November 4, 2014 HDL File: 14-025

Alan Fetters, Project Manager - Rural Energy Group
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, Alaska 99503

RE: Perryville Rural Power System Upgrade
Site Investigation Summary Report

Dear Mr. Fetters:

The purpose of this letter is to summarize the findings of a site investigation performed for the above referenced project on October 7, 2014.

CIVIL ENGINEERING
GEOTECHNICAL ENGINEERING
TRANSPORTATION ENGINEERING
ENVIRONMENTAL SERVICES
PLANNING
SURVEYING
CONSTRUCTION ADMINISTRATION
MATERIAL TESTING

Introduction:

Alaska Energy Authority (AEA) has contracted Hattenburg Dilley & Linnell (HDL) to evaluate options for a rural power systems upgrade project in Perryville, Alaska for the Native Village of Perryville (NVP) power generation plant. HDL is tasked with developing a Concept Design Report (CDR) accompanied with 35% conceptual design plans and recommended project alternatives for power plant site options, building layout, recovered heat potential, and renewable energy integration. To complete this objective HDL has teamed with Gray Stassel Engineering, Inc. (GSE) for power plant mechanical and electrical design and EEE, LLC for power distribution systems assessment and design. This site investigation summary report documents the existing power generation infrastructure and three site options.

Objectives:

The objectives of the site visit and summary report included the following:

- Meet with the community and stakeholders to outline the project and document suggestions and concerns regarding proposed locations of the new power plant.
- Evaluate the existing NVP power plant in Perryville.
- Identify components of the existing NVP Power Plant that are reusable and code compliant.
- Inspect the existing recovered heat distribution to the school.
- Inspect wind farm and its current integration with the diesel power generation system.
- Determine the condition of the existing intermediate fuel tanks and piping system.
- Assess power distribution infrastructure.
- Identify site options for the proposed new power plant.
- Describe proposed upgrades.

Site Visit:

On October 7, 2014, nine team members traveled to Perryville via Alaska Air Transit charter flight to evaluate the existing power generation infrastructure, and review proposed project sites. The team included: Alan Fetters (AEA), Mark Swenson (HDL), Mike Maryjanowski (HDL), Bill Price (GSE), Greg

Figure 1: Perryville

Errico (EEE), Shannon Allex (AEA), Jed Drolet (AEA), Chris Gobah (AEA), and Connie Fredenberg (Marsh Creek, LLC). Jed, Chris, and Connie made the trip to assist village administrators with completing the necessary reports to gain re-admittance into the Power Cost Equalization (PCE) Aid Program administered by the State of Alaska. At the time of this visit, the requirements to maintain enrollment in the program had not been met for the past two years.

Upon arrival, the weather in Perryville was moderate with overcast skies, a variable sea breeze, and an average temperature of 43°F. The group arrived at the NVP building at 10:30 AM to meet the President of NVP, Gerald Kosbruk; NVP Power Plant Operator, Alec Phillips; NVP Administrator, DanaLee Phillips; and other village representatives and stakeholders. The meeting addressed the goals of Perryville's energy infrastructure upgrades and provided a forum for community members to provide feedback regarding proposed upgrades and site locations. Please see appended meeting minutes. Greg Errico (EEE) and Alec Phillips broke from the group around 11:00 AM to investigate the power distribution systems. Following the meeting, the group started their investigations of local infrastructure and three proposed site inspections, and reported in detail under subsequent sections listed below.

At approximately 1:30 PM the team regrouped at the city building for an informal lunch. Following lunch, we met with Lake and Peninsula School District (LPSD) representatives including Tim McDermott, Maintenance Director, and Lindsey Moore, Head Teacher and school Principal. Tim discussed the school's interest in abandoning their bulk fuel tank farm and current ongoing energy efficiency improvements. Gerald expressed concern over a possible "40% drop in revenue from power generation sales" with the school's planned efficiency improvements. Alan met with Lindsey Moore to discuss having the school host a monthly video teleconference with the design team in Anchorage, with the intent of discussing progress and allowing for community feedback. Lindsey indicated the school has two Smart boards through which community members can correspond via Skype. The team departed Perryville at 3:15 PM via Alaska Air Transit charter, returning to Anchorage. Greg Errico (EEE) remained overnight to complete his assessment of the power distribution systems.

