

T. L. Harpster
VP-Bell Bend Project-Development

PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
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April 28, 2011

ATTN: LOMA Manager
LOMC Clearinghouse
7390 Coca Cola Drive
Suite 204
Hanover, MD 21076

**BELL BEND NUCLEAR POWER PLANT
FEMA FLOODPLAIN STUDIES SUBMITTAL
BNP-2011-077 Docket No. 52-039**

As part of its on-going site studies of the Bell Bend Nuclear Power Plant (BBNPP) project, PPL has completed floodplain studies for Walker Run and the Susquehanna River at the project site. These floodplain studies are being submitted to FEMA for review along with requests for Conditional Letters of Map Revision (CLOMR). (See Enclosures 1 and 2)

The studies were previously submitted to Salem Township, Luzerne County for review. Salem Township has issued a consistency letter stating that the BBNPP project is consistent with their municipal floodplain and stormwater management programs. (See Enclosure 3)

FEMA payment forms (FEMA Form 7) for each application with the appropriate review fees have been submitted to:

FEMA Fee Charge System Administrator
7390 Coca Cola Drive
Suite 204
Hanover, MD 21076

Please do not hesitate to contact Brad Wise of our staff [610-774-6508 or bawise@pplweb.com] directly should you have any questions regarding these documents and requests.

Respectfully,

Terry L Harpster

TLH/kw

- Enclosures:
- 1) Walker Run CLOMR Request
 - 2) Susquehanna River CLOMR Request
 - 3) Salem Township Consistency Letter (March 28, 2011)

cc: (w/ Enclosures provided on CD)

Dr. Donald Palmrose
Senior Project Manager
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Ms. Stacey Imboden
Project Manager
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Ms. Jamie Davis
Office of Environmental Programs (3EA30)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Mr. Tom Shervinskie
Pa Fish & Boat Commission
450 Robinson Lane
Bellefonte, PA 16823

Ms. Jennifer Kagel
United States Fish & Wildlife Service
Pennsylvania Field Office
315 S. Allen St. #322
State College, PA 16801

Ms. Amy Elliott
U.S. Army Corps of Engineers -
Baltimore District
State College Field Office
1631 South Atherton Street, Suite 102
State College, PA 16801

Ms. Paula B. Ballaron
Susquehanna River Basin Commission
1721 North Front Street
Harrisburg, PA 17102-0425

Mr. Thomas W. Beauduy
Susquehanna River Basin Commission
1721 North Front Street
Harrisburg, PA 17102-0425

Mr. Joshua Longmore
Luzerne Conservation District
485 Smiths Pond Road
Shavertown, PA 18708

Ms. Karen J. Karchner
Zoning/Building Code Official
38 Bomboy Lane
P.O. Box 405
Berwick, PA 18603

bcc: A. Khanwalkar GENTW-17
V. Kelly GENPL-4
G. Kuczynski GENPL-4
G. Petrewski GENPL-4
V. Lopiano GENTW-15
R. Sgarro GENPL-4
B. Wise GENPL-4
M. Detamore GENPL-4

Enclosure 1

Walker Run CLOMR Request

- a. Form 1 – Overview and Concurrence Form
- b. Form 2 – Riverine Hydrology & Hydraulics Form
- c. Form 3 – Riverine Structure Form
- d. Form 7 – Payment Information Form
- e. LandStudies, Inc. "Bell Bend Nuclear Power Plant Flood Study Report, Walker Run, Salem Township, Luzerne County, PA.", January 2011, Rev 1. (Data CD enclosed)
- f. Sealed Drawings for Bridge #4

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

- ☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
420625	Salem Township, Luzerne County	PA	420625	0020B	03/18/80

2. a. Flooding Source: Walker Run

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
- ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Bell Bend Nuclear Power Plant- Walker Run Restoration

4. FEMA zone designations affected: A4, B, C (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☒ Improved Methodology/Data ☒ Regulatory Floodway Revision ☒ Base Map Changes
- ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
- ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
- ☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

- Structures: ☐ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert
- ☐ Dam ☐ Fill ☒ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$4,400

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Terry Harpster, VP Bell Bend Project Dev

Company: PPL Bell Bend, LLC

Mailing Address:
38 Bomboy Lane, Suite 2
Berwick, PA 18603

Daytime Telephone No.: 570-802-8111

Fax No.: 570-802-8119

E-Mail Address: tharpster@pplweb.com

Signature of Requester (required):

Date: Feb 4, 2011

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Karen Karchner, Zoning/ Building Code Official

Community Name: Salem Township

Mailing Address:
P.O. Box 405, 38 Bomboy Lane
Berwick, PA 18603

Daytime Telephone No.: 570-752-4399

Fax No.: 570-752-4661

E-Mail Address: salemcodes@pa.metrocast.net

Community Official's Signature (required):

Date: 3/28/11

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Benjamin J. Ehrhart

License No.: PE062219

Expiration Date: 9/30/2011

Company Name: LandStudies, Inc.

Telephone No.: 717-627-4440

Fax No.: 717-627-4660

Signature:

Date: 1-28-11

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

- | | |
|---|---|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input checked="" type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Walker Run

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- ☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

3. Methodology for New Hydrologic Analysis (check all that apply)

- ☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Downstream Limit of Revised Flood Model	BHJ	652.54	653.29
Upstream Limit	Upstream Limit of Revised Flood Model	BIA	672.31	671.55

2. Hydraulic Method/Model Used

HEC-RAS

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/fhm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted

	Natural Run	Floodway Run	Datum
Duplicate Effective Model*	File Name: FEMAFileStudy.prj	Plan Name: FEMA FIS HECRAS	File Name: Plan
Name: NAVD88			
Corrected Effective Model*	File Name: WalkerRunFile.prj	Plan Name: Existing Conditions	File Name: Plan
Name: NAVD88			
Existing or Pre-Project Conditions Model	File Name: Plan Name: File Name: Plan Name:		
Revised or Post-Project Conditions Model	File Name: WalkerRunFile.prj	Plan Name: Proposed Conditions	File Name: WalkerRunFile.prj
Plan Name: Proposed Conditions NAVD88			
Other - (attach description)	File Name: Plan Name: File Name: Plan Name:		

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach a **copy of the effective FIRM and/or FBFM**, annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.
- b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No
- If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No
- If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No
- If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.
- For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

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Flooding Source: Walker Run

Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization complete Section B
Bridge/Culvert complete Section C
Dam/Basin complete Section D
Levee/Floodwall complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Floodplain/ Channel Restoration

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Beach Grove Road, ~3600 ft. south to confluence with unnamed tributary

Downstream Limit/Cross Section: 1602

Upstream Limit/Cross Section: 5198

2. Name of Structure: Bridge # 4

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: ~1300 ft. south of upper N. Market St. bridge

Downstream Limit/Cross Section: 2497

Upstream Limit/Cross Section: 2730

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Walker Run

Name of Structure: Walker Run Restoration

1. Accessory Structures

The channelization includes (check one):

- | | |
|--|--|
| <input type="checkbox"/> Levees [Attach Section E (Levee/Floodwall)] | <input type="checkbox"/> Drop structures |
| <input type="checkbox"/> Superelevated sections | <input type="checkbox"/> Transitions in cross sectional geometry |
| <input type="checkbox"/> Debris basin/detention basin [Attach Section D (Dam/Basin)] | <input type="checkbox"/> Energy dissipator |
| <input checked="" type="checkbox"/> Other (Describe): Floodplain restoration and channel relocation/ restoration | |

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry 16-35 (cfs) and/or the -y ear flood.

The design elevation in the channel is based on (check one):

- ☐ Subcritical flow ☒ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- ☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Walker Run

Name of Structure: Bridge #4

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Shape (culverts only) | <input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Material | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Cross-Section Locations |
| <input checked="" type="checkbox"/> Distances Between Cross Sections | |

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam
2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

Name of the agency or organization:

3. The Dam was permitted as (check one):

- a. ☐ Federal Dam ☐ State Dam

Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

Permit or ID number Permitting Agency or Organization

- b. ☐ Local Government Dam ☐ Private Dam

Provide related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

Was the dam/basin designed using critical duration storm?

- ☐ Yes, provide supporting documentation with your completed Form 2.
- ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport).

If No, then attach your explanation for why debris/sediment analysis was not considered.

6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of an existing levee/floodwall system
- ☐ a newly constructed levee/floodwall system
- ☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

- | | | |
|---|---------|----|
| <input type="checkbox"/> earthen embankment, dike, berm, etc. | Station | to |
| <input type="checkbox"/> structural floodwall | Station | to |
| <input type="checkbox"/> Other (describe): | Station | to |

c. Structural Type (check one):

- ☐ monolithic cast-in place reinforced concrete
- ☐ reinforced concrete masonry block
- ☐ sheet piling
- ☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

- | | |
|--|----------------|
| 1. Plan of the levee embankment and floodwall structures. | Sheet Numbers: |
| 2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. | Sheet Numbers: |
| 3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. | Sheet Numbers: |
| 4. A layout detail for the embankment protection measures. | Sheet Numbers: |
| 5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. | Sheet Numbers: |

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- 3.0 feet or more at the downstream end and throughout
- 3.5 feet or more at the upstream end
- 4.0 feet within 100 feet upstream of all structures and/or constrictions

<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Yes	<input type="checkbox"/> No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).

☐ Yes ☐ No

2.0 feet above the 1%-annual-chance stillwater surge elevation

☐ Yes ☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

- b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

- a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

- a. The maximum levee slope landside is:
- b. The maximum levee slope floodside is:
- c. The range of velocities along the levee during the base flood is: (min.) to (max.)
- d. Embankment material is protected by (describe what kind):
- e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

- f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

- d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

- e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

- f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

- g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

- h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ $P_A =$ psf; $P_p =$ psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ $P_w =$ psf

☐ Seepage (Uplift); ☐ Earthquake @ $P_{eq} =$ %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
- b. The computed range of settlement is ft. to ft.
- c. Settlement of the levee crest is determined to be primarily from :
- ☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):
- d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.
- Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:
- Draining to pressure conduit: acres
Draining to ponding area: acres
- b. Relationships Established
- | | | |
|------------------------------------|------------------------------|-----------------------------|
| Ponding elevation vs. storage | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Ponding elevation vs. gravity flow | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Differential head vs. gravity flow | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
- c. The river flow duration curve is enclosed: ☐ Yes ☐ No
- d. Specify the discharge capacity of the head pressure conduit: cfs
- e. Which flooding conditions were analyzed?
- | | | |
|-------------------------------------|------------------------------|-----------------------------|
| • Gravity flow (Interior Watershed) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| • Common storm (River Watershed) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| • Historical ponding probability | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| • Coastal wave overtopping | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
- If No for any of the above, attach explanation.
- f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No
- If No, attach explanation.
- g. The rate of seepage through the levee system for the base flood is cfs
- h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

- i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:

For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

- a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

- b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

- c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

- d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).

