STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF NORTHERN INDIANA PUBLIC SERVICE COMPANY FOR (1) APPROVAL OF AND A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR A FEDERALLY MANDATED ENVIRONMENTAL COMPLIANCE PROJECT; (2) AUTHORITY TO RECOVER FEDERALLY MANDATED COSTS INCURRED IN CONNECTION WITH THE ENVIRONMENTAL COMPLIANCE PROJECT; (3) APPROVAL OF THE ESTIMATED FEDERALLY MANDATED COSTS ASSOCIATED WITH THE ENVIRONMENTAL COMPLIANCE PROJECT; (4) AUTHORITY FOR THE TIMELY RECOVERY OF 80% OF THE FEDERALLY MANDATED COSTS THROUGH RIDER 787 – ADJUSTMENT OF FEDERALLY MANDATED COSTS AND APPENDIX I – FEDERALLY MANDATED COST ADJUSTMENT FACTOR; (5) AUTHORITY TO DEFER 20% OF THE FEDERALLY MANDATED COSTS FOR RECOVERY IN NIPSCO'S NEXT GENERAL RATE CASE; (6) APPROVAL OF SPECIFIC RATEMAKING AND ACCOUNTING TREATMENT; (7) APPROVAL TO DEPRECIATE THE ENVIRONMENTAL COMPLIANCE PROJECT ACCORDING TO PREVIOUSLY APPROVED DEPRECIATION RATES; AND (8) APPROVAL OF ONGOING REVIEW OF THE ENVIRONMENTAL COMPLIANCE PROJECT; ALL PURSUANT TO IND. CODE § 8-1-8.4-1 ET SEQ., § 8-1- 2-19, § 8-1-2-23, AND § 8-1-2-42.	CAUSE NO. 44872

OUCC REDACTED TESTIMONY

OF

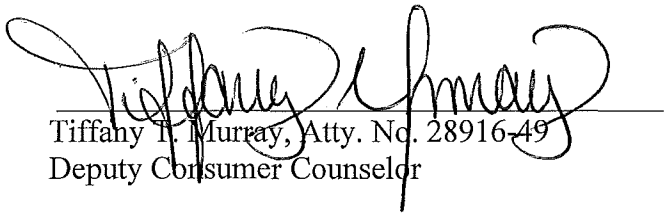
LEON A. GOLDEN – PUBLIC'S EXHIBIT NO. 3

ON BEHALF OF THE

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

Respectfully Submitted,

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR



Tiffany T. Murray, Atty. No. 28916-49
Deputy Consumer Counselor

CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing ***Office of Utility Consumer Counselor Redacted Testimony of Leon A. Golden*** has been served upon the following counsel of record in the captioned proceeding by electronic service on April 03, 2017.

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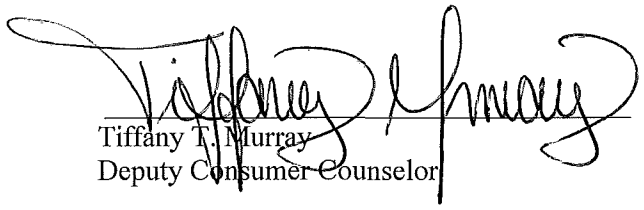

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REDACTED TESTIMONY OF OUCC WITNESS LEON A. GOLDEN
CAUSE NO. 44872
NORTHERN INDIANA PUBLIC SERVICE COMPANY

I. INTRODUCTION

Q: Please state your name and business address.

A: My name is Leon A. Golden, and my business address is 115 West Washington Street, Suite 1500 South, Indianapolis, Indiana 46204.

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

A: I am employed by the Indiana Office of Utility Consumer Counselor ("OUCC"), as a Utility Analyst II for the Resource Planning and Communications Division. My educational background and experience are detailed in Appendix A attached to this testimony.

Q: What is the purpose of your testimony?

A: I discuss my review and analysis of the engineering support for NIPSCO's proposed Coal Combustion Residual ("CCR") Compliance Plan and Effluent Limitations Guidelines ("ELG") Compliance Plan projects. The projects in these Plans comprise NIPSCO's proposed Environmental Compliance Project. I also discuss the capital and operations and maintenance ("O&M") cost estimates for the Environmental Compliance Project as provided by Burns & McDonnell, CH2M Hill Engineers, and NIPSCO.

My review revealed that NIPSCO's Environmental Compliance Project capital cost estimates contain multiple layers of contingency. As a result, and in order to appropriately balance the interests of NIPSCO's ratepayers and its shareholders, I ultimately recommend the disallowance of NIPSCO's proposed

[redacted]% monetary allowance applied to all projects in its Environmental Compliance Project. I also recommend that certain other contingency-related costs included in NIPSCO's Environmental Compliance Project be reduced. For NIPSCO's ELG Compliance Plan, I recommend that NIPSCO provide a Class 3 estimate when the EPC Contract is executed on April 28, 2017 and that the Commission require NIPSCO to file a Class II estimate by June 30, 2019 or six months before construction is set to begin. Finally, I recommend that NIPSCO's actual costs for recovery for the Environmental Compliance Project be capped at the amount approved in this Cause.

OUCC witness Mr. Edward Rutter details the policy reasons for the OUCC's position on NIPSCO's cost estimates and offers a review of relevant Commission decisions that relate to the reasonableness of cost estimates in CPCN and other capital cost recovery cases. OUCC witness Ms. Cynthia Armstrong offers her opinion with regard to the ability of the selected technologies to meet the required environmental rules. My recommendation as to the amount of capital cost recovery the Commission should approve in this Cause includes the removal of the Landfill-Pond Closure project as witness Armstrong recommends.

Q: Please describe the review and analysis you conducted to prepare your testimony.

A: I reviewed and analyzed Petitioner's testimony, exhibits, and responses to data requests issued by the OUCC and intervenors in this Cause. In addition, I met with NIPSCO staff on January 9, 2017 to discuss NIPSCO's CCR and ELG Compliance Plan technology choices. On January 27, 2017, I participated in a second meeting with NIPSCO staff regarding its CCR and ELG modeling. I furthered my review

of NIPSCO's CCR and ELG Compliance Plan by participating in a discussion and tour of NIPSCO's R. M. Schahfer Generating Station on March 7, 2017.

II. NIPSCO'S PROPOSED CCR COMPLIANCE PLAN PROJECTS

Q: How did NIPSCO develop its CCR Compliance Plan?

A: NIPSCO selected Burns & McDonnell to perform a limited[1] CCR Cost Compliance Study ("CCR Study") which was then used for planning purposes. The CCR Study used site information specific to Bailly Generating Station, Michigan City Generating Station, and Schahfer Generating Station.[2] Each generating station was individually evaluated and discussed in the CCR Study, along with each technology option evaluated. NIPSCO does not state in testimony which of the CCR modeling options it selected for implementation at any of the effected sites. However, for the Michigan City Generating Station, it appears that NIPSCO chose Option 3B as evaluated in the study.[3] For NIPSCO's Schahfer Generating Station, it appears that NIPSCO chose Option 4D from the study.[4] The estimated project costs as provided in the study for these options tie closely with the direct capital estimated costs of these projects as shown in NIPSCO's response to OUCC Data Request No. 5-001, Confidential Attachment A.[5] Tables 1.1 – 1.6 from the Confidential CCR Study

[1] The Burns & McDonnell study indicates that the report does not make a "final determination that the CCR units identified in this study will be required to close under the CCR Regulation, or final estimation of when the units will close or how long it will take to close a unit or convert a system to dry ash handling. All final closure, retrofit, and system conversion decisions and timelines will be made by NIPSCO after taking into account numerous factors not considered in this report…." (Petitioner's Exhibit No. 4, Attachment 4-B (Confidential), page 1-1.)

[2] Petitioner's Exhibit No. 4, Attachment 4-B (Confidential), pages 3-1 – 3-2.

