. I have verified that this is the case and in data and the analyses that follow the MP1 and MP3 locations have been corrected. The MP1 location stilling well staff gage was inadvertently mounted 0.05 feet too high and the MP3 stilling well staff gage was inadvertently mounted 0.02 high. The correction was made by using the standard 3 foot Parshall rating curve

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to convert flow to stage, correct the stage, then reconvert to flow. The labels in the plots for MP1 and MP3 have an asterisk (*) next to them to denote that this correction has been applied.

The remainder of this report summarizes the system and provides summary tables of the data and analysis provided electronically as well as data needs for future semi-annual analyses as required by the January 2, 2008 letter. The semi-annual analyses will be prepared prior to the start and just after the end of the normal irrigation season. Hence, this report is the first in an on-going series that will evaluate the system losses in the Santa Clara hydroelectric project. Since this report is being prepared near the beginning of the irrigation season, the next report will be provided at the end of the 2008 irrigation season, usually near the end of November.

For reference, a schematic of the Santa Clara hydroelectric project is shown in Figure 1. The majority of the water conveyance system is in open canal, with penstocks above each plant. The section between Upper Sand Cove Reservoir is all in pipe. Baker reservoir shown on the schematic is not owned or operated by PacifiCorp Energy. The irrigation diversions in the section between MP3 and MP4 (collectively represented by the single arrow) do not appear to be currently available from the State of Utah Division of Water Rights web site and are not taken into account in any of the analyses that follow. Hence the irrigation diversions are represented as system losses during the irrigation season, when in fact they represent beneficial use of water. The lack of irrigation diversion data in the analysis makes the results uncertain for this section. These diversions need to be taken into account to accurately determine the loss rate in that section.

