MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.

Before the Public Service Commission of North Dakota

Case No. PU-16-___

Direct Testimony
of
Alan L. Welte

Q. Please state your name and business address.

A. My name is Alan L. Welte and my business address is 400 North Fourth Street, Bismarck, North Dakota 58501.

Q. By whom are you employed and in what capacity?

A. I am the Director of Generation in the power production department of Montana-Dakota Utilities Co. (Montana-Dakota), a Division of MDU Resources Group, Inc.

Q. Please describe your duties and responsibilities with Montana-Dakota.

A. I have overall responsibility for the day-to-day operation of Montana-Dakota's electric generation facilities, represent Montana-Dakota's interests in jointly owned generation facilities operated by other companies, and I am also responsible for new generation development.

Q. Please outline your educational and professional background.

A. I hold a Bachelor's Degree in Mechanical Engineering from North Dakota State University. My work experience at Montana-Dakota includes eight years of experience as a plant engineer, twelve years of experience as a plant manager, and thirteen years of generation development and operational responsibilities in my current position which includes coal-fired, natural gas-fired, and renewable generation.

Q. Have you testified in other proceedings before regulatory bodies?

A. Yes. I have previously presented testimony before this Commission, the Public Service Commission of Montana and the Public Utilities Commission of South Dakota.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to describe the following electric generation facility projects recently installed by Montana-Dakota and provide an update of the on-line operations and costs:

- Lewis & Clark Station - RICE Project
- Lewis & Clark Station – MATS Project
- Lewis & Clark Station – Ash System Project
- Big Stone Plant – Air Quality Control System (AQCS) Project
- Coyote Station - Boiler Water Wall Project
- Heskett Station - Limestone Project

Mr. Travis Jacobson will address how each of the above projects affects the North Dakota revenue requirement in his direct testimony.

Q. What statements and exhibits are you sponsoring in this proceeding?

A. I am sponsoring Exhibit No.___(ALW-1).

Q. Please describe the Lewis & Clark Reciprocating Internal Combustion Engine (RICE) Project.

A. The Lewis & Clark RICE Project is the addition of an 18.6 MW natural-gas fired reciprocating internal combustion engine project comprised of two 9.3 MW Wartsilla 20V34SG generating units. The RICE units have very low emissions and are equipped with a Spark Ignited Lean Burn Combustion system as well as Selective Catalytic Reduction (SCR) for NOx removal and Catalytic Oxidation (CatOX) to control CO emissions. The Lewis & Clark RICE Project is a brown field project constructed on land owned by the Company and adjacent to the Lewis & Clark coal-fired electric generating facility near Sidney, Montana.

The RICE Project is interconnected into the existing Lewis & Clark 115kV substation and receives natural gas through the existing WBI Energy Transmission, Inc. (WBI Energy) pipeline serving the Lewis & Clark Station. With the development of new natural gas sources and pipelines in the Bakken Area, Montana-Dakota was able to contract with WBI Energy for firm natural gas transportation at the Lewis & Clark Station which was previously unavailable. Montana-Dakota was also able to secure favorable natural gas supply rates and fuel management services for the RICE units as provided under the existing Heskett Unit 3 agreement with Tenaska Marketing Ventures.

The layout for the Lewis & Clark RICE Project was designed for the potential expansion of two additional 9.3 MW Wartsilla 20V34SG generating units in the future. Co-locating the RICE Project at the existing Lewis & Clark Station provides many synergies and cost savings with the utilization of existing company property and facilities including land, natural gas pipeline, and electric transmission and substations. It also allows for the operation of the RICE Project with minimal employee additions. To support a combination of the RICE, MATS, and the Ash System projects Montana-Dakota has added one mechanic and is in the process of filling four operator positions.

Locating this facility near an existing facility has saved the project a considerable amount of expense as compared to siting this project at a green field location. The costs of infrastructure to purchase and develop a site, install a natural gas pipeline, install a new substation and transmission line, would be in the tens of millions of dollars. In addition, operations costs would also be hundreds of thousands of dollars per year as additional personnel would be required to operate the facility.

Q. Would you please describe the need for the Lewis & Clark RICE Project?

A. The primary need for the Lewis & Clark RICE Project was to meet a portion of the Company's growing peak load requirements demonstrated as part of the Company's 2013 IRP[1] and to assist in mitigating reliability concerns caused by rapidly increasing loads forecasted in the transmission constrained Bakken Oil Field areas of northwestern North Dakota and northeastern Montana as discussed with the Commission in the Company's public information exchange meetings and in course of the Generation Rider hearing in Docket No. PU-15-704.