[3] *Id*. Pages 7-18 – 7-20.

[4] *Id*. Pages 8-40 – 8-43.

[5] *See* Confidential Attachment LAG-3. Response to OUCC Data Request 5-001, Confidential Attachment A.

(Petitioner's Attachment 4-B Confidential) shows each combination of the technology options considered and Burns and McDonnell's associated cost estimates.

Q: How did you evaluate the technology options discussed by NIPSCO and Burns & McDonnell?

A: I reviewed the capital cost estimates, surface impoundment closure cost estimates, annual O&M cost estimates, and the preliminary schedule for every option modeled for each CCR Unit at Bailly, Michigan City, and Schahfer, that was provided by Burns & McDonnell in the CCR Study. I did not review the CCR Study to determine whether the technology options considered would serve as adequate compliance tools for the CCR rules. OUCC witness Armstrong provides this discussion in her testimony. I also reviewed and analyzed NIPSCO's annual O&M cost estimates associated with each of its capital projects and its incremental surface impoundment O&M estimates.

Q: What technologies did NIPSCO consider for bottom ash handling?

A: Using the CCR Study, NIPSCO considered the following options for bottom ash handling that would fit within its overall CCR Compliance Plan project:[6]

> *Under the Boiler Ash Conveying* – for a wet system, this option includes installation of a closed-loop remote submerged chain conveyor system that will dewater sluiced bottom ash/boiler slag from the units. A dry system eliminates the sluicing system and uses a conveyor to transport ash.
>
> *Remote Ash Conveying* – this option is similar to the wet Under the Boiler Ash Conveying system, with the exception that it is located away from the boiler and CCR are transported to it by the sluicing system.

[6] Petitioner's Exhibit No. 4, page 5, lines 12 – 17.

Dewatering Bin Systems – this option entails bottom ash being pumped to the top of tall dewatering bins. When the bottom ash slurry is pumped to the top of the dewatering bins, it is discharged into a decanting bin and then flows by gravity into a settling tank. The clear water overflowing the settling tank is eventually returned to the ash hopper to form the closed loop.

Retrofitting of Ponds – this option includes removal of the CCR material and underlying material contaminated with CCR material followed by installation of an impermeable liner. The liner would allow the impoundment to continue to be used for CCR material.

Q: Please describe the technology NIPSCO chose to comply with the CCR Rule.

A: Of the four compliance options for bottom ash handling, NIPSCO selected Remote Ash Conveying systems for both its Michigan City and Schahfer Generating Stations. NIPSCO stated in testimony that this option was selected based on concerns over safety, project feasibility, proven reliability, and the ability to complement compliance with the ELG rule.[7] In response to OUCC discovery, NIPSCO provided more detailed explanations to describe how each consideration led the Company to choose Remote Ash Conveying systems.[8]

Q: Do you have any engineering concerns with the CCR technology that NIPSCO plans to install?

A: No. After reviewing NIPSCO's technology selection and its overview of the safety, feasibility, and reliability aspects of Remote Ash Conveying, it is my opinion that it is reasonable. In meetings with NIPSCO personnel,[9] I explored in detail the basis for NIPSCO's determination. During the OUCC site visit to the Schahfer generating facility, I visually confirmed that the bottoms of both units were in

[7] *Id*. Page 6, lines 2 – 5.

[8] *See* Attachment LAG-1. Response to OUCC Data Request 3-002.

[9] These meetings were held on January 9, 2017 and January 27, 2017.

congested spaces. That observation confirmed why an Under the Boiler system would not be practical for the Schahfer generating facility.

I also conducted an independent analysis of the safety, feasibility, and reliability attributes of the Remote Ash Conveying option, through having multiple discussions with NIPSCO and OUCC staff, and reviewing industry articles and papers.[10] I confirmed that one of the issues with an Under the Boiler Conveying system is that longer outages are required for installation. Outages associated with installing Remote Ash Conveying systems primarily include only the tie-ins for piping, electrical, and system controls.[11] In contrast, installation of an Under the Boiler system requires that the unit be offline until construction is complete – in the range of 20-30 days for a dry ash system.[12] Furthermore, there are no redundancies with the Under the Boiler Conveying systems. In NIPSCO's specific case, there are also interferences to contend with on existing equipment such as cable trays, motor control centers, structural steel, and flue gas ductwork.[13]

Q: Please provide an overview of the cost estimates provided by NIPSCO for its CCR Compliance Plan projects.

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[10] Ray, Russell. *Coal Ash Handling & Storage: Shifting Direction*. Power Engineering. (Article) February 1, 2013. Website: http://www.power-eng.com/articles/print/volume-117/issue-2/abma-special-section/coal-ash-handling-storage-shifting-direction.html (Accessed: March 24, 2017.)
See also Fleming, Craig H. *Bottom Ash Conversion Options and Economics*. (Report) 2010/2011. Web: http://www.gerrardassociates.com/images/CBDD_Bottom_Ash_Conversion_Paper_-_Post_Electric_Power_Version.pdf (Accessed: March 24, 2017.)

[11] McDonough, Kevin L. *Coal Ash Management: Understanding Your Options*. (Article) Power Engineering. February 14, 2014. Website: http://www.power-eng.com/articles/print/volume-118/issue-2/abma-special-section/coal-ash-management-understanding-your-options.html (Accessed: March 24, 2017.)

[12] Ray, Russell. *Coal Ash Handling & Storage: Shifting Direction*. Power Engineering. (Article) February 1, 2013. Website: http://www.power-eng.com/articles/print/volume-117/issue-2/abma-special-section/coal-ash-handling-storage-shifting-direction.html (Accessed: March 24, 2017.)

[13] *See* Attachment LAG-2. Response to OUCC Data Request 3-001.

A: The Burns & McDonnell CCR Study provided NIPSCO with information for planning purposes. NIPSCO used the estimates included in the CCR Study and modified these estimates utilizing more specific data. NIPSCO's estimates for its CCR Compliance Plan projects are attached to Mr. Sangster's direct testimony.[14] Table 1 below provides a high level summary of the capital costs associated with each CCR project:

Table 1: NIPSCO CCR Compliance Plan Capital Costs (Excluding AFUDC)

CCR PROJECT	DIRECT CAPITAL	INDIRECT CAPITAL	TOTAL CAPITAL
Bailly Generating Station	$ 1,200,000	$ 180,000	$ 1,380,000
Michigan City Generating Station	$ 57,700,000	$ 8,655,000	$ 66,355,000
R. M. Schahfer Generating Station	$ 134,000,000	$ 20,100,000	$ 154,100,000
Total CCR Compliance Plan Capital Cost	**$ 192,900,000**	**$ 28,935,000**	**$ 221,835,000**

Q: How did Burns & McDonnell create the cost estimates used in the CCR Study shown in Petitioner's Exhibit No. 4, Attachment 4-B (Confidential)?

A: The cost estimates included in the Burns & McDonnell study were developed using parametric methods.[15] The CCR Study states that in order to estimate project costs

[14] Petitioner's Exhibit No. 4, Attachment 4-A.

[15] "Parametric cost estimates are a result of a cost estimating methodology using statistical relationships between historical costs and other program variables such as system physical or performance characteristics, contractor output measures, or personnel loading." NASA Cost Estimating Handbook. Version 4.0. February 2015. Page 16. https://www.nasa.gov/pdf/263676main_2008-NASA-Cost-Handbook-FINAL_v6.pdf (Accessed March 13, 2017).
See also Petitioner's Exhibit No. 4, Attachment 4-B (Confidential), page 5-9.

for purposes of the Study, Burns & McDonnell included an allowance for temporary construction electric and water; labor rates based on 2016 RS Means union rates; and the assumption that multiple subcontractors would be used and the owner [NIPSCO] would be responsible for procuring all major equipment.[16] In addition, the costs provided in the Burns & McDonnell study included estimates for indirect costs and a 30% project cost variability factor, which is based on the overall project cost.[17] Burns & McDonnell provided Class 4 Association for the Advancement of Cost Engineering ("AACE") estimates, which are appropriate for the study and feasibility phase of a project. An estimate that is created with approximately 1% - 15% project definition is expected to have an accuracy range of -30% to +50%.[18]

Q: Please explain AACE Class estimates, and what a Class 4 estimate means.

