PRELIMINARY REPORT REGARDING
SEWAGE OVERFLOW ON DECEMBER 19, 2010

SEWAGE SYSTEM OPERATOR: NORTH TAHOE PUBLIC UTILITY DISTRICT
RESPONSIBLE PUMP STATION: DOLLAR HILL
LOCATION: PLACER COUNTY, CALIFORNIA

SUBMITTED TO: JONATHAN BASS, ESQ.
COBLENTZ PATCH DUFFY & BASS, LLP
ONE FERRY BUILDING, SUITE 200
SAN FRANCISCO, CA 94111-4213

PERTAINING TO: STUART CORVIN
VS
NORTH TAHOE PUBLIC UTILITY DISTRICT
CASE NO. TCV0001801
SUPERIOR COURT, COUNTY OF PLACER
DATE 08-28-2013

PREPARED BY: JOSEPH PERRY, P.E.
JOSEPH PERRY P.E., LLC
PO BOX 141
PENNGROVE, CA 94951

This report was prepared by the undersigned:

Final report will bear engineer's stamp and be wet signed

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Introduction:

Stantec Consulting Inc., the Prime Engineering Company had an ongoing contract for Engineering with North Tahoe Public Utility District. Stantec Consulting Inc., offered to North Tahoe Public Utility District to prepare “amendment number 2 for Pump and Motor Replacement Design/Master Plan Preliminary Work” which included Electrical Engineering Services for the Dollar Hill Pump Station Standby Power Electrical System. Stantec Consulting Inc., informed North Tahoe Public Utility District that they would be using Dinter Engineering Co., the Electrical Engineering Company as a subcontractor to perform the electrical engineering for this project; it was further noted in Exhibit “A” to the North Tahoe Public Utility District that “Dinter Engineering Co., and Stantec Consulting Inc., have worked together on many projects for over forty years.”

On April 24th, 2009 the North Tahoe Public Utility District entered into an Engineering Contract with Stantec Consulting Inc., to prepare “amendment number 2 for Pump and Motor Replacement Design/Master Plan Preliminary Work” which included Electrical Engineering Services for the Dollar Hill Pump Station Standby Power Electrical System. The contract included preparing Plans and Specifications to add a new 600 KW generator to the Dollar Hill Pump Station. This generator was in addition to the existing generator; however both generators would derive their fuel from a new common Diesel Fuel Day Tank.

Stantec Consulting Inc. received a proposal from and entered into a Subcontract with Dinter Engineering Co., to perform the Electrical and Mechanical Engineering for this project. Dinter Engineering Co. performed the required Electrical Engineering and prepared the project Technical Specifications and Construction Plans. Stantec Consulting Inc. and North Tahoe Public Utility District reviewed the contract specifications and plans, approving them for construction.

North Tahoe Public Utility District added the necessary General Specifications and issued bid packages in two parts.
Part 1: Per Plans and Specifications, provide the Generator and Diesel Fuel Day Tank AKA Pryco Day Tank directly to the North Tahoe Public Utility District. These parts would be provided by North Tahoe Public Utility District to the selected Responsible Bidder for installation.

Part 2: Per Plans and Specifications provide the installation of the North Tahoe Public Utility District Supplied Generator and Diesel Fuel Day Tank with all necessary additional labor and material as specified and shown on the contract plans for a complete and functional generator addition to the Dollar Hill Pump Station.

North Tahoe Public Utility District Awarded Part 1 to Cashman Power Systems, the Day Tank and Generator Supplier and Part 2 to KFC Building Concepts, the General Contractor as the most responsible bidders.

KFC Building Concepts awarded a subcontract for the Electrical Installation to Western Pacific Electric Inc. the Electrical Contractor.

The final generator load testing was completed and the North Tahoe Public Utility District employees were trained in the care and maintenance of the generator system to the satisfaction of Stantec Consulting Inc., Dinter Engineering Co., and North Tahoe Public Utility District on June 7th, 2010.

The North Tahoe Public Utility District proceeded to maintain the Electrical and Mechanical system from the date of the final testing through December 19, 2010, the date of the sewage spill across the Corvin family property, into the mechanical room of their family home and into Lake Tahoe.

Scope of Investigation:

My specific assignment was to review available documents from the files of the following organizations:

1. North Tahoe Public Utility District
2. Stantec Consulting Inc., the Prime Engineering Company.
3. Dinter Engineering Co., the Electrical Engineering Company.
4. Cashman Power Systems, the Day Tank and Generator Supplier.
5. KFC Building Concepts, the General Contractor.
6. Western Pacific Electric Inc. the Electrical Contractor.

I attended an onsite meeting that was arranged so all interested Experts had the opportunity to visit the site and see the generators, day tank, electrical equipment (breakers, transformer/subpanel, mini power center) that was previously installed, new equipment (breakers, transformer/subpanel, mini power center) installed after the fuel system failure and perform/witness field tests of the installed Pryco Day Tank and the electrical system.

References:

1. Exhibit A, Pryco Day Tank Schematic
2. Exhibit B, Stantec Consulting Inc., the Prime Engineering Company, Electrical Plan, sheet E1.2
3. Exhibit C, Battery Charger Load
4. Exhibit D, North Tahoe Public Utility District Employee Interviews
5. Exhibit E, Pryco Day Tank Options
6. Exhibit F, Stantec Consulting Inc., the Prime Engineering Company, and Dinter Engineering Co., the Electrical Engineering Company, Electrical Engineering Service Proposal
7. Exhibit G, Fuel System, Pryco, day tank specification, include SCADA Contacts
8. Exhibit H, Boyle Engineering the North Tahoe Public Utility District Electrical Engineer, to be consulted regarding SCADA by Stantec Consulting Inc., the Prime Engineering Company/Dinter Engineering Co., the Electrical Engineering Company
9. Exhibit I, Cashman Power Systems, the Day Tank and Generator Supplier, Service Report
10. Exhibit J, Panel B Mini Power Center Cut Sheet
11. Exhibit K, “Main Sewer Pump Station Master Plan” July 2009, prepared by Stantec Consulting Inc.

Review of Data:

The volume of documents reviewed was considerable, I estimate the volume to be over 11,500 pages, and arrived in many forms such as percentage of completion drawings, proposed specifications, final drawings, final plans, submittals, change orders, email correspondence and contracts. I reviewed all documents submitted to me. I looked not only for information regarding the design and construction but for inconsistencies between the sources of information. No inconsistencies of data between the sources of documents are noted.

Site meeting June 19th, 2012

I spent 3 hours onsite taking pictures, examining equipment and asking questions.

1. Pictures of the 3 day tank motor nameplates confirmed that motors are installed as specified.
2. The day tank was emptied and filled manually, it was verified that there is a visual level sensor installed for the day tank. It was witnessed to be reasonably accurate.
3. I asked Joe Steck (Steck) (North Tahoe Public Utility District employee) to show me the onsite documentation that I expected to be onsite. According to Steck no such documentation exists.
   a. Written Standard Operating Procedure
   b. Written Emergency Operating Procedure
   c. Written Standby Generator Testing Procedure
4. I took Pictures of the original panel B, which was in service as of the incident date and has since been disconnected, and the existing panel B that supplies power to the day tank.
5. I asked Steck, the operator that was on duty the day of the accident several questions with his attorney present.
   a. Q. Is the cord onsite the one that was used to try to power the day tank from the portable generators?
      A. NO
   b. Q. How was the cord connected to the Day Tank Fill Pumps?
      A. The circuit breaker, panel B, was opened, the wires (1circuit was all that was wired to the day tank) removed from the 20 amp breaker, the wire was then connected to the extension cord and then plugged into the generator.
   c. Q. What happened when you plugged the temporary cord into the various portable generators?
      i. A. 1 KW portable generator: The generator stopped running and the breaker on the portable generator tripped.
      ii. A. 3.5 KW portable generator: The breaker on the generator tripped.
      iii. A. 100 KW portable generator: The breaker on the generator tripped.
   d. Q. Was the same cord used by the Cashman Power Systems, the Day Tank and Generator Supplier mechanic to get the pumps going?
      A. Yes.

6. I opened and looked at the SCADA Panel, I took pictures of the schematic, it was found that two spare inputs are currently used for Power Failure and Day Tank Low Fuel monitoring, no other new inputs were marked up on the schematic.
7. I reviewed the log book that was onsite, the generator run hours are written down daily. The log forms do not provide for condition or operation notes. Steck told me that they no longer test the generators manually, the exerciser does the testing. They know if the generator exercised by reviewing the run time meter. Steck further said that the generators test run about two tenths of an hour per week.
8. With both fill pumps running the measured load current is within specification for two 1/3 HP pump motors, 13.2 Amps (rated 6.6 Full Load Amperage (FLA) each motor) and the Return pump running was 8.66 Amps (rated 9.2 FLA), which is normal for a 1/2 HP Motor.
9. When the manual switch was turned on for the fill pumps BOTH fill pumps ran at the same time.
10. When the manual switch was turned on for the return pump, the return pump ran.
11. When the day tank was operated in the automatic mode, all functions worked as drawn in the Pryco day tank schematic.
12. The hand pump cannot be used to fill the day tank due to a Normally Closed anti-flooding solenoid valve installed on the inlet to the fill pumps. This valve is installed to prevent flooding of the day tank once it has been filled and the fill pumps are turned off.

Discussion:

1. **Exhibit "A"** The day tank manufacturer PRYCO, provided for two 20 amp 120 volt power circuits to the day tank; the first circuit being for the fill pumps (supply motors) and the second circuit for the return pump (reverse motor). Had the second circuit been specified and installed the load of three pumps would have been split between two circuits and would not have tripped even if all three pumps were running either in the automatic, manual or a control system malfunction mode. If a failure in the automatic controls occurs all three pumps would run, at least three failure scenarios could cause this to happen.

2. **Exhibit "B"** On Sheet E1.2 of the construction documents Dinter Engineering Co., the Electrical Engineering Company specified only one 20 amp 120 volt circuit to be installed to power the day tank. The single 20 amp circuit from panel B can start and run the two fill pumps (supply motors), but is insufficient to operate the two fill pumps (supply motors) and the return pump (reverse motor) at one time without overloading a single 20 amp 120 volt circuit.

3. **Exhibit "C"** Panel B's 7.5 KVA transformer as shown by Dinter Engineering Co., on the panel schedule on sheet E1.2, was undersized for the loads due to the following items: battery charger full load amps (FLA) being 6 amps (720 watts), not 0.83 amp (100 watts) as shown; the Crankcase heater; and the possibility that all three pumps could run at one time if there was a day tank control malfunction. The correct size of Panel B's transformer is 10 KVA, as now installed on the site.

4. Operation of the day tank by the portable generators:

a. The 3.5 KW and the 100 KW portable generators are adequate to start and run two 1/3 HP (fill pumps) and the one 1/2 HP (return pump) motors.

b. The 3.5 KW and the 100 KW portable generators would have been able to run both fill pumps and the return pump had it been selected to manual operation.

c. **Exhibit "D"** It was reported in the interviews of the North Tahoe Public Utility District employees on 12/21/2010 as transcribed by Marianne Potts on 12/22/2010 that the Cashman Power Systems, the Day Tank and Generator supplier mechanic, was able to run the fill pumps to fill the day tank with a cord connected to the 100 KW portable generator. The Cashman Power Systems Mechanic's Field report dated 12/20/2010 states that he opened the breaker to the day tank, connected a "pigtail" to the controller and using an extension cord; he connected the day tank to the large portable generator and was able to run the fill pump.

5. **Exhibit "E"** If an Anti-flooding solenoid valve with a manual bypass is installed (Day tank option366); the hand pump could be used to fill the day tank.