The following observations were noted concerning the existing power infrastructure in Perryville:

Perryville Power Plant Facility:

Power is provided to the community by the Native Village of Perryville owned and operated diesel power plant with wind power generation and recovered heat components. The community has an isolated electrical power grid with no outside interties. The below-grade distribution system is also owned and operated by the Native Village of Perryville.

The power plant is located centrally along First Avenue, and consists of a power plant building, shop, storage trailers, two 1,000 gallon intermediate fuel tanks, recovered heat piping, wind farm tie-in and metering, and step up transformers. A photo of the facility is shown in Figure 2 below.

NVP's existing power plant consists of a pre-fabricated steel building with metal siding constructed on a timber foundation. The power plant building is approximately 40'x20' for roughly 800 square feet of usable space. Access to the building is provided directly from First Avenue.

The southern side of the building has an overhead door for maintenance access allowing for equipment and generator repair/replacement. A single man door also provides access to the northwest corner of the building. At the time of the visit the overhead door and radiator ventilation louvers were all open. There were no mitigation measures observed for the effects of sound and exhaust from power generation.

Figure 2: NVP Power Plant, looking south. (Photo provided by AEA)

The existing power plant was renovated in 1992 with new generators and new switchgear. The powerhouse consists of three John Deere engine-generators, further described in Table 1 below. Generators are set on the floor, which consists of wooden planks that are open to the ground below. During the site visit, the '6076AF' genset was operating and others were reported to be functional. Engine hours for all three units are unknown, due to known replacement of active hour meters as well as lack of supporting maintenance records. Regardless, all three engine generators appear to be at or near the end of their useful life. The power plant has a marginally functional heat recovery system, discussed in further detail below.

Table 1: Diesel engine-generator general information

Generator Make	Model	Serial Number	RPMs	Hours	Generator Capacity (kW)
John Deere	6076AF-00	RG6076A18619	1800	Unknown	175
John Deere	6081AF-001	RG6081A00360	1800	Unknown	170
John Deere	6068T	SE6068T355932	1800	Unknown	128

Engine cooling is accomplished through skid mounted radiators and a 4" coolant piping manifold. The coolant circulates through a heat exchanger located along the north wall of the power plant. Each engine's coolant discharge is connected to the manifold through a thermostatic (AMOT) valve which will allow coolant to bypass the manifold and flow to the radiator as required.

The electric power demand has been reported to average 50kW. Peaks have been reported as high as 80kW with lows around 25kW. For FY 2013 the total annual power generation was 511,004 kWh, (37,243 kWh from wind) yielding an average community power demand of 54 kW (4 kW from wind).

It is anticipated that community loads will remain constant or grow only slightly over the next several years. The community of Perryville is interested in expanding their wind generation capability. The Perryville School is currently installing efficiency upgrades which are projected to reduce the school's electric consumption. Additional research will be conducted into potential community peak load and generation requirements and will be included in the CDR.

Heat Recovery:

The existing diesel generation heat recovery system was installed in 1992 and renovated in 2001. The system provides heat to the Perryville School. The 295MBH heat exchanger, located in the power plant, is connected as a secondary loop directly to the school heating system. A portion of the system is shown in Figure 3. Water is circulated between the power plant and the school boiler by a Grundfos UPS 50/80F pump through a 3" buried arctic pipe. The school is heated by a central boiler system which was updated in 2006. There is no monitoring of the heat transferred to the school. Tim McDermott has reported that heat transfer has little measureable effect on the school's heating needs. During the site visit coolant temperatures were measured using an infrared temperature gun as most of the thermometers were visibly inaccurate. Generator #3 was supplying 135°F fluid; temperatures at the school were measured to be 125°F. It was reported that 130-135°F at the school is typical, though it can be as high as 160°F depending on the generator in use.