A: The AACE is an organization of professionals involved in cost estimating and cost management. The organization has several published guidelines that offer assistance in developing capital project cost estimates. Project estimates are classified based on the project definition level in the design process. Depending upon the level of project definition, the expected cost estimate accuracy at that time can be classified from a Class 5 to a Class 1. When a greater degree of expected cost estimate accuracy is desired, that translates to a greater degree of project

[16] Petitioner's Exhibit No. 4, Attachment 4-B (Confidential), page 5-9.
[17] *Id*. Pages 5-9 – 5-11.
[18] American Association of Cost Engineering International. Recommended Practice No. 18R-97. Rev. March 1, 2016. Page 3. http://www.aacei.org/toc/toc_18R-97.pdf

definition. Table 2 illustrates the AACE guidelines for project definition and the corresponding expected accuracy range for that level of definition.

Table 2: AACE Cost Estimate Classification Matrix[19]

	Primary Characteristic	*Secondary Characteristic*		
ESTIMATE CLASS	**MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Q: How did NIPSCO develop the cost estimates shown in Petitioner's Attachment 4-A for which it is seeking cost recovery approval in this Cause?

A: NIPSCO started with the Burns & McDonnell study Class 4 estimates, which include a 30% project cost variability factor, and then "refined these estimates using information from NIPSCO's Major Projects team, various vendor surveys, evaluation of site-specific conditions, and potential market risks."[20] NIPSCO's cost estimates are also at a Class 4 level, with an expected accuracy range of -15/-30% to +20/+50%.[21]

[19] American Association of Cost Engineering International. Recommended Practice No. 18R-97. Rev. March 1, 2016. Page 3. http://www.aacei.org/toc/toc_18R-97.pdf

[20] Petitioner's Exhibit No. 4, page 18, lines 4 – 13.

[21] *Id*.

NIPSCO's response to OUCC discovery shows that the $192.900M total direct capital cost estimate for the CCR Compliance Plan in NIPSCO's Attachment 4-A contains several components, including:

- a 30% project variability factor included in the direct capital estimates,
- [redacted]% in owner's costs,
- a [redacted]% allowance applied to the direct capital with owner's costs to accommodate for the variation in a Class 4 estimate, and
- a [redacted]% annual escalation factor for all estimates of work to be performed after 2016.[22]

Q: When does NIPSCO intend to begin construction of its CCR Compliance Plan projects?

A: In testimony, Petitioner's witness Greg Baacke explained that NIPSCO is targeting the second quarter of 2017 to initiate construction:

> NIPSCO is working with an architectural engineering firm, equipment vendors, and subject matter experts to evaluate potential engineer, procure, and construct bidders for the project execution. Since NIPSCO is targeting to initiate construction as early as the second quarter of 2017 in order to meet compliance with the CCR Rule. [sic] NIPSCO will need to complete the process with the architectural engineering firm, vendors, and subject matter experts prior to that time in order to be in a position to timely comply with the Environmental Rules.[23]

[22] *See* Confidential Attachment LAG-3. Response to OUCC Data Request 5-001, Confidential Attachment A.
See also Attachment LAG-4. Response to OUCC Data Request 6-010.
[23] Petitioner's Exhibit No. 3, page 7, line 16 – page 8, line 7.

According to discovery responses, NIPSCO intends to award engineer, procure and construct ("EPC") contract for its Remote Ash Conveying systems proposed for Schahfer and Michigan City Generating Stations by April 28, 2017.[24] The construction start date for the Material Handling Area project at Michigan City Generating Station has been extended and is now scheduled to start April 28, 2017, because NIPSCO intends to integrate this work into the EPC contract for the Remote Ash Conveying project.[25] NIPSCO's Groundwater Monitoring projects were all started in mid-2016.[26]

NIPSCO estimates that the Remote Ash Conveying projects at Michigan City and Schahfer will cost approximately $185,265,000. These two projects alone comprise nearly half of the total cost of NIPSCO's Environmental Compliance Project. With an EPC contract that will include these projects about to be executed, NIPSCO's CCR Compliance Plan projects should be well beyond the study and feasibility phase, with tighter estimates than Class 4 estimates.

Q: Why are you concerned that NIPSCO's cost estimates contain both a 30% project variability factor and a monetary allowance for the accuracy range of a Class 4 estimate?

A: Rather than further develop its cost estimate for the CCR Compliance Plan to show more accurate costs, NIPSCO has included a 30% contingency in the direct capital estimate at the individual project level of $32.327M, in addition to a [redacted].0% monetary Class 4 estimate allowance of $[redacted]M. These two layers of contingency costs account for [redacted]%, or $[redacted]M, of the total cost of the CCR

[24] *See* Attachment LAG-5. Response to OUCC Data Request 6-003.
[25] *Id*.
[26] Petitioner's Exhibit No. 4, Attachment 4-A.

Compliance Plan. It is unreasonable to include a monetization of a Class 4 estimate risk in the cost the CCR Compliance Plan. Further, given that execution of an EPC Contract is imminent or has already begun, it is troubling that NIPSCO's cost estimates remain at a Class 4 level.

NIPSCO filed its case, providing the OUCC and other intervenors Class 4 estimates to evaluate for reasonableness. As I discuss below, several components of NIPSCO's Class 4 estimates are reasonable; however, it would be inappropriate to allow NIPSCO full cost recovery based on its estimate as filed.

Q: Do you have any concerns regarding the annual [redacted]% escalation factor included in NIPSCO's CCR Compliance Plan projects?

A: No. The estimates were created in 2016 dollars[27] and the last CCR Compliance Plan project is estimated to be completed by October 2018. It is reasonable that a conservative escalation rate be applied for work taking place after 2016.

Q: Do NIPSCO's CCR Compliance Plan project cost estimates include owner's costs?

A: Yes. NIPSCO's cost estimates for CCR Compliance Plan projects include $[redacted] in owner's costs, which is approximately [redacted]% of its estimated total capital costs.[28]

Q: Do you have concerns with the owner's costs included in NIPSCO's estimate?

A: No. NIPSCO's owner's costs contain costs associated with project management, project engineers, project controls, construction management, third party testing, construction site facilities, consultants, subject matter experts, start-up and

[27] Petitioner's Exhibit No. 4, Attachment 4-B (Confidential).
[28] *See* Confidential Attachment LAG-3. Response to OUCC Data Request 5-001, Confidential Attachment A.

commissioning support, general sites services such as surveying, training for the new systems, and Owner's Engineers.[29] Owner's costs are typical of large capital projects and generally include costs associated with these areas that are the responsibility of the project owner.[30]

Q: Do NIPSCO's CCR Compliance Plan project cost estimates include indirect costs?

A: Yes. NIPSCO's cost estimates for CCR Compliance Plan projects include $28.935M in indirect costs.

Q: Do you have any concerns with the indirect costs included in NIPSCO's estimates?

A: No. Indirect costs are not directly charged to a specific project, resulting in the costs being spread among all capital projects. Among these costs are overhead costs that include portions of benefits such as vacation and holiday pay, charges incurred for outside services to support NIPSCO's capital project process, and portions of payroll for NIPSCO employees who serve a supporting role in a project management function, or an administrative and general function.[31] The estimated amount of indirect costs NIPSCO included is 15% of Direct Capital[32]

Q: Do NIPSCO's CCR Compliance Plan project costs include O&M estimates?