6. **Exhibit "F"** Supervisory and Data Acquisition (SCADA) Monitoring: The Stantec Consulting Inc. proposal Exhibit "A" dated April 6, 2009, task 1 item 4 to North Tahoe Public Utility District stated that "the report will also discuss the connection of controls and alarms reporting to the existing SCADA or monitoring/alarm system". The Dinter Engineering Co. (subcontractor) proposal to Stantec Consulting Inc. on July 01, 2009 stated "We are proposing design of electrical connections associated with the generator, radiator, louver

controls, fueling, **SCADA**, modifications to the electrical switchgear and a new automatic transfer switch". Dinter Engineering Co. attached a spread sheet to their proposal showing that they included 11 hours in their estimate for the engineering work to investigate, design and document the additions to the SCADA system. I did not find correspondence in the Stantec Consulting Inc., Dinter Engineering Co., or North Tahoe Public Utility District documents that suggest that SCADA investigation was done by contacting the North Tahoe Public Utility District Electrical Engineer, Boyle Engineering to see if their organization recommended additional SCADA monitoring.

7. **Exhibit "G"** The standard of care for pump station monitoring would include SCADA monitoring of Low and High Fuel level in the day tank. SCADA system monitoring of Generator operation and fuel status is imperative, since without fuel, the generators cannot run and if the tank was over full, a fuel spill could happen. In fact the Dinter Engineering Co. day tank specifications section 16100-8 par 2.6.1 included "SCADA monitoring contacts". The Cashman Power Systems, the Day Tank and Generator Supplier submittals included High and Low level alarm floats (SCADA monitoring contacts), and were approved as submitted. During the submittal review the reviewing engineer for Dinter Engineering Co., should have questioned how the "SCADA monitoring contacts" were to be integrated with the SCADA system and then realized that they had not been integrated with the SCADA system. If this additional SCADA monitoring was installed, the estimated additional cost would have been less than $7,000.00 including hardware, installation and programming.

8. A local alarm panel would have served a similar function as SCADA monitoring. This would have provided the North Tahoe Public Utility District an early warning that the fuel tank was in a low fuel condition, allowing time to determine the cause of the low fuel before it became critical during the winter storm that occurred on December 19, 2010. If this additional local alarm panel was installed, the estimated additional cost would have been less than $3,000.00 including hardware and installation.

9. **EXHIBIT "H"** I did not find correspondence from Stantec Consulting Inc. or Dinter Engineering Co. to North Tahoe Public Utility District's Electrical Engineer, Boyle Engineering requesting input or direction as to additional recommended SCADA monitoring for the Dollar Pump Station.

10. **EXHIBIT "I"** On the day of the sewage spill Cashman Power Systems arrived onsite, found the 20 amp breaker to the day tank tripped, connected a pigtail to the fill pump wiring then connected the day tank controls to the 1000 KW Portable Generator. Then he was able

to fill the day tank to supply fuel to the two standby generators, test the generators and day tank operation.

11. **Exhibit "J"** Mini Power Center specifications lists the increased maximum capacity of the replacement 10 KVA transformer over the specified 7.5 KVA transformer from 30 to 40 amps an increase of 25% in capacity.

12. **Exhibit "K"** Main Sewer Pump Station Master Plan, completed in July of 2009, by Stantec Consulting Inc., recommends generator monitoring by the SCADA system, but no mention of Fuel Tank or Day Tank level monitoring. During an emergency, without fuel, the Standby Generators cannot run to supply power to the sewer pumps to prevent a sewer spill!

Conclusions:

Based on the facts presented previously in this document; and to a reasonable degree of engineering certainty; I have made the following conclusions.

The Fuel level in the day tank is paramount to the operation of the Standby Generators and utmost care should have been taken to assure that the day tank stays full and is monitored with the SCADA system.

1. Dinter Engineering Co., the Electrical Engineering Company, was negligent in their design:
   a. Two 120 volt circuits should have been supplied for the day tank to eliminate the possibility of overloading and tripping the single 20 amp breaker that was specified and installed.[1]
   b. The 7.5 KVA transformer/mini power center was undersized for the load, due to Dinter Engineering Co. miscalculating the load of the battery charger (720 watts not 100 watts)[2],[3],[4], the possibility of multiple pumps running under abnormal day tank operating conditions and during inclement weather, the possible lower than normal voltage, causing the pumps to have a higher starting and running current.

[1] Pryco Schematic "Exhibit A" Clearly shows two circuits to the day tank.

[2] "Exhibit B" Panel Schedule.

[3] "Exhibit C" North Tahoe PUD Caterpillar Generator Set Installation Summary.

[4] "Exhibit J" Eaton Transformers Mini-Power Centers.

c. The 20 amp 2 pole breaker feeding the 7.5 KVA transformer/mini power center was undersized by Dinter Engineering Co. and at a minimum should have been a 30 amp 2 pole breaker equaling or exceeding the primary breaker to the transformer/mini power center as supplied by the manufacturer (Eaton).[5]

d. Day tank SCADA contacts were specified[6] by Dinter Engineering Co. to monitor the fuel level in the day tank; however, Dinter Engineering Co. did not specify that the contacts be connected to the SCADA system or a local alarm panel.

e. Day tank sequence of operation[7] clearly describes the Low and High level floats. Dinter Engineering Co. did not specify that the contacts be connected to the SCADA system or a local alarm panel.

f. One or both day tank fill pumps could have been specified by Dinter Engineering Co. as Battery operated to providing operation during a loss of commercial or backup power. See exhibit "E" option 440/441.

g. The generator specification written by Dinter Engineering Co. required that the generator representative train the North Tahoe Public Utility District personnel. The specific training desired and duration of training was not specified by Dinter Engineering Co. nor were training materials required to be left with the North Tahoe Public Utility District personnel for reference. This lack of direction to Cashman Power Systems the Generator Supplier, allowed them to not provide the North Tahoe Public Utility District personnel written reference materials to be used in case of an emergency, such as the day tank running out of fuel and/or the generators losing prime.

2. Stantec Consulting Inc., the Prime Engineering Company was negligent:

a. Stantec Consulting Inc. did not recognize that the power supply for the day tank was inadequate and that SCADA was not integrated to monitor the fuel level in the day tank.

b. Stantec Consulting Inc. did not complete the work outlined in their April 6th 2009 proposal to North Tahoe Public Utility District under "Scope of Work Task 1-Generation option report", item 4, "connection of the existing SCADA system as required to the new equipment." [8]

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[5] National Electrical Code 2008 article 450.3B and table 450.3B

[6] "Exhibit G" Paragraph 2.6.1

[7] "Exhibit E" Day Tank O&M

[8] "Exhibit F" Stantec Proposal for Electrical Engineering Services – Dollar Lift Station

c. Stantec failed to consider SCADA improvements as part of the pump station improvements as required under contract with the North Tahoe Public Utility District.[9]

d. Stantec Consulting Inc. stated to North Tahoe Public Utility District that they have worked with Dinter Engineering Co. for over 40 years; this statement by Stantec Consulting Inc. induced the reader to believe Dinter Engineering Co. was a competent Electrical Engineering firm. My review of the Stantec Consulting Inc. and North Tahoe Public Utility District documents found a lack of notes or review comments regarding Dinter Engineering Electrical Engineering specifications, by either party. The lack of correspondence and review comments of the drawings and specifications prepared by Dinter Engineering Co. is an indication that neither Stantec Consulting Inc. nor North Tahoe Public Utility District performed a peer review of Dinter Engineering Co.'s work.

e. Main Sewer Pump Station Master Plan, completed in July of 2009, by Stantec Consulting Inc., recommends generator monitoring by the SCADA system[10], but no mention of Fuel Tank or Day Tank level monitoring. Stantec Consulting Inc. failed to recognize the importance of SCADA monitoring of the day tank fuel level. During an emergency, without fuel, the Standby Generators cannot run to supply power to the sewer pumps to prevent a sewer spill!

3. The North Tahoe Public Utility District was negligent.

a. Dollar pump station has over 900 HP of Pumps ranging from 1/3 HP to 350 HP. With a high degree of engineering certainty it can be stated that, using the 100 KW portable generator to timely start and run either the small 1/3 HP day tank fill pump or the 100 HP lead sewage pump, would have avoided the sewage spill.

b. It is questionable if the 1 KW generator tried first would successfully start the 1/3 HP pump. It is noted that the 3.5 KW portable generator tried second would have easily run the 1/3 HP day tank fill pump but not the 100 HP sewage pump.

c. When the power went off, the smallest pump motor in the station, only 1/3 HP, needed to be wired in such a way to temporarily provide power to the day tank fill pump to fill the day tank. The North Tahoe Public Utility District employees failed to successfully temporarily connect the day tank fill pump to the two larger portable generators (3.5 KW and 100 KW) to run the pump to fill the empty day tank with fuel so the large

[9] "Exhibit H" Paragraph V *SCADA Considerations* of the NTPUD Master Plan stated that SCADA was to be considered for the pump station improvements.

[10] "Exhibit K" North Tahoe Public Utility District " Main Sewer Pump Station Master Plan" Completed by Stantec Consulting Inc. July 2009.

generator(s) could run the sewage pumps and prevent the sewage spill from happening. When the Cashman Power Systems technician arrived, he was able to run the day tank fill pump with a temporary pigtail and an extension cord to a portable generator that was already onsite.[11]

d. When North Tahoe Public Utility District personnel connected the temporary cord between the 1/3 HP day tank fill pump and the portable generators and the breaker tripped on both of the 3.5KW and the 100KW portable generators; this was an indication that the cord or wiring was miswired, not the portable generators being of insufficient capacity. It was necessary at that point to further analyze the temporary wiring to ascertain what the problem was. Running either one of the two 1/3 HP fill pumps could have filled the day tank and allowed the new generator to be primed and run, thereby supplying power to the sewage pump(s) to pump down the wet well and avoid the sewage spill.
e. Only after the sewage spill had already occurred were the North Tahoe Public Utility District personnel able to start a much larger sewage pump (100HP) using a portable cable brought from another pump station, thereby temporarily connecting the portable 100 KW generator to pump #3 to lower the sewage level in the wet well and stop the sewage spill.
f. The unsatisfactory response to the sewage spill emergency by the North Tahoe Public Utility District personnel was substandard. Using the SCADA system logs it was determined that from the time the North Tahoe Public Utility District personnel entered the station to the time sewage pumping was restarted, 3.76 hours had elapsed, the sewage spill had already been overflowing for 2.86 hours.
g. A visual fill indicator is installed on the day tank, at any time the day tank fuel level can be noted simply by looking at the fuel gauge; this gauge is much like a cars fuel gauge; displaying E for Empty and F for Full. This fuel gauge works even in the absence of SCADA monitoring or electricity. During weekly visits to the pump station; maintenance personnel should have seen that the tank was becoming less full and been aware that the fill pumps were not keeping the day tank filled to capacity.
h. The North Tahoe Public Utility District does not have an established program of routine maintenance and operations testing as suggested by the National Fire Protection Association (NFPA) standard 110. NFPA standard 110 “Emergency and Standby

[11] “Exhibit I” Cashman Field Report Segment 1 & 2

Power Systems" paragraph A.8.1 suggests that for "The continuing reliability and integrity of the EPSS (Emergency Power Standby System) are dependent on an established program of routine maintenance and operations testing".

i. The following three Documents are not on site for operators of this pump station to reference:
    i. A written Standard Operating Procedure.
    ii. A written Emergency Operating Procedure.
    iii. A written Standby Generator Testing Procedure.