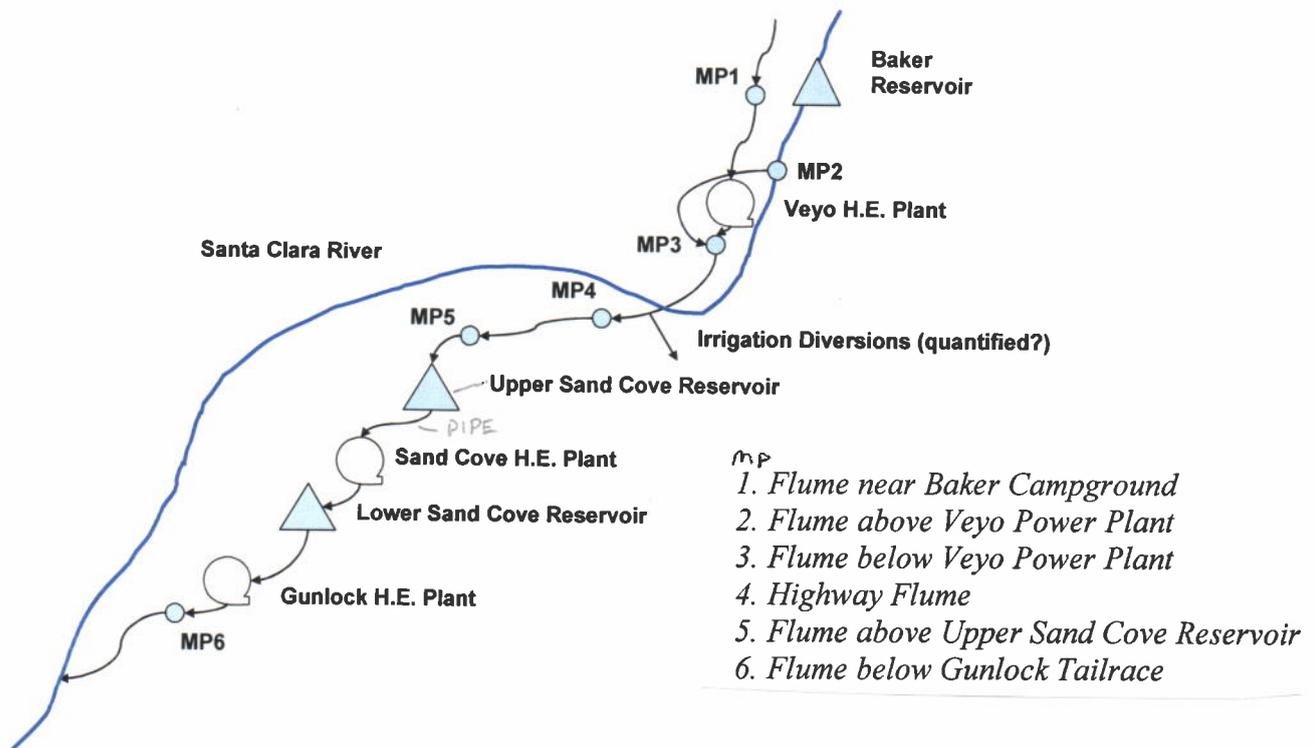


Figure 1. Schematic representation of the Santa Clara Hydroelectric (H.E.) Project showing measuring points (MP1 ... MP6), hydroelectric plants and reservoirs.

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Diversion Data

The diversion data for the past 10 years was digitized from the daily log books kept by the local operator. Each measuring point was not recorded every day, see the accompanying data file for specifics. Table 1 shows the median diversion amount by month. Note that direct comparison of median diversion amounts between measuring points may not be meaningful since not all sites were measured on the same days. The canal section loss results shown in the next section of this report compare all available pairs of measurements for each canal section.

Table 1. Median Diversion Amounts (cfs) by Month

Month	MP1*	MP2	MP3*	MP4	MP5	MP6
Jan	9.5	NA	10.0	10.0	9.7	8.3
Feb	10.2	NA	10.0	10.0	9.8	8.0
Mar	11.4	NA	11.4^	12.0^	10.9	8.0
Apr	16.8	NA	16.0^	14.4^	14.0	11.5
May	16.6	NA	19.5	16.9	15.3	13.7
Jun	9.6	NA	13.5	11.3	12.0	8.6
Jul	7.6	NA	9.3	8.9	9.3	6.6
Aug	9.1	NA	8.0	7.7	7.3	5.8
Sep	8.1	NA	6.7	5.4	5.3	4.5
Oct	7.3	NA	7.2	6.2	6.6	4.5
Nov	10.4	NA	11.4	11.0	9.0	8.7
Dec	9.6	NA	10.5	10.5	9.3	9.3

Notes:

* correction for mis-placed staff gages applied.

^ direct comparison of median diversion amounts between measuring points may not be meaningful – see text.

Section-by-Section Loss

The loss data computed from daily readings exhibit wide variability as seen in the raw daily loss values. One cause is water travel time in the canal. False “negative loss” values (apparent reach gains) arise when flow decreases at an upstream flume before the decrease in flow reaches the downstream flume. Similarly, false high loss values result when an increase in flow at an upstream flume is recorded before the increase in flow reaches the downstream flume. Another cause specific to the MP5-MP6 section is fluctuations in Upper and Lower Sand Cove reservoirs. Overall, the affect of the reservoir changes on the conclusions of this report appear to be negligible due to the focus on median daily loss by month. Two winter months of reservoir level data were obtained for months which also had a high percentage of available flume readings and the daily loss calculation was compared to the change in reservoir storage. The relationship was linear and average naïve loss rate (without explicitly considering reservoir storage changes) for the two sample months was within 7% and 11% of the corrected loss. This investigation, combined with the fact that the reservoir level fluctuations are much less than the total capacity and are not seasonal in nature means that there is no strong bias expected in the median loss rates due to reservoir level fluctuations. The magnitude of evaporation from the 20 acres of open-water surface area is minor, but is implicitly represented in the loss analysis, as would any seepage loss. To estimate system losses, this analysis relies on the median of the all daily loss

values by month, which provides a robust determination of the central tendency and seasonal trend in loss rates.

