SCS ENGINEERS

February 17, 2016 File No. 25211357.31

Mr. John Terrell Indianapolis Power & Light Eagle Valley Generating Station 4040 Bluff Road Martinsville, IN 46151-7887

Subject: 2015-2 Dike Inspection - Eagle Valley Generating Station Ponds A, B, and C

Dear Mr. Terrell:

SCS Engineers (SCS) is pleased to submit this dike and basin inspection report for the Indianapolis Power & Light Company (IPL) Eagle Valley Generating Station Ash Ponds A, B, and C. This report was prepared by Mr. David M. Hendron, PE. The report presents a Summary of Visual Observations, and Conclusions and Recommendations. The inspection was performed on November 10, 2015, by Mr. Hendron and Mr. John Terrell. A presentation of the preliminary findings was given to Mr. Terrell at the conclusion of the inspection. A brief summary of the findings was prepared and presented at the meeting after the completion of the field inspection. The weather at the time of this inspection was clear and cool.

For this inspection, we filled out the IPL Dike Field Review Checklist form to document the results of the inspection. The completed form is given in **Attachment A** to this letter report. Documentation of the visual conditions of the dikes and ponds during this inspection is presented in the text of this report and shown in the photographs taken during the inspection. Photographs taken during this inspection are shown in **Attachment B**.

SUMMARY OF VISUAL OBSERVATIONS

IPL's Eagle Valley Plant continues to be operated on an intermittent basis. In general, conditions at the ash ponds continue to appear satisfactory. Water levels in Ash Ponds A, B, and C were below the invert of discharge structures for each pond.

There were no visual indications of seepage flow occurring anywhere on the downstream slope of any of the ponds. The vegetation on the downstream slopes of all the ash ponds was in good condition. IPL mowed the vegetation on the downstream slopes just prior to the inspection. There was no visible damage to the slopes by the mowing operations.

The following observations are noted.

Mr. John Terrell February 17, 2016 Page 2

Ash Ponds A, B, and C

The layouts of the Ponds A, B, and C are shown on **Figure 1**. At the time of the inspection, IPL was not operating the Eagle Valley Plant. Photographs taken during the inspection of Ponds A, B, and C are presented in **Attachment B** to this letter.

Results of the visual inspection performed on November 10, 2015, for Ponds A, B, and C is summarized below.

- The freeboard in Pond A appeared to remain adequate. The airspace previously provided was essentially full at this inspection.
- There was no discharge occurring from any of the ponds at the time of the inspection.
- The vegetation on all exterior slopes appeared to be in good condition. These slopes were mowed just prior to the inspection. The slopes appeared to be in good condition.
- The interior slopes of Pond C at the time of the inspection continued to appear to be in good condition. Pond C contained no evidence of water at the time of the inspection.
- The exterior slopes of Ponds A, B, and C continue to appear stable and well-vegetated with no visual evidence of seepage along the dike toes at the time of the inspection.
- The visible portions of the inside slope of the exterior dikes of Ponds A, B, and C continued to appear in good condition.
- There were no areas of softening or rutting noted during this inspection.
- IPL previously placed the material excavated from the interior of Pond A along the downstream slope of the intermediate dike between Pond A and Pond B as shown on **Figure 1**. No instabilities of the berm material were observed during placement, and the completed berm appeared stable during the inspection.

CONCLUSIONS AND RECOMMENDATIONS

Based on the observations made during the inspection, we conclude that conditions in Ponds A, B, and C are satisfactory at this time, and these basins show no visible signs of significant erosion or instability.

Recommendations for Ash Ponds A, B, and C

We make the following recommendations for Ponds A, B, and C.

Mr. John Terrell February 17, 2016 Page 3

- 1. Recommend that all interior slopes of perimeter dikes for Ponds A, B, and C be continued to be monitored for erosion and that rip-rap be placed on the interior slopes if and when erosion activities are significant.
- 2. Recommend that IPL continue systematic observation for all of the ash pond dikes with specific attention to the conditions in the rutted area on the downstream slope of the northeast corner of Pond A, noted in previous inspections. If conditions appear to change, IPL should contact Mr. Hendron as soon as practical to identify the need for response to the changes being observed.

SCS appreciates the opportunity to perform this inspection and looks forward to assisting IPL in future inspection of their ash disposal facilities. If you have any questions with regard to this report, please do not hesitate to contact me at 312-286-9397.