In 2012 Central Alaska Engineering Company calculated the annual fuel use of the school to be 11,360 gallons. Fuel purchases reported by LPSD show an actual fuel usage averaging near 10,000 gallons annually. Therefore the school is estimated to have a heat load of 11,000 gallons of fuel annually for space heat and hot water, as a portion of the load is carried by the existing heat recovery system.

Figure 3: Heat loop, as seen from the school's Mechanical Building

Wind & Solar Power Generation:

Perryville is equipped with 10 Skystream 3.7 turbines rated at 2.1 kW at an 11 m/s wind speed. For FY2013 the total annual power generation was 37,243 kWh. The turbines have no individual voltage regulation or load shedding capability. It was reported that the voltage regulators located on the diesel generators are being damaged when the wind turbine production approaches the overall community electric load; which typically happens during the summer months.

The existing wind turbines are connected into only two phases of the three phase power. This causes severe phase imbalance and system instability during periods of high wind output. In addition, the electrical connections and cabling at the wind farm do not appear to be code compliant. The NVP Building (Figure 4) is equipped with solar electric panels. When the solar production exceeds demand, the excess electricity is exported to the Perryville distribution. For FY2013 the total annual power generation exported was 561 kWh.

Figure 4: Community building renewable energy systems include solar and thermal energy utilization

NVP Fuel Storage Facilities:

NVP owns and operates a new bulk fuel tank farm (Figure 5) to support the existing power plant as well as the local community, and is located roughly one mile southwest of town past the airport. The existing tank farm was installed new in 2013.

The tank farm consists of a fenced gravel pad containing five single wall horizontal tanks, three 28,000-gallon diesel tanks, one 15,000-gallon gasoline tank and one 3,000 gallon ULSD tank. The tanks are within an HDPE-type lined earthen containment dike covered with a layer of rounded, small diameter, free draining gravel. Adjacent to the bulk storage tanks is a new three product fleet dispensing station with secondary truck containment. Fuel is transferred from the bulk tanks to haul vehicles and equipment via hose reels. Security for the containment area is provided by chain link fencing with locking man and vehicle gates. In April of this year NVP accepted its first annual fuel delivery of over 60,000 gallons of fuel at the new facility. According to Gerald Kosbruk, this is enough fuel to last through the winter.

Figure 5: NVP Bulk Fuel Tank Farm, looking southwest

Fuel is delivered from the tank farm to the power plant's intermediate tanks via a truck mounted tank, roughly two or three times per month. Generator fuel storage consists of 2 external 1000 gallon tanks located approximately 20' west of the power plant. These tanks are supported on timbers approximately 3' above grade, and do not have secondary containment. Fuel is piped into the power plant below the timber floor through threaded piping, also without any secondary containment. The power plant 70 gallon day tank is located in the south east corner and does not have secondary containment. Used oil is stored in drums.

Adjacent to the community power house is the community gasoline retail dispensing station. This station consists of a retail dispenser and a new fire-protected 3,000 gallon dispensing tank.

In addition to the NVP bulk fuel tank farm and intermediate tanks, the school maintains a bulk fuel tank farm and marine header consisting of three 7,800 gallon tanks of heating fuel, one 300 gallon

gasoline tank, and a 300 gallon skid mounted auxiliary tank. LPSD has expressed interest in decommissioning these tanks and purchasing fuel from the community.

Power Distribution Infrastructure:

On October 7th and 8th, 2014, Greg Errico conducted a review of the power distribution system in Perryville. The following are his remarks discussing his initial assessment:

The primary distribution system is an underground 7,200V/12,470V grounded WYE system with both three-phase and single-phase circuits. Some single-phase transformers are sourced from three-phase circuits by installation in one leg of the three-phase circuits. The 150 kVA step-up transformer is located close to the current power plant and is sourced on the secondary side by double runs of 500 or 600 MCM copper cables.