With the available data, losses can be analyzed in 2 sections (MP4-MP5 and MP5-MP6). Due to growth of vegetation in the area around MP5, recent readings ceased to be recorded, so the bulk of the data at MP5 (and hence for the section MP5 to MP6) is from earlier in the period of record (see the data for site MP5 in the data file). Data is available for a longer period at MP4 so an additional analysis is conducted for the MP4-MP6 reach to supplement the MP5-MP6 analysis.

Due to the lack of irrigation diversion data, the loss analysis in section (MP3-MP4) is compromised, but is still computed to evaluate winter losses. The losses in the irrigation season are artificially inflated because historic irrigation diversion data was not available at the time of this analysis. If this data exists, it could be used to compute the loss rate during the irrigation season. However, as it stands the loss calculations are skewed by lack of availability of this data during the irrigation season. Despite the lack of irrigation data, losses will be calculated, but the impact of the irrigation data will be noted.

Due to the lack of data at MP2, the loss in section MP1-MP3 cannot be calculated (since the flow at both MP1 and MP2 enter the canal upstream of MP3). The upstream channel and flume at MP2 routinely collects significant sediment when incoming runoff is sediment-laden during surface runoff after a rain event. This flume was recently cleaned as requested in the November 14, 2007 letter, but sandy sediment during a recent rainstorm refilled the recently cleaned area and returned it to the previous condition. Plant personnel indicate that this type of sedimentation event is a frequent occurrence. The issue will be investigated further to determine what can be done.

Table 2. Section-by-section median loss amount (cfs) and percentage of upstream flume flow. Values presented here are calculated using the raw data. The data is no verified and is subject to the qualifications set forth in the *Section-Section Loss* section beginning on page 3.

Month	MP3 to MP4 (Irrigation diversions counted as losses)	MP4 to MP5	MP5 to MP6	MP4 to MP6
Jan	0.14 (1%)	-0.15 (-1%)	1.38 (13%)	1.2 (12%)
Feb	0.34 (3%)	0.1 (1%)	1.9 (19%)	1.8 (19%)
Mar	0.85 (7%)	0.2 (2%)	2.14 (19%)	2 (19%)
Apr	2.03 (15%)*	0.04 (1%)	2.46 (17%)	2.4 (17%)
May	3.13 (17%)*	0 (1%)	2.9 (16%)	2.8 (17%)
Jun	2.54 (21%)*	-0.2 (-1%)	2.6 (21%)	2.4 (21%)
Jul	2.16 (22%)*	0.1 (2%)	2 (21%)	2.13 (23%)
Aug	1.94 (20%)*	0.05 (1%)	1.8 (21%)	2.06 (25%)
Sep	1.77 (24%)*	0.06 (2%)	1.25 (18%)	1.49 (23%)
Oct	1.5 (20%)*	-0.1 (-1%)	1.49 (21%)	1.73 (26%)
Nov	0.87 (8%)	-0.09 (-1%)	1.7 (15%)	1.76 (17%)
Dec	0.29 (2%)	0.1 (1%)	1.1 (11%)	1.2 (11%)

Note:

* months when loss is artificially increased by irrigation diversions in this reach that were not quantified.

Results of System Loss Analysis

The summary table of median values (Table 2) characterizes the system losses. The losses in the MP3-MP4 section are below 15% from November through March. The April through October period is influenced by irrigation diversions that range from 1 to 3 cfs, and even if the median diversion is close to 1 cfs, the adjusted loss rate could be below 15%. The loss rate in section MP4-MP5 is well below 15% with the unrealistic negative losses likely due to a combination of the flow fluctuations and time lag issues discussed earlier combined with extremely small loss in this short section. The losses in section MP5-MP6 are below 15% in December and January, but are slightly higher than the other sections for the balance of the year. This is consistent with the leaks observed in recent regular and special inspections. This is confirmed by the additional analysis using the alternate upstream flume (MP4) that spans a longer time frame. The loss in the MP1-MP3 section was unable to be calculated, but readings will begin to be taken soon at the MP2 flume and the sediment situation will be investigated more thoroughly.