[1] 2013 Montana-Dakota Utilities Co. Integrated Resource Plan. Attachment C - Supply-Side & Integration Documentation. Page 21.

Q. Please describe the reasons requiring the Lewis & Clark RICE to be a fast track project and identify the alternatives considered?

A. Montana-Dakota is transmission dependent on the WAPA and Basin Electric (IS System) in the Bakken Region for bulk power delivery facilities. Rapidly increasing rural electric cooperative (REC) forecasted loads created a possibility as early as the winter of 2015-2016 where the transmission system would not be able to serve the entire area load (including Montana-Dakota's) under peak load system intact conditions[2] and which would be even more restricted under first transmission contingency conditions. This potential lack of load serving capability created the risk of Montana-Dakota customer load curtailments for less than firm loads on the IS System (estimated at 40 MW for the winter of 2015 - 2016) and forced the Company to explore mitigation alternatives in a very short time frame in order to avoid the need to curtail 40 MW of load. These alternatives included partnership opportunities in new generation facilities, building a transmission line into the Bakken area from other MISO facilities in Beulah or Dickinson, or building generation within the Bakken area on a stand-alone basis. Montana-Dakota's chosen alternative was to use a combination of 9 MW of demand response (5 MW CPower and 4 MW Williston Water Treatment Plant), its existing 6 MW of portable generators (3 x 2 MW units), 5 MW of additional peaking generation capacity from Lewis & Clark Unit 1 using natural gas co-firing

[2] Bakken Update. July 2014. Page 13.
http://www.oasis.oati.com/WAPA/WAPAdocs/Bakken_Update_July_2014.pdf

(firm natural gas now available), and to build the Lewis & Clark RICE project scaled back from 4 units (37 MW) to 2 units (19 MW) on a fast track schedule.

Q. Please explain why other alternatives were not viable?

A. Partnering to build a jointly owned generation facility was appealing from an economy of scale perspective, however, following several meetings with another utility, it was ruled out because the potential projects were at locations where it was unlikely that Montana-Dakota could obtain transmission service from others and which could not be constructed in time to meet Montana-Dakota's critical reliability need caused by increased REC load forecasts. Building a transmission line from Beulah or Dickinson into the Bakken area was also assessed, but ruled out because the new transmission facilities could not be sited, have right of way secured and be constructed in time to meet Montana-Dakota's critical reliability need. It would also be a more costly alternative (estimated at greater than $100 million). Other larger self-build generation options at the Lewis & Clark site were ruled out because when combined with Lewis & Clark Unit 1 they would likely have exceeded the transmission system capability (90 MW) creating system impacts and requiring transmission upgrades. The result would be exposure to uncertain costs and delays in the getting generation interconnection approval.

Q. Please provide key dates demonstrating the accelerated nature of the Lewis & Clark RICE project schedule?

A. As shown in the following table, the period starting with work required to obtain the air permit to the date the units were available for emergency operation was only 19 months. This was a very aggressive timeline necessitated by the need to have the RICE units in service for the winter of 2015-2016.

Lewis & Clark RICE - Key Dates

Bison began work on air permit	May 29, 2014	↑
Engaged S&L for engineering	June 12, 2014	
Completed RICE technology evaluation	July 11, 2014	1
Executed equipment supply contract	October 10, 2014	9
Filed air permit application	November 7, 2014	
Received & evaluated GWC bids	Nov. - Dec., 2014	
Air Permit Issued	January 22, 2015	m
Executed GWC LNTP	February 19, 2015	o
Executed GWC contract	March 19, 2015	
GWC mobilized to begin construction	March 23, 2015	n
Engine & generator equipment arrival	July 3, 2015	t
Backfeed established	October 13, 2015	
First fire & bearing runs completed	December 14, 2015	h
First generator synchronization	December 15, 2015	s
Achieve full load operation	December 17, 2015	
Units available for emergency operation	December 31, 2015	↓
Generator, performance & emissions testing	Jan. - March, 2016	
Units released for full MISO market operations	April 30, 2016	

Q. Please provide an update on the current operation and the project cost.

A. Successful achievement of performance and emissions guarantees have been demonstrated through testing and the units are operating very well. Through September 15, 2016, the Lewis & Clark RICE Station 2 has been operated 105 times for 683.6 hours and has produced 7,045 net MWh of energy. The total cost at this time is $47.2 million.

Q. Please explain the difference in the Lewis & Clark RICE Project cost and the estimate for a generic RICE unit "WSCT" provided in the Company's 2013 Integrated Resource Plan (IRP)[3]?

A. The Lewis & Clark RICE project installed cost of $2,537 per kW is higher than $955 per kW provided as a supply side resource in the 2013 IRP due to a number of factors. First, the new supply side resources[4] including the generic RICE resource in the IRP are presented on an overnight construction basis and are not site specific. They do not include interest during construction, natural gas interconnection ahead of final filtration and metering, transmission interconnection beyond the generator step up transformer and breaker and system upgrade costs, and do not take into account local reliability or economic benefits. Secondly, Montana-Dakota's consultant's estimate for the generic RICE unit was understated due to the apparent quality of the indicative Original Equipment Manufacturer (OEM) pricing received as well as the lack of historical information available in their construction and engineering cost estimating software. Montana-Dakota worked with the consultant to correct the understatement of the generic RICE resource in the 2015 IRP process. Third, as previously discussed the project fast track schedule required bidding and contract execution, as well as construction to begin before the detailed design was completed. Less certainty results in

[3] 2013 Montana-Dakota Utilities Co. Integrated Resource Plan. Attachment C - Supply-Side & Integration Documentation. Table 3-1, Page 17
[4] 2013 Montana-Dakota Utilities Co. Integrated Resource Plan. Attachment C - Supply-Side & Integration Documentation. Table 2-5, Page 15

increased cost of bids due to perceived risk. Finally, higher construction costs in the Bakken area were a factor contributing to the higher cost.

Q. Please compare the projected Lewis & Clark RICE costs to the generic RICE generation resource presented in the 2015 IRP?

A. Exhibit No.___(ALW-1) provides a comparison of the Lewis & Clark RICE Project costs to the generic RICE generation resource presented in the 2015 IRP. The largest cost difference of $605 per kW occurs in the balance of plant, construction, and engineering total. It is not possible to distinguish the impacts related to the fast track schedule, economy of scale, and Bakken area construction on these costs without obtaining additional bids or conducting more studies. These impacts resulted in an approximate increase in cost of $15 million, however, favorable construction and procurement markets, as well as more normal project schedules resulted in other projects described in my testimony to come in well under the original budgeted amounts, such as Big Stone AQCS under by $30 million and Lewis & Clark MATS under by $11 million.

Q. What steps were taken to ensure that the investment cost for the chosen alternative was minimized?

A. As previously discussed, Montana-Dakota scaled back the size of the Lewis & Clark RICE Project to reduce the total investment and shorten the overall project schedule. Additionally, Montana-Dakota engaged a consulting engineer to perform a technology evaluation of RICE generation. Five different RICE OEMs were evaluated and Wartsila was determined to offer the lowest cost and ranked highest using a number of weighting factors. Montana-Dakota also received five General Work Contractor (GWC) bids for the construction of the Lewis & Clark RICE Project and executed a contract with the low bidder. Constructing the project on Company owned property also allowed Montana-Dakota to complete several activities in advance of the GWC mobilizing to the site to begin construction. These included site clearing and leveling, and development of construction parking and laydown. Again, it is important to recognize that the selection of an existing site with natural gas and electric transmission infrastructure, as well as staffing to be shared, made this option much more cost effective.

Q. What benefits would be realized if Montana-Dakota were to construct a duplicate (mirror) on the same site in the future?

A. In addition to the labor, land and existing infrastructure cost savings related to locating this project at the Lewis & Clark Station, the following items could be either utilized or would require only minor modifications or additions:

- Construction parking and lay down area,
- Site grading, drainage, roads, sanitary system, fence and gates,
- Buildings – Lube oil, control room, battery room, and rest room,
- Substation, natural gas line, fire system modifications
- Lube oil and urea storage and unloading,
- Miscellaneous foundations and

- Engineering and design.

Q. Please describe the additional equipment and scrubber modifications installed at the Lewis & Clark Station to comply with the U.S. Environmental Protection Agency's (EPA) Mercury and Air Toxics Standards (MATS) Rule non-mercury hazardous pollutant metals requirements?

A. To comply with the non-mercury hazardous pollutant metals portion of the MATS Rule, Montana-Dakota installed the following additional equipment and scrubber modifications:

- Turning vanes to improve the distribution of the flue gas within the stack,
- A sieve tray and mist eliminator system to increase the efficiency of removing filterable particulate matter (FPM) which is the surrogate for the non-mercury metals,
- Replacement of scrubber slurry recycle pumps,
- A forced oxidation system to control the chemical reactions within the system and to prevent deposits from forming on the scrubber surfaces,
- A weather enclosure was added to the stack to allow for required year round emissions testing.

Q. Would you please describe the current status and cost of the Lewis & Clark MATS Project?

A. The majority of the Lewis & Clark MATS project construction activities were completed during an eleven week scheduled outage occurring from September 4 to November 23, 2015. Initial operation, tuning and preliminary testing was completed from late November through mid-December 2015, and commercial operation of the new systems was achieved on December 23, 2015. Successful final performance guarantee results were demonstrated through testing in March of 2016. The total project cost of $16.7 million was well under the $27.7 million amount projected in the ND Advance Determination of Prudence (ADP) Case No. PU-13-332 where it was demonstrated by the modeling, the optimal resource plan included Lewis & Clark Station retrofit even under the assumption the plant would be retired five years after installation of the Project. This analysis demonstrated the value of upgrading the Lewis & Clark Station to meet customers' electric requirements as compared to a myriad of other options.

Q. Please describe the purpose of the EPA Coal Combustion Residuals (CCR) Rule and the additional ash system equipment and modifications installed at the Lewis & Clark Station that were driven by the CCR Rule.

A. Prompted by a catastrophic coal ash spill in 2008 that occurred at the Tennessee Valley Authority power plant in Kingston, TN, the EPA proposed a rule in 2010 to provide requirements for the safe disposal of coal ash from coal-fired power plants. The EPA published the final CCR Rule in April 2015. The Lewis & Clark Ash System project was implemented as a result of the CCR Rule and can be divided into three main parts: (1) retirement of the large ash pond; (2) construction of a new concrete bottom ash tank; and (3) modifications necessary to handle fly ash entirely as a dry material.

Retirement of the large ash pond

The large ash pond was retired since continued long-term operation of the pond would have resulted in a higher cost of compliance than other ash management options. The large ash pond was used to settle out sluiced solids including bottom and fly ash, as well as those contained in scrubber pond and water treatment blow downs, and temporarily store them prior to dewatering. After dewatering, the solids were transported to the Station's dry ash disposal site located on Company-owned property, which is an abandoned surface coal mine near Savage, Montana. At the large ash pond, we discontinued sluicing operations, dewatered the pond, and filled it. With the exception of final shaping and capping scheduled for 2017, this work was completed on October 17, 2015, during the scheduled MATS Project outage.

Construct a new Concrete Ash Tank

To replace the ash pond's functionality of settling and temporarily storing solids, a new concrete tank was constructed with tie-ins to the existing bottom ash sluice line and effluent discharge piping systems. This portion of the project was constructed and ready for operation when Lewis & Clark Station Unit 1 returned to service following the MATS Project outage on November 23, 2015.

Fly Ash Handling Modifications

To minimize the size and cost of the new concrete ash tank, the Station was converted to dry fly ash handling. This involved adding equipment and making modifications to handle fly ash entirely as a dry material from the collection hopper through transportation in trucks to the ash disposal site. To handle fly ash through means of a concrete tank would be cost-prohibitive due to the volume of fly ash produced. The Company also considered that the Effluent Limitation Guidelines (ELG) rule which proposed limits for ash pollutants in waste water discharges from coal-fired steam electric generating units was not yet final and could be modified in the rule's final form to require fly ash to be managed dry at Lewis & Clark.

This portion of the project included raising the existing fly ash storage silo and installing an enclosed unloading platform with equipment to condition the fly ash when loaded into trucks for transportation to the ash disposal site. Additionally, new fly ash handling equipment, including transport blowers, a filter separator, an equipment building, storage silo vent filters and piping were installed. To allow the Station to continue operating, it was necessary to install portions of the project in phases. The entire new system became operational on April 14, 2016.

Q. Please provide the projected costs for the Ash System Project.

A. The projected costs for the three portions of the project are $1.8 million for the dewatering and filling of the ash pond, $5.3 million for the construction of the bottom ash tank, and $8.8 million for the fly ash system for a total project cost of $15.9 million.

Q. Please compare the project to other alternatives considered.

A. Alternatives to this project, including continued long-term operation of the large ash pond, construction of a new pond, and conversion of both wet fly ash and bottom ash to dry handling systems, were projected to be higher cost, take excessive time compared with discontinuing use of the large pond and constructing a concrete bottom ash tank during the 2015 Fall outage along with converting to dry fly ash management.

Although the large pond had a synthetic liner, the pond would not have met the rigorous liner requirements under the CCR Rule. Also, Montana-Dakota determined there was a potential for the pond to be subject to closure under the CCR Rule. If the pond was required to be closed, the CCR Rule mandates that the facility cease using the pond within six months of making a determination that closure is required. Therefore, the Station would have only six months to plan, design, and construct an alternative treatment system, and this would have been disruptive to plant operations. It would also not allow sufficient time to develop and implement the lower cost, long-term ash management solution to replace the pond. Since the unit was already off-line for an atypically long outage to install MATS controls in 2015, it was advantageous to retire the pond and install the tank at that time since both projects needed approximately the same amount of time (three months) for completion.

Rebuilding the large pond according to CCR Rule requirements was determined to be a higher cost alternative. The reconstruction effort would require additional fill materials to raise the pond, a new CCR-compliant liner system, a CCR-compliant temporary bottom ash management system, long-term pond run-on and run-off controls, and groundwater monitoring wells. The Station would also incur costs for long-term groundwater monitoring. In contrast, concrete tanks are exempt from the CCR Rule, and thus not subject to the location restrictions, liner requirements and groundwater monitoring that a pond would be subject to and which serve to increase the overall costs of ash management.

Q. Please describe results from modeling analysis which support making the investments in the Lewis & Clark Station MATS and Ash System Projects, as well as additional capital investments presented in this filing.

A. In addition to the modeling presented in the 2013 IRP which was also included as part of the Advance Determination of Prudence filing for MATS compliance, Montana-Dakota performed additional modeling in 2014 with high capital cost scenarios for the Lewis & Clark MATS project. In these scenarios the Base Case was to retire Lewis & Clark Unit 1 in 2014, as compared to options with an additional capital cost of $40.4 million necessary to continue operations with both five and ten year additional plant lives. The model selected the continued operation of Lewis & Clark in both of these high capital cost scenarios under both the five year and 10 year life assumptions.

Q. What additional AQCS equipment was installed at Big Stone Plant to comply with the South Dakota State Implementation Plan (SIP) for

the EPA Regional Haze Rule and the EPA MATS Rule as authorized in Case No. PU-11-163?

A. To comply with the Regional Haze Rule, the following equipment was added as part of the AQCS Project:

- Selective catalytic reduction technology (SCR) with separated over-fired air for control of NO_x.
- Circulating dry scrubbers for control of SO_2.
- Replacement baghouses for control of particulate matter.
- Replacement induced draft fans.
- Modifications to the boiler tube surfaces to obtain the required SCR inlet flue gas temperature and to the boiler structure to meet the new pressure requirements for the boiler setting.
- Pebble lime and ammonia reagent handling systems.
- Waste ash handling system.

An activated carbon injection system was installed to comply with the mercury limit of the MATS Rule.

Q. What is the current status and cost of the Big Stone AQCS Project?

A. Big Stone was shut down on February 27, 2015, for the start of the outage to "tie-in" all of the AQCS equipment. The outage was scheduled to be completed and the unit back on line by June 9, 2015, but because of problems found with the plant's High Pressure (HP) steam turbine during routine inspection, the outage had to be extended. The plant returned to service on August 4, 2015, following the HP steam turbine repair and blade replacements which were unrelated to the AQCS Project.

Construction of the AQCS Project was completed in the third quarter of 2015. Following initial operation, tuning, and testing the AQCS was declared commercially operational on December 29, 2015. Activities in 2016 centered on contract close outs, demolition of the old baghouse, and site restoration. All major equipment guarantees have been met with the exception of some SCR catalyst operational guarantees that are being addressed with the manufacturer supplier. As described in quarterly reports provided to the Commission by Otter Tail Power Company the Plant Operating Agent, the AQCS Project budget was reviewed in early 2013 and then again in 2014. Following both reviews the projected project budget was reduced. The original project budget was $491 million; it was reduced in 2013 to $405 million and again to $384 million in 2014. With most contracts closed out, the project has been forecasted at $368.3 million, or 15.9 million below the 2014 budget. Montana-Dakota's share of the $368.3 million project cost including internal costs and loadings is $86.7 million.

Q. Please describe the Coyote Station Boiler Lower Wall Replacement Project.

A. The Boiler Lower Wall Replacement Project involved the replacement of sections of the boiler lower water wall tube panels including the cyclone burner throat openings. Inspections had revealed that micro-tangential cracking was appearing over the entirety of the lower water wall tubes which was the likely result of heat cycles, erosion and the extremely harsh environment experienced in this area of the boiler over time. The replacement project was needed to avoid future failures of the water tubes. It also allowed for the resizing of the cyclone throat openings to complement the installation of the advanced over-fired air system which was installed to comply with the North Dakota State Implementation Plan for the EPA Regional Haze Rule.

Q. What is the status and cost of the Coyote Station Boiler Lower Wall Replacement Project?

A. The project was completed during a scheduled major outage occurring from March 20 to June 10, 2016. Montana-Dakota's ownership share of the cost is $4.6 Million. In addition to preventing future tube failure outages, through the resizing of the cyclone burner entrance throats, this project contributed to the successful balancing of air flow and differential pressures in the cyclone burners and the boiler.

Q. Please describe the Limestone Project installed at Heskett Station required for Unit 2 to comply with the North Dakota State Implementation Plan (SIP) for the EPA Regional Haze Rule.

A. To comply with the North Dakota SIP for the EPA Regional Haze Rule, the Limestone Project included the installation of equipment necessary to unload, store, and convey limestone to the existing Unit 2 atmospheric fluidized bed combustor (AFBC) portion of the boiler. The limestone is a reagent that will be used in combination with the existing fluidized bed sand material to provide the chemical reactions required to reduce SO_2 emissions.

Q. What is the status and cost of the Heskett Unit 2 Limestone Project?

A. The project construction began at the end of September of 2015. Equipment was tied-in during a scheduled Unit 2 outage in March 2016, and construction was completed in early June 2016. Initial operation, tuning and preliminary testing of the equipment was completed by the end of June 2016. Testing to select the best limestone from two different suppliers and to begin optimizing its use in the AFBC to control SO_2 was conducted in July 2016. In September, a demonstration test of the selected limestone began which includes further optimization and adjusting of limestone feed controls. This will be followed by the continuous use of limestone as required to meet the May 7, 2017, compliance date. The project cost is projected to be $9.7 Million.

Q. Does this conclude your direct testimony?

A. Yes, it does.

MONTANA-DAKOTA [illegible]TIES CO.

Comparison Lewis & Clark RICE Project to 2015 IRP Generic RICE Project

	2015 IRP Generic 3x9.3 WARTSILA 20V34SG w/Site Specific adj.		Lewis & Clark RICE WARTSILA 20V34SG		
Model					
Size (each unit) MW net	9.3		9.3		
Plant size - MW net	27.9		18.6		
	Capital Investment	Cost per KW	Capital Investment	Cost per KW	
Equipment, Construction and Owner					
Total Equipment Cost	$16,222,500	581	$13,735,808	738	1/
Balance of plant / Construction /Engineering	$24,333,750	872	$27,466,335	1,477	2/
Owner's Soft Cost less loadings (legal, permits & licensing)	$1,622,250	58	$1,499,775	81	
	$42,178,500	1,512	$42,701,919	2,296	
Site Specific & Other					
Investigations / Testing / Modifications)	$408,532.82	15	$345,910	19	
Transmission Interconnection	$2,078,561.22	75	$1,759,946	95	
Fuel Supply	$808,977	29	$808,977	43	
Spare Parts	$116,335.70	4	$98,503	5	
	$3,412,407	122	$3,013,336	162	3/
Total Capital Investment -Unloaded	**$45,590,907**	**1,634**	**$45,715,255**	**2,458**	
Loadings (Administration & development and financing)	$2,027,813	109	$1,479,260	80	
Total Capital Investment -Loaded	**$47,618,719**	**1,707**	**$47,194,515**	**2,537**	

Differences

1/ Economy of Size and Trans-Atlantic Shipping.

2/ Economy of Size, Bakken Area Construction and Fast Track Project Impacts. The fast fast track schedule required project to be bid and construction to start before the design was completed. This combined with higher Bakken area construction impacted the labor cost for project design, construction management, project administration and to construct the equipment.

3/ Adjustments for Site Specific items not included in 2015 IRP analysis for comparison purposes.

Case No. PU-16-____
Exhibit No. ______ (ALW-1)