Sincerely,

David M. Hendron, PE Indiana PE 10000050 SCS ENGINEERS

DH/AJV

Enclosures: Figure 1 – Location Plan of Basin and Ponds Attachment A – IPL Dike Field Review Checklist Form Attachment B – Photographs

I:\3573\Inspection Reports\Eagle Valley - 15-2 Inspection Report\Ash Ponds\Revised Final\Text and Figure 1 - 2015-2 - Inspection - Ponds A-E.doc

FIGURE 1

Location Plan of Basin and Ponds



Figure 1 – Location Plan of Basin and Ponds

ATTACHMENT A

IPL Dike Field Review Checklist Form

- <u>Complete all Portions of this Section (Pre-review) Inspection 15-2</u> Date of Review: <u>November 10, 2015</u> Name of Dike: Eagle Valley Basins A, B, and C Project Number: 25211357.31
- 2) <u>Review Inventory Highlight missing information (Pre-review)</u> Owner(s) Name(s): <u>Indianapolis Power and Light Company (IPL)</u> Address: <u>4040 Blue Bluff Road</u> City: <u>Martinsville</u> State: <u>Indiana</u> Zip (+4) <u>46151-7887</u> Telephone (Home): ______ Telephone (Work): <u>765-349-3401</u> Contact Persons: <u>Mr. Rick Jacobs and Mr. John Terrell</u> Designed By: <u>IPL</u> Constructed By: <u>IPL contractors and sub-contractors</u> Year Completed: <u>Unknown</u> Plans Available (Yes, No) (Location): <u>Not complete for all ponds.</u> Purpose of Dike: <u>Form basins for Ash Ponds A, B, and C at the Eagle Valley Facility</u> Age of Dike:
- 3) <u>General Information</u>

Mowing (times per year): Once or twice

Prior problems (wet areas, erosion, slides): <u>See previous inspection reports.</u> Repair or modification (what & when): <u>IPL has continued to make periodic monitoring and</u> <u>inspection of the dikes since last inspection. IPL continues to operate the EV plant on an</u> <u>intermittent basis and will not require full-time use of Ponds A through C for ash processing</u> for the foreseeable future. Water levels in Ponds A, B, and C were significantly below the <u>invert levels of discharge pipes in the ponds. There was no discharge from Pond C at the</u> <u>time of the inspection.</u>

Failure/Incident/Breach (max. pool): None since the last inspection. Downstream hazard status (recent changes): No changes

Dike Embankment Material: **Primarily ash materials with well-vegetated downstream slope** erosion protection. Vegetation in good condition as a result of recent rainfall amounts. Downstream slopes recently mowed.

Slope Erosion Control: Interior – rip-rap along most slopes. Only remaining interior slopes without rip-rap protection in the west and north of Pond C. Continue to recommend placing rip-rap in this area if erosion of the slopes is observed to occur. No significant erosion at the time of the inspection.

Field Information (while at site)
 Pool Elevation (during review): Water level in all active Ponds were significantly below the discharge inverts for the ponds. Water level in Ponds B and C remain significantly below the invert of control structures.
 Site Conditions (temp., weather, ground moisture): Clear and cool

Review Party: Dave Hendron, PE, and Mr. John Terrel. Mr. Terrel briefed after the inspection with a summary of findings.