A: Yes. NIPSCO's cost estimates for CCR Compliance Plan projects include $6.641M annually in O&M costs.[33] This figure includes O&M associated with groundwater monitoring at Bailly, incremental surface impoundment O&M, and O&M costs for

[29] *See* Attachment LAG-6. Response to OUCC Data Request 6-005.
[30] The Project Definition. http://www.theprojectdefinition.com/owners-cost/ (Accessed March 21, 2017)[31] *See* Attachment LAG-7. Response to OUCC Data Request 6-006.
[31] *See* Attachment LAG-7. Response to OUCC Data Request 6-006.
[32] *Id*.
[33] Petitioner's Exhibit No. 4, Attachment 4-A.

the remote ash conveying system to be located at Michigan City and Schahfer Generating Stations.

Q: Do you have any concerns with the O&M cost estimates NIPSCO provided for its CCR Compliance Plan projects in this filing?

A: Yes. NIPSCO's estimated O&M costs include a [redacted]% contingency for Groundwater Monitoring projects, and a [redacted]% contingency for the other CCR Compliance Plan projects.[34] O&M costs are necessary in order to operate the ash handling systems at Michigan City and Schahfer, and it is reasonable to include O&M costs associated with on-going groundwater monitoring activities and incremental surface impoundment maintenance activities. However, the level contingency included in NIPSCO's O&M estimates is unreasonable, and I recommend they are reduced by half.

Q: Do you have any recommendations regarding NIPSCO's cost estimates for the proposed CCR Compliance Plan projects?

A: Yes. First, NIPSCO's 30% project variability factor (contingency) included in each of the CCR Compliance Plan project cost estimates is too high given that NIPSCO is set to execute an EPC Contract for the CCR Compliance Plan on April 28, 2017. It would be reasonable to expect that NIPSCO would have developed a "control or bid/tender" estimate by this time in order to form the baseline for the EPC Contract. Acknowledging that some level of contingency is appropriate, I recommend that the 30% contingency applied to the direct capital estimates at the project level be

[34] *See* Confidential Attachment LAG-9. Response to OUCC Data Request 6-008, Confidential Attachment A.

reduced to a more reasonable 15%, given the current stage of the CCR Compliance Plan, in which the risks to the project should be more manageable or understood.

Second, in my experience, monetizing the risk of a Class 4 estimate, as NIPSCO has done, is highly unusual and inappropriate. NIPSCO's ratepayers should not bear an increased project cost for the CCR Compliance Plan simply because NIPSCO chose to base its filing on a Class 4 estimate. As such, I also recommend NIPSCO's [redacted]% Class 4 monetary allowance be disallowed.

Third, in line with my recommendation to reduce contingencies at the project cost level, I recommend the contingencies included in NIPSCO's O&M estimates be reduced by half. My Attachment LAG-12 shows the total adjustment to NIPSCO's proposed O&M estimates. I am recommending NIPSCO's O&M estimates be reduced from at total amount of $[redacted] to $[redacted].

Finally, a cap on NIPSCO's costs for recovery in this case is appropriate. While the OUCC recommends approval of almost all of NIPSCO's proposed projects in this filing, NIPSCO will only recover the actual costs it incurs as it constructs the projects over time. I have recommended that the cost of NIPSCO's CCR Compliance Plan includes 15% contingency at the direct capital level. Again, given the current stage at which NIPSCO's CCR Compliance Plan is, with an EPC Contract set to be executed by April 28, 2017, the contingency percentage I recommend should adequately address the potential for any unknown costs. As such, I recommend NIPSCO's actual costs for recovery be capped at the amount approved in this case. If NIPSCO's actual costs exceed this approved amount, NIPSCO should be required to provide specific justification in its next federally

mandated cost adjustment tracking mechanism filing as to why its project management process and awarded contingency level did not adequately address these excesses.

My recommendations include the reduction to NIPSCO's proposed CCR Compliance Plan proposed by OUCC witness Cynthia Armstrong to remove the costs of the Landfill-Pond Closure project at the Schahfer Generating Station, in the amount of $18.285M. The OUCC's adjusted CCR Compliance Plan capital cost estimate being recommended is $[redacted]M. A detailed breakdown of these recommended costs are included in my testimony as Confidential Attachment LAG-11.

Q: Please explain Confidential Attachment LAG-11.

A: Confidential Attachment LAG-11 to my testimony shows the OUCC's adjustments to NIPSCO's capital cost estimates for the CCR and ELG Compliance Plans. A portion of Confidential LAG-11 shows NIPSCO's direct capital breakout, including NIPSCO's Class 4 capital cost estimate that includes a 30% contingency, NIPSCO's owner's costs, the [redacted]% monetary allowance NIPSCO applied to account for the expected variation of its Class 4 estimate, and the 3% escalation factor NIPSCO applied to the direct capital. The total of these direct capital amounts are added with the indirect cost and AFUDC estimates to arrive at NIPSCO's provided total capital estimate for CCR Compliance Plan projects of $228.535M.

Confidential LAG-11 reflects the $18.285M that OUCC Witness Cindy Armstrong is recommending be disallowed. It also shows a 15% reduction to NIPSCO's original direct capital estimate that reflects my adjustment to NIPSCO's

included 30% contingency. Finally, Confidential Attachment LAG-11 shows the removal of estimated costs associated with the [redacted]% monetary allowance added by NIPSCO to account for the variance in the expected accuracy of its Class 4 estimate. The OUCC's recommended CCR Compliance Plan total cost is $[redacted]M.

III. NIPSCO'S PROPOSED ELG COMPLIANCE PLAN PROJECTS

Q: Please describe the ELG Compliance Plan project options that were considered by NIPSCO in this filing.

A: Similar to its approach to its proposed CCR Compliance Plan, NIPSCO retained CH2M Hill to conduct an evaluation of seven alternatives for Schahfer Generating Station in order to meet ELG compliance. [35]

The CH2M Hill study and cost analysis report include an evaluation of different technologies and multiple versions of each that can be used to meet ELG compliance. The study also included cost estimates for these technologies. The CH2M Hill study described a screening meeting that was held with NIPSCO personnel, and determined that ABMet®, passive biological, and ZLD by thermal evaporation would be used for conceptual design evaluations. The testimony of OUCC witness Armstrong describes the adequacy of each technology considered for purposes of ELG compliance. NIPSCO chose the partial ZLD technology option for ELG compliance at Schahfer Generating Station.[36]

[35] Petitioner's Exhibit No. 4, page 20, lines 2 – 10.
[36] Petitioner's Exhibit No. 4, page 20, lines 12 – 15.

Q: Do you have any engineering concerns with the ZLD technology NIPSCO plans to install?

A: No. Biological treatment systems and ZLD technology are both appropriate technologies to consider for treating FGD effluent. Biological treatment is a less expensive option than the partial ZLD technology NIPSCO selected.[37] In evaluating engineering challenges that can occur with each option, my research indicated that biological systems are sensitive to pH, temperature, and the salinity of the wastewater.[38] Furthermore, the CH2M Hill study pointed out that [redacted] [39]

Q: How did NIPSCO develop its capital cost estimates for its ELG Compliance Plan projects?