Conductors:

The current embedment of the power distribution cabling has not been confirmed and no sub-surface investigation was performed. The primary distribution conductors are mostly #2 aluminum non-jacketed 175mil cables; that appear to be the original primary distribution cabling system. Other primary cable types exist within the system, such as:

- #2 aluminum jacketed 220 mil cable is utilized for a newer single-phase circuit to the furthest transformer to the north,
- 1/0 aluminum jacketed 220 mil cables have been installed for the three-phase circuit to the new transformer that serves the recently constructed health clinic and community offices
- 1/0 aluminum jacketed 220 mil cable was installed for the transformer at the airport; and the
- Newest housing (ANCSA 14(C), B2 & B3) is tapped off the water treatment transformer; with #2 aluminum jacketed 220 mil cables.

The primary cables appear to be performing well, with no cable failures identified by the power plant operator. However, where inset transformers were spliced into existing circuits, some of the splices were installed without sufficient installation radii, due to limited space in the transformer compartment. Some of these splices are cracked and will likely fail in the near term.

Transformers:

Transformers surveyed are all pad-mount, WYE-WYE, dead-front primary transformers; and most are dead-front secondary. All of the transformers appear to be of mild steel construction, and all have some degree of corrosion (rust). Although none of the transformers were noted to be leaking from corrosion initiated tank failure, about half of the transformers can either: not be locked or not securely bolted due to corrosion of the closure/locking means originally provided. Most single phase units are installed on plastic flat pads; some single-phase units are set directly on the ground; and a few single-phase units are on box pads. The three-phase transformers at the school and health clinic/community offices are on fiberglass box pads; and the step-up transformer at the power plant (Figure 6) is supported by deteriorating timbers. Over current protection is provided with internal fusing of the individual transformers.