	Requ Actio
INSIDE SLOPE Gradient: Horizontal: <u>Unknown</u> Vertical: (est. meas.)	Vone Monitor
x□ VEGETATION [no problem]	None Monitor
x □ Trees: Quantity: (<5, sparse, dense) None	~ ~ ~ ~
Diameter: (<6", 6-12", >12")	X
Location:	
Notes:	
x□ Brush: Quantity: (spare, dense) <u>None to sparse</u> Location: <u>See photos</u>	
Notes:	
x Ground Cover: Type: (grass, crown vetch) Other:	
quantity: (bare, sparse, adequate, dense) Poor where rip-rap not present in	
Pond C.	
Appearance: (too tall, too short, good) Lush	
Notes: Continue to monitor Pond C and add rip-rap if erosion is observed,	
and if Pond C water level is increased to impinge on exterior slope.	
x SLOPE PROTECTION [no problem, could not inspect thoroughly]	
x Riprap: Average Diameter: Approximately 5 to 6 inches where present.	
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted-yes, no)	
Notes: <u>Rip-rap placed in most areas except for west and north interior</u>	□ X □
slope of Pond C. Continue to recommend that rip-rap be placed as recommended in	
the previous section of this report.	
Wave Berm:	
Vegetation: (adequate, bare, sparse, improper vegetation)	
Notes:	
□ Other:	
Notes:	
x□ EROSION [no problem, could not inspect thoroughly]	
x Wave Erosion (beaching): Scarp: Length: Height:	
Location: Minor erosion noted on west and north interior slopes of Pond C.	
Notes: <u>Recommend to place rip-rap in these areas if erosion</u>	
continues or if the water level in the basin impinges on exterior slope and erosion	
is observed.	□ X □
x Runoff Erosion (Gullies): Quantity: Some minor erosion noted on interior	
slopes of Pond C as noted previously in this inspection report.	
Depth: Width:	
Length:	
Location:	
Notes/Causes:	
x INSTABILITIES [no problem, could not inspect thoroughly]	
□ Slides: Transverse Length: Longitudinal Length:	
Scarp: Width: Length:	
Location:	X 🗆
Crack: Width: Depth:	AL LI
Notes/Causes	
□ Cracks: □ Transverse □ Longitudinal □ Other	
Quantity: Length: Width: Depth:	
Location: Location:	
Notes/Causes:	None Monitor Maintenance
	<u> </u>
Notes/Causes:	л na

Required Action

	Required Action
□ Cracks: □ Transverse □ Longitudinal □ Other Quantity: Length: Width: Depth: Location: Notes/Causes:	 None Monitor Maintenance Engineer
 Bulges Depressions Hummocky Size: Height: Depth: Location: 	
Notes/Causes: Bulges Depressions Hummocky Size: Height: Depth: Location: Notes/Causes:	
 x OTHER [no problem, could not inspect thoroughly] Rodent Burrows: (few, numerous) <u>No animal activity noted.</u> Location:	x o o o o
□ Other: Notes:	
6) CREST Length: Width: (est. meas.) x□ VEGETATION [no problem] □ Trees: Quantity: (<5, sparse, dense)	x □ □ □ □
□ Brush: Quantity: (spare, dense) Location: Notes:	
□ Ground Cover: Type: (grass, crown vetch) Other: <u>Stone roadway continues in</u> <u>good condition in all areas of the ash ponds.</u> Quantity: (bare, sparse, adequate, dense) Appearance: (too tall, too short, good) Notes:	
 x EROSION [no problem, could not inspect thoroughly] Runoff Erosion (Gullies): Quantity: Depth: Width: Length: Location: Notes: 	x □ □ □ □

	None Monitor Maintenance Engineer
x□ WIDTH [no problem]	None Monitor Maintena Engineer
Too Narrow Location:	x o o o
Notes/Causes:	
x INSTABILITIES [no problem, could not inspect thoroughly] Cracks: Transverse Longitudinal Other Quantity: Length: Width: Depth: Location: Notes/Causes:	X II II II
□ Cracks: □ Transverse □ Longitudinal □ Other Quantity: Length: Width: Depth: Location: Notes/Causes:	
 Bulges: Depressions Hummocky Size: Height: Depth: Depth: Location: Notes/Causes: 	
X OTHER [no problem, could not inspect thoroughly] Rodent Burrows: (few, numerous) Location: Notes: 	X
X Other: Limited freeboard on the Eastern perimeter slope of F corrected by excavation of an area of Pond A. Area appears to conform to p recommendations. Pond A is not being used for ash processing at the time Notes:	orevious
 7) OUTSIDE SLOPE Gradient: Horizontal: <u>3.0</u> Vertical: <u>1.0</u> (est x VEGETATION [no problem] Trees: Quantity: (<5, sparse, dense) Diameter: (<6", 6-12", >12") Location: Notes: Brush: Quantity: (spare, dense) 	XUUUU
Location: Notes: Ground Cover: Type: (grass, crown vetch) Other: Quantity: (bare, sparse, adequate, dense) Appearance: (too tall, too short, good)	X □ □ □
Notes: Vegetation was mowed just prior to the inspection. V appeared to be in good condition throughout.	
{Inside Slope, Crest, Outside Slope , Outlet/Inlet Structures, Pond D	ain} Bainten Monitor Bragineer Vonitor Bragineer Action

	Required Action ဗ္ဗ
x EROSION [no problem , could not inspect thoroughly]	None Monitor Maintenance Engineer
Runoff Erosion (Gullies): Quantity: Depth: Width: Length: Location: Notes/Causes:	X
x INSTABILITIES [no problem, could not inspect thoroughly] Slides: Transverse Length: Longitudinal Length: Scarp: Width: Length: Crack: Width: Length: Notes/Causes:	x
 Cracks: Transverse Longitudinal Other Quantity: Length: Width: Depth: 	
□ Cracks: □ Transverse □ Longitudinal □ Other Quantity: Length: Width: Depth: Location: Notes/Causes:	
 Bulges: Depressions x Hummocky Size: Height: Depth: Depth: Location: Notes/Causes: No evidence of new rutting or seepage on any exterior slope during this inspection. 	□ x □ □ □
 x OTHER [no problem, could not inspect thoroughly] Rodent Burrows: (few, numerous) None observed Other: 	
 x SEEPAGE [no problem, could not inspect thoroughly] Wet Area Flow Boil Sinkhole Flow Rate; Size: Location: Aquatic Vegetation None 	ם ם ם ם ח
 □ Rust Colored Deposits □ Sediment in Flow □ Other: Notes/Causes: 	
{Inside Slope, Crest, Outside Slope , Outlet/Inlet Structures, Pond Drain}	None Monitor Maintenance Engineer

□ Wet Area □ Flow □ Bo	oil 🗆 Sink	hole		
Flow Rate		Size:		
Location:				
Aquatic Vegetation	None			
Rust Colored Deposits	None			
Sediment in Flow	None			
□ Other:				
Notes/Causes:				

8) OUTLET/INLET STRUCTURES

x GENERAL INLET [no problem, could not inspect thoroughly]

x□ Inlet Pipe Dimensions: <u>About 10 inches</u> (adequate, too small)

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other): Steel Location:

Deterioration: (missing sections, rusted, collapsed)

In Use: (Yes, No)

x Pond Erosion at Inlet: (Describe) None observed

Other –

x OUTLET STRUCTURES [<u>no problem</u>, could not inspect thoroughly]

□ Number of Outlet Structures: <u>Three</u>

x Description/Location of Outlet Structures: <u>All outlet structures visible at the time of</u> the inspection. All appeared to be in good condition. Water level in ash Ponds A, B, and C was below the invert elevation of all discharge pipes. No discharge was occurring from Pond C at the time of the inspection.

x Outlet Structure 1: **Basin A to Basin B**

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):

Deterioration:(missing section, collapsed, rusted):

Erosion at Outlet Structure: (soil piping, seep collar, etc.)_____

Debris: (leaves, trash, logs, ice, etc.)_____

Notes: No discharge occurring at the time of the inspection.

{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}

	x□ Type (not accessible, from shore, boat, walkway, other) Notes	
¥□	Operated During Inspection (yes, <u>no</u>) Notes: ACCESS TO VALVE/SLUICE GATE [no problem, could not inspect thoroughly]	v n n n -
	(isolated control/intake tower, valve vault w/outlet conduit, valve in riser/drop inlet, siphon)	
	 □ None Found □ Does not have one x□ Type of Pond Drain Drainage provided by Outlet 3 to the river 	
	OND DRAIN GENERAL	
	Notes:	
	Debris: (leaves, trash, logs, ice, etc.)	
	Erosion at Outlet Structure: (soil piping, seep collar, etc.)	
x □ Ou	Itlet Structure 4 Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other): Deterioration:(missing section, collapsed, rusted):	
	Notes: No discharge occurring at the time of the inspection.	
	Debris: (leaves, trash, logs, ice, etc.)	
	Erosion at Outlet Structure: (soil piping, seep collar, etc.)	
	Deterioration:(missing section, collapsed, rusted):	x □ □ □ (
x □ Oι	Itlet Structure 3 <u>Basin C to the river</u> Type: (steel <u>, concrete</u> , aluminum, stainless steel, corrugated metal wood, other):	
	Notes: No discharge at the time of the inspection.	
	Debris: (leaves, trash, logs, ice, etc.)	
	Erosion at Outlet Structure: (soil piping, seep collar, etc.)	
	Deterioration:(missing section, collapsed, rusted):	x □ □ □ [
x ⊡ Ou	Itlet Structure 2 <u>Basin B to Basin C</u> Type: (steel, concrete, aluminum, stainless steel, <u>corrugated metal</u> wood, other):	
		Aone Vone Maintenance Engineer

Action

	Required Action ଞ
	None Monitor Maintenance Engineer
Wood Deterioration Notes:	
Metal Deterioration (minor, moderate, extensive, other) Notes:	
X POND DRAIN COMPONENTS [no problem, could not inspect thoroughly] X Concrete Structure	X
Locations: Description: (deterioration, misalignment, cracks): Notes/Causes:	- -
 X□ Valve Control (Operating Device) □ No Operating Device □ No Stem □ Bent/Broken Stem □ Other Notes/Operability: Not tested at this inspection 	-
 Metal Deterioration: (surface rust, minor, moderate, extensive, other) Location: Flow Rate: Notes/Causes: 	
□ Mis-alignment Notes/Causes:	
Leakage – Flow Rate: Notes/Causes:	-
□ Outlet Conduit	
 Metal: (loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out) Location: Notes/Causes: 	
 Concrete (bug holes, hairline crack, efflorescence) (spalling, popouts, honeycombing, scaling, craze/map cracks) (isolated crack, exposed rebar, disintegration, other) Dimensions/Location:	
 Plastic: (deterioration, cracking) Location: Notes/Causes: 	_

{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}

	None Monitor Maintenance Engineer
Conduit Deformation	
Location: Notes/Causes:	
 Separated Joint Loss of Joint Material Location/Description: Notes/Causes: 	
 Undermining Location/Description: Notes/Causes: 	
Vegetation (trees, brush) Notes:	
□ Other Notes:	
 Discharge Outlet Type (pipe outlet, concrete channel, rock-lined channel, none) Notes: 	
 Riprap: Average Diameter: (adequate, sparse, displaced, weathered, vegetation) bedding/fabric noted – yes, no)) Notes: 	
 Concrete (bug holes, hairline crack, efflorescence) (spalling, popouts, honeycombing, scaling, craze/map cracks) (isolated crack, exposed rebar, disintegration, other) Dimensions/Location: Notes/Causes: 	
 Mis-alignment Location/Description: Notes/Causes: 	
 Separated Joint Loss of Joint Material Location/Description: Notes/Causes: 	
 Undermining Location/Description: Notes/Causes: 	
Other Notes:	None Monitor Maintenance Engineer
{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain }	None Monitor Mainten

Required

Required Action

ATTACHMENT B

Photographs



Photo 1: Pond A, looking west from the Northeast corner of Pond A.



Photo 2: Same, looking southwest.



Photo 3: Same, looking south.



Photo 4: Typical condition of the downstream slope of the East perimeter dike of Pond A.



Photo 5: Freeboard in the Northeast corner of Pond A.



Photo 6: Surface of Pond A, looking southeast from the center of the East perimeter dike of Pond A.

I:\3573\Inspection Reports\Eagle Valley - 15-2 Inspection Report\Ash Ponds\Revised Final\Attachment B - Photos With Captions - Ponds A-C - 15-2 Inspection - compressed photos.doc 2



Photo 7: Same, looking south.



Photo 8: Pond A, looking north from the Southeast corner of Pond A.



Photo 9: Same, looking west.



Photo 10: Typical condition of the downstream slope of the East perimeter dike of Pond A, looking north from the Southeast corner of Pond A.



Photo 11: Typical conditions of the downstream slope of the South perimeter dike of Pond A, looking west.



Photo 12: Typical condition of the crest and downstream slope of the West perimeter dike of Pond A and Pond B, looking north from the Southwest corner of Pond B.





Photo 13: Outlet from Pond A to Pond B.

Photo 14: Discharge pipes from Pond A into Pond B. No discharge at the time of the inspection.



Photo 15: Downstream slope of intermediate dike between Pond A and Pond B, looking northeast from West end of intermediate dike.



Photo 16: Typical condition of the interior slope of the West perimeter dike of Pond B, looking north from the West end of the intermediate dike.



Photo 17: Same as Photo 16, looking northeast from the center of the intermediate dike.



Photo 18: Pond B, looking east from the Northwest corner of Pond B.







Photo 20: Same, looking at the condition of the rip-rap placed in the Northwest corner of Pond B.



Photo 21: Outlet from Pond B into Pond C.



Photo 22: Outlet from Pond B into Pond C. No discharge occurring at the time of the inspection.



Photo 23: Typical condition of the downstream slope of Pond B, looking south from the Northwest corner of Pond B.



Photo 24: Same, looking north.



Photo 25: Outlet structure and interior slope of the West perimeter dike of Pond C, looking south from the Northwest corner of Pond C.