A: The CH2M Hill study and cost estimates provided NIPSCO with information it could use for selecting technologies for ELG compliance.[40] The CH2M Hill study included project cost data and also included a preliminary schedule for compliance; a list of equipment, including equipment electrical loads, and unit cost information for equipment; construction, and labor.[41] These estimates included [redacted] [42] The CH2M Hill estimates were

[37] See Attachment LAG-8. Response to OUCC Data Request 3-003. [38] Review of Available Technologies for the Removal of Selenium from Water. Final Report. June 2010. Page 4-57. http://www.namc.org/docs/00062756.PDF (Accessed March 14, 2017).
[38] Review of Available Technologies for the Removal of Selenium from Water. Final Report. June 2010. Page 4-57. http://www.namc.org/docs/00062756.PDF (Accessed March 14, 2017).
[39] Petitioner's Exhibit No. 4, Attachment 4-C (Confidential), page 3-8.
[40] *Id.* at page 1-1.
[41] *Id*.
[42] *Id.* Appendix D – ZLD Conceptual Design. *Schahfer Generating Station. Physical-Chemical Treatment System – Partial ZLD (Evaporator Only). Estimated Capital Cost.* Page 2.

provided as Class 4 estimates, and included an expected accuracy range of -30% to +40%.[43]

NIPSCO designed its cost estimates for the ELG Compliance Plan based on CH2M Hill's study and cost estimates, with additional data provided by NIPSCO's Major Projects team, various vendor surveys, evaluation of site-specific conditions, and potential market risks.[44] NIPSCO's cost estimate for the ELG Compliance Plan project at Schahfer Generating Station included direct capital amounts of $142.500M and indirect capital amounts of $21.375M, for a total capital estimate of $163.875M not including AFUDC.[45] NIPSCO's ELG cost estimates are also at a Class 4 level, with a typical expected accuracy range of -15/-30% to +20/+50%.[46]

Similar to NIPSCO's CCR Compliance Plan direct capital cost estimates, the ELG Compliance Plan direct capital cost estimates also contain contingency markups. NIPSCO has included a 30% contingency in the direct capital estimate at the individual project level of $[redacted], in addition to a [redacted].0% monetary allowance of the risk of a Class 4 estimate in the amount of $[redacted] and a [redacted]% annual escalation amount of $[redacted] for work to begin after 2016.

[43] Petitioner's Exhibit No. 4, Attachment 4-C (Confidential), page 3-31.
[44] Petitioner's Exhibit No. 4, page 24, line 14 – page 25, line 2.
[45] *Id.*, Attachment 4-A.
[46] *Id*.

Q: Do you have any concerns regarding the annual [redacted]% escalation factor included in NIPSCO's CCR Compliance Plan projects?

A: No. The estimates were created in 2016 dollars[47] and the ELG Compliance Plan projects are estimated to be completed by December 2023. It is reasonable that a conservative escalation rate be applied for work scheduled to begin after 2016.

Q: Do NIPSCO's ELG Compliance Plan project cost estimates include owner's costs?

A: Yes. NIPSCO's cost estimates for ELG Compliance Plan projects include $[redacted] in owner's costs, which is approximately [redacted]% of estimated total capital costs.[48]

Q: Do you have any concerns with the owner's costs included in NIPSCO's ELG compliance estimate?

A: No. Similar to owner's costs included in NIPSCO's CCR Compliance Plan, the owner's costs in the ELG Compliance Plan contain costs associated with project management; project engineers; project controls; construction management; third party testing; construction site facilities; consultants; subject matter experts; start-up and commissioning support; and general site services such as surveying, training for the new systems, and Owner's Engineers. Owner's costs are typical of large capital projects and generally include costs associated with these areas that are the responsibility of the project owner.

[47] Petitioner's Exhibit No. 4, Attachment 4-B (Confidential).
[48] *See* Confidential Attachment LAG-3. Response to OUCC Data Request 5-001, Confidential Attachment A.

Q: Do NIPSCO's ELG Compliance Plan project cost estimates include indirect costs?

A: Yes. NIPSCO's cost estimates for ELG Compliance Plan projects include $21.375M in indirect costs.[49]

Q: Do you have any concerns with the indirect costs included in NIPSCO's estimates?

A: No. NIPSCO's indirect costs for its ELG Compliance Plan are calculated the same as the indirect costs for its CCR Compliance Plan projects. Indirect costs are not directly charged to a specific project, resulting in the costs being spread among all capital projects. Among these costs are overhead costs that include portions of benefits such as vacation and holiday pay, charges incurred for outside services to support NIPSCO's capital project process, and portions of payroll for NIPSCO employees who serve a supporting role in a project management function, or an administrative and general function. The estimated amount of NIPSCO's indirect costs is 15% of Direct Costs.

Q: Do NIPSCO's ELG Compliance Plan project cost estimates include O&M costs?

A: Yes. NIPSCO's cost estimates for ELG Compliance Plan projects include $2.60M annually for O&M costs.[50] NIPSCO's annual O&M costs pertain to the operation of the ZLD system, maintenance of the ZLD system and its components, disposal of solids, and chemicals required for the process.[51]

Q: Do you have any concerns with the quality of the O&M cost estimates NIPSCO provided for its ELG Compliance Plan projects in this filing?

[49] Petitioner's Exhibit No. 4, Attachment 4-A.
[50] Petitioner's Exhibit No. 4, Attachment 4-A.
[51] *Id*. Page 23, lines 7 – 9.

A: No. Operating the partial ZLD system will require on-going O&M expense. The confidential breakdown of NIPSCO's ELG Compliance Plan O&M cost estimates provided in response to OUCC discovery are shown without contingency.[52]

Q: What are your recommendations regarding NIPSCO's ELG Compliance Plan cost estimates?

A: I have several recommendations to modify NIPSCO's ELG Compliance Plan cost estimates and to institute certain reporting requirements on the Company. First, I recommend that NIPSCO be required to file an updated estimate for the projects in its ELG Compliance Plan once the EPC Contract is executed. In response to OUCC discovery, NIPSCO stated it has changed the construction start date for its Piping Bottom Ash to FGD project from January 2020 to April 28, 2017.[53] Even with this change, NIPSCO did not provide an updated class cost estimate for this project. It should be required to do so. NIPSCO also stated in response to OUCC discovery that by the execution of the EPC Contract, it should have an updated Class III cost estimate for the ZLD Project.[54] The EPC Contract is expected to be executed on April 28, 2017. Given that NIPSCO will have to bid its projects before construction can begin, and that construction for the ZLD Project is estimated to begin in January 2020, it is reasonable to expect that NIPSCO should soon be in a position to provide the Commission, OUCC, and other parties with a more defined and accurate estimate than the Class 4 estimate NIPSCO provided in its case-in-chief.

[52] *See* Confidential Attachment LAG-9. Response to OUCC Data Request 6-008, Confidential Attachment A.
[53] *See* Attachment LAG-5. Response to OUCC Data Request 6-003.
[54] *See* Attachment LAG-10. Response to OUCC Data Request 6-007.

Second, I recommend the Commission require NIPSCO to file at least a Class 2 estimate by June 30, 2019, or six months before construction will be scheduled to begin its ZLD project. OUCC witness Rutter provides excerpts from several Commission orders describing the obligation on a petitioning utility to provide accurate and complete cost estimates in CPCN and other similar cases. These orders support the conclusion that NIPSCO must provide the Commission and the parties with a more defined project estimate for the ZLD project than is currently available.

Third, as a safeguard for NIPSCO's ratepayers, similar to the recommendations I made regarding NIPSCO's CCR Compliance Plan projects, the contingency included in NIPSCO's ELG Compliance Plan project estimates should be reduced. Prior to the start of construction, NIPSCO should have a "control or bid level" estimate for the projects in its ELG Compliance Plan. Acknowledging that some level of contingency is appropriate, I recommend that the unreasonably high 30% contingency applied to the direct capital estimates at the project level be reduced to a more reasonable 15%.

Fourth, I recommend the removal of the monetary allowance for the accuracy range of NIPSCO's Class 4 estimate for this project. Again, it is unreasonable and inappropriate to ask NIPSCO's ratepayers to finance its risk associated with its cost estimate for its ELG Compliance Plan. The OUCC's adjusted ELG Compliance Plan total cost estimate is $[redacted]M. A detailed breakdown of these recommended costs are included as Confidential Attachment LAG-11.