Efforts to Prevent Loss of Water

PacifiCorp Energy has made regular efforts to keep the water conveyance system in good repair including quarterly inspections (see Appendix A) and a regular budget for maintenance. Recent efforts to repair leaks in the piped sections of the system have reduced losses which has been noticed by the Santa Clara Water Commissioner (as reported by Larry Staheli, operator at the Santa Clara hydroelectric plants). After the receipt of the November 14, 2007 letter, the Utah production manager accompanied the operator on an inspection of the water conveyance system.

Conclusions and Next Actions

The most obvious actionable loss is in section MP5-MP6. Canal liners have been purchased and are on site and will be installed in the next month. Irrigation diversion data should be collected to allow computation of loss in section MP3-MP4. Flume readings will be taken at MP2 to allow computation of loss in section MP1-MP3. Further analysis as the automated data telemetry system becomes functional will guide future reports. The next report will be provided at the end of the 2008 irrigation season.

Appendix A. Water Conveyance System Inspection Forms

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**SANTA CLARA - (SAND COVE) HYDROELECTRIC PROJECT - FERC NO. 9281
INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES**

INSPECTION FREQUENCY:

D-Daily, W-Weekly, 2W-Twice Weekly, M-Monthly, 2M-Twice Monthly, Q-Quarterly, S-Semi Annual, Y-Yearly, P-Periodic
* Refer To Description and Inspection Details For Frequency

Structure or Device	Frequency	Date	Description / Notes
Penstock	Q	Steel - Walk length of flowline/penstock checking for signs of leakage on buried section and condition of pipe on exposed sections.	
		1/14/06	<i>flowline plugged one leak, penstock looks good</i>
		5/8/06	<i>flowline and penstock no leaks</i>
		8/15/06	<i>plugged two leaks on flowline one on penstock</i>
11/16/06	<i>no leaks</i>		
Flowline / Canal	Q	Steel Portion - Walk length of flowline/penstock checking for signs of leakage on buried sections and condition of pipe on exposed sections.	
		Canal Portion - Walk length of Canal System checking for signs of leakage and washouts	
		1/14/06	<i>found and repaired one leak</i>
		5/23/06	<i>found two big leaks and repaired both</i>
9/28/06	<i>Canal looks good</i>		
12/23/06	<i>found three small leaks, repaired two</i>		
Intake Valve – (Butterfly) Upper Sand Cove & at Dam	Y	Steel - Check operating mechanism and test operate open and close.	
Unit Isolation Gate Valve	Y	Steel - Check operating mechanism and test operate open and close.	
			N/A
Surge Tank	Q	Steel - Check for seepage, rust, blistering, vandalism, etc.	
		1/14/06	<i>Surge tank looks good</i>
		5/8/06	<i>Surge tank, no leaks</i>
		8/15/06	<i>No leaks</i>
11/16/06	<i>No leaks</i>		

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**SANTA CLARA - (VEYO) HYDROELECTRIC PROJECT - FERC NO. 96281
INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES**

INSPECTION FREQUENCY :

D-Daily, W-Weekly, 2W-Twice Weekly, M-Monthly, 2M-Twice Monthly, Q-Quarterly, S-Semi Annual, Y-Yearly, P-Periodic

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Structure or Device	Frequency	Date	Description / Notes
Penstock	Q		Steel - Walk length of flowline/penstock checking for signs of leakage on buried section and condition of pipe on exposed sections.
		2/2/06	<i>Penstock is in great shape, tightening bolts on coupling</i>
		4/12/06	<i>Penstock looks good</i>
		8/17/06	<i>Penstock good, tighen bolts on coupling</i>
		11/30/06	<i>Still no leaks</i>
Penstock Supports	Q		Concrete - Check for cracking, spalling, slumping, movement, etc.
		2/2/06	<i>Supports look good</i>
		4/12/06	<i>Supports look good</i>
		8/17/06	<i>Supports look good</i>
		11/30/06	<i>Supports look good</i>
Flowline/Canal	Q		Canal & Steel Pipe - Walk length of canal checking for leakage and repairing as required.
		2/2/06	<i>A few small leaks</i>
		4/5/06	<i>Leaks are remaining the same</i>
		8/17/06	
		12/2/06	<i>Fixed two leaks</i>



**SANTA CLARA - (GUNLOCK) HYDROELECTRIC PROJECT - FERC NO. 9281
INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES**

INSPECTION FREQUENCY:

D-Daily, W-Weekly, 2/W-Twice Weekly, M-Monthly, 2/M-Twice Monthly, Q-Quarterly, S-Semi Annual, Y-Yearly, P-Periodic
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Structure or Device	Frequency	Date	Description / Notes
Penstock	Q	Steel - Walk length of flowline/penstock checking for signs of leakage on buried section and condition of pipe on exposed sections.	
		1/11/06	Pipe looks good
		4/25/06	Penstock had one leak, fixed it
		7/28/06	Penstock ok. Plugged one leak on flowline
		12/16/06	Plugged one lak on penstock
Penstock Supports	Q	Concrete - Check for cracking, spalling, slumping, movement, etc.	
		1/11/06	Some spalling on one support
		4/25/06	Unchanged
		7/28/06	Unchanged
		12/16/06	Unchanged
Flowline	Q	Canal and Steel Pipe - Walk length of flowline checking for signs of leakage and condition of pipe and canal	
		1/11/06	No leaks
		4/25/06	Two leaks not too big
		7/31/06	A little leakage in cement ditch
		10/24/06	A little leakage in cement ditch
Flowline Supports	Q	Concrete and Wood - Check for cracking, spalling, slumping, movement, condition of wood, etc.	
		1/11/06	All supports look good
		4/25/06	All supports look good
		7/28/06	All supports look good
		12/16/06	All supports look good

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**SANTA CLARA - (GUNLOCK) HYDROELECTRIC PROJECT - FERC NO. 9281
INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES**

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Structure or Device	Frequency	Date	Description / Notes
Intake and Unit Isolation Valve	Y	2/1/06	Steel – Check operating mechanism and test operate open and close
			Closed and opened gate valve. Tested good
Surge Tank	Q		Steel - Check for seepage, rust, blistering, vandalism, etc.
		1/11/06	No leaks
		4/25/06	No seep or leaks
		7/28/06	No seep or leaks
		12/16/06	No seep or leaks

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**SANTA CLARA - (VEYO) HYDROELECTRIC PROJECT - FERC NO. 96281
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Structure or Device	Frequency	Date	Description / Notes
Penstock	Q	2-20-07	NO Leaks in Penstock
		4-7-07	NO Leaks in Pipe One Brass Coupling Looking a Little
		7-26-07	NO Leaks in Pipe + Tighten Bolt's in Brass Coupling
		11-13-07	NO Leaks
Penstock Supports	Q	Concrete - Check for cracking, spalling, slumping, movement, etc.	
		2-20-07	Supports look good
		4-7-07	unchanged
		7-26-07	unchanged
Flowline/Canal	Q	11-13-07	unchanged
		Canal & Steel Pipe - Walk length of canal checking for leakage and repointing as required.	
		2-21-07	Fixed Two Leaks
		4-6-07	5K Little Leaks
		7-3-07	Plugged Hole in Cement Ditch
11-1-07	Plugged one Seal Wicketon Feet at Bribel V-1		

Requirement of: FERC Water Conveyance Program - Accepted 8/31/884

**SANTA CLARA - (SAND COVE) HYDROELECTRIC PROJECT - FERC NO. 9281
2007 INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES**

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Structure or Device	Frequency	Date	Description / Notes
Penstock	Q	1-13-07	Walk Flow Line & Penstock No Leaks
		5-8-07	Walk Penstock No Leaks
		8-15-07	Walk Penstock
		10-28-07	Penstock No Leaks
Flowline / Canal	Q	Steel Portion - Walk length of flowline/penstock checking for signs of leakage on buried sections and condition of pipe on exposed sections.	
		Canal Portion - Walk length of Canal System checking for signs of leakage and washouts	
Intake Valve - (Butterfly) Upper Sand Cove & at Dam	Y	1-13-07	Checked Canal & Flowline
		5-8-07	Canal & Condu. Still Leaky. No Leaks on Flowline
		8-15-07	Canal Fixed on Leaky Flowline No Leaks
		10-28-07	Canal Repairs at Leaky Flowline Let Penstock Joint Leaking
Unit Isolation Gate Valve	Y	6-11-07	Closed Butterfly Valve at Upper Sand Cove, 6-11-07 Opened Valve
		Steel - Check operating mechanism and test operate open and close.	
Surge Tank	Q	N/A	
		Steel - Check for seepage, rust, blistering, vandalism, etc.	
		1-13-07	Surge Tank Looks Good
		5-8-07	Surge Tank No Problems
		8-15-07	Surge Tanks No Problems
10-28-07	Surge Tank No Problem		



Requirement of: FERC Water Conveyance Program - Accepted 8/31/864

SANTA CLARA - (GUNLOCK) HYDROELECTRIC PROJECT - FERC NO. 9281
2007 INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES

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* Refer To Description and Inspection Details For Frequency

Structure or Device	Frequency	Date	Description / Notes
Penstock	Q	1-17-07	No Leaks on Penstock
		5-30-07	Fixed Two Leaks
		8-2-07	No Leaks
		10-21-07	No Leaks
Penstock Supports	Q		Concrete - Check for cracking, spalling, slumping, movement, etc.
		1-17-07	Some Spalling on Two Supports
		5-30-07	unchanged
		8-2-07	unchanged
Flowline	Q	10-21-07	unchanged
			Canal and Steel Pipe - Walk length of flowline checking for signs of leakage and condition of pipe and canal
		1-17-07	Canal Four Leaks Flowline No Leaks
		5-30-07	Canal 3 Leaks Flowline No Leaks
Flowline Supports	Q	8-2-07	Canal Still 3 Leaks
		10-21-07	Walk Canal + Flowline
			Concrete and Wood - Check for cracking, spalling, slumping, movement, condition of wood, etc.
		1-17-07	Some Cracking & Spalling on Supports
Intake and Unit	Q	5-30-07	unchanged
		8-2-07	unchanged
		10-21-07	unchanged
		5-30-07	Steel - Check operating mechanism and test operate open and close

SCANNED

SANTA CLARA - (GUNLOCK) HYDROELECTRIC PROJECT - FERC NO. 9281
2007 INSPECTION PROGRAM FOR WATER CONVEYANCE FACILITIES

INSPECTION FREQUENCY:

D-Daily, W-Weekly, 2W-Twice Weekly, M-Monthly, 2M-Twice Monthly, Q-Quarterly, S-Semi Annual, Y-Yearly, P-Periodic
 * Refer To Description and Inspection Details For Frequency

Structure or Device	Frequency	Date	Description / Notes
Surge Tank	Q	3/2/04	Steel - Check for seepage, rust, blistering, vandalism, etc.
		1-17-07	No Leak!
		5-30-07	UN changed
		8-7-07	UN changed
		10-31-07	UN changed

Appendix B. Documentation for Diversion Data and System Loss Calculations

The Microsoft Excel spreadsheet file on the accompanying CD-ROM provides the daily readings digitized from the original record recorded by the operators. The data is believed to be correct and obvious errors were corrected, such as when water level was recorded instead of the typical flow corresponding to the water level (in that case, the corresponding flow was substituted). However, there may be other errors or incorrect data entry. The computed daily loss amount and percentages are also shown for sections where that is possible. Both the original and corrected data for MP1 and MP3 are shown on the worksheet (MP1 and MP3 Corrections). The text string "NA" is substituted for blank values when no reading was available for a flume or there is insufficient data to calculate a loss for a section. The month column was used to group the daily values for analysis.

SCANNED