4. The Western Pacific Electric Inc. the Electrical Contractor was negligent:

   When connecting the day tank the Western Pacific Electric Inc. electrician read the day tank schematic to determine where to connect the power to the control panel. Reading the schematic was necessary since the Dinter Engineering Co., Electrical Engineer did not specifically show on the construction drawing where to connect the 120 volt power to the day tank. The schematic clearly indicates terminals 1&2 are to be used "To 120 VAC power supply for controls and supply motors" (Fill pumps); terminals 3&4 are to be used "To 120 VAC power supply for reverse motor" (Return Pump). The foregoing statement clearly indicates that two 120 volt circuits are required when supplying power to the Pryco day tank. The Western Pacific Electric Inc. electrician should have questioned there being only one circuit supplied to the day tank controls and the three motors. If the Western Pacific Electric Inc. electrician had questioned, through a Request for Information (RFI), "if two circuits were required to the day tank as shown on the day tank schematic?" Dinter Engineering Co. would have had the opportunity to reconsider the need for one or two 120 volt circuits run to the day tank. With the answer in hand; the Western Pacific Electric Inc. electrician would have wired the day tank as further considered and clarified by Dinter Engineering Co.

5. Cashman Power Systems, the Day Tank and Generator Supplier was negligent:

   Training of the North Tahoe Public Utility District personnel was required by the generator specifications, page 16100-10 paragraph 3.4.1. "Provide on-site training to instruct the owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts manuals, and emergency service procedures." I have asked for a written training manual or training checklist to be provided for my review. I have been told that no written training manual or written emergency checklist was provided by Cashman Power Systems to North

Tahoe Public Utility District personnel. It is below the Standard of Care to train plant mechanics on such a complex subject as 600 KW Generator Maintenance and expect that the mechanics being trained will remember the information covered without issuing a written training manual or written emergency checklist to be used by the North Tahoe Public Utility District for reference.

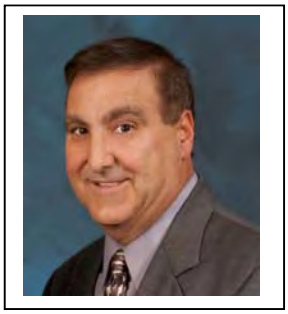
6. KFC Building Concepts, the General Contractor was negligent:

   KFC Building Concepts hired as a subcontractor Western Pacific Electric Inc. the Electrical Contractor to wire the new generator and the associated equipment including the day tank. The Prime contractor is responsible for its subcontractor's performance.

Curriculum Vitae

June 18, 2013

JOSEPH PERRY P.E. JP$_{PE}$



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Personal Statement

33 years' experience as a Professional Electrical Engineer and Licensed Electrical Contractor provides an extensive background in Electrical Power and Controls Engineering. I am seeking Expert Witness Work relating to losses or damages associated with the Water and Wastewater industry, Industrial Electrical Controls/Processes. I have many years of construction experience in Municipal Construction Projects and Interpreting Municipal Plans and Specifications and can provide testimony as to the Standard of Care Provided by Electrical Engineers and Contractors.

Licenses

Professional Electrical Engineer	CA# 9683E & HI# E12924
Licensed Contractor, Electrical, Plumbing, HVAC	CA# 402494

Skills

SCADA and Telemetering Control & Design
Variable Frequency Motor Control & Design
Reduced Voltage Soft Start Control & Design
Flow and Blow-off Control & Design
Motor Control Center (MCC) Applications
Estimating, Project Management
Well, Storage Tank, Pumping Control & Design
Cellular and Radio Communications
Critical Load and Standby Generator Applications
Facility Automation, Programmable Logic Control
Energy Monitoring and Control Applications
Standard of Care, Forensic Analysis

Educational Foundation

Healds Engineering College, San Francisco
BS Electrical Engineering (Power and Control Systems Focus) BSEE May 1974

Current Employment

Independent Consulting Electrical Engineer Control Systems West, Inc.

June 2002 – Current.

My primary design duties are to design Power and Controls for Water and Wastewater Pump Stations and medium size Wastewater Treatment Plant Control Panels. I am the responsible Electrical Engineer for all Control Systems West, Inc. CA and HI projects that require an Electrical Engineer's design approval and engineering stamp. I am the Contract Administrator for most of the Control Systems West, Inc. contracts to provide control panels, which are used by municipalities in California and Hawaii. I am the Primary contact for Underwriters Laboratory (UL) certification of Industrial Control Panels (UL508A and UL698) that are designed and built at Control Systems West, Inc.

Reference Contact

Bruce Borders, President

Phone: 707-763-1108 x3011 Email: bruce.borders@controlwest.com

Work History

Owner California Energy Experts

June 2001 – June 2002

I was an Independent Engineering Consultant and Electrical Contractor for the City of Cotati Department of Public Works Water and Wastewater Pump Stations. Also I worked for various clients performing Electrical Contracting Services. Working with Control Systems West, Inc., with its established volume of business, offered a superb opportunity to utilize my Engineering Design talents in the Design of Industrial Control Panels dedicated to the Water and Waste Water Industry.

Investment Broker Edward Jones Investments

June 1998 – June 2001

After Passing the Securities and Exchange Commission Series 7 License, I opened an Edward Jones Investment office in Rohnert Park, CA. I serviced my clients by selling Stocks, Mutual Funds, Bonds, Annuities, Life and Long Term Care Insurance. I enjoyed helping my clients establish a safe and secure financial future. I enjoyed the sales aspect of the business however this business was much too distant from the finite business of Engineering that I love.

Outside Sales Cal Air, Inc.

April 1997 – May 1998

Outside Sales of Heating Ventilation and Air Conditioning (HVAC) Services, Cal Air purchased my previous Electrical Engineering; Electrical, HVAC, Plumbing Contracting business, I agreed to stay on in the sales capacity for one year to expand their presence in the Sonoma County area and provide continuity with our existing client base. Cal Air was a business consolidator, purchasing contractor shops in the Energy Management and HVAC industry.

President California Energy Experts, Inc., (CEE)

Nov 1984 – April 1997

We designed and built Facility Automation Systems totaling 7.6 million square feet of municipal, school, commercial and light industrial building spaces in 15 states. Project makeup was approximately 36% new & 64% retrofit installations. We Incorporated, programmed, and supported dedicated technically advanced controllers for HVAC Systems. Our Lighting Control Systems incorporated Day-lighting and Time of Day Scheduling. Variable Frequency Drives (VFD) (AFD), were used on cooling towers, pumps, supply and return fans to enhance the energy efficiency of HVAC systems. Economizer Damper positioning and monitoring were an integral part of our control designs which led to further energy reductions. Demand Control routines were incorporated in the designs when advantages to the customer. All systems included remote communication abilities to allow offsite monitoring and minor software revisions. We expanded our company's expertise by bidding and installing Well, Water, Wastewater, Flood Control, Power and Control Systems. Designed and built Standby Generator Systems (up to 250KW) including single and multiple transfer switches and isolation of critical/non-critical loads, we incorporated Peak Shaving strategies into the design when applicable. California Energy Experts was expanded by incorporating HVAC and Plumbing contracting under our umbrella. California Energy Experts was sold to Cal Air, Inc. which provided me an opportunity to explore Outside Sales without the stress of running the day-to-day business of the Engineering / Contracting business.

Owner Energy Experts

May 1982 – Nov 1984

When Energy Experts was formed my goal was to design and install Control Systems dedicated to Energy Management in Commercial Buildings; utilizing the most recent computerized advancements in HVAC and Lighting Controls. I began by selling the concept to businessmen in our county, then designing and installing the control system. After landing Energy Management System Design and Installation contracts with a major Department Store chain, Energy Experts quickly grew and earned the respect of the Facilities Managers for this chain. As the company volume grew Energy Experts was incorporated and renamed to California Energy Experts, Inc.

Electrical Engineer P.E. RE Corp. Inc., DBA Reliance Enterprises

April 1979 - April 1982

After obtaining Professional Engineer Status I was immediately moved to the office environment. I soon began estimating Electrical Construction Projects and assisted in Contract Administration and Purchasing materials that were required to complete the successfully bid projects. Our firm was the Electrical Engineers for several Waste Water Treatment projects and I was responsible for specifying the Electrical Devices that were to be used and minor design modifications. As time progressed I began to design Water and Waste Water controls for many Pump Stations and Wells. I also earned my Electrical Contractors License during this period. The Engineering & Contracting

foundation established at RE Corp afforded me the knowledge, experience and confidence to start my own Engineering / Contracting business Energy Experts specializing in Control Systems.

Engineering Trainee EIT RE Corp. Inc., DBA Reliance Enterprises

June 1974 – April 1979

My first position at RE Corp placed me in the field for 5 years, this hands on experience consisted of troubleshooting and repairing HVAC Equipment and Control Systems, Fire Alarm Systems, Communication and Electronic Clock Systems at schools and commercial customers. I was also trained on the repair of Boiler Controls primarily for the commercial and Industrial business sector. This practical field experience was a stepping stone to a better understanding of Applied Engineering designed by others and allowed me the opportunity to learn to be a Practical Design Engineer not just a Theoretical Engineer.

References

Dave Thomas P.E.	Peer / Electrical Engineer specializing in the Water/ Waste Water Industry
Phone:	707-769-1410
Email:	dthomas@dmtassociates.net

Bruce Borders	Owner / Control Systems West Inc.
Phone:	707-7631108 x 1011
Email:	bruce.borders@controlwest.com

Dan Blanquie	Insurance Loss Mitigation Trainer / Friend
Phone:	707-338-4003
Email:	danb@dbclaims.com

Membership in Trade Associations

Institute of Electrical Electronic Engineers, (IEEE), my IEEE # 90393171
Senior Member Status

Forensic Expert Witness Association, (FEWA), San Francisco Chapter
Board of Directors, Membership Chair

EXHIBIT "A"