Finally, a cap on NIPSCO's costs for recovery in this case is appropriate. While the OUCC recommends approval of almost all of NIPSCO's proposed projects in this filing, NIPSCO will only recover the actual costs it incurs as it constructs the projects over time. I have reduced the cost of NIPSCO's ELG Compliance Plan to include 15% contingency at the direct capital level, which should adequately address the potential for any unknown costs. As such, I recommend NIPSCO's actual costs for recovery be capped at the amount approved in this case. If NIPSCO's actual costs exceed this approved amount, NIPSCO should be required to provide specific justification in its next federally mandated cost adjustment tracking mechanism filing as to why its project management process and awarded contingency level did not adequately address these excesses.

Q: Please describe how Confidential Attachment LAG-11 shows your adjustments to NIPSCO's ELG cost estimates.

A: Similar to the CCR Compliance Plan projects, the direct capital breakout for NIPSCO's ELG Compliance Plan projects is based on its Class 4 estimate that includes a 30% contingency. It also includes owner's costs, the [redacted]% monetary allowance to account for the expected variation of a Class 4 estimate, and the [redacted]% escalation factor applied to the direct capital. The total of these direct capital amounts are added with the indirect cost estimates to arrive at NIPSCO's total capital estimate for ELG Compliance Plan projects of $[redacted]M.

Confidential Attachment LAG-11 shows a 15% reduction to NIPSCO's original direct capital estimate that reflects my adjustment to NIPSCO's included 30% contingency. Attachment LAG-11 shows the removal of estimated costs associated with the [redacted]% monetary allowance added by NIPSCO to account for the

expected accuracy variance of its Class 4 estimate. The OUCC's final recommended ELG Compliance Plan total cost is $[redacted]M.

IV. RECOMMENDATIONS

Q: Please summarize your recommendations.

A: In addition to the recommendations made by OUCC witness Cynthia Armstrong, I recommend the Commission:

1. Reduce the 30% contingency applied at the CCR Compliance Plan project level to 15%, and disallow the [redacted]% Class 4 monetary allowance included in NIPSCO's CCR Compliance Plan project cost estimates.
2. Reduce the O&M contingencies applied to the CCR Compliance Plan projects by half.
3. Approve the OUCC's adjusted CCR Compliance Plan cost estimates in the amount of $[redacted]M.
4. Reduce the 30% contingency applied at the ELG Compliance Plan project level to 15%, and disallow the [redacted]% Class 4 monetary allowance included in NIPSCO's ELG Compliance Plan project cost estimates.
5. Approve the OUCC's adjusted ELG Compliance Plan cost estimates in the amount of $[redacted]M.
6. Cap NIPSCO's costs for recovery to the amount approved in this case. In the event NIPSCO's actual costs for its Environmental Compliance Project exceed the costs approved in this case, require

NIPSCO to provide specific justification as to why its project management process and awarded contingency level did not adequately address these excesses in its federally mandated cost adjustment tracking mechanism.

7. For its ELG Compliance Plan projects, require NIPSCO to file an updated estimate once the EPC contract is executed (April 28, 2017), and for the ZLD project, that NIPSCO be required to file a Class 2 estimate with the Commission and the OUCC by June 30, 2019, or six months before construction on this project is set to begin.

Q: Does this conclude your testimony?

A: Yes, it does.

APPENDIX A

Q: Please describe your educational background and experience.

A: I graduated from Purdue University School of Engineering and Technology - Indianapolis in 2011, with a Bachelor of Science degree in Mechanical Engineering. In October of 2011, I passed the Fundamentals of Engineering exam administered by the Indiana Professional Licensing Agency.

I worked as a civil engineering technician from 2005-2008, performing materials testing in field and laboratory settings, conducting analysis of mechanical properties of soils, and working in accordance with a variety of testing standards. From 2009-2014, I worked as an engineer co-op and project engineer in the electric utility industry in a number of different areas, including; Customer Projects, Substation Relaying and Protection, Standards and Code Compliance, and distributed generation interconnections.

I have participated in several IEEE technical workshops, including; Smart Grid Cyber-Security, Smart Distribution Systems, and Wind Farm Collector System Design workshops. I have attended New Mexico State University – Center for Public Utilities' Basic Regulatory Training for the Electric Industry in New Mexico.

Q: Have you previously testified before this Commission?

A: Yes. I have testified in a number of Causes before this Commission.

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OUCC Request 3-002:

Refer to Direct Testimony of Kurt Sangster, pages 5-6. It is stated that NIPSCO chose Remote Ash Conveying systems for both Michigan City and Schahfer for the following reasons:

- Safety
- Feasibility of project execution
- Proven reliability
- Ability to compliment compliance with ELG

Please elaborate on why these reasons support selecting Remote Ash Conveying systems in detail, and provide any supporting documentation.

Objections:

Response:

Safety- Remote Ash Conveying is a safer option with respect to Retrofit of Ponds and the Dewatering Bin System. Retrofit of Ponds would require two ponds (concrete or lined) operating side by side. Bottom ash would sluice to one pond until the pond was full of ash, then sluicing would switch to the second pond while the first pond is emptied of ash. These ponds are typically designed with sloped access to allow the pond to be cleaned out with heavy equipment such as a front-end loader. During the winter months, the pond that is out of service can freeze up without the heat from the sluicing operation coming into the pond. This is a risk given the climate within which NIPSCO operates. Cleaning out the pond can be hazardous with an icy slope and heavy equipment. A Dewatering Bin System is a high-maintenance system, due to its mechanical nature and the erosive properties of the bottom ash. Any system that is high-maintenance also, by its nature, presents more safety challenges than one that requires less maintenance.

Feasibility of Project Execution- Project execution of a Remote Ash Conveying system has less execution risk and a higher likelihood of success as compared with an Under the Boiler option. In executing an Under the Boiler system at an existing unit, there are interferences to contend with on existing equipment such as cable trays, motor control centers (MCCs), building structural steel, and flue gas duct. In addition, a Remote Ash Conveying System does not have the same level of execution risk because tying into the

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existing system alleviates the need for an extended unit shut down and the equipment can be installed in a separate, safe environment.

Proven Reliability- Under the Boiler Systems inherently have lower reliability than a remote system since the slag tank is removed when the under boiler conveyor is installed, in essence removing that storage capacity for slag. This storage capacity essentially allows you to buy time to make repairs to the ash handling system without shutting down the boiler. A remote system, on the other hand, actually allows for even more storage capacity. This is because you could sluice to the remote conveyor and store bottom ash, allowing for additional time for repairs. A double train remote conveyor system has two trains that could be operated, so if one is down for repairs the other train can operate while repairs are made to the other train.

Ability to Complement Compliance with ELG- For both Retrofit of Ponds and the Bin Dewatering System, the pond and the dewatering bins are open to the atmosphere allowing rain water to enter the sluicing system. Once ELG compliance is required, NIPSCO would be required to treat the rain water as sluice water. While this rain water (now sluice water) can be recycled into the FGD process, it cannot be discharged. Once in the FGD system, this water becomes subject to the requirements of the ELG Rule. Introducing this rain water into the water balance therefore drives larger ZLD systems (higher capital and O&M costs) to handle the additional flow.

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OUCC Request 3-001:

Refer to Direct Testimony of Kurt Sangster, page 5. It is stated that NIPSCO considered the following bottom ash handling options:

- Under the Boiler Ash Conveying (wet to dry ash and fully dry)
- Remote Ash Conveying
- Dewatering Bin System
- Retrofit of Ponds

Please describe the advantages and disadvantages for each of these systems NIPSCO considered in its decision making.

Objections:

Response:

Under the Boiler Ash Conveying (wet to dry ash)

Pros

- Eliminates existing sluicing system
- Lower capital and O&M costs than a Remote System for single units
- Proven reliability, multiple installations
- The rules state that quench water is not regulated by ELG

Cons

- Longer outage for installation
- No redundancy
- Interferences on bottom of boiler

Under the Boiler Ash Conveying (fully dry)

Pros

- Eliminates existing sluicing system
- Lower capital and O&M costs than a single unit Remote System

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- Completely dry system

Cons

- Longer outage for installation
- Higher capital cost than wet under the boiler ash conveying
- No redundancy
- Potential interferences on bottom of boiler
- Technology is only designed for Pulverized Coal (PC) boilers and not for Cyclone fired boilers. (Two of three NIPSCO units needing controls are Cyclone fired boilers.)