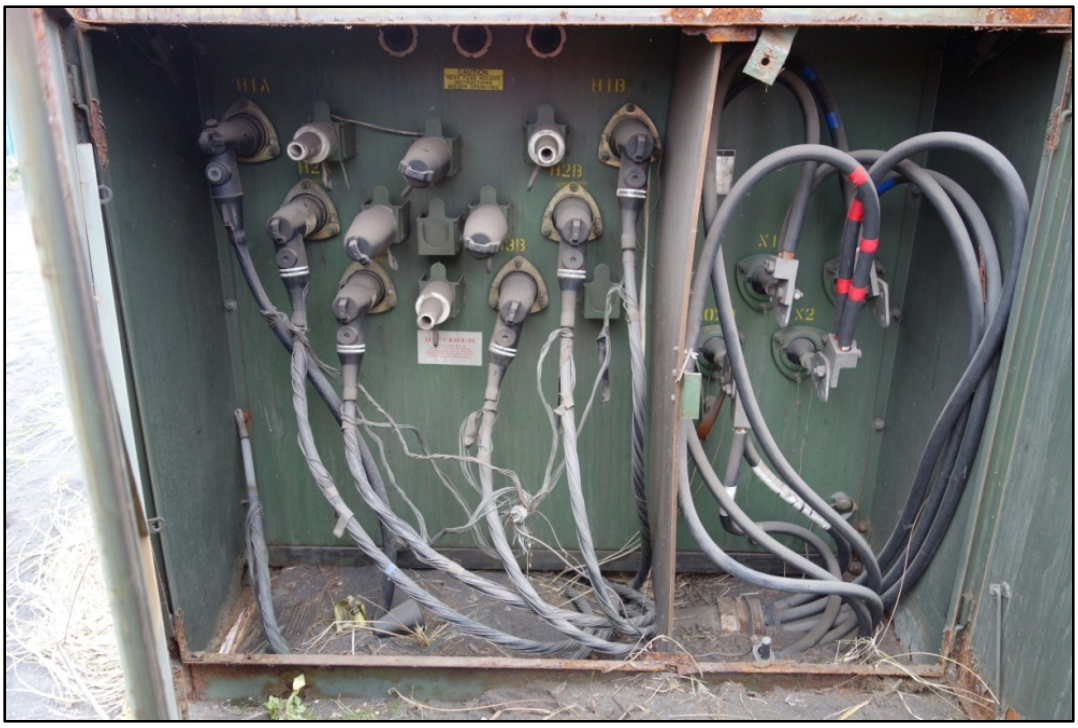

Figure 6: Inside step-up transformer junction box

All single phase transformers are 120/240V secondary; most are 25kVA and 15kVA with one 50kVA in the vicinity of the school, and a 37.5kVA at the airport. Almost all are oversized. The majority of the single-phase transformers (the 25 kVA and 15kVA's) are Cooper Ranch Runner transformers. Single-phase transformers by other manufacturers and of other Cooper models are also installed in the system.

There are only three (3) three-phase transformers in the system. The plant step-up transformer is a 150kVA 120/208V secondary. The school transformer is a 45kVA 120/208V secondary Cooper transformer. The NVP building/health clinic transformer is a 75kVA 120/208V secondary T&R Supply re-manufactured transformer.

Junction Boxes:

Both single-phase and three-phase junction boxes are installed on the system. Of the four (4) three-phase primary junction enclosures, three are mild steel junction boxes installed, at grade, on either flat pads or timbers. These enclosures are significantly rusted, with holes that have been patched with sheet metal. The fourth three-phase junction enclosure is an at-grade/submerged enclosure found to be in good repair.

Three single-phase primary junction enclosures were identified in the field. One is a newer appearing, mild steel junction box installed at grade on either a flat pad or timbers. A primary cable is looped up into the enclosure, but is not terminated, and no junctions are installed. The other two are fiberglass enclosures installed on the airport circuit, and are in good condition.

Pedestals:

Secondary pedestals are utilized throughout the village. Most are two-piece mild steel type in good operating condition; except where they have been damaged. These pedestals have means for locking, but a means to secure them is not available. Some fiberglass pedestals have been installed, and where not damaged, are in good condition.

Service Entrances:

Service entrance review and remediation is outside the scope of this review, which does not extend beyond the service laterals. However, identifying the meter locations and trying to elucidate the source distribution equipment for the services, necessitates observation of the services (where accessible). Several concerns were observed, with regard to electric service facilities and are noted below. These observations are not to be construed as a review of the consumer owned electrical facilities beyond the metering point. Most of the service entrances, in the older part of the Village, can be found either inside arctic entries or within the home; and some are located underneath the buildings. Many of the service entrance enclosures do not have mechanical protection for the consumer's service entrance cabling. Some of the service lateral risers were found missing, broken, separated, or not long enough to provide mechanical protection (for the service laterals). Many of the service entrance facilities are deteriorating/rusting. Corrections or improvements, through repair or replacement to some of the service laterals, will require coordination with the corresponding consumer, as the consumer typically owns their service entrance equipment.

Probable source transformers were identified for nearly all of the meters located, with exception of buildings within the immediate vicinity of the power plant; where no pad mounted single-phase distribution transformer was found. The power plant operator related a story, of a dig-in to a secondary circuit to the east of the power plant, which caused an extended outage to GCI (one of the buildings in this area). The power was re-established by closing one of the breakers inside the power plant; suggesting that these buildings may be sourced directly from the power plant. The meters in this area were not identified as network meters. If these buildings are served with 120/208 power, the services would operate with little or no negative consequences, but the metering would not be as accurate as desired without appropriate meters.

Extra Equipment Available On Site:

At the power plant there are 12 or 13 spare single-phase pad mount transformers. One is a Ranch Runner type transformer, assumed to be retired and inoperative. Of the others, one was confirmed to be a 15 kVA transformer; while the remaining units are assumed to be 15kVA or 25kVA and are newer or have never been installed (some are still on their shipping pallets). However, these units are beginning to rust at welds and other wear points.

Equipment Not Field Verified:

Some pad-mounted equipment, thought to exist, based on information from the power plant operator or from community mapping, were not found during the field investigation. For instance, the source transformer for the isolated home east of the post office will need to be determined.

Photo documentation and information on such items are being requested from the power plant operator.