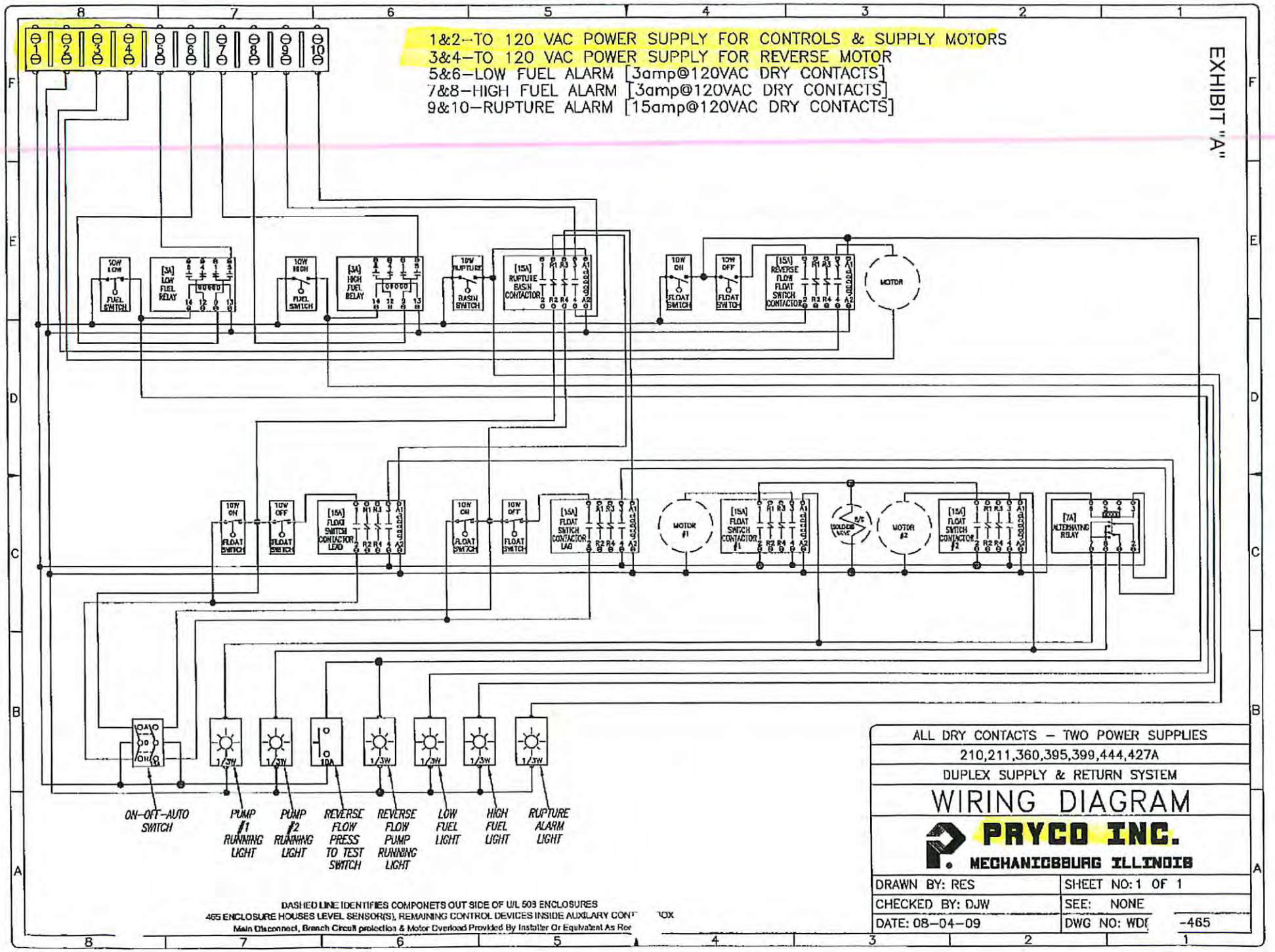

1&2--TO 120 VAC POWER SUPPLY FOR CONTROLS & SUPPLY MOTORS
3&4--TO 120 VAC POWER SUPPLY FOR REVERSE MOTOR
5&6--LOW FUEL ALARM [3amp@120VAC DRY CONTACTS]
7&8--HIGH FUEL ALARM [3amp@120VAC DRY CONTACTS]
9&10--RUPTURE ALARM [15amp@120VAC DRY CONTACTS]
EXHIBIT "A"
ON-OFF-AUTO SWITCH
PUMP #1 RUNNING LIGHT
PUMP #2 RUNNING LIGHT
REVERSE FLOW PRESS TO TEST SWITCH
REVERSE FLOW PUMP RUNNING LIGHT
LOW FUEL LIGHT
HIGH FUEL LIGHT
RUPTURE ALARM LIGHT
DASHED LINE IDENTIFIES COMPONETS OUT SIDE OF U/L 508 ENCLOSURES
465 ENCLOSURE HOUSES LEVEL SENSOR(S), REMAINING CONTROL DEVICES INSIDE AUXILARY CONTROL BOX
Main Disconnect, Branch Circuit protection & Motor Overload Provided By Installer Or Equivalent As Req
ALL DRY CONTACTS - TWO POWER SUPPLIES
210,211,360,395,399,444,427A
DUPLEX SUPPLY & RETURN SYSTEM
WIRING DIAGRAM
PRYCO INC.
MECHANICSBURG ILLINOIS
DRAWN BY: RES
SHEET NO: 1 OF 1
CHECKED BY: DJW
SEE: NONE
DATE: 08-04-09
DWG NO: WD[-465

EXHIBIT "B"

PANEL SCHEDULE:

PANEL BOARD	'B'	7.5 Kva, MINI POWER ZONE, 10 KAIC								
DIRECTORY	LOAD	BKR	CIR			CIR	BKR	LOAD	DIRECTORY
BATTERY CHARGER	100	20/1	1	A		2	20	1500	BLOCK HEATER
DAY TANK FUEL PUMP	1000	↓	3	B		4	2	1500	↓
LOUVER DAMPERS	200	↓	5	A		6	-		SPACE
SPARE		20/1	7	B		8	-		↓
↓		20/1	9	A		10	-		
		20/1	11	B		12	-		
			13	A		14			
			15	B		16			
			17	A		18			
			19	B		20			
			21	A		22			
			23	B		24			
			25	A		26			
			27	B		28			
			29	A		30			
			31	B		32			
			33	A		34			
			35	B		36			
			37	A		38			
			39	B		40			
			41	A		42			
CONNECTED LOAD		4300 VA		(18 A)					OTHER NOTES:
	A=	1800 VA		15 A					120/240V., 1PH, 3W
	B=	2500 VA		21 A					40 AMP MCB
									100 AMP BUS

SHEET NOTES:

1 NEW 4 S THWN IN FROM (E NEW ATS

2 RECONNE 800A BF

3 CONNEC 800A 3F LINE DIA

4 NOTE DE

5 EXISTING

6 NEW GEI CONTROL PROVIDE

7 NEW SCA

18 EXTEND ELECTRICAL CONNECTIONS AS REQUIRED TO MOVE (E) AIR COMPRESSOR TO CREATE CLEARANCE AROUND NEW

"B"

18
LOCATED
)AIR
)MPRESSOR

8
)NL–B–3

:W DAY TANK,
CATE PER
:CHANICAL
ANS

V ATS

EXHIBIT "C"

NORTH TAHOE PUD
CATERPILLAR GENERATOR SET
INSTALLATION SUMMARY

POWER REQUIREMENTS

EQUIPMENT	INPUT VOLTAGE	LOAD
BATTERY CHARGER	120VAC SINGLE PHASE	720 WATTS
JACKET WATER HEATER	240/208 VAC SINGLE PHASE	3,000 WATTS

BOTH ARE FED WITH SINGLE 120/208 OR 120/240 SINGLE PHASE CIRCUIT

CONTROL WIRING – CONTROL VOLTAGE: 24VDC

WIRING RUN/ALL STRANDED WIRE	NUMBERS OF WIRES
ATS TO ENGINE CONTROL PANEL (TYPICAL) SUPPLIED BY OTHERS	1 PAIR EACH ATS – STRANDED
GENERATOR TERMINAL STRIP TO REMOTE ANNUNCIATOR	#14 STRANDED (6) WIRING FOR REMOTE ANNUNCIATOR **CANNOT** EXCEED 800FT SEE DRAWING TAB 11 FOR WIRING TYPE DETAIL SOURCE FOR # J1939 WIRE IS JCH WIRE & CABLE – JOHN HALLAWAY 702-639-4120

EXHIBIT "D"

Sewer Spill on 12/19/2010
Interviews of Events Taking Place

Norm Moore (from email sent 12/21/10):

12:57pm- power fail came in from S-1 and S-2
1:12pm- power fail came in from D7,6,5 &4
1:13pm Dollar primary generator started and transferred power.
1:16pm called in Paul Sandhoffer and Sebastian Rameriz to tow portables to satellites. .
1:19pm Dollar primary generator faulted and power was out to Dollar Main at this point.
1:20pm called in Joe Steck to try to get Dollar generators started.
1:30pm Joe got the old Dollar generator started and turned on pump #2
1:40 the old Dollar generator then failed also and Dollar was again out of power
1:42pm called in Mike Thornton to help Joe at Dollar. They found that fuel starvation was the problem on both generators and the circuit breaker to the fuel pumps was tripped out and the fuel day tank was empty.
1:45pm called the duty sup, Paul Schultz, and informed him of the real possibility of a SSO due to Dollar generator(s) failure. He asked me to keep him informed.
1:50pm called Cashman tech and informed him of what was going on and asked him to please come up to Dollar. He said he would head our way.
2:00pm Joe and Mike still trying to get fuel pumps going. Had Joe then come to base and get the large portable and tow to Dollar. Even that large generator would not run the fuel pumps to fill day tank.
2:16pm we started spilling out of the manhole at D-5.
2:17pm called Paul Schultz again and informed him that we were now spilling. He said he would come in and he went to Dollar first.
2:30pm we started getting high wet wells out of the satellites and I dispatched Paul's crew to pump the stations down.
2:40pm called in Chris Avery to help with sand bagging at spill site and to help with portable generators.
3:00pm I started calling agencies per the RED book. Talked to Dana at Lahonton and reported spill in progress. She issued us a control number 10-7642.
3:30pm I called Sherriff dept dispatch and asked them to advise Placer County Environmental Health of active spill.
3:40pm I tried to contact TRPA but the phone number listed in the RED book is incorrect. Tried to contact Fish and Game but got no answer.
5:10pm Joe and Mike got the large portable hooked up to pump #3 and running.
5:13pm spilling stopped at this time due to #3 pump running at Dollar.
5:30 Roy from cashman got the fuel issue solved and the primary generator started. This put us back in normal pumping at Dollar.
6:00pm normal power came back on to most areas except for S-1 and S-2. Power remained out to these sites for most of the night. I had Paul park a portable there and leave it.
7:30pm I released crews to go home and I remained to deal with S-1 and S-2 as well as several components that were fried on the Scada rack due to power spikes.

Mike Thornton:

Norm Moore called Mike Thornton at home at 1:42 p.m. to go to Dollar Main to help Joe Steck. He and Joe found that the power was out, the breaker was tripped, and the day tank was empty.

Mike made several attempts to start both generators. Joe left to get the 100v portable generator to power up the fuel system, but it wasn't big enough. Chris Cannizzaro was taking generators to the satellite stations, but was called by Norm to bring a larger generator to Dollar. Joe and Paul Sandhofner stopped at Carnelian main to get a temporary wire to run the generator on their way back to Dollar. It also failed to work. Then they brought the 480v generator and started pump #3 which got control on the flow.

When Roy from Cashman arrived, he hooked up the fuel system to the new, bigger generator, filled the fuel tank and got the fuel system working. The primary backup generator was started about 6:30 p.m. and power came back on about an hour later at about 7:30 p.m. Mike left the station running on this generator when he left the station.

Joe Steck (1/4/11):

Norm Moore called Joe at home approximately 1:15 P.M. to advise the power was out and Dollar generator had stopped running. I went to the station and found primary generator off line, started older secondary generator which ran for about 5 minutes and ran out of fuel. I discovered the day tank was empty, and supply breaker was blown. I called Norm and informed him of the problem. I tried to pump fuel in by hand and found that it did not work. Went to get portable small generator to fill the day tank. It wasn't big enough. I called Norm at base for a bigger generator and he said he'd send one out. I went to get the big generator so we could run a pump directly from that generator. We stopped by Carnelian Main to get generator leads and brought it to Dollar and hooked it to pump #3. That stopped the spill. Then Roy from Cashman arrived. He plugged the day tank into the large portable generator, got it refilled and got the primary generator running. Everything looked like it was running well after that. I checked in at base, pick up my truck, and left around 8:30 P.M.

When I came in the next day after the power outage was over and the generator (main) had shut off during the night and found the breaker to the day tank was blown again. Also, the main breaker in the power panel was blown.

Sebastian Ramirez:

Norm called Sebastian Ramirez a little past 1:00 p.m. and asked him to come in because of the power outage. He picked up a generator at base and responded to a high wet well alarm and pump it into the system. Since D6 has an old type plug and is connected to Dollar, he and Paul Sandhofner passed that station and proceeded to D5 when they discovered the spill coming from the sewer manhole located at 3730 North Lake Blvd. They began moving snow in order to block the flow from the manhole toward the house. Paul called Chris Cannizzaro to bring sandbags, but he had just been called to deliver the large generator to Dollar so he sent Chris Avery. Chris Avery brought the sandbags, and Sebastian, Paul S. and Chris A. placed the sandbags. Chris A. returned to base to get more sandbags. After placing the sandbags (approximately 20), the flow was contained. Sebastian and Chris A. plowed the parking lot with Paul's truck which has a plow on it in order to get the generator hooked into D5 until the power came back on. Paul S. sent

Chris and Sebastian to get a pump from base to pump under the house as soon as it was reported by the homeowner that there was water under the house. By the time they got back with the pump, the water under the house had disappated, but the homeowner advised that there was a small amount of water in the mechanical room. Sebastian and Chris A. swept out the room. Sebastian brought the generator back to base and fueled it in case it was needed again. Paul S. and Chris C. brought it out to S1 and S2. Sebastian remained at base in the event of another callout, but there were no further problems and he left base at about 10:00 P.M.

Paul Sandhofner:

Norm called Paul Sandhofner at about 1:00 p.m. to bring the generator to pump down D7 which had a high wet well. He and Sebastian Ramirez then went to D5 where he saw the flow from the manhole outside of 3730 North Lake Blvd. He called Norm to advise, and he called Chris Cannizzaro and Chris Avery to come in to help. He and Sebastian shoveled snow to contain the flow and divert from the house. Chris Cannizzaro came to pick up Paul to bring him to base to get the generator out to Dollar. Paul drove Joe Steck back to the Dollar station and went to D4 with Chris Cannizzaro to pump down the high wet well there, and then was sent to pump down S1 and S2. This took place at approximately 4:00 P.M. as it was beginning to get dark. He had Chris A. and Sebastian place sandbags to contain the flow and make sure it didn't get into the house. They went to pump station D4 when Sebastian called at 5:08 p.m. to advise him that the sewage had stopped flowing from the manhole. They went to pump S1 and S2 again, and left the generator there in the event it was needed later in the evening.

Chris Avery:

Chris Avery was called in by Chris Cannizzaro at 3:17 P.M. He arrived at base at 3:30 P.M. and spoke to Norm who was fielding calls at base and monitoring the alarm board. He called Paul Sandhofner to see what he needed in the field and was aksed to bring sandbags to the spill site at 3730 North Lake Blvd. He placed the bags (approximately 10) and returned to base for 10 additional bags at Paul Schultz request. The crew there cleared snow around the cannon plug so they could access D5 and begin pumping as soon as they got the go ahead. Once the flow stopped, he found out that the station was running on generator power. Paul S. sent Chris A. to check the Chinquapin station, and he found no evidence of overflowing and returned to 3730 NLB. He advised Paul that we needed a trash pump to pump fluid which had gone into the crawl space under the house before the sandbags were placed. He returned to base to get the pump, but was stuck in traffic for 20 minutes due to an auto accident between the site and base. Upon returning to the spill site, the fluid in the crawl space had disappeared, but the homeowner asked for some cleanup in his mechanical room. They swept and cleaned up the water in the mechanical room. They were on standby for an alarm at D5 in case it needed pumping again, but the power came back on. Chris A. called Norm about 8 P.M. when he saw the power across the street, and was advised that all the D series stations were up and running, and that Norm was continuing to monitor S1 and S2. He fueled up the generators and parked them in the shop to make sure they were ready to go if needed.

Chris Cannizzaro:

Chris Cannizzaro received a call from Norm about 3:00 P.M. who asked Chris C. to take a generator to S1 and S2 to respond to a high wet well alarm. He came back to bring the small generator to Mike Thornton at Dollar station to try to get the day tank running. He went back to base and got the backhoe to dig out the big generator while Joe Steck put chains on the truck. He drove the generator back to Dollar, while Joe rode back with Paul Sandhofner. Joe and Paul stopped at the Carnelian Main station to pick up the leads in order to hook up the generator at Dollar Hill. Once that generator was delivered, the station was brought on line and Chris and Paul left for D4 to pump that down (high wet well). Chris Cannizzaro called all staff and was able to get a hold of Chris A. Chris C. went to S1 and S2 to pump down those stations, and went back to D4 to pump that down again. Chris C. returned to base, and returned to S2 with Paul S. to drop of the generator in case it was needed later.

Paul Schultz (Duty Supervisor):

Paul was at home at approximately 1:00 P.M. when the power went out. At 1:44 P.M., he received a call from Norm Moore who advised him of the problems being experienced and the potential for overflow. Paul asked to be kept informed. At 2:39, he received a call back from Norm who advised them they were spilling. Norm advised Paul that he thought the spill was taking place in multiple locations, but it was determined that there was only one spill taking place at 3730 North Lake Boulevard because of holding flows back and a judicious use of storage. Paul drove to the site as soon as he received the call, but because of a tree across highway 89, traffic was stopped. He arrived at the Dollar Pump Station at 3:50 P.M. Mike Thornton was the only one there and was hooking up the generator to the fuel pumps as they discussed the problem. Paul called Norm at 4:10 P.M. to get more particulars on what led up to the spill and get his read on the current status. Paul then drove to the spill site and checked D4 to make sure it wasn't spilling, which it was not. The flow stopped at 5:08 P.M., and preliminary cleanup of the site was completed. He advised Norm, and drove back to meet with the property owner, Stewart Corbin and explained the situation. Paul called Chris Avery to bring more sandbags, and at 5:41 P.M. received a call from property owner requesting that we pump out the crawl space under the house and his mechanical room. He called Norm who dispatched Chris Cannizzaro and Sebastian to get the pump and help the homeowner with the cleanup. When Paul left at 6:45 P.M., all stations were operating on generator power.

Transcribed by Marianne Potts on 12/22/10 unless otherwise noted.

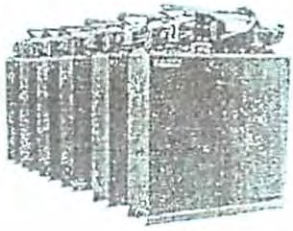
EXHIBIT "E"

PRYCO, INC.
P. O. BOX 108
Mechanicsburg, IL 62545

Telephone: 217 / 364-4467

Fax: 217 / 364-4494

OPERATIONS AND MAINTENANCE MANUAL



PUMPS AND MOTORS
GENERAL INFORMATION

PUMPS - The standard pump is a 2 GPM Bronze Gear Pump. Other pump models include: 4, 8, 10, 23, and 40 GPM. Each come with or without a pressure relief valve. This information generally applies to all models

The pump is driven directly from the shaft of the electric motor by means of a flexible coupling. An aluminum adapter connects the pump to the motor.

The pump is of bronze construction with stainless steel shafts, positive spring-loaded buna lip seals, and self-lubricating carbon bearings.

Due to close tolerances of components, fuel to the pump must be clean. Fine abrasives such as sand, silt, and powders in suspension will destroy its pumping ability. A **fuel strainer** (Pryco option # 314 or 315) should be installed just ahead of the pump (and solenoid valves, check valves, and other like devices) to keep debris from entering the system.

The pump's basic metals construction allow a temperature range of -40°F. to +400°F.; however, the buna lip seals have a temperature limit of +250°F. Avoid extreme temperatures and rapid fluctuations as they are detrimental to the pump's service life.

The pump is capable of creating 18 (plus) inches of vacuum on the suction side and up to 100 psi on the discharge side. Refer to pages 4 and 5 for a chart of the performance of each pump at 1725 RPM.

Before starting the system for the first time, you should apply some fuel oil through a **priming tee** (Pryco option #312) to wet the pump gears. The fuel retained in the system lines and the gear chambers serve to wet the gears on subsequent starts.

MOTORS - The standard motor coupled to the pump has these characteristics: 1/3 HP, 115 VAC, 1 PH, 60 Hz, Thermal Protected, 6.6 FL Amps, 1.0 Service Factor.

The standard motor is special split phase with moderately high starting torque as well as a moderately high starting current. The thermal protected motors have internal, automatic protectors that will reset after the motor cools. Other motor configurations available range from 1/4 HP VDC motors up to 5 HP, 460 VAC.

Install power to the motor(s) according to National Electrical Code.

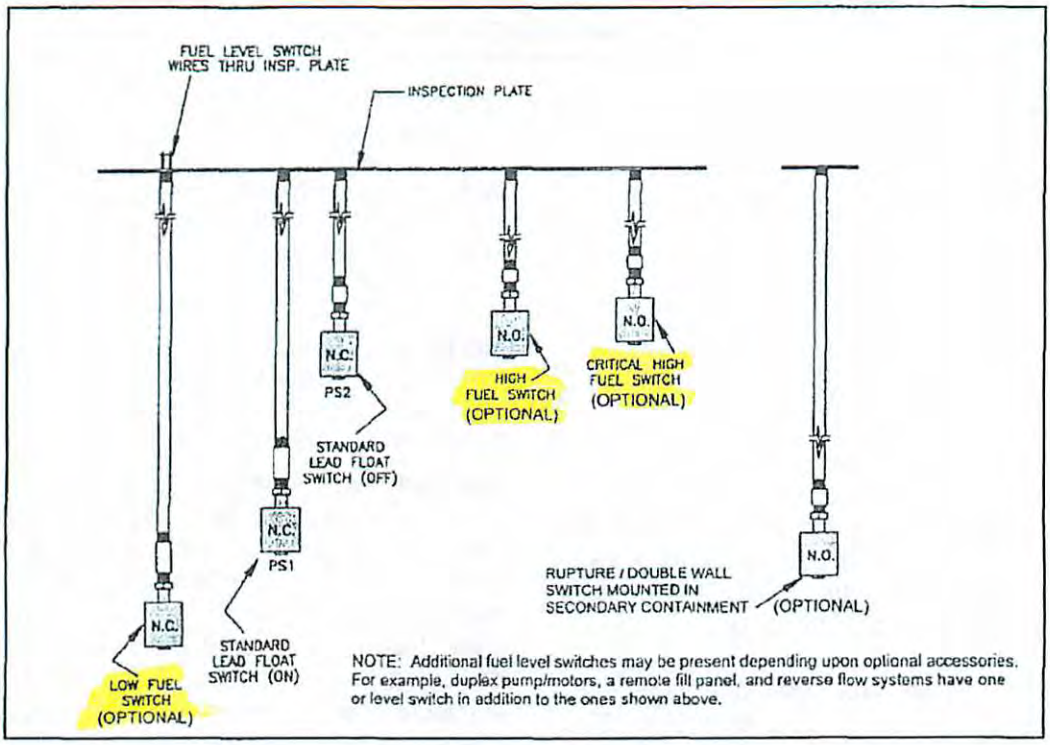
MOTOR LUBRICATION

Sleeve Bearings - re-oil using #5W-20 oil every 3000 hours of motor operation.

Ball Bearings - If the motor has provision for re-greasing, use a good grade of bearing grease every 2000 hours.

If lubrication instructions appear on the motor, they will supercede these instructions.

Do not use unauthorized repair parts. These can affect proper and safe operation of the motor. Contact Pryco for replacement motors.

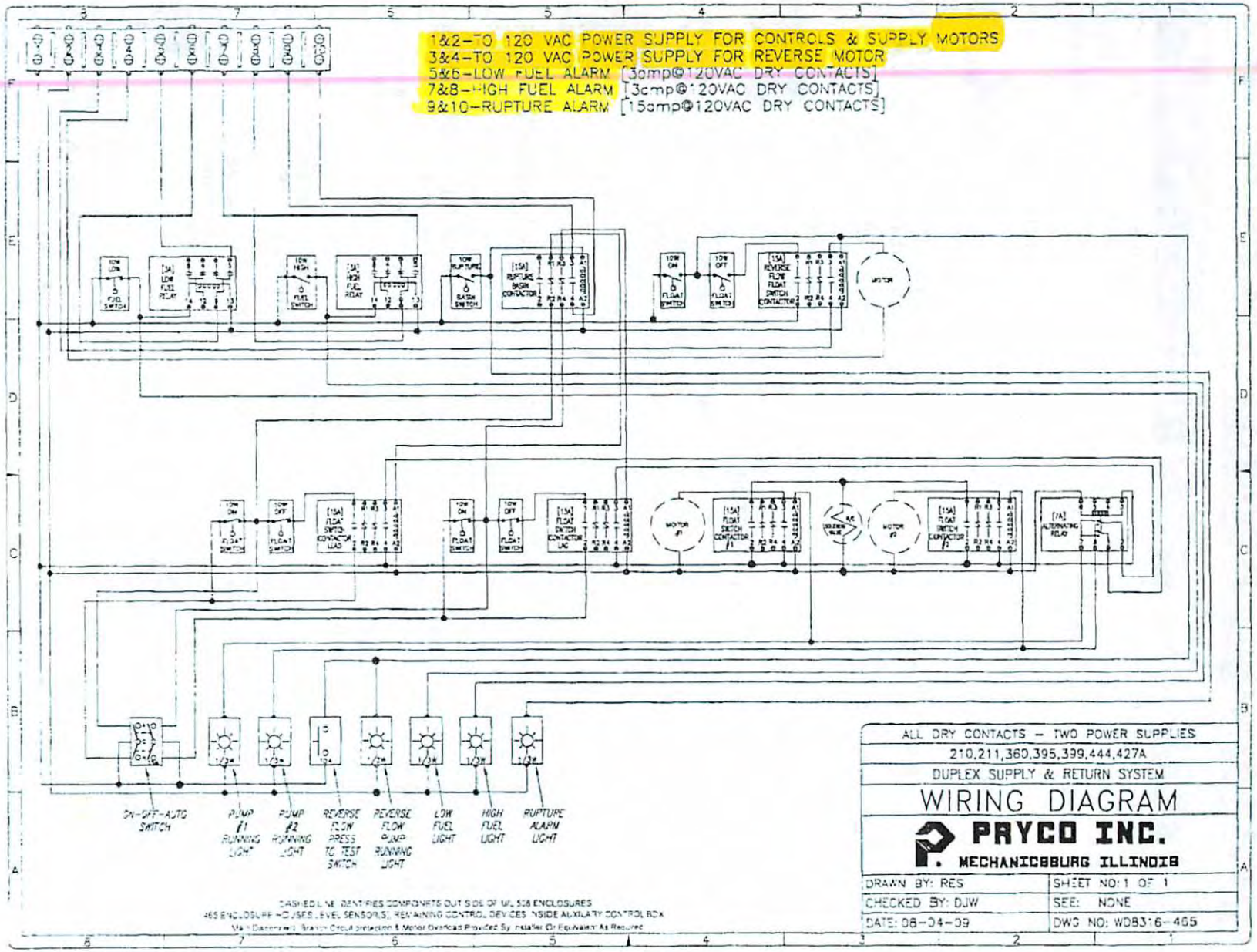


GENERAL SEQUENCE OF OPERATION

When power is applied to the day tank, the pump/motor will begin to fill the day tank.

- As the fuel rises to the 86% level, the PS1 (Pump/Motor-ON) float switch opens and the tank continues to fill.
- When the fuel level reaches the 100% level, the PS2 (Pump/Motor OFF) float switch opens and stops the pump/motor.
- As the generator engine consumes fuel and the level drops to the 86% level, the pump/motor will fill the tank until the 100% fuel level is reached. PS1 turns on the pump/motor — PS2 turns it off.
- If the fuel level drops to 75%, the LOW FUEL SWITCH (option 203) closes allowing a light on the control panel to illuminate.
- If the fuel in the tank should reach 102% full, the HIGH FUEL SWITCH (Option 209) will close sending a high fuel level signal to the day tank terminal block.
- If the fuel level rises to 103%, the CRITICAL HIGH FUEL SWITCH (option 213) closes allowing the following:
  - a Critical High Fuel light on the control panel to illuminate,
  - a N.O. solenoid valve will close causing the pump/motor to stop, and
  - a set of dry contacts, to be used for remote annunciation, will become active.
- If the fuel rises to 5% in the secondary containment (if installed), the RUPTURE ALARM SWITCH (option 395) closes allowing the following:
  - a Rupture Alarm light on the control panel to illuminate,
  - the pump/motor to stop, and
  - a set of dry contacts, to be used for remote annunciation, will become active.

P. O. Box 108, Mechanicsburg, IL 62545 — Phone 217 / 364-4467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PUMP #2 RUNNING LIGHT
REVERSE FLOW PRESS TO TEST SWITCH
REVERSE FLOW PUMP RUNNING LIGHT
LOW FUEL LIGHT
HIGH FUEL LIGHT
RUPTURE ALARM LIGHT
DASHED LINE IDENTIFIES COMPONENTS OUT SIDE OF WDS28 ENCLOSURES
465 ENCLOSURE HOUSES LEVEL SENSORS, REMAINING CONTROL DEVICES INSIDE AUXILIARY CONTROL BOX
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ALL DRY CONTACTS - TWO POWER SUPPLIES
210,211,360,395,399,444,427A
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PRYCO INC.
MECHANICSBURG ILLINOIS
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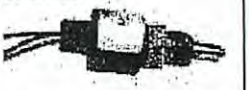
SEE: NONE
DATE: 08-04-09
DWG NO: WD8316-465

CEC 1985

OPTIONS

PRYCO, INC.

Option Code	Description
334	**COVER, STANDARD** - single pump 334-3 - Cover Nema 1 Triplex pump and motor
335	**COVER, WEATHERPROOF** - single pump
335RB Specify:	**STEEL WEATHERPROOFING OF RUPTURE BASIN** A - 10 - 25 gal. B - 50 - 75 gal. C - 100 - 150 gal. D - 200 - 300 gal. E - 400 - 600 gal. F - 700 - 800 gal. G - 900 - 1000 gal.
336	**COVER, TRIM** - for trim tanks
337	**COVER, DOUBLE PUMP and MOTOR**
338	**ENCLOSURE, PUMP SET** A - Wall Mount, NEMA-1, Single Pump B - Wall Mount, NEMA-1, Duplex Pump C - Wall Mount, NEMA-3R, Single Pump D - Wall Mount, NEMA-3R, Duplex Pump NEW E - Pad Mount, NEMA-1, Single Pump F - Pad Mount, NEMA-1, Duplex Pump G - Pad Mount, NEMA-3R, Single Pump H - Pad Mount, NEMA-3R, Duplex Pump X - Custom
339 NEW	**DOOR INTERLOCK w/CIRCUIT BREAKER** for Wall Mount Enclosures
340	**DRAIN PETCOCK VALVE** - replaces threaded plug in end at bottom of tank
341	**DRAIN, PIPED THRU** - for use with Rupture Basin (includes option 340)
345	**DRAIN, NOMINAL 10 GPM** - includes manual valve
350	**DRAIN, EMERGENCY FOR REMOTE ACTUATION** - nominal 10 GPM. Signaled valve gravity drains day tank to main tank using existing plumbing. Indicator light on control panel illuminates and pump-motor disconnects

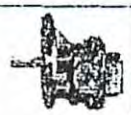
Option Code	Description
352	**OIL COOLER** - mounted on day tank for cooling hot fuel returned from engine 
353	**TEMPERATURE SWITCH** - to automatically control on/off of cooler motor 
354	**HIGH TEMPERATURE RETURN THERMOSTATIC VALVE** - 1" NPT (specify temperature)
355 Specify: A - 1/2" B - 1'	**CHECK VALVE** - installed on pump intake to prevent loss of pump prime 
360 Specify: A - 1/2" N/C (2 - 8 gpm pumps) B - 1" N/C (10-23 gpm pumps)	**SOLENOID VALVE, AC systems** - installed on pump intake to prevent tank flooding 
361	**SOLENOID VALVE, 2", N/O** - for option 226
365 Specify: A - 1/2" N/C (2 - 8 gpm pumps) B - 1" N/C (10-40 gpm pumps)	**SOLENOID VALVE, DC systems** - same as option 360
366	**SOLENOID VALVE w/manual override, 1/2", N/C** - AC or DC
367	**SOLENOID VALVE w/manual override, 1", N/C** - AC or DC 
370	**CUT OFF VALVE,** manual - mounted on fuel inlet for gravity fed day tanks (ship loose)

P.O. Box 108, Mechanicsburg, IL

Phone - 217 / 364-4467 Fax - 217 / 364-4494

OPTIONS — PRYCO, INC.

PUMPS and MOTORS

Option Code	Description
400	**PUMP, 8 GPM** - replaces standard 2 GPM pump. Requires 1/2 HP motor (options 440 - 448) 
401	**PUMP, 4 GPM** - replaces standard 2 GPM pump. Requires 1/3 HP motor.
402	**PUMP, 2 GPM - (standard)** Requires 1/3 HP motor.
403	**PUMP, 10 GPM** - replaces standard 2 GPM pump. Requires 3/4 HP motor 
404	**PUMP, 23 GPM**- replaces standard 2 GPM pump. Requires 1 HP motor
410	**DC MOTOR** - 1/4 HP, 12vdc
411	**DC MOTOR** - 1/4 HP, 24-28vdc
414	**MOTOR - (standard)** 1/3 HP, 115vac, 1 PH, 60 Hz, [Note 1]
424	**MOTOR** - 1/3 HP, 115vac, 1 PH, 60 Hz, ***Totally Enclosed, Fan Cooled*** [Note 1]
425	**MOTOR** - 1/3 HP, 115vac, 1 PH, 60 Hz, ***Explosion Proof*** [Note 1]
426	**MOTOR** - 1/3 HP, 115vac, 1 PH, 50 Hz [Note 1]
427	**SECOND STANDARD PUMP and MOTOR ASSEMBLY** - 1/3 HP, 115vac, 1 PH, 60 Hz, ***Thermal Protected*** motor and 2 GPM pump. Includes second float switch. First pump-motor operates at 86% of usable fuel capacity; the second pump-motor operates at 82% of usable fuel capacity. Both pump-motors shut off at 100% capacity.

Option Code	Description
427A	**AUTOMATIC TRANSFER SWITCH** - to automatically alternate each pump-motor (of option 427) into the lead starting position. Pump "RUN-OFF-AUTO" operates mode selector switch. Includes "Pump Running" amber light for each Pump-motor.
427B	**MANUAL TRANSFER SWITCH** - to manually alternate each pump-motor (of option 427) into the lead starting position. Motor run-time meter included for each pump-motor.
428	**MOTOR** - 1/3 HP, 230vac, 1 PH, 60 Hz [Note 1]
429	**MOTOR** - 1/3 HP, 230vac, 1 PH, 50 Hz [Note 1]
433	**MOTOR** - 1/3 HP, 230/460vac, 3 PH, 60 Hz [Note 2]
434	**MOTOR** - 3/4 HP, 115vac, 1 PH, 60 Hz, ***Explosion Proof*** [Note 1]
435	**MOTOR** - 3/4 HP, 230/460vac, 3 PH, 60 Hz ***Explosion Proof*** [Note 2]
436	**MOTOR** - 1 HP, 115vac, 1 PH, 60 Hz, ***Explosion Proof*** [Note 1]
437	**MOTOR** - 1 HP, 230/460vac, 3 PH, 60 Hz ***Explosion Proof*** [Note 2]
440	**DC MOTOR** - 1/2 HP, 12vdc
441	**DC MOTOR** - 1/2 HP, 24-28vdc
442	**MOTOR STARTER** - 3 PH, 130 watt control transformer and heater
443	**MOTOR STARTER** - 1 PH

[1] All single phase motors are Thermal Protected.
[2] All three-phase motors include Motor Starter and Control Transformer.

P.O. Box 108, Mechanicsburg, IL Phone - 217 / 364-4467 Fax - 217 / 364-4494

EXHIBIT "F"

Stantec Consulting Inc.
6980 Sierra Center Parkway Suite 100
Reno NV 89511
Tel: (775) 850-0777
Fax: (775) 850-0787

Stantec

Exhibit "A"

April 6, 2009
180101130

Mr. David Berry
Engineering Technician
NORTH TAHOE PUBLIC UTILITY DISTRICT
P.O. Box 135
Tahoe Vista, CA 96148

Re: Proposal for Electrical Engineering Services – Dollar Lift Station

Dear Mr. Berry,

Stantec consulting proposes to utilize Dinter Engineering as a sub-consultant to provide electrical engineering services for The Dollar Main Pump Station as described in The Scope of work as listed below. Dinter Engineering and Stantec have worked together on many projects for over forty years.

Dinter Engineering Contact information:

Peter K. Hackbusch, President
Dinter Engineering Co.
385 Gentry Way, Reno NV, 89502
(775) 826-4044, phackbusch@dinter.com

SCOPE OF WORK

General Statement:

The work included in this Scope of Work is limited to providing field investigation to develop a report recommending optional schemes for a new generator or modifications to the existing generator at the existing Dollar Lift Station. The Report will be based upon the results (desired pump sizes) resulting from The North Tahoe Public Utility District Pump Station Master Plan Update currently underway. Optional work includes a technical specification to aid the North Tahoe Public Utility District (NTPUD) in early procurement of new generating equipment.

Task 1-Generation Option Report

1. Review the available record drawings with specific interest in the areas related to the electrical services and proposed standby generator upgrades.
2. Send (2) members of our design staff to the facility to do field investigations to ascertain loads, determine available space and identify electrical tie in points.
3. Meet with Owner to ascertain lift station operations as it relates to standby power needs.
4. Produce a report outlining optional electrical system changes and enhancements for the installation of a new standby generator system. Recommended generating modifications will be compatible with all existing systems and the National Electrical Code. The Report will include suggested power connections and necessary upgrades for the new generator system including automatic and/or manual transfer switch. Recommendations for the fueling system will be included. The report will also discuss the connection of controls and alarms reporting to the existing SCADA or monitoring/alarm system as required by the new equipment.

5. Perform any necessary electrical calculations to complete the report.
6. Provide opinion of probable construction cost.
7. Produce and provide three reports for each submittal (estimated at 90% and final).
8. Attend report review meeting with Owner

Task 2-Early Procurement Specification

1. Produce electrical technical specifications in CSI format for the purpose in assisting the Owner in early Procurement of long lead generating equipment.
2. Attend the specification review meeting at 90% submittal with Owner.
3. Attend the Prebid meeting at site with Owner and prospective suppliers.
4. Review bids and offer recommendations.
5. Review generating equipment shop drawing submittals.

Excluded from our scope of work is the following:

1. Site development and structural design.
2. Instruction to bidders or division 1 specifications, (work limited to division 16 technical specs).
3. Installation designs ready for bid or permitting.

Items required by others for Dinter Engineering to complete work:

1. Site and building base plans in AutoCAD.
2. Facility electrical record drawings.
3. Owner supervised access to electrical service equipment including possible momentary shut down.
4. Plant operations as they relate to stand by power needs.

Optional services not included in proposal:

1. Electrical construction documents designing the installation of selected generation option.
2. Bid assistance for generator equipment installation design.
3. Review of shop drawings related to installation documents.
4. Standard construction observation services.
5. Witness generator onsite testing.

Fees

Stantec's fees for providing Engineering Services for the above Scope of Work follow. The fees are proposed on a Time and Materials basis with an upset. Fees will not be exceeded without written permission by NTPUD:

Task 1	$ 6,600.00
Task 2	$ 5,300.00
Total	**$ 11,900.00**

Upon receipt of your authorization, Stantec will proceed with our services in accordance with the terms and conditions of our current agreement.

Stantec appreciates the opportunity to be of continued service to the North Tahoe Public Utility District. Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

STANTEC CONSULTING INC.

John J. Welsh, P.E.
Managing Principal

JB:tb

V:\52801\active\180101130\correspondence\Letters\Proposal_Letter_Dinter_Fees_Berry_06apr09.doc

North Tahoe Public Utility District
Generator Power Upgrades
Electrical Scope of Work
April 3, 2009

Dinter Engineering Company proposes for the cost attached to this scope of work, to accomplish the following for the above mentioned project.

General Statement:

The work included in this proposal is limited to providing field investigation to develop a report recommending optional schemes for a new generator or modifications to the existing generator at the existing lift station. Optional work includes a technical specification to aid the Owner in early procurement of new generating equipment.

Task One-Generation Option Report

1. Review the available record drawings with specific interest in the areas related to the electrical services and proposed standby generator upgrades.

2. Send (2) members of our design staff to the facility to do field investigations to ascertain loads, determine available space and identify electrical tie in points.

3. Meet with Owner to ascertain lift station operations as it relates to standby power needs.

4. Produce report outlining optional electrical system changes and enhancements for the installation of a new standby generator system. Recommended generating modifications will be compatible with all existing systems and the National Electrical Code. Report will include suggested power connections and necessary upgrades for the new generator system including automatic and/or manual transfer switch. Recommendations for fueling system will be included. The report will also discuss the connection of controls and alarms reporting to the existing SCADA or monitoring/alarm system as required by the new equipment.

5. Perform any necessary electrical calculations to complete the report.

6. Produce construction cost opinion.

7. Produce and provide approximately three reports for each submittal (estimated at 90% and final).

8. Attend report review meeting with Owner

Task Two-Early Procurement Specification

1. Produce electrical technical specifications in CSI format for purpose in assisting the Owner in early Procurement of long lead generating equipment.

2. Attend specification review meeting at 90% submittal with Owner.

3. Attend Prebid meeting at site with Owner and prospective suppliers.

4. Review bids and offer recommendations.

5. Review generating equipment shop drawing submittals.

Excluded from our scope of work is the following:

1. Site development and structural design.
2. Instruction to bidders or division 1 specifications, (work limited to division 16 technical specs).
3. Installation designs ready for bid or permitting.

Items required by others for Dinter Engineering to complete work:

1. Site and building base plans in AutoCAD.
2. Facility electrical record drawings.
3. Owner supervised access to electrical service equipment including possible momentary shut down.
4. Plant operations as they relate to stand by power needs.

Optional services not included in proposal:

1. Electrical construction documents designing the installation of selected generation option.
2. Bid assistance for generator equipment installation design.
3. Review of shop drawings related to installation documents.
4. Standard construction observation services.
5. Witness generator on site testing.

Contact information:
Peter K. Hackbusch, President
Dinter Engineering Co.
385 Gentry Way, Reno NV, 89502
(775) 826-4044, phackbusch@dinter.com

End

MPE Work for Generator Install

EMPLOYEE CLASSIFICATION / TASK DESCRIPTION		PRINCIPAL PROJECT MANAGER Hours	SENIOR PROFESSIONAL ENGINEER Hours	DESIGN ENGINEER Hours	DESIGNER Hours	CADD TECH Hours	CLERICAL Hours	TOTAL HOURS
Design Services								
Field Investigation	(1 mtg)				6			6
Design coordination meetings	(1 mtgs)				2			2
Electrical symbols, notes and Scope of Work	(1 dwgs)				1	3		4
Electrical Layout Plan Demolition	(1 dwgs)				2	4		6
Electrical Layout Plan New work	(1 dwgs)			1	6	8		15
Electrical Single Line Diagram Demolition	(1 dwgs)			1	3	4		8
Electrical Single Line Diagram New Work	(1 dwgs)			1	4	6		11
Electrical Details	(1 dwgs)			1	4	6		11
SCADA Details and Diagrams	(1 dwgs)			1	4	6		11
Mechanical Symbols, Notes, and Schedule	(1 dwgs)			2	2	4		8
Mechanical Ventilation Layout Plan	(1 dwgs)			2	4	8		14
Mechanical Details	(1 dwgs)			1	2	4		7
Fuel Piping Details	(1 dwgs)			2	2	6		10
MPE Technical Specifications					12		4	16
MPE Cost Estimate					5			5
Submittal Prep & Production (65%, Final, Bid)						10		10
QA/QC review, stamp and seal			4					4
Design/Review Meetings	(1 mtgs)				6			6
Bid support (addendums, rfi, recommendations)					4			4
SUBTOTALS		0	4	12	69	69	4	158
Construction Support Services								
Construction Meeting & Field Visit	(2 mtg)				16			16
Construction Meeting & Field Visit Generator Test	(1 mtg)		6		8			14
Submittal Review (shop drawings)					4			4
Contractor RFI, RFC				2	4	2		8
Record Drawings	(12 dwgs)				2	12		14
SUBTOTALS		0	6	2	34	14	0	56

1. Annunciators shall be networked directly to the generator set control
2. Local Annunciator shall include a lamp test pushbutton, alarm horn and alarm acknowledge pushbutton
3. Provide the following individual light indications for protection and diagnostics
    a. Overcrank
    b. Low coolant temperature
    c. High coolant temperature warning
    d. High coolant temperature shutdown
    e. Low oil pressure warning
    f. Low oil pressure shutdown
    g. Overspeed
    h. Low coolant level
    i. EPS supplying load
    j. Control switch not in auto
    k. High battery voltage
    l. Low battery voltage
    m. Battery charger AC failure
    n. Emergency stop
    o. Spare
    p. Spare

2.5 Cooling System

The generator set shall be equipped with a remote mounted, electric motor driven radiator with blower fan and all accessories. The cooling system shall be sized to operate at full load conditions and 110 F* ambient air. The radiator shall be a vertical mounted, low sound level unit, Rocore SVB33-8-361/642-20C or equivalent. The cooling system shall include a heat exchanger for turbo charger cooling in order to meet EPA air quality criteria. The heat exchanger shall be installed on the generator as a complete integral part of the factory generator construction. Heat exchanger shall be a Rocore CAC, shell and tube unit or equivalent. Provide a circulation pump between the heat exchanger and the radiator as required for proper performance. The generator set supplier is responsible for providing a properly sized cooling system based on the engine performance characteristics, the elevation of the installation, the ambient temperatures for the Tahoe Basin and the local emission standards. Radiator components shall be turned over to the installation contractor for installation by them according to the manufacturer's installation guidelines.

2.6 Fuel System

2.6.1 Fuel System

The fuel system shall be integral with the engine. In addition to the standard fuel filters provided by the engine manufacturer, there shall also be installed a primary fuel filter/water separator in the fuel inlet line to the engine. All fuel piping shall be black iron or flexible fuel hose rated for this service. No galvanized piping will be permitted. Flexible fuel lines shall be minimally rated for 300 degrees F and 100 psi. Furnish generator set with a Pryco Py-75-DW or equivalent with two supply line inputs, one return pump and with SCADA monitoring contacts.

2.7 Exhaust System (Indoor Installations Only)

2.7.1 Silencer

A critical/residential grade silencer, companion flanges, and flexible stainless steel exhaust fitting properly sized shall be furnished and installed according to the manufacturer's recommendation. Mounting shall be provided by the installation contractor. The silencer shall be remote mounted on the roof and shall be furnished with mounting accessories. The silencer shall be mounted so that its

v. SCADA Considerations

Stantec understands that the District's on-call electrical engineer is Boyle Engineering. Stantec will coordinate with Boyle and the District for pump station alternative considerations pertaining to Supervisory Control and Data Acquisition (SCADA) aspects of pump station operation. It is anticipated that to address SCADA considerations, the scope of work will include analyzing the existing SCADA aspect of main pump station operations, interviewing operations staff to identify their wants and needs with respect to SCADA, and developing SCADA alternatives and the associated costs and decision making regarding the SCADA aspect of main pump station improvements.

vi. Ancillary Equipment Considerations

Ancillary pump station considerations include auxiliary power supply, discharge flow metering, suction and discharge pressure monitoring, control valuing, and surge anticipation/relief. These factors will be included in the ancillary equipment considerations for pump station alternatives development.

vii. Force Main Considerations

The size of the force main for each of the four main pump stations will be a consideration in pump station alternatives development. The size of the force main will be based on the results of Task 2 and Task 7. Additionally, potential future modifications to the District's main pump station force mains will be considered in developing pump station alternatives.

viii. Operational Rules and Device Setting Considerations

The operational rules governing pump station operations and setting for key devices such as major valves will be considered for each pump station alternative developed.

In subtask 6b Stantec will develop up to three alternatives for each of the four main pump stations based on the eight considerations discussed above. Capital and operation and maintenance cost estimates will be prepared for each of the alternatives for use in subtask 6c.

c. Main Pump Station Improvements Alternatives Ranking

Upon completion of alternatives development (subtask 6b) a progress meeting will be held to provide an overview of the alternatives and establish the criteria to be used in evaluating the alternatives. The alternatives developed will be evaluated using decision making software to identify the best alternative. Evaluation criteria will include, at a minimum, the following considerations:

i. Evaluation Criteria
   1. Capital Cost
   2. Operating and Maintenance Cost
   3. Property Considerations
   4. Operation and Maintenance Accessibility

CASHMAN CAT

EXHIBIT "I"
INVOICE

1.800.937.2326
www.cashmanequipment.com

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INVOICE NUMBER	INVOICE DATE	CUSTOMER #
INWO0610749	03-08-11	069024
AMOUNT		
CONT'D		

***** To ensure proper credit, please detach this portion and return with remittance. *****

INVOICE NUMBER	INVOICE DATE	CUSTOMER #	CUSTOMER ORDER #	STORE	DIV.	SALESMAN	TERMS	PAGE
INWO0610749	03-08-11	069024	GENERATOR FAILUER	78	E		2	1

PSO/WO NUMBER	DOC. DATE	PC	LC	MC	SHIP VIA	INV. SEQ. NUMBER
RE13180	12-20-10	10	10	10		2983687

MAKE	MODEL	SERIAL NUMBER	EQUIPMENT NUMBER	METER READING	MACH. I.D. NUMBER
AA	C18	0EKW00373		10.0	07-917

QUANTITY	ITEM	N/R	DESCRIPTION	UNIT PRICE	EXTENSION
			CONTACT: NORM 530-546-4219 CALL OUT SERVICE - T/S GENERATOR		
			TROUBLE SHOOT GENERATOR SET		
			T/S NO FUEL		
			CUSTOMER COMPLAINT: CALLED OUT BY NORM, GENERATOR DAY TANK IS EMPTY CAUSE OF FAILURE: RESULTANT DAMAGE: REPAIR PROCESS COMMENTS: ONSITE I TALKED WITH MIKE FROM NORTH TAHOE PUD. MIKE EXPLAINED TO ME THAT WHEN HE CAME INTO THE ROOM AND FOUND THE DAY TANK WAS EMPTY HE CHECKED THE BREAKER PANEL ON THE WALL AND FOUND THE 20 AMP BREAKER TO THE DAY IS TRIPPED.		
			TOTAL LABOR SEG. 01		218.00 *
			SEGMENT 01 TOTAL		218.00 T
			PRIME FUEL SYSTEM		
			CUSTOMER COMPLAINT: CAUSE OF FAILURE:		

PLEASE PAY THIS AMOUNT	CONT'D
AMOUNT CREDITED	

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PO #41528 2ND QTR
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INWO0610749	03-08-11	069024
AMOUNT		
CONT'D		

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INVOICE NUMBER	INVOICE DATE	CUSTOMER #	CUSTOMER ORDER #	STORE	DIV.	SALESMAN	TERMS	PAGE
INWO0610749	03-08-11	069024	GENERATOR FAILUER	78	E		2	2

PSO/WO NUMBER	DOC. DATE	PC	LC	MC	SHIP VIA	INV. SEQ. NUMBER
RE13180	12-20-10	10	10	10		2983687

MAKE	MODEL	SERIAL NUMBER	EQUIPMENT NUMBER	METER READING	MACH. I.D. NUMBER
AA	C18	0EKW00373		10.0	07-917

QUANTITY	ITEM	N/R	DESCRIPTION	UNIT PRICE	EXTENSION
			RESULTANT DAMAGE: REPAIR PROCESS COMMENTS: I OPENED THE BREAKER TO THE DAY TANK CONNECTED A PIG TAIL TO THE CONTROLLER AND PLUGGED IT INTO A SMALL PORTABLE GENERATOR. THE GENERATOR WAS NOT LARGE ENOUGH TO POWER THE MOTOR. MIKE RAN A EXTENSION CORD OUT TO THE LARGE PORTABLE GENERATOR. I MANUALLY TURNED ONE PUMP ON. ONCE THE TANK WAS AT 1/2 I PRIMED THE C18 GEN SET. STARTED THE C18 GENERATOR. THE GEN SET POWERED THE BUILDING. I UNPLUGGED THE CORD AND REMOVED THE PIGTAIL. CLOSED THE 20 AMP BREAKER AND BOTH SUPPLY PUMPS TURNED ON FOR THE DAY TANK. WITH BOTH PUMPS RUNNING IT WAS PULLING 13 AMPS. THE TANK FILLED UP AND ONE PUMP WOULD TURN ON TO KEEP THE TANK TOPPED OFF. THE PUMPS ALTERNATE EACH TIME. NO PROBLEMS FOUND WITH THE DAY TANK AT THIS TIME.		
			TOTAL LABOR SEG. 02		109.00 *
			SEGMENT 02 TOTAL		109.00 T
			TRAVEL TO/FROM		
			TRAVEL TO/FROM NORTH TAHOE PUD		

PLEASE PAY THIS AMOUNT	CONT'D
AMOUNT CREDITED	

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Computer Protection Systems — WHEN FAILURE IS NOT AN OPTION — CPS NEVADA, LLC

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EXHIBIT " J"

Product Selection

Additional Product Selection information begins on Page 9-164.

Table 9-88. Single-Phase — Mini-Power Centers

kVA	Style Number	Full Cap. Taps FCBN	Wt. Lbs.	Wt. kg	Frame	Wiring Diagram Number	Main Circuit Breaker		Feeder Breakers ②③ Max. Number		Max. Amp
							Primary ①	Secondary	1-Pole	2-Pole	
480 Volts to 120/240 Volts											
3	P48G11S03P	2@-5%	105	47	FR283	97A3K	EHD2015	BR215	8	4	12
5	P48G11S05P	2@-5%	110	50	FR284	110A5K	EHD2020	BR225	12	6	20
7.5	P48G11S07P	2@-5%	125	56	FR284	109A7K	EHD2030	BR230	12	6	30
10	P48G11S10P	2@-5%	180	82	FR285	108A10K	EHD2040	BR250	12	6	40
15	P48G11S15P	2@-5%	215	98	FR286	107A15K	EHD2060	BR270	20	10	60
25	P48G11S25P	2@-5%	373	169	FR287	106A25K	EHD2100	BR2125	26	13	100
600 Volts to 120/240 Volts											
5	P60G11S05P	2@-5%	110	50	FR284	110B5K	FDB2015	BR225	12	6	20
7.5	P60G11S07P	2@-5%	125	56	FR284	10987K	FDB2030	BR230	12	6	30
10	P60G11S10P	2@-5%	180	82	FR285	108B10K	FDB2040	BR250	12	6	40
15	P60G11S15P	2@-5%	215	98	FR286	107B15K	FDB2060	BR270	20	10	60
25	P60G11S25P	2@-5%	373	169	FR287	106B25K	FDB2100	BR2125	26	13	100

① Primary breakers with higher interrupting capacity available. For HFD breaker, add suffix "H." For FD breaker, add suffix "F." For FDC breaker, add suffix "C." Main breakers are fixed only.
② Combinations can be selected.
③ Feeder breakers not included. Use Eaton's Type BR.

Table 9-89. Three-Phase — Mini-Power Centers

kVA	Style Number	Full Cap. Taps FCBN	Wt. Lbs.	Wt. kg	Frame	Wiring Diagram Number	Main Circuit Breaker		Feeder Breakers ②③ Max. Number			Max. Amp
							Primary ①	Secondary	1-Pole	2-Pole	3-Pole	
480 Δ Volts to 208Y/120 Volts												
15	P48G28T15P	2@-5%	320	145	FR289A	105A15K	EHD3040	BR350	18	9	6	40
22.5	P48G28T21P	2@-5%	565	256	FR290A	103A21K	EHD3070	BR370	18	9	6	60
30	P48G28T30P	2@-5%	635	288	FR291A	104A30K	EHD3090	BR3100	24	12	8	80
600 Δ Volts to 208Y/120 Volts												
15	P60G28T15P	2@-5%	320	145	FR289A	105D15K	FDB3030	BR350	18	9	6	40
22.5	P60G28T21P	2@-5%	565	256	FR290A	103B21K	FDB3050	BR370	18	9	6	60
30	P60G28T30P	2@-5%	635	288	FR291A	104B30K	FDB3070	BR3100	24	12	8	80

① Primary breakers with higher interrupting capacity available. For HFD breaker, add suffix "H." For FD breaker, add suffix "F." For FDC breaker, add suffix "C." Main breakers are fixed only.
② Combinations can be selected.
③ Feeder breakers not included. Use Eaton's Type BR.

Note: For 304 Grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix, i.e., P48G11S03SS, or add "SS" suffix before the addition of "CUB."

For other ratings or styles not shown, or for special enclosure types (including stainless steel) refer to Eaton.

Discount Symbol DT-1

EXHIBIT "K"

North Tahoe Public Utility District
Main Sewer Pump Station Master Plan

An engineering analysis of the District's four main sewer pump stations with recommendations to cost-effectively implement the District's mission of protecting the community's public health and water quality in Lake Tahoe.

July 2009

Project No. 180101130

Prepared for:
North Tahoe Public Utility District
875 National Avenue
P.O. Box 139
Tahoe Vista, California 96148

Prepared by:
Stantec Consulting Inc.
6980 Sierra Center Parkway
Suite 100
Reno, Nevada 89511

STANTEC: 1181

Section 4 – SCADA System Assessment

The existing Supervisory Control and Data Acquisition (SCADA) system was analyzed for its ability to accommodate the recommended alternatives by examining its major components: data acquisition, user interface, alarming, historization, remote access, supervisory control and input/output capacity. The Following is a summary of each item as it relates to the existing and future system:

4.1 Data Acquisition

- Data throughput is sufficient for the points being read and the proposed additions for pump control and flow monitoring.
- Reliability issues with the radio links have been resolved by reducing throughput.
- Future data that should be gathered includes pump flow rate and speed for each new variable frequency drive (VFD), along with emergency generator status.

4.2 User Interface

The existing Wonderware InTouch user interface is sufficient for current and future operation. However, the District is planning to upgrade the Wonderware InTouch software in the relatively near future in order to improve redundancy and expandability, and to change from raster to vector image displays.

4.3 Alarming

The existing SCADAlarm software system is sufficient for current and future operation.

4.4 Historization

The existing SQL database with an Active Factory interface is sufficient for current and future operation.

4.5 Remote Access

Remote access is accomplished via laptop computers connected to the network. The connections are limited to 9600 bandwidth and, as a result, the data acquisition and screen refresh is extremely slow. System bandwidth should be increased to improve remote access capability.

4.6 Supervisory Control

The existing system does not currently provide supervisory control. Future enhancements should include:

- Ability to manually start and stop pumps or swap lead/lag status remotely by overriding the Programmable Logic Controller (PLC).
- Remote set point adjustment of well levels and VFD speeds.

4.7 Input/Output (I/O) Capability

At a minimum, each VFD will require the following I/O from the PLC:

- Speed Command – Analog Output
- Speed Feedback – Analog Input
- Start/Stop – Discrete Output
- Summary Alarm – Discrete Input
- Pump Running Status (Existing)

The existing PLC I/O at each pump station has sufficient spare capacity for all but the analog outputs. A SCADAPack model 5302 analog output module will be required at each station. Interposing relays may have to be installed for start/stop control depending on the VFD requirements.

Most VFD vendors also provide Ethernet connectivity that could be used by the SCADA system for monitoring and control. A local interface should be available for control in the event that the network connection is lost. A significant amount of data can be monitored via an Ethernet link. For example:

- Volts, Watts and Volt-Amperes (Vars) per Phase
- Power Consumption
- Horsepower
- Temperature
- Speed
- Run Time Hours
- Warnings, Alarms and Faults

4.8 Flow Measurement

The most cost effective method of flow measurement is via a clamp on ultrasonic Doppler flowmeter (see *Appendix D* for a detailed explanation of the technology). An analog signal