Remote Ash Conveying

Pros

- Shortened outage/tie in time
- Reduction of potential interferences on boiler footprint
- Redundancy
- Unit outage not required for maintenance of this system
- Lower capital cost for multiple units at same site as compared with under the boiler

Cons

- Higher cost when compared to single unit under the boiler system
- Continued use of the sluicing system
- Complete enclosure needed due to weather
- Water chemistry and Total Suspended Solids (TSS) concerns due to the fact that the transport water is in a closed loop and concentrations of solids and chemicals need to be monitored and controlled
- Transport water is regulated by ELG and must be treated

Dewatering Bin System

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Pros

- System redundancy
- Reduction of potential interferences on boiler footprint
- Minimal outage required for installation
- Loads directly to truck

Cons

- Higher cost when compared to single unit under the boiler
- Continued use of the sluicing system – a relatively high O&M cost
- High O&M cost and numerous mechanical components
- Requires units to run during winter months to prevent system freeze up
- Introduction of rainwater into the system (open tanks)
- History of operational concerns including inadequate dewatering and high Total Suspended Solids (TSS) carryover
- Closed loop water chemistry concerns
- Transport water is regulated by ELG and must be treated
- Chemical addition required

Retrofit of Ponds (Concrete settling pond or lined pond)

Pros

- Costs less than other options
- Minimal technology
- Reduction of potential interferences on boiler footprint

Cons

- Continued use of the sluicing system
- Winter operations are potentially unsafe
- Double handling of ash for dewatering likely required
- Taking on rain water creates large water balance concerns especially during

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times when units are offline and blowdown to scrubber is not possible

- Water chemistry and Total Suspended Solids(TSS) carryover risks due to the fact that the transport water is in a closed loop and concentrations of solids and chemicals need to be monitored and controlled
- Large footprint required
- Capital cost increase to create 5' of separation from groundwater
- If concrete pond not created as a "tank," then considered an impoundment and subject to CCR rule

Cause No. 44872
Northern Indiana Public Service Company's
Objections and Responses to
OUCC's Data Request Set No. 5

OUCC Request 5-004:
Please describe any amounts of project contingency or management reserves included in NIPSCO's cost estimates for CCR and ELG projects.
Objections:
NIPSCO objects to this Request on the grounds and to the extent that this Request seeks information that is confidential, proprietary and/or trade secret information.
Response:
Subject to and without waiver of the foregoing general and specific objections, NIPSCO is providing the following response: See OUCC Request 5-001 Attachment A. The amount of contingency is included in the Direct Capital-Class 4 Estimate column. For all estimates, a contingency of 30% was used. OUCC Request 5-001 Attachment A also includes amounts for Direct Capital-Upper End of Accuracy Range, which is also known as management reserve.

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Northern Indiana Public Service Company's
Objections and Responses to
OUCC's Data Request Set No. 5

OUCC Request 5-001:
Refer to Direct Testimony Kurt Sangster. Mr. Sangster discusses capital costs and annual O&M costs associated with the options for CCR and ELG compliance. Cost estimates included in Sangster's testimony, and Confidential Attachments 4-B and 4-C do not appear to agree on a dollar-to-dollar comparison. Please describe in detail the differences between these estimates. Provide supporting documentation.
Objections:
NIPSCO objects to this Request on the grounds and to the extent that this Request seeks information that is confidential, proprietary and/or trade secret information.
Response:
Subject to and without waiver of the foregoing general and specific objections, NIPSCO is providing the following response: See the attached spreadsheet, OUCC Request 5-001 Confidential Attachment A, for an explanation of the buildup of the estimates. The total includes the Direct Capital from Petitioner's Confidential Attachments 4-B and 4-C, Direct Capital-Owner's Cost, Direct Capital-Upper End of Accuracy Range, and Direct Capital- Escalation. These are all summed to get to the Total Direct Capital amounts that are shown on Petitioner's Attachment 4-A.

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Cause No. 44872
Northern Indiana Public Service Company's
Objections and Responses to
OUCC's Data Request Set No. 6

OUCC Request 6-010:
Please explain why an escalation factor is included for groundwater monitoring projects at Bailly, Michigan City, and Schaefer when these projects will be complete and in-service by October 2017.
Objections:
Response:
The estimate for the groundwater monitoring is in 2016 dollars. In order to recognize inflation and its impact on costs into the future, an escalation factor of 3% per year is applied for any work forecasted to occur after 2016. This approach is consistent with all of the projects identified in Attachment 4-A.

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OUCC's Data Request Set No. 6

OUCC Request 6-003:

Please provide any updates for "Construction Start Date" and "In-Service Date" for each CCR and ELG Compliance Plan project shown in Petitioner's Attachment 4-A. Provide detailed explanations for describing the reason for the change in each date.

Objections:

Response:

The term "Construction Start Date" as used in Petitioner's Exhibit No. 4 defines the dates in Petitioner's Attachment 4-A for award of the EPC contracts. There have been changes to Construction Start Dates for five (5) of the fourteen (14) projects listed in Petitioner's Attachment 4-A, and these changes are listed below. All of the in-service dates, with exception to Piping of Bottom Ash to FGD, remain unchanged.

- R. M. Schahfer Generating Station (RMSGS) & Michigan City Generating Station (MCGS) Remote Ash Conveying Systems – The construction start dates for these projects have been changed from 4/1/17 to 4/28/17. These dates have been changed due to the anticipated award of the EPC contract on 4/28/17.
- MCGS Material Handling Area - The construction start date for this project has been changed from 4/1/17 to 4/28/17. This date has changed since this work is planned to be integrated with the EPC contract for the Remote Ash Conveying System project at MCGS.
- RMSGS Material Handling Area - The construction start date for this project has been tentatively changed from 4/1/17 to 4/1/18. It is anticipated that construction of this project can occur in a single year. However, the schedule for this project is still under review to determine any impacts from constructing the new RMSGS Material Handling Area in 2018.
- Piping Bottom Ash to FGD - The construction start date for this project has been changed from 1/1/20 to 4/28/17. The in-service date for this project has been changed from 12/1/23 to 10/19/18. This date has changed since this work is planned to be integrated with the EPC contract for the Remote Ash Conveying System project at RMSGS.

NIPSCO also notes that it anticipates beginning excavation for the MCGS and RMSGS Remote Ash Conveying Systems, the MCGS Material Handling Area, and the Piping Bottom Ash to FGD on or about July 1, 2017.

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OUCC Request 6-005:
Refer to NIPSCO's Response to OUCC Data Request 5-001 (Confidential) Attachment A. Please provide a detailed breakout of Owner's Costs along with detailed descriptions for each line item.
Objections:
Response:
Owner's Costs includes the direct project costs as it relates to the management of the project by NIPSCO's project team. Those costs include the following types of categories: project management, project engineers, project controls (cost and schedule), construction management, quality control/quality assurance including 3rd party testing, temporary facilities on the job site, consultants, subject matter experts, start up and commissioning support, general project site services such as surveying, personnel training for new systems, Owner's Engineer, etc. The typical approach of estimating Owner's Cost at this phase of project development is to apply a percentage to the Direct Capital Cost for each project. NIPSCO utilized 8% Owner's Cost based on project history. This approach was applied to nine of the eleven capital projects included in Attachment 4-A of Petitioner's Exhibit No. 5. The two exceptions, R.M. Schahfer Generating Station (RMSGS) Remote Ash Conveying and Zero Liquid Discharge projects, included the application of the typical 8% described above, as well as estimated costs for scope not included in the estimates provided in Attachments 4-B and 4-C. The items that account for the additional $3,600,000 over the 8% in the Owner's Cost for the RMSGS Remote Ash Conveying project include a dedicated compressed air system, as well as costs to provide power to the Remote Ash Conveying system via a new transformer in the switchyard. The items that account for the additional $5,400,000 over the 8% in the Owner's Cost for the ZLD project include a dedicated compressed air system, new transformer to provide power to the ZLD system, and additional costs for the modification of the existing Units 14 and 15 Waste Water Treatment (WWT) system.