Future System Expansion:

Distribution line extensions are planned for the new housing on Blocks 2 and 3 ANCSA 14(C), and for a line to the Tsunami Center north (uphill) of the village. Future line extensions are outside the scope of this project.

Coordination with New Power Plant:

The location of the replacement power plant will affect the necessary distribution system improvements. These improvements will need to be coordinated with other upgrades to the distribution system.

Optional Sites for New Power Plant:

Three site options were investigated during the site visit for the construction of a new power plant in Perryville.

Option 1: Existing Power Plant Site

The team investigated the option of locating a new facility adjacent to the existing power plant, on the lot (Block 6, Lot 10). There appears to be sufficient room to construct the new power plant and intermediate tank on the existing site. The area currently contains one connex container and is used for heavy equipment parking (Figure 7). The site is reasonably level with grass vegetation with no observed wetlands. HDL conducted a title search on this property prior to the site visit. The property is owned by the Native Village of Perryville. No liens, encumbrances, or easements were noted on this property other than Right-of-Way AA-54621; which grants ROW for the power house and bulk fuel storage sites as written in the US Patent recorded in Book 25, at Page 726, Records of the Aleutian Islands Recording District, Third Judicial District, State of Alaska and also attaches to Lot 11 of Block 6 and Lots 3 &4 of Block 5.

Figure 7: Site Option 1: Existing power plant site; looking southwest

Developing this site would allow for easy connection to the existing power distribution grid and connection/utilization of recovered heat at the school.

The LPSD owns and operates a marine header that runs from the beach to their bulk fuel tank farm behind the school's mechanical building. This header is assumed to run along the eastern side of Block 6, lots 10 and 5, presumably below the existing trail. The exact location of this header pipe is unknown, and will need to be determined in final design.

Option 2: Block 6, Lot 5 - North of Existing Power Plant:

A second site was investigated immediately just north of the existing power plant lot (Block 6, Lot 10 of the Perryville Subdivision), (Figure 8). The title report for this lot indicates the parcel is owned by the Native Village of Perryville with no liens, encumbrances, or easements against the property. The lot is closer to the school than the existing plant, is undeveloped, and is in close proximity to existing power distribution infrastructure. However, community members stated that this lot had been used for oil and drum storage. There is a deep depression in the middle of the site with high surrounding berms that appears to have once been a containment storage area for the drums. This area would require deep fill (3 to 4 feet deep) to level the site. It is also likely that contaminated soil would be encountered during development of the site that will require mitigation and ADEC coordination. This site would also locate the new power plant closer to existing school increasing the potential for greater ambient noise levels in the school. For these reasons, this site was not preferred for new power plant construction.

Figure 8: Site Option #2: North of the existing power plant, looking south

Option 3: Corner of Fourth Ave & 'C' Street:

A third site option for power plant development was investigated approximately 500 feet northeast of the Perryville School on Block 8, Lot 1 of the Perryville Village Subdivision (Figure 9). NVP representatives encouraged us to evaluate this site because it is further from the town center and has potential for reducing noise impact on the community. This site also offers a direct line to the school through un-developed lands. The area is moderately covered with low shrubs and grasses and has a gentle slope to the northeast. The site is on the corner of Fourth Avenue (to the north)

and 'C' Street (to the east). An established trail for pedestrian and 4-wheeler traffic exists through the southern portion of the property.

Developing this site would require significant re-routing of the power distribution grid. Also, this site would require increasing the distance of the recovered heat distribution to the school mechanical building, which could reduce the quality of recovered heat provided. The truck travel distance between the proposed power plant and the existing bulk fuel tank farm would also increase. Also, NVP's shop, storage building, maintenance, and power plant facilities would no longer be co-located.

For these reasons, construction of a new power plant at this site is not recommended.

Figure 9: Site Option #3: New site at corner of Fourth and C Street

Conclusion:

Near Term Power Distribution System Recommendations:

Locked equipment (with operable means of locking), were re-locked during the site visit and need to continue to be locked securely with either pad-locks or one-time, pedestal style locks. It is essential that the doors of all pad mounted equipment be locked or otherwise secured.

Proposed Power Plant Replacement:

Due to the age and condition of the existing building as well as the total hours on the existing generators and equipment, the preliminary recommendation is that the power plant should be replaced entirely. Keeping the existing plant in operation during construction of the new plant will provide power to the community and eliminate the cost of providing temporary community power.

The new power plant will be a modular steel building constructed in Anchorage and shipped to Perryville. The proposed engines will be EPA Tier 2 or Tier 3 compliant which will significantly reduce exhaust emissions. The steel module will have sound insulated construction and the engines will be equipped with critical grade disc silencers to reduce noise. The following features are proposed for the new power plant:

- Sound insulated control room and separate generation room.
- Three engine-generator sets with either new or fully remanufactured John Deere engines. Preliminary engine selections include 2 each Model 4045AFM (110kW capacity) and 1 each Model 6090AFM (210kW capacity). The proposed engines all have a good record of reliable performance, provide very good fuel efficiency, and are equipped with marine jackets to increase heat available for the school.
- Three phase 277/480V generation.
- Programmable automatic paralleling switchgear with remote SCADA and all equipment necessary to integrate the existing wind turbines.
- New pad-mount step up transformer and community feeder connection to the existing below grade distribution system.
- Heat recovery system to serve the adjacent school.
- Water mist fire suppression system.
- New 3000 gallon double wall exterior intermediate tank and 160 gallon interior day tank. Fuel system to include automatic fuel transfer between power plant intermediate tank and the day tank. In the event LPSD and the community of Perryville agree to have the community provide fuel to the school, the intermediate tank capacity may be increased accordingly.
- A used oil blending system to allow used engine lube oil to be filtered, blended, and burned in the engines.

School Heat Recovery Upgrades:

The newly constructed power plant will be significantly quieter, have less emissions, and the ability to provide for more recovered heat to the school. Based on preliminary analysis, the new power plant with marine jacketed engines will provide in excess of 9000 gallons of the estimated 11,000 gallons of heat required at the school annually.

Wind Integration Upgrades:

To improve power quality and stability, a small (25kW max) electric boiler will be installed in the diesel power plant. The boiler will be controlled by the diesel switchgear through an SCR to perform two functions: (1) Fast response frequency correction as the wind power output varies; and (2) Load control to maintain minimum loading on the running diesel engine during periods of high wind output coinciding with low electric loads. The electric boiler will be connected to the heat recovery loop to allow excess electric power to be used for school heat.

A new weather protected three phase circuit breaker panel will be installed at the wind farm. Existing cables from the individual turbines will be routed through new conduit and connected to the breakers approximately balanced on all three phases. New three phase cable will be routed from the breaker panel to the diesel module. The wind power will connect to the diesel generation

bus through a dry pack step up transformer, circuit breaker, contactor, and meter located in the module.

Based on the above site investigation, a new power plant (Option 1 at the existing power plant site will be proposed in the CDR. Information gathered in office research, and this trip report, will allow HDL, GSE, and EEE to work with AEA and NVP to advance the conceptual design of the Perryville Rural Power System Upgrade project.

Sincerely,

HATTENBURG DILLEY & LINNELL

Michael Maryjanowski, Engineering Assistant

cc: Mark Swenson, P.E., HDL Project Manager
Bill Price, GSE Mechanical Engineer
Brian Gray, PE, GSE Principal
Greg Errico, PE, EEE Principal

Appended:
Community Meeting Minutes (3 Pages)

MEETING MINUTES

Perryville RPSU – Site Visit
HDL Job No.: 14-025

October 7, 2014

1. **Time and Location:**

10:30 AM - Perryville Community Building Conference Room

Attendance:

- Gerald Kosbruk (NVP President)
- DanaLee Phillips (VNP Administrator)
- Alec Phillips (Power Plant Operator)
- Alan Fetters (AEA)
- Mark Swenson (HDL)
- Greg Errico (EEE)
- Bill Price (GSE)
- Mike Maryjanowski (HDL)
- Jed Drolet (AEA)
- Christopher Gobah (AEA)
- Shannon Allex (AEA)
- Connie Fredenberg (Marsh Creek)

1. **Introduction & Opening discussion:**

- After introduction Alan opened the meeting and proceeded to summarize the project.

2. **Site Visit Overview:**

- Mark gave a quick synopsis of the ensuing site visit; listing facilities the design team would like to tour.
- Mark also inquired about lodging and transportation for Greg Errico as he would be staying the night.
    - Gerald responded that Greg should speak with DanaLee Phillips about lodging, transportation.

3. **Community Discussion:**

- Alan discussed the need for accurate usage data for incorporation into the preliminary design.
- Gerald discussed a known issue regarding significant line loss between power generation and power distribution systems.
- Gerald mentioned an issue experienced primarily in summer months, where wind power generation approaches the level of power demand by the village causing load balancing issues. The existing automatic voltage regulators burn out on the diesel engines when this happens.

    - Design team asked for clarification on village power demands to which Gerald and Alec both responded in turn, that power demands fluctuate between 25kVA in the summer months to around 80kVA in the winter.
    - AEA indicated that they would look into the matter while visiting the power plant.
- Alan asked for confirmation of current generator status.
    - Gerald deferred to Alec, who responded that two generators are operational; while one was still down for maintenance, but that repair parts had arrived.
- Site options were next discussed with Mark inquiring about the general status of the lot behind the power plant (Block 6, Lot 5)
    - Gerald answered that site was undeveloped, but was historically used as storage lot for used oil drums.
- Gerald asked about moving the power plant away from town center to mitigation the effects of potential noise and air pollution, from the new plant, on the community.
    - Design team asked if there was a specific location they had in mind.
        - Team indicated that a new power plant module would have fewer emissions, and silencers would be used to make the plant quieter than the existing plant.
    - Gerald indicated that the corner of First and 'C' Street (Block 8, Lot 1) would be acceptable and the design team added the site to the list of prospects to investigate.
- Bill asked what the community's plans were for future development, in regards to changes in power generation needs in the community.
    - Gerald mentioned Perryville is in the initial stages of developing a new water treatment plant to be located near the existing water storage tank.
    - Community also plans to develop a commercial dock near the tank farm.
- Alan responded to a question about new generators, indicating the project would likely incorporate new John Deere Marine diesel engine-generators.
- Gerald asked about the project's incorporation of more renewable energies to further reduce Perryville's dependence on fuel.
    - Alan responded that this project is intended to solve short term power generation issues and that further development of local renewable recourses could not begin until after the completion of a new power plant and a new REF grant application should be submitted for future alternative energy studies. The design team added that they would be looking into both wind power and recover heat systems as part of this project.
    - Gerald indicated that the new NVP Building/Clinic had several renewable

systems integrated into it, including a geothermal heat pump, solar water heater, and solar panel array.

- Gerald discussed growing concern over aging infrastructure and increasing cost of maintenance and operations as well as decreasing reliability with three outages in 2014. Gerald also mentions the need to inspect several transformers that were recently repaired.

4. Perryville's Status in PCE Program:

- Alan opened the discussion on Perryville's status in the PCE Program. Connie Fredenberg, Jed Drolet, and Chris Gobah took turns discussing various aspects of the program and the community's need to re-enter the program.
- Gerald indicated that the City's head administrator, DanaLee Phillips was back from leave and can help provide needed information.
    - Connie mentioned that the community needs to file an annual report for 2013 and submit current power generation data.
    - Alan mentioned that the community needs to be current in the PCE program to avoid project funding issues.

5. Tentative Schedule

- Gerald inquired about project's tentative schedule.
    - Alan responded that AEA has project funding but that a preliminary design and subsequent approval was needed first before a full design could be performed. Assuming a complete design was approved by the start of the legislative session in 2015, funding to build the new power plant would be appropriated. Procurement could begin in the fall of 2015 for 2016 construction.

2. Adjourned:

11:05AM