If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
- b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No
- c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

A sediment transport analysis in the terms requested above (ac-ft., % by volume) was not performed for individual structures. There is no indication from historical records that sediment transport significantly affects the BFE, and the sediment supply to the upstream limit of the project reach is insignificant. The channel and floodplain restoration design, which employs natural channel design principles, does consider sediment transport in order to create a stable dimension, pattern, and profile. The intent of the design is to minimize shear stresses in the system to avoid mobilization of sediment from within the project reach, correcting the currently unstable banks that are the primary sediment (sand and silt) source under existing conditions.

**FEDERAL EMERGENCY MANAGEMENT AGENCY
PAYMENT INFORMATION FORM**

Community Name: Salem Township, Luzerne County, PA

Project Identifier: Walker Run Restoration

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Type of Request:

☐ MT-1 application }
☒ MT-2 application }

FEMA Fee Charge System Administrator
7390 Coca Cola Drive
Suite 204
Hanover, MD 21076

☐ EDR application }

FEMA Project Library
847 South Pickett St.
Alexandria, VA 22304
FAX (703) 212-4090

Request No.: _____ (if known)

Amount: \$4,400

☐ INITIAL FEE* ☐ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☒ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

**Note: Check only if submitting a corrected fee for an ongoing request.

COMPLETE THIS SECTION ONLY IF PAYING BY CREDIT CARD

CARD NUMBER

EXP. DATE

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

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Month Year

Date

Signature

NAME (AS IT APPEARS ON CARD): _____
(please print or type)

ADDRESS: _____
(for your
credit card
receipt—please
print or type)

DAYTIME PHONE: _____

Enclosure 2

Susquehanna River CLOMR Request

- a. Form 1 – Overview and Concurrence Form
- b. Form 2 – Riverine Hydrology & Hydraulics Form
- c. Form 7 – Payment Information Form
- d. LandStudies, Inc. "Bell Bend Nuclear Power Plant Flood Study Report, Susquehanna River, Salem Township, Luzerne County, PA.", November 2010, Rev. 1.

**U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM**

*O.M.B No. 1660-0016
Expires: 12/31/2010*

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

- ☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
420625	Salem Township, Luzerne County	PA	420625	0020B	3/18/80

2. a. Flooding Source: Susquehanna River

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
- ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Bell Bend Nuclear Power Plant - Proposed Cooling Water Intake Structure

4. FEMA zone designations affected: A13, B (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☒ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
- ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
- ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
- ☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

- Structures: ☐ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert
- ☐ Dam ☐ Fill ☐ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$4,400

☐ No, Attach ExplanationPlease see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.**D. SIGNATURE**

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Terry Harpster, VP Bell Bend Project Dev

Company: PPL Bell Bend, LLC

Mailing Address:
38 Bomboy Lane, Suite 2
Berwick, PA 18603

Daytime Telephone No.: 570-802-8111

Fax No.: 570-802-8119

E-Mail Address: tharpster@pplweb.com

Signature of Requester (required):

Date: Feb 4, 2011

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Karen Karchner, Zoning/ Building Code Official

Community Name: Salem Township

Mailing Address:
P.O. Box 405, 38 Bomboy Lane
Berwick, PA 18603

Daytime Telephone No.: 570-752-4399

Fax No.: 570-752-4661

E-Mail Address: salemtownship@pa.metrocast.net

Community Official's Signature (required):

Date: 3/28/11

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Benjamin J. Ehrhart

License No.: PE062219

Expiration Date: 9/30/2011

Company Name: LandStudies, Inc.

Telephone No.: 717-627-4440

Fax No.: 717-627-4660

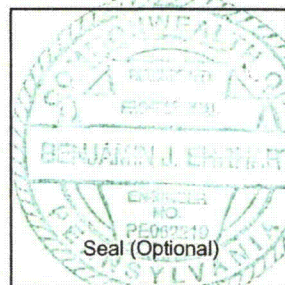
Signature:

Date: 1-28-11

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)**Required if ...**

- | | |
|---|---|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Susquehanna River

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- ☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

3. Methodology for New Hydrologic Analysis (check all that apply)

- ☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Downstream Limit of Revised Flood Model	BT	511.82	511.82
Upstream Limit	Upstream Limit of Revised Flood Model	CD	513.60	513.57

2. Hydraulic Method/Model Used

HEC-RAS

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/fhm_soft.shtml. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted	Natural Run	Floodway Run	Datum
Duplicate Effective Model*	File Name: SusqFEMA.prj	Plan Name: Susquehanna Natural	File Name: Plan
Name: <u>NAVD88</u>			
Corrected Effective Model*	File Name: Susquehanna.prj	Plan Name: Existing Conditions	File Name: Plan
Name: <u>NAVD88</u>			
Existing or Pre-Project Conditions Model	File Name: Plan Name:	File Name: Plan Name:	
Revised or Post-Project Conditions Model	File Name: Susquehanna.prj	Plan Name: Proposed Conditions	File Name: Plan
Name: <u>NAVD88</u>			
Other - (attach description)	File Name: Plan Name:	File Name: Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.
- b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No
- If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No
- If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No
- If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.
- For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

**FEDERAL EMERGENCY MANAGEMENT AGENCY
PAYMENT INFORMATION FORM**

Community Name: Salem Township, Luzerne County, PA

Project Identifier: Bell Bend Nuclear Power Plant - Proposed Cooling Water Intake Structure

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Type of Request:

☐ MT-1 application }
☒ MT-2 application }

FEMA Fee Charge System Administrator
7390 Coca Cola Drive
Suite 204
Hanover, MD 21076

☐ EDR application }

FEMA Project Library
847 South Pickett St.
Alexandria, VA 22304
FAX (703) 212-4090

Request No.: _____ (if known)

Amount: \$4,400

☐ INITIAL FEE* ☒ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☒ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

**Note: Check only if submitting a corrected fee for an ongoing request.

COMPLETE THIS SECTION ONLY IF PAYING BY CREDIT CARD

CARD NUMBER

EXP. DATE

1	2	3	4

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5	6	7	8

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9	10	11	12

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13	14	15	16

Month	Year

 —

Month	Year

Date

Signature

NAME (AS IT APPEARS ON CARD): _____
(please print or type)

ADDRESS: _____
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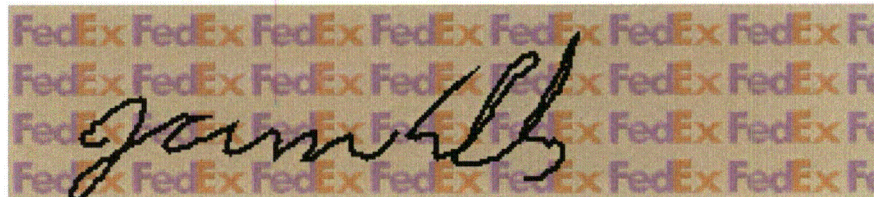
May 2, 2011

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NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

June 30, 2011

Mr. Benjamin J. Ehrhart
LandStudies, Inc.
315 North Street
Lititz, PA 17543

IN REPLY REFER TO:
Case No.: 11-03-1701R
Communities: Township of Salem,
Township of Nescopeck and,
Township of Conyngham, PA
Community Nos.: 420625, 420619 and 420600

316-AD

Dear Mr. Ehrhart:

This responds to your request received on May 3, 2011, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) for the above-referenced communities, Luzerne County, Pennsylvania. Pertinent information about the request is listed below.

Identifier:	Bell Bend Nuclear Power Plant
Flooding Source:	Susquehanna River
FIRM Panel Affected:	4206250020 B, 4206190010 B, and 420600 B
FBFM Panel Affected:	420625002 and 4206190010

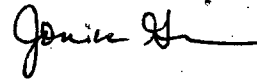
The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the attached summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the current fee schedule is available for your information on the FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited if the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please contact the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Ms. Ekta Amar, CFM, by e-mail at eamar@dweberry.com or by telephone at (703) 849-0345, or the Revisions Coordinator for your State, Ms. Sharon Freiland, P.E., CFM, at sfreiland@dweberry.com or at (703) 849-0116.

Sincerely,



Jonica Gibson, P.E., CFM
LOMC Manager
Risk Assessment, Mapping,
and Planning Partners

Attachment:

Summary of Additional Data

cc: Ms. Karen J. Karchner
Zoning/Building Code Official
Township of Salem

Mr. Terry Harpster
VP Bell Bend Project Dev
PPL Bell Bend, LLC



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

Summary of Additional Data Required to Support a Conditional Letter of Map Revision (CLOMR)

Case No.: 11-03-1701R

Requester: Mr. Benjamin J. Ehrhart

Community: Township of Salem, PA

Community No.: 420625

The issues listed below must be addressed before we can continue the review of your request.

1. This CLOMR request will be processed by FEMA only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, "not likely to adversely affect" determination from the National Marine Fisheries Service or the U.S. Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat. If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the Conditional LOMC request. For additional information about the ESA and compliance requirements and for responses to frequently asked questions, please refer to FEMA Procedure Memorandum 64 which can be accessed on FEMA's website at:
<http://www.fema.gov/library/viewRecord.do;jsessionid=778CF22E0477B66905D140EA1F8FEC0C.WorkerLibrary?action=back&id=4312>.
2. Our review of your request revealed that the Townships of Conyngham and Nescopeck are also affected by this revision. Please provide community acknowledgment in the form of a letter stating that the townships have reviewed the revision request and understand the effects of the revision on flooding conditions in their respective communities, and that any existing or proposed structures to be removed from the Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), are reasonably safe from flooding. Alternatively, please submit Application/Certification Form 1, entitled "Overview and Concurrence Form," signed by an official of the Township of Conyngham and the Township of Nescopeck.
3. Our review of hydraulic model for the Susquehanna River revealed the following issues. Please revise the hydraulic model and provide digital copies of the input and output files for this model.
 - a. The currently projected date for the Luzerne County Preliminary Study to become effective is in March 2012, but is subject to change. Although this flooding source is being restudied, the CLOMR must be issued based on the currently effective FIRM and FIS. The LOMR following the CLOMR will ultimately be issued on the effective information at the time of issuance, so depending on construction schedule, the follow up LOMR could be issued on the currently effective FIRM or the preliminary FIRM after it has gone effective. Please submit a hydraulic analysis based on the currently effective model that ties into the effective hydraulic model within 0.5 foot, or within 0.0 feet if practical. Knowing how the project ties-in to the

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currently effective model as well as the preliminary model is extremely useful. So, please continue to provide hydraulic information based on the preliminary model in addition to the required hydraulic information from the currently effective model. Please extend the analysis to show that the proposed analysis ties into the preliminary model within 0.5 foot, or within 0.0 feet if practical.

- b. The submitted application did not include a duplicate effective hydraulic model. The effective model used to produce the current Flood Insurance Rate Map (FIRM) must be obtained, reproduced on your equipment using the same software, and submitted as the duplicate effective model. Please submit a duplicate effective hydraulic model including the multiple profile and floodway analyses for the Susquehanna River.
 - c. If you continue to provide hydraulic information based on the preliminary model in addition to the required hydraulic information from the currently effective model, please submit a duplicate preliminary model as well.
 - d. Our review revealed that a floodway analysis was not performed for the existing and proposed conditions models. Please revise the existing and proposed conditions HEC-RAS models to include an analysis of the regulatory floodway. Please also ensure that the surcharges do not exceed the 1.0-foot maximum allowed and there are no negative surcharges.
 - e. Our review revealed that the levee option was used at several locations along the revised reach of Susquehanna River to model the ineffective flow areas. However, since an accredited levee does not exist, the use of the ineffective flow area option may be more appropriate. Please provide documentation to support using the levee option or make the appropriate changes.
4. Our review revealed that the BFE in the backwater area of Big Wapwallopen Creek may be affected by this revision for the Susquehanna River. Please show the revised backwater delineation of Big Wapwallopen Creek on the certified work map.
 5. The submitted topographic work map entitled "100 Year Floodplain Map Flood Study – Susquehanna River" prepared by LandStudies, Inc., dated November 19, 2010, does not provide the essential information required to complete our review of this request. Please submit a topographic work map, certified by a registered Professional Engineer that shows, at a sufficient scale, all applicable items listed in Section C of Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form," including the following information:
 - a) Complete boundary delineations of the proposed conditions base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway
 - b) Complete boundary delineations of the currently effective base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway
 - c) Logical and smooth tie-ins between the revised and effective flood hazard boundary delineations at downstream and upstream ends of revised reach
 - d) Topographic contour information (including labels) used in the hydraulic model and for the boundary delineations of the proposed base floodplain and 0.2-percent-annual-chance floodplain
 - e) Locations and alignments of all cross-sections used in the hydraulic model
 - f) The flow line used in the hydraulic model
 - g) Reference to datum, such as the National Geodetic Vertical Datum of 1929 (NGVD 29). If datum is different than the effective model and map (NGVD 29), please specify datum conversion factor used

6. To aid in accuracy, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data along with the hardcopy topographic work map submittal. Please ensure the digital data are spatially referenced, and cite what projection (coordinate system, example: UTM/State Plane) was used.
7. Please submit annotated FIRM panels 4206250020 B, 4206190010 B, and 420600 B and FBFM panels 420625002 and 4206190010, at the scale of the effective FIRMs, that show the revised boundary delineations of the base floodplain, 0.2 percent-annual-chance floodplain, and regulatory floodway shown on the submitted work map, and how they tie-in to the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.

Please send the required data to:

FEMA LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

For identification purposes, please include the case number referenced above on all correspondence.



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

July 1, 2011

Mr. Benjamin J. Ehrhart, P.E.
LandStudies, Inc.
315 North Street
Lititz, PA 17543

IN REPLY REFER TO:
Case No.: 11-03-1940R
Community: Township of Salem, PA
Community No.: 420625

316-AD

Dear Mr. Ehrhart:

This responds to your request received on May 3, 2011, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) for Township of Salem, Luzerne County, Pennsylvania. Pertinent information about the request is listed below.

Identifier:	Walker Run Restoration
Flooding Sources:	Walker Run, Unnamed Tributary to Walker Run
FIRM Panel Affected:	4206250020 B
FBFM Panel Affected:	4206250020

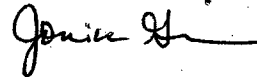
The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the attached summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the current fee schedule is available for your information on the FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited if the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please contact the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Ms. Ekta Amar, CFM, by e-mail at eamar@dewberry.com or by telephone at (703) 849-0345, or the Revisions Coordinator for your State, Ms. Sharon Freiland, P.E., CFM, at sfreiland@dewberry.com or at (703) 849-0116.

Sincerely,



Jonica Gibson, P.E., CFM
LOMC Manager
Risk Assessment, Mapping,
and Planning Partners

Attachment:

Summary of Additional Data

cc: Ms. Karen J. Karchner
Zoning/Building Code Official
Township of Salem

Mr. Terry Harpster
VP Bell Bend Project Dev
PPL Bell Bend, LLC



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

Summary of Additional Data Required to Support a Conditional Letter of Map Revision (CLOMR)

Case No.: 11-03-1940R

Requester: Mr. Benjamin J. Ehrhart, P.E.

Community: Township of Salem, PA

Community No.: 420625

The issues listed below must be addressed before we can continue the review of your request.

1. This CLOMR request will be processed by FEMA only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, "not likely to adversely affect" determination from the National Marine Fisheries Service or the US Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat. If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the Conditional LOMC request. For additional information about the ESA and compliance requirements and for responses to frequently asked questions, please refer to FEMA Procedure Memorandum 64 which can be accessed on FEMA's website at:
<http://www.fema.gov/library/viewRecord.do;jsessionid=778CF22E0477B66905D140EA1F8FEC0C.WorkerLibrary?action=back&id=4312>
2. Our review revealed that the discharges computed for the **Unnamed Tributary to Walker Run** is performed using Hydraflow model. Hydraflow model is not a FEMA accepted hydrology model. Please update the hydrology of the Unnamed Tributary to Walker Run using one of the FEMA approved hydrologic models. More information about FEMA approved models can be obtained from http://www.fema.gov/plan/prevent/fhm/en_hydro.shtm. Please provide supporting documents for computation of current existing drainage areas, curve numbers and times of concentration. Also, please provide Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form" for the Unnamed tributary to Walker Run. This form was omitted from your previous submittal.
3. Please provide as-built plans, certified by a registered Professional Engineer or licensed Land Surveyor that shows the dimensions and inverts of the existing bridges and culverts along **Walker Run** to confirm the bridge and culvert modeling for the structures not modeled exactly as they were in the effective HEC-2 model. Also, provide as-built plans for all existing bridges along **Unnamed Tributary to Walker Run**. If as-built plans are not available, please submit certified survey plans. In addition, please provide design plans for all proposed bridges on the **Unnamed Tributary to Walker Run**. Please also provide Application/Certification Form 3, entitled "Riverine Structures Form," for each structure modeled in the proposed analysis, unless it is modeled exactly as it was in the effective hydraulic analysis.

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4. Sealed plans submitted for Bridge 4 entitled, "Bridge No. 4 Access Road V over Walker Run," prepared by Pennoni Associates Inc., dated April 19, 2011, shows that all four piers are at different elevations such as 669.03, 669.83, 670.63, and 671.43 feet but in hydraulic model they are all modeled at elevation of 671.26 feet. Please be consistent in the information present in the plans and information. Also, plan is not printed to correct scale as per scale bar so it is difficult to confirm the pier width shown on plan with hydraulic model. Please submit another copy of plans printed to correct scale and show consistent information in hydraulic model and plans.
5. The submitted application did not include a duplicate effective hydraulic model. Comparison with this model is shown in the submitted report but a digital copy of this model was not provided. The effective model used to produce the Flood Insurance Rate Map (FIRM) must be obtained, reproduced on your equipment using the same software, and submitted as the duplicate effective model. Please submit a duplicate effective hydraulic model including the multiple profile and floodway analyses for **Walker Run**.
6. Our review of the existing and proposed conditions hydraulic models for Walker Run and Unnamed Tributary to Walker Run revealed the following issues. Please revise the models as necessary and submit digital copies of the input and output files.
 - a. Several bridges over **Walker Run and Unnamed Tributary to Walker Run** contain piers and the hydraulic modeling computations use the energy method only. Bridges with piers should be modeled using the highest energy answer between energy and momentum methods.
 - b. The hydraulic models were run using the mixed flow regime for **Walker Run and Unnamed Tributary to Walker Run**. FEMA accepts base floodplain boundary delineations based on supercritical flow depths only for concrete-lined, engineered channels. Because the proposed channel is not concrete lined, critical depth is the minimum depth permissible to map the one-percent-annual-chance (base) floodplain boundary delineations along this reach. Please revise the hydraulic analysis for this portion of the channel using subcritical modeling
 - c. Surcharges between the natural (unencroached) and encroached profiles over 1.0 foot were found at many of the cross sections in the existing and proposed conditions HEC-RAS hydraulic models for **Walker Run**. Negative surcharges were also found at several cross sections for **Unnamed Tributary to Walker Run**. Please revise the floodway analyses for both the flooding source so surcharges do not exceed the 1.0 foot maximum allowed and eliminate all negative surcharges.
 - d. The downstream boundary condition of known water surface elevation, along **Walker Run** appears to be based on the FEMA effective HEC-2 model for Walker Run. However, the HEC-2 model is in National Geodetic Vertical Datum of 1929 (NGVD 29) and the submitted MT-2 Form 2 Section B "Hydraulics," specifies that the Existing and Proposed conditions models are in North American Vertical Datum of 1988 (NAVD 88). Please be sure to convert the water surface elevations accordingly and provide the vertical datum conversion factor used.

- e. Paragraph 65.6(a)(8) of the National Flood Insurance Program (NFIP) regulations states that the revised conditions hydraulic analysis for a flooding source with established elevations of the base flood must include an evaluation of the same recurrence intervals studied in the effective Flood Insurance Study (FIS), such as the base flood and the 10-percent-, 2-percent-, and 0.2-percent-annual-chance floods, and of the regulatory floodway. Please revise the submitted existing and proposed conditions hydraulic models to include all the above-referenced intervals for ***Walker Run***.
 - f. The HEC-RAS model uses the junction option as the downstream boundary condition for ***Unnamed tributary to Walker Run***. Please remove the junction from the submitted hydraulic model. This option should only be used if the tributary and main stream has coincident peaks. Please model the tributary independent of the main stream, using normal depth as the downstream boundary condition, or provide engineering data and calculations to support a coincident peak with Walker Run. Please be certain to use the backwater effects of Walker Run to map the confluence.
 - g. The submitted existing and proposed conditions hydraulic analysis uses the levee option at several locations along the revised reach of ***Unnamed Tributary to Walker Run*** to model ineffective flow areas. However, since an accredited levee does not exist, the use of the ineffective flow area option may be more appropriate. Please provide documentation to support using the levee option or make the appropriate changes.
 - h. Our review revealed that there are interpolated cross sections in the HEC-RAS hydraulic model for ***Unnamed Tributary to Walker Run***. Please revise the model to include surveyed geometries of the above mentioned cross-sections, or remove them from the model. Interpolated cross sections are not appropriate at locations where the bounding cross-sections have greatly varied geometry.
7. Please submit a topographic work map, certified by a registered Professional Engineer that shows all applicable items listed in Section C of Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form," including the following information.
 - a) Boundary delineations of the proposed conditions base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway
 - b) Boundary delineations of the currently effective base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway
 - c) Logical and smooth tie-ins between the revised and effective flood hazard boundary delineations at the downstream and upstream ends of the revised reach
 - d) Topographic contours used in the hydraulic model and for the boundary delineations of the base floodplain and 0.2-percent-annual-chance floodplain
 - e) Locations and alignments of all cross-sections used in the hydraulic model
 - f) The flow line used in the hydraulic model
 - g) Scale and north arrow
 - h) Reference to a datum, such as NGVD 29. If datum is different than the effective model and map (NGVD 29), please specify datum conversion factor used
 8. To aid in accuracy, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data along with the hardcopy topographic work map submittal. Please ensure the digital data are spatially referenced, and cite what projection (coordinate system, example: UTM/State Plane) was used.

9. Please submit annotated FIRM panel 4206250020B and FBFM panel 4206250020, at the scale of the effective FIRMs, that show the revised boundary delineations of the base floodplain, 0.2 percent-annual-chance floodplain, and regulatory floodway shown on the submitted work map, and how they tie-in to the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.

Please send the required data to:

FEMA LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

For identification purposes, please include the case number referenced above on all correspondence.

T. L. Harpster
VP-Bell Bend Project-Development

PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
Tel. 570.802.8111 FAX 570.802.8119
tlharpster@pplweb.com



September 22, 2011

Attn: LOMA Manager
LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover MD 21076

BELL BEND NUCLEAR POWER PLANT
FEMA CASE NO. 11-03-1701R COMMENT RESPONSES
BNP-2011-157 Docket No. 52-039

- References: 1) FEMA-2011-137, Jonica Gibson, FEMA, to Benjamin Ehrhart, LSI "Additional Data Request for Case No. 11-03-1701R", 6/30/11
- 2) BNP-2011-152, Bradley Wise, PPL, to LOMA Manager, FEMA, "FEMA ESA Determination Request", 8/10/11

This letter is in response to the request for additional data required to support the Conditional Letter of Map Revision (CLOMR) review for the above-referenced case. This CLOMR request is in support of the proposed Bell Bend Nuclear Power Plant in Salem Township, Luzerne County, PA. In response to reference 1) above a revised study; "Bell Bend Nuclear Power Plant Flood Study Report, Susquehanna River, Salem Township, Luzerne County, PA., LSI Doc. No. FS-SR-001, Revision 3, dated August 16, 2011" is provided as Enclosure 1.

Listed below are FEMA's 6/30/11 comments, followed by our responses to those comments.

- This CLOMR request will be processed by FEMA only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, "not likely to adversely affect" determination from the National Marine Fisheries Service or the U.S. Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat. If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the Conditional LOMC request. For additional information about the ESA and compliance requirements and for responses to frequently asked questions, please refer to FEMA Procedure Memorandum 64 which can be accessed on FEMA's website at: <http://www.fema.gov/library/viewRecord.do;jsessionid=778CF22E0477B66905D140EA1F8FEC0C>. WorkerLibrary?action=back&id=4312.*

Response: Per reference 2, PPL has requested that FEMA defer to the NRC its verification of ESA compliance and continue the review of the CLOMR request.

2. *Our review of your request revealed that the Townships of Conyngham and Nescopeck are also affected by this revision. Please provide community acknowledgment in the form of a letter stating that the townships have reviewed the revision request and understand the effects of the revision on flooding conditions in their respective communities, and that any existing or proposed structures to be removed from the Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), are reasonably safe from flooding. Alternatively, please submit Application/Certification Form 1, entitled "Overview and Concurrence Form," signed by an official of the Township of Conyngham and the Township of Nescopeck. Also, based on conversations with the FEMA reviewers, the downstream extent of the study has been moved upstream of Wapwallopen Creek. The flood study no longer extends to Nescopeck Township, so this community's acknowledgement and signatures are no longer needed.*

Response: At the request of the Conyngham Township Supervisors the revised Flood Study and CLOMR documentation was provided to Luzerne County Planning Commission to act on behalf of the Township. The attached letter (Enclosure 2) from the Luzerne County Planning Commission verifies that they have reviewed the application and understand the effect on Conyngham Township. Also, based on conversations with the FEMA reviewers, the downstream extent of the study has been moved upstream of Wapwallopen Creek. The flood study no longer extends to Nescopeck Township, so this community's acknowledgement and signatures are no longer needed.

3. *Our review of hydraulic model for the Susquehanna River revealed the following issues. Please revise the hydraulic model and provide digital copies of the input and output files for this model.*
 - a. *The currently projected date for the Luzerne County Preliminary Study to become effective is in March 2012, but is subject to change. Although this flooding source is being restudied, the CLOMR must be issued based on the currently effective FIRM and FIS. The LOMR following the CLOMR will ultimately be issued on the effective information at the time of issuance, so depending on construction schedule, the follow up LOMR could be issued on the currently effective FIRM or the preliminary FIRM after it has gone effective. Please submit a hydraulic analysis based on the currently effective model that ties into the effective hydraulic model within 0.5 foot, or within 0.0 feet if practical. Knowing how the project ties-in to the currently effective model as well as the preliminary model is extremely useful. So, please continue to provide hydraulic information based on the preliminary model in addition to the required hydraulic information from the currently effective model. Please extend the analysis to show that the proposed analysis ties into the preliminary model within 0.5 foot, or within 0.0 feet if practical.*

Response: The Flood Study has been revised using the Current Effective Model, prepared by SRBC in 1977. The model used in the Flood Study Report, Revision 2 was based on a preliminary model and has been withdrawn from this application.

- b. *The submitted application did not include a duplicate effective hydraulic model. The effective model used to produce the current Flood Insurance Rate Map (FIRM) must be obtained, reproduced on your equipment using the same software, and submitted as the duplicate effective model. Please submit a duplicate effective hydraulic model including the multiple profile and floodway analyses for the Susquehanna River.*

Response: Two Duplicate Effective Models are now provided (See Appendices E and F of the revised Flood Study Report). Duplicate Effective Model A was run in HEC-2 to recreate the original model in the original software. Duplicate Effective Model B was run in HEC-RAS using input that was identical, to the greatest extent possible, to the effective model. A Comparison of results is provided in Appendix D of the revised Flood Study Report.

- c. *If you continue to provide hydraulic information based on the preliminary model in addition to the required hydraulic information from the currently effective model, please submit a duplicate preliminary model as well.*

Response: The Preliminary Model is no longer included with this application.

- d. *Our review revealed that a floodway analysis was not performed for the existing and proposed conditions models. Please revise the existing and proposed conditions HEC-RAS models to include an analysis of the regulatory floodway. Please also ensure that the surcharges do not exceed the 1.0-foot maximum allowed and there are no negative surcharges.*

Response: An encroachment analysis has now been included in the Existing and Proposed Conditions models. (See Appendices H and I of the revised Flood Study Report) Surcharges range from 0.65 ft to 1.00 ft.

- e. *Our review revealed that the levee option was used at several locations along the revised reach of Susquehanna River to model the ineffective flow areas. However, since an accredited levee does not exist, the use of the ineffective flow area option may be more appropriate. Please provide documentation to support using the levee option or make the appropriate changes.*

Response: Levees were removed from the Corrected Effective, Existing Conditions, and Proposed Conditions, model and ineffective flow areas were used, as appropriate. Levees were used in the Duplicate Effective Models (See Appendices A and B), as levees were in fact used in the Effective Model.

4. *Our review revealed that the BFE in the backwater area of Big Wapwallopen Creek may be affected by this revision for the Susquehanna River. Please show the revised backwater delineation of Big Wapwallopen Creek on the certified work map.*

Response: The downstream limit of the Revised Flood Study is at Cross Section CU, which is upstream of the Wapwallopen Creek. Therefore, no change in the Susquehanna River Backwater elevation in the Wapwallopen Creek is proposed.

5. *The submitted topographic work map entitled "100 Year Floodplain Map Flood Study – Susquehanna River" prepared by LandStudies, Inc., dated November 19, 2010, does not provide the essential information required to complete our review of this*

request. Please submit a topographic work map, certified by a registered Professional Engineer that shows, at a sufficient scale, all applicable items listed in Section C of Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form," including the following information:

- a) Complete boundary delineations of the proposed conditions base floodplain, 0.2-percent annual-chance floodplain, and regulatory floodway.*
- b) Complete boundary delineations of the currently effective base floodplain, 0.2-percent annual-chance floodplain, and regulatory floodway.*
- c) Logical and smooth tie-ins between the revised and effective flood hazard boundary delineations at downstream and upstream ends of revised reach.*
- d) Topographic contour information (including labels) used in the hydraulic model and for the boundary delineations of the proposed base floodplain and 0.2-percent-annual-chance floodplain.*
- e) Locations and alignments of all cross-sections used in the hydraulic model.*
- f) The flow line used in the hydraulic model.*
- g) Reference to datum, such as the National Geodetic Vertical Datum of 1929 (NGVD 29). If datum is different than the effective model and map (NGVD 29), please specify datum conversion factor used.*

Response: All requested changes have been added to the Floodplain Map. (See Appendix B): The elevation datum for the Floodplain Map is NAVD 88. All models were prepared using vertical datum NGVD 29 for consistency with the effective model. Elevations used for the flood hazard boundary delineations were converted to NAVD 88 for plotting on the plan. The conversion factor of -0.7 ft is noted on the plan.

- 6. To aid in accuracy, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data along with the hardcopy topographic work map submittal. Please ensure the digital data are spatially referenced, and cite what projection (coordinate system, example: UTM/State Plane) was used.*

Response: AutoCAD.dwg files are provided on DVD, as requested.

- 7. Please submit annotated FIRM panels 4206250020 B, 4206190010 B, and 420600 B and FBFM panels 420625002 and 4206190010, at the scale of the effective FIRMs, that show the revised boundary delineations of the base floodplain, 0.2 percent-annual-chance floodplain, and regulatory floodway shown on the submitted work map, and how they tie-in to the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.*

Response: An annotated FIRM panel has been included in the revised Flood Study Report (Appendix C), as requested. The effective flood hazard boundaries have been included on the Floodplain Map and in the AutoCAD.dwg file. This is a more accurate method of overlaying the effective flood hazard boundaries with the proposed delineations. Therefore, the upstream and downstream limits of the study, as well as the location of the proposed intake structure, have

been annotated on the FIRM panel but the proposed delineations have not been shown as this would be a less accurate depiction than what is provided on the Floodplain Plan.

Should you or your staff have any questions about this response please contact Bradley Wise of my staff at (610) 774-6508 or bawise@pplweb.com.

Respectfully,



Terry L Harpster

TLH/kw

- Enclosure:
- 1) Bell Bend Nuclear Power Plant Flood Study Report, Susquehanna River, Salem Township, Luzerne County, PA., LSI Doc. No. FS-SR-001, Revision 3, August 16, 2011
 - 2) Letter from Luzerne County Planning Commission and a signed FEMA Form 1, entitled "Overview and Concurrence Form"
 - 3) DVD containing HEC-RAS and AutoCAD.dwg files

cc: (w/ Enclosure provided on DVD)

Ms. Stacey Imboden
Project Manager
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Ms. Jamie Davis
Office of Environmental Programs (3EA30)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Mr. Tom Shervinskie
Pa Fish & Boat Commission
450 Robinson Lane
Bellefonte, PA 16823

Ms. Jennifer Kagel
United States Fish & Wildlife Service
Pennsylvania Field Office
315 S. Allen St. #322
State College, PA 16801

Ms. Amy Elliott
U.S. Army Corps of Engineers Baltimore District
State College Field Office
1631 South Atherton Street, Suite 102
State College, PA 16801

Ms. Paula B. Ballaron
Susquehanna River Basin Commission
1721 North Front Street
Harrisburg, PA 17102-0425

Mr. Thomas W. Beauduy
Susquehanna River Basin Commission
1721 North Front Street
Harrisburg, PA 17102-0425

Mr. Joshua Longmore
Luzerne Conservation District
485 Smiths Pond Road
Shavertown, PA 18708

Ms. Karen J. Karchner
Zoning/Building Code Official
38 Bomboy Lane
Berwick, PA 18603

Enclosure 1

Bell Bend Nuclear Power Plant Flood Study Report, Susquehanna River,
Salem Township, Luzerne County, PA.,
LSI Doc. No. FS-SR-001, Revision 3, August 16, 2011

Enclosure 2

Letter from Luzerne County Planning Commission and a signed FEMA Form 1,
entitled "Overview and Concurrence Form"

MARYANNE C. PETRILLA, CHAIRMAN
THOMAS P. COONEY
STEPHEN A. URBAN

DOUGLAS A. PAPE
County Manager/Chief Clerk



P.02

N. Brian Caverly
Chairman

Stephen Mann, Solicitor

LUZERNE COUNTY
Planning Commission
Penn Place - Suite 208
20 N. Pennsylvania Avenue
WILKES-BARRE, PENNSYLVANIA 18711

(570) 825-1560
FAX (570) 825-6362
TDD (570) 825-1860
E-Mail: Adrian.Merolli@luzernecounty.org

September 16, 2011

Terry L. Harpster
PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, Pa. 18603

RE: Bell Bend Nuclear Power Plant
Flood Study Report
Susquehanna River
Salem Township, Luzerne County

Dear Mr. Harpster:

We have received and reviewed the above referenced report on behalf of Conyngham Township and find that it is consistent with the municipal flood plain and stormwater management programs. We understand the effects of the proposed Bell Bend Nuclear Power Plant intake and discharge structures on loading conditions in Conyngham Township and have determined that any existing or proposed structures to be removed from the Special Flood Hazard Area (SFHA) are reasonably safe from flooding. The report also indicates that the project will have no impact on flooding levels along this reach of the Susquehanna River.

Also, please find the enclosed executed Overview & Concurrence Form.

If you have any questions, please call me at 825-1560.

Sincerely,

A handwritten signature in cursive script that reads "Adrian Merolli".

Adrian Merolli, Executive Director
Luzerne County Planning Commission

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. Please do not send your completed survey to the above address.

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

- ☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
420625	Salem Township, Luzerne County	PA	420625	0020B	3/18/80
420600B	Conyngham Township, PA	PA	420600B	10, 11, 12	12/2/74

2. a. Flooding Source: Susquehanna River

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
- ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Bell Bend Nuclear Power Plant - Proposed Cooling Water Intake Structure

4. FEMA zone designations affected: A13, B (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☒ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
- ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
- ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
- ☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

- Structures: ☐ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert
- ☐ Dam ☐ Fill ☐ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$4,400

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/fhm_fees.shtml for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Terry Harpster, VP Bell Bend Project Dev

Company: PPL Bell Bend, LLC

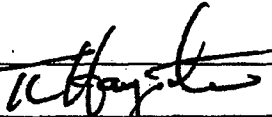
Mailing Address:
38 Bombay Lane, Suite 2
Berwick, PA 18603

Daytime Telephone No.: 570-802-8111

Fax No.: 570-802-8119

E-Mail Address: tharpster@pplweb.com

Signature of Requester (required):



Date:

8/25/2011

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Adrian Merolli, Director - Luzerne County Planning Commission

Community Name: Conyngham Township

Mailing Address:
Penn Place
20 N. Pennsylvania Avenue
Wilkes-Barre, PA 18711

Daytime Telephone No.: (570) 825-1580

Fax No.:

E-Mail Address: ADRIAN.MEROLLI@LUCERNECOUNTY.ORG

Community Official's Signature (required):



Date:

9-16-11

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Benjamin J. Ehrhart

License No.: PE062219

Expiration Date: 9/30/2011

Company Name: LandStudies, Inc.

Telephone No.: 717-627-4440

Fax No.: 717-627-4660

Signature:



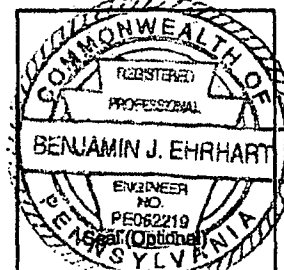
Date: 8-26-11

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required If...

- | | |
|---|---|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



Enclosure 3

DVD containing HEC-RAS and AutoCAD.dwg files

T. L. Harpster
VP-Bell Bend Project-Development

PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
Tel. 570.802.8111 FAX 570.802.8119
tlharpster@pplweb.com



September 22, 2011

Attn: LOMA Manager
LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

BELL BEND NUCLEAR POWER PLANT
FEMA CASE NO. 11-03-1940R COMMENT RESPONSES
BNP-2011-170 Docket No. 52-039

- References:
- 1) FEMA-2011-142, Jonica Gibson, FEMA, to Benjamin Ehrhart, LSI "Additional Data Request for Case No. 11-03-1940R", 7/1/11
 - 2) BNP-2011-152, Bradley Wise, PPL, to LOMA Manager, FEMA, "FEMA ESA Determination Request", 8/10/11

This letter is in response to the request for additional data required to support the Conditional Letter of Map Revision (CLOMR) review for the above-referenced case. This CLOMR request is in support of the proposed Bell Bend Nuclear Power Plant in Salem Township, Luzerne County, PA. In response to reference 1) above a revised study; "Bell Bend Nuclear Power Plant Flood Study Report, Walker Run, Salem Township, Luzerne County, PA., LSI Doc. No. FS-WR-001, Revision 2, dated September 14, 2011" is provided as enclosure 1.

Listed below are FEMA's 7/1/11 comments, followed by our responses to those comments.

1. *This CLOMR request will be processed by FEMA only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, "not likely to adversely affect" determination from the National Marine Fisheries Service or the U.S. Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat. If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the Conditional LOMC request. For additional information about the ESA and compliance requirements and for responses to frequently asked questions, please refer to FEMA Procedure Memorandum 64 which can be accessed on FEMA's website at: <http://www.fema.gov/library/viewRecord.do;jsessionid=778CF22E0477B66905D140EA1F8FEC0C>. WorkerLibrary?action=back&id=4312.*

Response: Per reference 2, has requested that FEMA defer to the NRC its verification of ESA compliance and continue the review of the CLOMR request.

2. *Our review revealed that the discharges computed for the Unnamed Tributary to Walker Run is performed using Hydraflow model. Hydraflow model is not a FEMA accepted hydrology model. Please update the hydrology of the Unnamed Tributary to Walker Run using one the FEMA approved hydrologic models. More information about FEMA approved models can be obtained from http://www.fema.gov/plan/prevent/fhm/en_hydro.shtm. Please provide supporting documents for computation of current existing drainage areas, curve numbers and times of concentration. Also, please provide Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form" for the Unnamed tributary to Walker Run. This form was omitted from your previous submittal*

Response: Peak discharges used for the revised flood study have been calculated using Win TR-20. All time of concentration and curve number calculations are provided in Appendix I of Enclosure 1. A Form 2 for the Unnamed Tributary #1 is provided as Enclosure 2.

3. *Please provide as-built plans, certified by a registered Professional Engineer or licensed Land Surveyor that shows the dimensions and inverts of the existing bridges and culverts along Walker Run to confirm the bridge and culvert modeling for the structures not modeled exactly as they were in the effective HEC-2 model. Also, provide as-built plans for all existing bridges along Unnamed Tributary to Walker Run. If as-built plans are not available, please submit certified survey plans. In addition, please provide design plans for the all proposed bridges on the Unnamed Tributary to Walker Run. Please also provide Application/Certification Form 3, entitled "Riverine Structures Form," for each structure modeled in the proposed analysis, unless it is modeled exactly as it was in the effective hydraulic analysis.*

Response: Enlargements of the existing structures with field surveyed spot elevations and descriptions have been provided on Sheet 2 of the Floodplain Map found in Appendix B of Enclosure 1. Form 3 has been completed for all proposed structures and is provided as Enclosure 3.

4. *Sealed plans submitted for Bridge 4 entitled, "Bridge No. 4 Access Road V over Walker Run," prepared by Pennoni Associates Inc., dated April 19, 2011, shows that all four piers are at different elevations such as 669.03, 669.83, 670.63, and 671.43 feet but in hydraulic model they are all modeled at elevation of 671.26 feet. Please be consistent in the information present in the plans and information. Also, plan is not printed to correct scale as per scale bar so it is difficult to confirm the pier width shown on plan with hydraulic model. Please submit another copy of plans printed to correct scale and show consistent information in hydraulic model and plans.*

Response: Bridge geometry data for Bridge # 4 has been updated to be consistent with the sealed plan.

5. *The submitted application did not include a duplicate effective hydraulic model. Comparison with this model is shown in the submitted report but a digital copy of this model was not provided. The effective model used to produce the Flood Insurance Rate Map (FIRM) must be obtained, reproduced on your equipment using the same*

software, and submitted as the duplicate effective model. Please submit a duplicate effective hydraulic model including the multiple profile and floodway analyses for Walker Run.

Response: Two Duplicate Effective Models are now provided. Duplicate Effective Model A was run in HEC-2 to recreate the original model in the original software. Duplicate Effective Model B was run in HEC-RAS using input that was identical, to the greatest extent possible, to the effective model. A comparison of results is provided in Appendix D of Enclosure 1.

6. *Our review of the existing and proposed conditions hydraulic models for Walker Run and Unnamed Tributary to Walker Run revealed the following issues. Please revise the models as necessary and submit digital copies of the input and output files.*
- a. *Several bridges over Walker Run and Unnamed Tributary to Walker Run contain piers and the hydraulic modeling computations use the energy method only. Bridges with piers should be modeled using the highest energy answer between energy and momentum methods.*

Response: The bridge modeling method has now been set to use the highest energy answer between the energy and momentum methods.

- b. *The hydraulic models were run using the mixed flow regime for Walker Run and Unnamed Tributary to Walker Run. FEMA accepts base floodplain boundary delineations based on supercritical flow depths only for concrete-lined, engineered channels. Because the proposed channel is not concrete lined, critical depth is the minimum depth permissible to map the one-percent-annual-chance (base) floodplain boundary delineations along this reach. Please revise the hydraulic analysis for this portion of the channel using subcritical modeling*

Response: The Existing Conditions (Corrected Effective) Model and the Proposed Conditions Model have been run using a subcritical flow regime. The Duplicate Effective Models (A and B) were run using a mixed flow regime, consistent with the methods used in the Effective Model.

- c. *Surcharges between the natural (unencroached) and encroached profiles over 1.0 foot were found at many of the cross sections in the existing and proposed conditions HEC-RAS hydraulic models for Walker Run. Negative surcharges were also found at several cross sections for Unnamed Tributary to Walker Run. Please revise the floodway analyses for both the flooding source so surcharges do not exceed the 1.0 foot maximum allowed and eliminate all negative surcharges.*

Response: The encroachment analysis has been revised to eliminate surcharges greater than 1.0 ft. All negative surcharges at modeled cross sections have also been eliminated.

- d. *The downstream boundary condition of known water surface elevation, along Walker Run appears to be based on the FEMA effective HEC-2 model for Walker Run. However, the HEC-2 model is in National Geodetic Vertical Datum of 1929 (NGVD 29) and the submitted MT-2 Form 2 Section B "Hydraulics," specifies that the Existing and Proposed conditions models are in North American Vertical Datum of 1988 (NAVD 88). Please be sure to convert the water surface elevations accordingly and provide the vertical datum conversion factor used.*

Response: The downstream boundary condition known water surface elevations have now been adjusted to the NAVD 88 vertical datum (NGVD 29, -0.75ft.) for all HEC-RAS models.

- e. *Paragraph 65.6(a)(8) of the National Flood Insurance Program (NFIP) regulations states that the revised conditions hydraulic analysis for a flooding source with established elevations of the base flood must include an evaluation of the same recurrence intervals studied in the effective Flood Insurance Study (FIS), such as the base flood and the 10-percent-, 2-percent-, and 0.2-percent-annual-chance floods, and of the regulatory floodway. Please revise the submitted existing and proposed conditions hydraulic models to include all the above-referenced intervals for Walker Run.*

Response: The Existing and Proposed Condition Models now include an evaluation of the 10-year, 50-year, and 500-year floods.

- f. *The HEC-RAS model uses the junction option as the downstream boundary condition for Unnamed Tributary to Walker Run. Please remove the junction from the submitted hydraulic model. This option should only be used if the tributary and main stream has coincident peaks. Please model the tributary independent of the main stream, using normal depth as the downstream boundary condition, or provide engineering data and calculations to support a coincident peak with Walker Run. Please be certain to use the backwater effects of Walker Run to map the confluence.*

Response: The junction at the confluence of the Unnamed Tributary with Walker Run has been removed. Normal depth has been used as the downstream boundary condition for the tributary. The backwater of Walker Run has been reflected in the delineation on the Floodplain Map.

- g. *The submitted existing and proposed conditions hydraulic analysis uses the levee option at several locations along the revised reach of Unnamed Tributary to Walker Run to model ineffective flow areas. However, since an accredited levee does not exist, the use of the ineffective flow area option may be more appropriate. Please provide documentation to support using the levee option or make the appropriate changes.*

Response: All Levees have been removed from the Existing and Proposed Models.

- h. *Our review revealed that there are interpolated cross sections in the HEC-RAS hydraulic model for Unnamed Tributary to Walker Run. Please revise the model to include surveyed geometries of the above mentioned cross-sections, or remove them from the model. Interpolated cross sections are not appropriate at locations where the bounding cross-sections have greatly varied geometry.*

Response: Interpolated cross sections have been removed. Four additional cross sections have been added to better define the geometry of the Unnamed Tributary.

7. *Please submit a topographic work map, certified by a registered Professional Engineer that shows all applicable items listed in Section C of Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form," including the following information.*

- a) *Boundary delineations of the proposed conditions base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway.*

Response: The floodway and 0.2-percent-annual-chance flood delineations have been added to the Floodplain Map in Appendix B of Enclosure 1.

- b) *Boundary delineations of the currently effective base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway*

Response: Base Flood, Floodway and 0.2-percent- annual-chance flood delineations from the currently effective Flood Insurance Rate Maps have been overlaid on the Floodplain Map in Appendix B of Enclosure 1.

- c) *Logical and smooth tie-ins between the revised and effective flood hazard boundary delineations at the downstream and upstream ends of the revised reach.*

Response: Tie-ins from the effective flood hazard boundaries to the proposed delineations have been provided at the upstream and downstream ends of the study reach.

- d) *Topographic contours used in the hydraulic model and for the boundary delineations of the base floodplain and 0.2-percent-annual-chance floodplain.*

Response: Labeled contour lines are included on the revised Floodplain Map in Appendix B of Enclosure 1.

- e) *Locations and alignments of all cross-sections used in the hydraulic model.*

Response: The locations and alignments of all cross sections are shown on the Floodplain Map in Appendix B of Enclosure 1.

- f) *The flow line used in the hydraulic model.*

Response: The flow lines used in the hydraulic model are shown on the Floodplain Map in Appendix B of Enclosure 1.

- g) *Scale and north arrow.*

Response: A scale bar and north arrow are shown on the Floodplain Map in Appendix B of Enclosure 1.

- h) *Reference to a datum, such as NGVD 29. If datum is different than the effective model and map (NGVD 29), please specify datum conversion factor used.*

Response: The elevation datum for the Floodplain Map is NAVD 88, and this is noted on the plan. A conversion factor of -0.75 was used to convert NGVD29 elevations from the effective model.

8. *To aid in accuracy, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data along with the hardcopy topographic work map submittal. Please ensure the digital data are spatially referenced, and cite*

what projection (coordinate system, example: UTM/State Plane) was used.

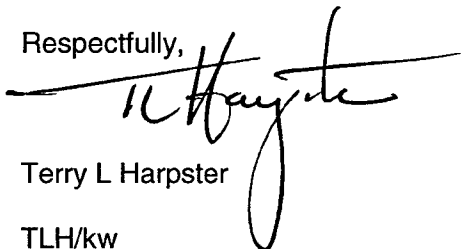
Response: AutoCAD.dwg files are provided on DVD, as requested. The drawings use NAD83 Pennsylvania State Plane, South Zone, US Foot.

9. *Please submit annotated FIRM panel 4206250020B and FBFM panel 4206250020, at the scale of the effective FIRMs, that show the revised boundary delineations of the base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway shown on the submitted work map, and how they tie-in to the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.*

Response: Annotated FIRM and FBFM panels have been included in the revised Flood Study Report (Appendix C of Enclosure 1), as requested. The effective flood hazard boundaries have been included on the Floodplain Map and in the AutoCAD.dwg files. This is a more accurate method of overlaying the effective flood hazard boundaries with the proposed delineations. Therefore, the upstream and downstream limits of the study have been annotated on the FIRM but the proposed delineations have not been shown as this would be a less accurate depiction than what is provided on the Floodplain Plan.

Should you or your staff have any questions about this response please contact Bradley Wise of my staff at (610) 774-6508 or bawise@pplweb.com.

Respectfully,



Terry L Harpster

TLH/kw

- Enclosures:
- 1) Bell Bend Nuclear Power Plant Flood Study Report, Walker Run, Salem Township, Luzerne County, PA., LSI Doc. No. FS-WR-001, Revision 2, September 2, 2011
 - 2) Revised Form 2 for Riverine Hydrology & Hydraulics
 - 3) Revised Form 3 for proposed Riverine Structures
 - 4) Updated, Sealed Bridge Drawing Set
 - 5) DVD containing HEC-RAS and AutoCAD.dwg files

cc: (w/ Enclosures provided on DVD)

Ms. Stacey Imboden
Project Manager
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Ms. Jamie Davis
Office of Environmental Programs (3EA30)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Mr. Tom Shervinskie
Pa Fish & Boat Commission
450 Robinson Lane
Bellefonte, PA 16823

Ms. Jennifer Kagel
United States Fish & Wildlife Service
Pennsylvania Field Office
315 S. Allen St. #322
State College, PA 16801

Ms. Amy Elliott
U.S. Army Corps of Engineers Baltimore District
State College Field Office
1631 South Atherton Street, Suite 102
State College, PA 16801

Ms. Paula B. Ballaron
Susquehanna River Basin Commission
1721 North Front Street
Harrisburg, PA 17102-0425

Mr. Thomas W. Beauduy
Susquehanna River Basin Commission
1721 North Front Street
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Mr. Joshua Longmore
Luzerne Conservation District
485 Smiths Pond Road
Shavertown, PA 18708

Ms. Karen J. Karchner
Zoning/Building Code Official
38 Bomboy Lane
Berwick, PA 18603

Enclosure 1

Bell Bend Nuclear Power Plant Flood Study Report, Walker Run, Salem Township,
Luzerne County, PA., LSI Doc. No. FS-WR-001, Revision 2, September 2, 2011

Enclosure 2

Revised Form 2 for Riverine Hydrology & Hydraulics

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Unnamed Tributary #1 to Walker Run
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- ☐ Not revised (skip to section B) ☒ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
To XS 6850	0.68	N/A	300

3. Methodology for New Hydrologic Analysis (check all that apply)

- ☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model Win TR-20
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Downstream Limit of Flood Model	183	N/A	654.95
Upstream Limit	Upstream Limit of Flood Model	6850	N/A	712.52

2. Hydraulic Method/Model Used

HEC-RAS

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/firm_soft.shtml. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted

	<u>Natural Run</u>	<u>Floodway Run</u>	<u>Datum</u>
Duplicate Effective Model*	File Name: FEMAIdStudy.prj	Plan Name: FEMA FIS HECRAS	File Name: Plan
Name: <u>NAVD88</u>			
Corrected Effective Model*	File Name: WalkerRunFld.prj	Plan Name: Existing Conditions	File Name: Plan
Name: <u>NAVD88</u>			
Existing or Pre-Project Conditions Model	File Name: Plan Name: File Name: Plan Name:		
Revised or Post-Project Conditions Model	File Name: WalkerRunFld.prj	Plan Name: Proposed Conditions	File Name: WalkerRunFld.prj
Plan Name: Proposed Conditions <u>NAVD88</u>			
Other - (attach description)	File Name: Plan Name: File Name: Plan Name:		

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach a **copy of the effective FIRM and/or FBFM**, annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

Enclosure 3

Revised Form 3 for proposed Riverine Structures

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Walker Run, Unnamed Tributary #1 to Walker Run
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization complete Section B
Bridge/Culvert complete Section C
Dam/Basin complete Section D
Levee/Floodwall complete Section E
Sediment Transport complete Section F (if required)

Description Of Structure

1. **Name of Structure: Floodplain/ Channel Restoration**

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Beach Grove Road, ~3600 ft. south to confluence with unnamed tributary

Downstream Limit/Cross Section: 1602

Upstream Limit/Cross Section: 5198

2. **Name of Structure: Bridge # 4**

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Access Bridge on Walker Run

Downstream Limit/Cross Section: 2497

Upstream Limit/Cross Section: 2730

3. **Name of Structure: Bridge #3**

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Access Bridge on Unnamed Tributary #1 to Walker Run

Downstream Limit/Cross Section: 1252

Upstream Limit/Cross Section: 1360

NOTE: For more structures, attach additional pages as needed.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

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Flooding Source: Unnamed Tributary #1 to Walker Run
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization complete Section B
Bridge/Culvert complete Section C
Dam/Basin complete Section D
Levee/Floodwall complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Bridge #7

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Pipe Bridge on Unnamed Tributary #1

Downstream Limit/Cross Section: 1658

Upstream Limit/Cross Section: 2326

2. Name of Structure: Bridge #2/6

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Access/ Pipe Bridge on Unnamed Tributary #1

Downstream Limit/Cross Section: 2834

Upstream Limit/Cross Section: 3060

3. Name of Structure: Bridge #5

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: RR Crossing on Unnamed Tributary #1

Downstream Limit/Cross Section: 3060

Upstream Limit/Cross Section: 3162

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Walker Run

Name of Structure: Walker Run Restoration

1. Accessory Structures

The channelization includes (check one):

- | | |
|--|--|
| <input type="checkbox"/> Levees [Attach Section E (Levee/Floodwall)] | <input type="checkbox"/> Drop structures |
| <input type="checkbox"/> Superelevated sections | <input type="checkbox"/> Transitions in cross sectional geometry |
| <input type="checkbox"/> Debris basin/detention basin [Attach Section D (Dam/Basin)] | <input type="checkbox"/> Energy dissipator |
| <input checked="" type="checkbox"/> Other (Describe): Floodplain restoration and channel relocation/ restoration | |

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry 16-35 (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

- ☐ Subcritical flow ☒ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- ☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Walker Run

Name of Structure: Bridge #3, #4, #2/6, #5, #7

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Shape (culverts only) | <input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Material | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Cross-Section Locations |
| <input checked="" type="checkbox"/> Distances Between Cross Sections | |

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam
2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

Name of the agency or organization:

3. The Dam was permitted as (check one):

- a. ☐ Federal Dam ☐ State Dam

Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

Permit or ID number Permitting Agency or Organization

- b. ☐ Local Government Dam ☐ Private Dam

Provide related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

Was the dam/basin designed using critical duration storm?

- ☐ Yes, provide supporting documentation with your completed Form 2.
- ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport).

If No, then attach your explanation for why debris/sediment analysis was not considered.

6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

- ☐ earthen embankment, dike, berm, etc. Station to
☐ structural floodwall Station to
☐ Other (describe): Station to

c. Structural Type (check one):

- ☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- 3.0 feet or more at the downstream end and throughout
3.5 feet or more at the upstream end
4.0 feet within 100 feet upstream of all structures and/or constrictions

☐ Yes ☐ No
☐ Yes ☐ No
☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).

☐ Yes ☐ No

2.0 feet above the 1%-annual-chance stillwater surge elevation

☐ Yes ☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

- b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

- a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

- a. The maximum levee slope landside is:
- b. The maximum levee slope floodside is:
- c. The range of velocities along the levee during the base flood is: (min.) to (max.)
- d. Embankment material is protected by (describe what kind):
- e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

- f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

- d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

- e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

- f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

- g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

- h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ $P_A =$ psf; $P_p =$ psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ $P_w =$ psf

☐ Seepage (Uplift); ☐ Earthquake @ $P_{eq} =$ %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans. †

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
- b. The computed range of settlement is ft. to ft.
- c. Settlement of the levee crest is determined to be primarily from :
- ☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):
- d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.
- Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:
- Draining to pressure conduit: acres
Draining to ponding area: acres
- b. Relationships Established
- Ponding elevation vs. storage ☐ Yes ☐ No
Ponding elevation vs. gravity flow ☐ Yes ☐ No
Differential head vs. gravity flow ☐ Yes ☐ No
- c. The river flow duration curve is enclosed: ☐ Yes ☐ No
- d. Specify the discharge capacity of the head pressure conduit: cfs
- e. Which flooding conditions were analyzed?
- Gravity flow (Interior Watershed) ☐ Yes ☐ No
• Common storm (River Watershed) ☐ Yes ☐ No
• Historical ponding probability ☐ Yes ☐ No
• Coastal wave overtopping ☐ Yes ☐ No
- If No for any of the above, attach explanation.
- f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No
- If No, attach explanation.
- g. The rate of seepage through the levee system for the base flood is cfs
- h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
- b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No
- c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

A sediment transport analysis in the terms requested above (ac-ft., % by volume) was not performed for individual structures. There is no indication from historical records that sediment transport significantly affects the BFE, and the sediment supply to the upstream limit of the project reach is insignificant. The channel and floodplain restoration design, which employs natural channel design principles, does consider sediment transport in order to create a stable dimension, pattern, and profile. The intent of the design is to minimize shear stresses in the system to avoid mobilization of sediment from within the project reach, correcting the currently unstable banks that are the primary sediment (sand and silt) source under existing conditions.

Enclosure 4

Updated, Sealed Bridge Drawing Set

Enclosure 5

DVD containing HEC-RAS and AutoCAD.dwg files



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

October 27, 2011

Mr. Benjamin J. Ehrhart
LandStudies, Inc.
315 North Street
Lititz, PA 17543

IN REPLY REFER TO:
Case No.: 11-03-1701R
Communities: Township of Salem and
Township of Conyngham, PA
Community Nos.: 420625 and 420600

316-AD

Dear Mr. Ehrhart:

This responds to your submittal dated October 6, 2011, concerning a May 3, 2011, request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) for the above-referenced communities, Luzerne County, Pennsylvania. Pertinent information about the request is listed below.

Identifier:	Bell Bend Nuclear Power Plant
Flooding Source:	Susquehanna River
FIRM Panel Affected:	4206250020 B and 420600 B
FBFM Panel Affected:	4206250020 and 4206190010

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the attached summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the current fee schedule is available for your information on the FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm.

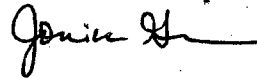
FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited if the requested data are not received within 90 days.

LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076 / PH: 1-877-FEMA MAP / FX: 1-800-358-9620

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If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please contact the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Sagar Deshpande, CFM, GISP, by e-mail at sdeshpande@dewberry.com or by telephone at (703) 849-0345, or the Revisions Coordinator for your State, Ms. Sharon Freiland, P.E., CFM, at sfreiland@dewberry.com or at (703) 849-0116.

Sincerely,



Jonica Gibson, P.E., CFM
LOMC Manager
Risk Assessment, Mapping,
and Planning Partners

Attachment:

Summary of Additional Data

cc: Ms. Karen J. Karchner
Zoning/Building Code Official
Township of Salem

Mr. Terry Harpster
VP Bell Bend Project Dev
PPL Bell Bend, LLC



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

Summary of Additional Data Required to Support a Conditional Letter of Map Revision (CLOMR)

Case No.: 11-03-1701R

Requester: Mr. Benjamin J. Ehrhart

Community: Township of Salem and
Township of Conyngham, PA

Community No.: 420625 and 420600

The issues listed below must be addressed before we can continue the review of your request.

1. This CLOMR request will be processed by FEMA only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). Your previous correspondence indicated that the Nuclear Regulatory Commission (NRC) requires ESA compliance, which will be resolved in the future. Please provide written documentation from the NRC that they will handle all documentation related to ESA requirements.
2. Our review of corrected effective, existing, and proposed conditions hydraulic model for the Susquehanna River revealed the following issues. Please revise the hydraulic model and provide digital copies of the input and output files for this model.
 - a. Our review revealed that there are interpolated cross-sections in the HEC-RAS hydraulic model. Please revise the model to ensure that the geometry in the model for all cross-sections matches the topography shown on the submitted work map, entitled "100 Year Floodplain Map," as prepared by LandStudies, Inc., last revised August 18, 2011.
 - b. The typical contraction and expansion loss coefficients are equal to 0.1 and 0.3 at cross-sections not located at the structure. Please revise the submitted hydraulic model so that the contraction and expansion loss coefficients are equal to 0.1 and 0.3, respectively, at Cross-Section 138205, or provide an explanation why the contraction and expansion loss coefficients used in the model were chosen.
3. The vertical datum conversion from National Geodetic Vertical Datum of 1929 (NGVD 29) to the North American Vertical Datum of 1988 (NAVD 88) used in the hydraulic model is -0.7 foot, but the value listed in the Flood Insurance Study (FIS) is -0.643 foot. Please provide the source of the vertical datum conversion factor.
4. The above referenced topographic work map does not provide the essential information required to complete our review of this request. Please submit a topographic work map, certified by a registered Professional Engineer that shows, at a sufficient scale, all applicable items listed in Section C of Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form," including the following information:
 - a) Complete boundary delineations of the proposed conditions 1-percent-annual-chance (base) floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway.
 - b) Complete boundary delineations of the currently effective base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway.

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- c) Logical and smooth tie-ins between the revised and effective flood hazard boundary delineations at downstream and upstream ends of revised reach.
 - d) Topographic contour information (including labels) used in the hydraulic model and for the boundary delineations of the proposed base floodplain and 0.2-percent-annual-chance floodplain.
 - e) Locations and alignments of all cross-sections used in the hydraulic model
 - f) The flow line used in the hydraulic model.
 - g) Reference to datum, such as the NGVD 29. If datum is different than the effective model and map (NGVD 29), please specify datum conversion factor used.
5. Our review of the submitted data revealed that the above referenced topographic work map was submitted only electronically. Please submit a paper copy of the revised work map, certified by a registered Professional Engineer, in addition to the electronic files.
6. Our review of the submitted Annotated FIRM (Appendix C) revealed that they are not annotated copies of the effective FIRM and FBFM. Please submit annotated FIRM Panels 4206250020B and 420600B and FBFM Panels 4206250020 and 4206190010, at the scale of the effective FIRMs, that show the revised boundary delineations of the base floodplain, 0.2- percent-annual-chance floodplain, and regulatory floodway shown on the submitted work map, and how they tie-in to the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.

Please send the required data to:

FEMA LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

For identification purposes, please include the case number referenced above on all correspondence.



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

October 21, 2011

Mr. Benjamin J. Ehrhart, P.E.
LandStudies, Inc.
315 North Street
Lititz, PA 17543

IN REPLY REFER TO:
Case No.: 11-03-1940R
Community: Township of Salem, PA
Community No.: 420625

316-AD

Dear Mr. Ehrhart:

This responds to your submittal received on September 26, 2011, concerning a May 3, 2011, request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) for Township of Salem, Luzerne County, Pennsylvania. Pertinent information about the request is listed below.

Identifier:	Walker Run Restoration
Flooding Sources:	Walker Run, Unnamed Tributary to Walker Run
FIRM Panel Affected:	4206250020 B
FBFM Panel Affected:	4206250020

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the attached summary.

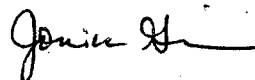
If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the current fee schedule is available for your information on the FEMA Web site at http://www.fema.gov/plan/prevent/fhm/firm_fees.shtm.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data for revision requests.

If a requester is informed by letter that additional data are required to complete our review of a request, the data **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited if the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please contact the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Mr. Sagar Deshpande, GISP, CFM, EIT by e-mail at sdeshpande@leonardjackson.net or by telephone at (703) 849-0345, or the Revisions Coordinator for your State, Ms. Sharon Freiland, P.E., CFM, at sfreiland@dewberry.com or at (703) 849-0116.

Sincerely,



Jonica Gibson, P.E., CFM
LOMC Manager
Risk Assessment, Mapping,
and Planning Partners

Attachment:

Summary of Additional Data

cc: Ms. Karen J. Karchner
Zoning/Building Code Official
Township of Salem

Mr. Terry Harpster
VP Bell Bend Project Dev
PPL Bell Bend, LLC



NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

Summary of Additional Data Required to Support a Conditional Letter of Map Revision (CLOMR)

Case No.: 11-03-1940R

Requester: Mr. Benjamin J. Ehrhart, P.E.

Community: Township of Salem, PA

Community No.: 420625

The issues listed below must be addressed before we can continue the review of your request.

1. This CLOMR request will be processed by FEMA only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). Your previous correspondence indicated that the Nuclear Regulatory Commission (NRC) requires ESA compliance which will be resolved in the future. Please provide written documentation from the NRC that they will handle all documentation related to ESA requirements.
2. Our review revealed that hydrologic computations were performed using Win-TR20 for Walker Run and Unnamed Tributary to Walker Run (referred to as Tributary #1 in the submission). Effective discharges were used in the submitted hydraulics model for Walker Run as they were not significantly different than the discharges computed using Win-TR20. But, the discharge computed using Win-TR20 was used in the hydraulics model for the Unnamed Tributary to Walker Run. Please submit digital copies of the input and output files only for the hydrologic model prepared for the Unnamed Tributary to Walker Run using Win-TR20. Also, please ensure that the revised HEC-RAS hydraulic computer model uses the intended hydrology.
3. As-built plans submitted for structures on Walker Run and the Unnamed Tributary to Walker Run in Appendix B of the submittal were not certified. Additionally, the as-built information is difficult to read, and the hydraulic input parameters could not be verified. Please submit certified as-built plans of all existing structures and make sure that the information is presented in a clear and easy to read format and to the scale printed on the plans. Structure dimensions, length of span, and upstream and downstream inverts of all structures should be shown clearly for verification of the hydraulic modeling.
4. The submitted plan, entitled "Drawing No. B1-S1," prepared by Pennoni Associates Inc., dated April 19, 2011, appears to be a design plan for proposed Bridge No. 1. However, it is not clear in the hydraulic model which bridge this is intended to be. Please clarify which bridge this drawing is intended to provide design information.
5. Sealed design plans submitted for Bridge 4 over Walker Run entitled, "Bridge No. 4 Access Road V over Walker Run," prepared by Pennoni Associates Inc., dated April 19, 2011, shows all four piers at the elevations 669.03, 669.83, 670.63, and 671.43 feet respectively, but in the hydraulic model they are modeled at elevation of 666.6, 665.8, 665, and 664.2 feet, respectively. Please be consistent in the information presented on the plans and in the hydraulic model. Also, because the plan is not printed to the scale shown on the plan, it is difficult to confirm the pier width shown on plan with the input for the hydraulic model. Please submit a design plan, printed to the same scale shown on the plan that shows information consistent with the data in the hydraulic model. Similarly, the drawings

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submitted for the proposed bridges over the Unnamed Tributary to Walker Run such as Bridge 3, Pipe Bridge 7, Bridge 2, Pipe Bridge 6 and Railroad Bridge 5 show different elevations for piers on the drawings than in the model. Pier thickness is not specified on the plan for Bridge 2 and Pipe Bridge 6. Please submit all drawings to scale and show consistent information in hydraulic model and plans.

6. The submitted application did not include a digital copy of duplicate effective HEC-2 hydraulic model. The paper copy of the duplicate effective model did not include the multiple profiles (10-percent, 2-percent, 1-percent and 0.2-percent-annual-chance floods). Please submit digital copy of the input and output files for the duplicate effective model run in HEC-2, including the required multiple profiles.
7. Our review of the existing and proposed conditions hydraulic models for Walker Run and Unnamed Tributary to Walker Run revealed the following issues. Please revise the models as necessary and submit digital copies of the input and output files. The HEC-RAS Hydraulic Reference Manual referenced below can be accessed at http://www.hec.usace.army.mil/software/hec-ras/documents/HEC-RAS_4.1_Reference_Manual.pdf.
 - a. The flow at Cross-Sections 2620 (Bridge # 4) and 3914 does not overtop the roadway. In low flow situations, the pressure and/or weir flow method should not be selected as the bridge modeling approach. Please select energy only method to model these structures.
 - b. The floodway plan, entitled "WalkerRunFld.p09," for Walker Run shows encroachment stations within channel bank points at Cross-Sections 3860 and 3785 and encroachment stations outside the 1-percent-annual-chance (base) floodplain for Cross-Sections 2336 and 6361. Please revise the floodway analysis to place the encroachment stations at the bank points or within the flood fringe (the area between the channel bank station and the limits of the base floodplain) for all cross-sections and remove encroachments from occurring within structures.
 - c. The floodway plan, entitled "WalkerRunFld.p09" for Unnamed Tributary to Walker Run shows encroachment stations within channel bank points at Cross-Sections 5500, 4750, 4530, 4500, and 1360. Please revise the floodway analysis to place the encroachment stations at the bank points or within the flood fringe (the area between the channel bank station and the limits of the base floodplain) for all cross-sections and remove encroachments from occurring within structures.
 - d. The vertical datum conversion from National Geodetic Vertical Datum of 1929 (NGVD 29) to North American Vertical Datum of 1988 (NAVD 88) used in the hydraulic model is -0.75, but the value listed in the Flood Insurance Study (FIS) is -0.643. Please provide the source of the vertical datum conversion factor.
 - e. The typical contraction and expansion loss coefficients are equal to 0.3 and 0.5, respectively, at Bridge and Culvert Sections 2, 3, and 4 (as referenced in the HEC-RAS Hydraulic Reference Manual) and are equal to 0.1 and 0.3, respectively, at all other sections. Please revise the submitted hydraulic model so that the contraction and expansion loss coefficients are equal to 0.3 and 0.5, respectively, at Cross-Sections 4750, 3356, 3162, 3108, 5547, and 933 and are equal to 0.1 and 0.3, respectively, at Cross-Section 4400, or provide an explanation why the contraction and expansion loss coefficients used in the model were chosen.
 - f. According to Tables 6.3 and 6.4 of the HEC-RAS Hydraulic Reference Manual, the culvert entrance loss coefficient for a culvert entrance shape of smooth tapered inlet throat is equal

- to 0.2. Please revise the culvert data in the submitted hydraulic model at Cross-Section 4528 to agree with the culvert entrance loss coefficient in the referenced tables, or provide an explanation why the entrance loss coefficient used in the model was chosen.
- g. Weir flow occurs at the structure located at Cross-Section 4528. Please revise the submitted existing and proposed conditions models so that the ineffective flow elevations at Cross-Sections 4530 and 4500 are less than the elevations where significant weir flow passes over the road, or provide justification for the ineffective flow elevation used.
8. Our review of the submitted work map, entitled "100 year Floodplain Map," prepared by Land Studies and dated September 2, 2011, revealed the following issues. Please submit a revised topographic work map, certified by a registered Professional Engineer, that shows all applicable items listed in Section C of Application/Certification Form 2, entitled "Riverine Hydrology and Hydraulics Form," including the following information:
- Work map is not certified by a registered Professional Engineer.
 - Contour elevations are not labeled.
 - Work map is not printed to correct scale.
 - It is hard to read cross-section labels and difficult to follow the delineations shown.
 - Please print work map to a more appropriate scale and clearly show the revised delineation and effective delineation, including smooth and logical graphical tie-ins at the downstream and upstream ends of the revised reach. Any backwater effects of Walker Run on Tributary to Walker Run should be mapped appropriately.
9. To aid in accuracy, please continue to provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data along with the hardcopy topographic work map submittal. Please ensure the digital data are spatially referenced, and cite what projection (coordinate system, example: UTM/State Plane) was used.
10. Our review of the submitted plans entitled "Appendix C: Annotated FEMA Maps: Floodway map and FIRM," revealed that they are not annotated copies of the effective Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM). Please revise the above FIRM and FBFM panels to show the revised delineations shown on the work map and how they tie-in to the effective delineations on the downstream and upstream ends of the revised reach.
11. Our review indicates that the proposed project on Walker Run encroaches upon a regulatory floodway and will cause increases in base flood elevations (BFEs). Please submit evidence that the proposed project satisfies the requirements of subparagraph 65.12 of the National Flood Insurance Program (NFIP) regulations, including the items stated below. A copy of Part 65 of the regulations can be accessed at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title44/44cfr65_main_02.tpl.
- Evaluation of alternatives, which would not result in any increase in flood levels within the community during the occurrence of the base flood discharge, and an explanation why these alternatives are not feasible.
 - Documentation of individual legal notice to all impacted property owners, explaining the impact of the proposed action on their property. Please submit draft notice for verification, prior to distribution.
 - Certification that no structures are located in areas which would be impacted by the increased BFE.

Please send the required data to:

FEMA LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, MD 21076

For identification purposes, please include the case number referenced above on all correspondence.