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Northern Indiana Public Service Company's
Objections and Responses to
OUCC's Data Request Set No. 6

OUCC Request 6-006:

Refer to NIPSCO's Response to Data Request 5-001 (Confidential) Attachment A. Please provide a detailed breakout of Indirect Costs along with detailed descriptions for each line item.

Objections:

Response:

NIPSCO's typical approach of estimating Indirect Cost is to apply a percentage to the Direct Capital Cost for each project. NIPSCO utilized 15% for Indirect Cost as an estimate for the amount that would be capitalized based upon applicable NIPSCO indirect cost calculations.

Indirect capital costs are associated with capital projects and must be capitalized in order to comply with Generally Accepted Accounting Principles ("GAAP"). However, these often cannot be charged directly to a specific capital project work order as they cannot be directly linked to one particular project. These capital costs tend to be incurred away from the job site. Excluding AFUDC for purposes of this explanation, NIPSCO groups these indirect capital costs into two categories: (1) overheads, and (2) stores, freight and handling.

The overhead component of indirect capital includes items such as:

1. Portions of benefits such as vacation and holiday pay;
2. Portions of charges incurred for outside services that support NIPSCO's capital project processes; and
3. Portions of payroll for NIPSCO employees involved in supporting capital projects in either a project management function (i.e., project engineering, operations) or an administrative and general function (i.e., fixed asset accounting, financial planning).

Stores, freight, and handling charges are also indirect capital costs that must be capitalized for GAAP purposes. This component of indirect capital represents costs that NIPSCO incurs to procure materials and equipment. Generally, this represents the payroll for NIPSCO's supply chain and procurement functions. It also includes labor costs and other warehousing expenses associated with NIPSCO's warehousing function for inventoried materials and supplies.

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Both of the indirect capital components must be capitalized in order to conform with GAAP for public utilities. For classification of all other capital spending, NIPSCO has consistently followed this approach internally for both direct and indirect capital costs for years, including during the test year in its last general rate case proceeding (Cause No. 44688).

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OUCC Request 3-003:

Refer to Direct Testimony of Kurt Sangster, page 20. It is stated that several option were considered for ELG compliance, including:

- Zero Discharge (a/k/a Zero Liquid Discharge or "ZLD") with full sized crystallizer (no brine discharge)
- ZLD with appropriately sized crystallizer
- ZLD Evaporator only (no crystallizer)
- Biological treatment including Advanced Biological Metals (ABMet) removal process
- Absorptive media
- Zero Valent Iron
- Deep Well Injection

Please describe the advantages and disadvantages for each type of system NIPSCO used in its decision making.

Objections:

Response:

Zero Discharge (a/k/a Zero Liquid Discharge or "ZLD") with full sized crystallizer (no brine discharge)

Pros

- No FGD wastewater discharge, if distillate is reused
- Minimal final cake product
- Can be eliminated if used for pug mill process
- No ash or gypsum requirements
- Future proofing technology
- Can run independent of unit operation with auxiliary boiler

Cons

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- Most expensive of the ZLD options

ZLD with appropriately sized crystallizer

Pros

- No FGD wastewater discharge, if distillate is reused
- Further reduces brine volume from ZLD Evaporator-only option
    - This option may be necessary if brine volume is in excess of volume to wet ash prior to landfilling
- Future proofing technology
- Can run independent of unit operation with auxiliary boiler

Cons

- More expensive than ZLD Evaporator-only option

ZLD Evaporator only (no crystallizer)

Pros

- No FGD wastewater discharge, if distillate is reused
- Brine used to wet ash prior to landfilling
- Future proofing technology
- Can run independent of unit operation with auxiliary boiler
- Lowest cost of ZLD options

Cons

- High cost of capital and O&M

Biological treatment including Advanced Biological Metals (ABMet) removal process

Pros

- Material costs and labor less expensive than other options

Cons

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- Systems are not fully proven
- Limits fuel options
- Susceptible to temperature and process swings
- Long time to "resuscitate" the bug population
- Process upsets from oxidants, toxics, or slug loads
- High risk with multiple units
- Limited suppliers

Absorptive media

Pros

- Good for polishing

Cons

- Not currently used for ELG compliance
- Not a large reduction of metals
- High cost of media replacement and disposal
- Media typically more effective for selenate vs. selenite

Zero Valent Iron (ZVI)

Pros

- Target mercury, arsenic, selenium, and other metals

Cons

- No full-scale application in service
- Bio treatment still needed for nitrate
- Filtration system may be needed
- ZVI usage and iron sludge

Deep Well Injection

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Pros

- NPDES permit not required
- Simple technology
- Favorable regional geology

Cons

- Calcium sulfate-based chemistry not suggested for deep well
- Will need physical/chemical treatment
- Arduous process for Underground Injection Control (UIC) permit
- Potential public concern and need for educational campaign and outreach
- May require selenium-pretreatment to maintain non-hazardous waste well classification

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OUCC Request 6-008:
For each CCR and ELG Compliance Plan project being proposed by NIPSCO, please provide any documentation that supports NIPSCO's annual estimated O&M estimates.
Objections:
NIPSCO objects to this Request on the grounds and to the extent that this Request seeks information that is confidential, proprietary and/or trade secret information.
Response:
Subject to and without waiver of the foregoing general and specific objections, NIPSCO is providing the following response: The O&M estimates for the CCR and ELG Compliance Plans are attached hereto as OUCC Request 6-008 Confidential Attachment A.

THIS PAGE MARKED AS CONFIDENTIAL

Cause No. 44872
Northern Indiana Public Service Company's
Objections and Responses to
OUCC's Data Request Set No. 6

OUCC Request 6-007:
Please provide complete copies of any Request for Proposal ("RFP") that has been sent out by NIPSCO in regard to any CCR or ELG Compliance Plan project.
Objections:
NIPSCO objects to this Request on the grounds and to the extent that this Request seeks information that is confidential, proprietary and/or trade secret information.
Response:
Subject to and without waiver of the foregoing general and specific objections, NIPSCO is providing the following response: NIPSCO chose to utilize an Engineer, Procure, & Construct (EPC) contract strategy for the Unit 12, 14, and 15 Remote Ash Conveying Projects and the RMSGS Zero Liquid Discharge (ZLD) Project. Attached hereto as OUCC Request 6-007 Confidential Attachment A.zip is the RFP package that was sent out for the Remote Ash Conveying and ZLD projects. This RFP package included conceptual design information that was used to solicit company information, plans for project execution, and indicative/non-binding pricing from the EPC bidders. Using the information gathered during the RFP process, NIPSCO evaluated each RFP candidate. Based on this evaluation, a Time and Materials contract was issued to one candidate to undertake an open book EPC engineering and proposal phase. The result of this open book phase will be an executable EPC price to perform the Remote Ash Conveying projects and an updated Class III cost estimate for the ZLD system. The intent of this RFP and evaluation process is to utilize a single EPC contractor to perform the Remote Ash Conveying and ZLD projects. This is the only RFP that has been sent out by NIPSCO.

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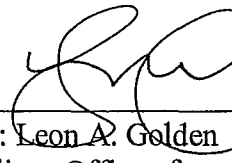
AFFIRMATION

I affirm, under the penalties for perjury, that the foregoing representations are true.



By: Leon A. Golden
Indiana Office of
Utility Consumer Counselor

4/3/2017
Date: