PMVictoriaESPPEm Resource

From: david.distel@exeloncorp.com
Sent: Monday, March 21, 2011 11:20 AM
To: Jessie, Janelle; Hale, Jerry
Subject: Exelon Letter - Response to Hydrology Audit Information Needs Items 41b and 47
Attachments: NP-11-0013 - Hydrology Audit information Needs Response INH 41b, 47.pdf

Janelle/Jerry – Attached is a courtesy copy of the Exelon Response to Hydrology Audit Information Needs Items 41b and 47 submittal letter signed out today. The original letter and the designated cc's are being mailed today. Please forward a copy to the appropriate staff hydrology reviewers.

Thanks.

Dave Distel

Hearing Identifier: Victoria_ESP_Public
Email Number: 255

Mail Envelope Properties (354482C26DF3984ABE2CB92266860D3E692347)

Subject: Exelon Letter - Response to Hydrology Audit Information Needs Items 41b and 47
Sent Date: 3/21/2011 11:20:29 AM
Received Date: 3/21/2011 11:20:48 AM
From: david.distel@exeloncorp.com

Created By: david.distel@exeloncorp.com

Recipients:
"Jessie, Janelle" <Janelle.Jessie@nrc.gov>
Tracking Status: None
"Hale, Jerry" <Jerry.Hale@nrc.gov>
Tracking Status: None

Post Office: mobmsxch04.energy.power.corp

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MESSAGE	1179	3/21/2011 11:20:48 AM
NP-11-0013 - Hydrology Audit information Needs Response INH 41b, 47.pdf	1729363	

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Priority: Standard
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Reply Requested: No
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Recipients Received:

Exelon Generation

NP-11-0013
March 21, 2011

10 CFR 52, Subpart A

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Exelon Nuclear Texas Holdings, LLC
Victoria County Station Early Site Permit Application
Hydrology Audit Information Needs Response
NRC Docket No. 52-042

In response to the NRC information needs requests identified during the NRC Hydrology Audit conducted on November 30, 2010 and December 1, 2010, Exelon is providing responses to the following NRC Information Needs (INH) Items:

INH No. 41b (SSAR Section 2.4.12)
INH No. 47 (SSAR Section 2.4.12)

If any additional information is needed, please contact David J. Distel at (610) 765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 21st day of March, 2011.

Respectfully,

Marilyn C. Kray
Vice President, Nuclear Project Development

Attachments:
1. INH No. 41b Response
2. INH No. 47 Response
3. Summary of Commitments

cc: USNRC, Director, Office of New Reactors/NRLPO (w/Attachments)
USNRC, Project Manager, VCS, Division of New Reactor Licensing (w/Attachments)
USNRC Region IV, Regional Administrator (w/Attachments)

Information Needs Item No. 41b:

NRC Request:

Please provide a SME that can detail development of the groundwater flow model, the integration of the previous site model, existing regional (e.g., TWDB GAM) studies and site specific parameters and data, and discuss the model simulations and calibration.

Response:

During the hydrology audit held on November 30 and December 1, 2010, a technical discussion on the development of the groundwater model was conducted. The NRC suggested and Exelon agreed that the SSAR would be updated to include information from the Texas Water Development Board (TWDB) Groundwater Availability Model (GAM) and deep geotechnical borings as well as other available site and region information and to expand the description of the conceptual model for groundwater. The expanded description will be provided in new SSAR Subsection 2.4.12.3.1.1, as shown below.

Associated ESPA Revision:

A new subsection is being added to Subsection 2.4.12.3.1 of the SSAR:

2.4.12.3.1.1 Site Conceptual Model

Prior to development of a numerical groundwater model, a conceptual model of the Victoria County Station (VCS) site and surrounding area was developed. The conceptual model is the overall qualitative understanding of how the local and regional topography, climate, geomorphology, stratigraphy, groundwater use patterns, hydrology and boundary conditions affect groundwater flow in the aquifer.

{The topography for the groundwater model for the VCS site was established using the U.S. Geological Survey 1999 National Elevation Dataset}. This dataset references surface elevations to the NAVD88 vertical datum. Climatic parameters of average rainfall and evapotranspiration were determined from records of the Victoria County Groundwater Conservation District (Reference 2.4.12-2) and the {Texas A & M University System Texas ET Network}. The regional stratigraphy and geomorphology were established from publications of the TWDB (References 2.4.12-4, 2.4.12-8, 2.4.12-14 and 2.4.12-16), the Texas Department of Water Resources (Reference 2.4.12-5) and the U.S. Geological Survey (Reference 2.4.12-3). The stratigraphy at the VCS site was determined by drilling and testing more than 200 geotechnical borings, monitoring wells and cone penetrometer tests in the Chicot aquifer. Groundwater use patterns were established with information available from the U.S. Environmental Protection Agency (Reference 2.4.12-9) and TWDB (References 2.4.12-10, 2.4.12-11 and 2.4.12-12). Hydrology and boundary conditions were determined from publications of the Texas Department of Water Resources (Reference 2.4.12-5) and the TWDB (References 2.4.12-8, 2.4.12-14 and 2.4.12-16).

{The conceptual model of the VCS site includes interbedded sand and clay layers based on the site geotechnical boring logs, geophysical logs, monitoring well data and cone penetrometer test results included in Part 5 of the ESP application.} {Groundwater levels measured in a total of 62 observation wells at the VCS site at different times during 2008 and 2009 were used to develop potentiometric surface maps for the Upper Shallow, Lower Shallow, and Deep aquifer} zones established for the Chicot aquifer based on the geotechnical borings. The bottom of the model domain was set at an elevation of -260 ft, which is the approximate bottom elevation of "Sand 10" at the Powerblock area. The bottom elevation of the "Sand 10" layer was based on the average S-wave velocity profile in SSAR 2.5.4 (Figures 2.5.4-A-71 and 2.5.4-A-72). Based on the potentiometric surface maps the groundwater flow direction at the site is generally to the east toward the Guadalupe River. The site-specific potentiometric surface maps show groundwater trends similar to the regional groundwater flow to the southeast, as measured by the TWDB (Reference 2.4.12-6) and modeled by the TWDB Groundwater Availability Model (GAM) of the Central Gulf Coast Aquifer System (Reference 2.4.12-14).

The domain of the GAM model includes the VCS site in Victoria County, Texas. The GAM model is a regional numerical model with four (4) layers and the Chicot aquifer is included as one continuous single layer within the model. In contrast, the site-specific VCS model subdivides the upper Chicot aquifer into various sands and clay units based on the site geotechnical boring logs and test results. Similar subdivision of the upper Chicot aquifer into a series of interbedded sand and clay layers was done for a site-specific groundwater model in Port Arthur, Texas (Reference 2.4.12-28).

To represent the regional flow at the VCS site, a general head boundary (GHB) was assigned to the cells at the north, east and west perimeters of the groundwater model domain in each of the saturated sand layers. The application of the GHB is to "represent heads in a model that are influenced by a large surface water body outside the model domain with a known water elevation. The purpose of using this boundary condition is to avoid unnecessarily extending the model domain outward to meet the element influencing the head in the model. As a result, the General Head boundary condition is usually assigned along the outside edges of the model domain" (Reference 2.4.12-21). The inclusion of a GHB for cells to the north and west in the VCS model was not related to the presence of a large surface water body, but rather to dictate that groundwater flow within the vicinity of the site is consistent with observed aquifer flow patterns without unnecessarily extending the model. The GHB to the east represents the effect of the Guadalupe River.

Rivers in the VCS model domain such as the San Antonio River, Coleto Creek, Victoria Barge Canal and Guadalupe River were assigned the river package boundary of MODFLOW. The river package boundary models the groundwater and surface water interaction within the aquifer via a seepage layer separating the surface water body from the groundwater system. Small creeks were assigned as drain package boundaries to allow the groundwater model to represent groundwater discharge from the aquifer to the creeks. The drain package is designed to remove groundwater from the aquifer at a rate proportional to the difference between the head in the aquifer and some fixed head or elevation. The drain package assumes the drain has no effect if the head in the aquifer falls below the fixed head of the drain. A constant head boundary was assigned to Linn Lake to represent a steady-state water elevation in the lake and to provide a continuous source of water to the layers below.

The magnitudes of recharge and evapotranspiration assigned to the VCS groundwater model were similar to those assigned to the GAM model. The GAM model included boundary conditions similar to those assigned in the VCS site groundwater model, including GHBs, river

package boundaries, drain package boundaries and constant head boundaries. Thus, based on site-specific geotechnical boring logs and test results and a conceptual hydrogeologic understanding of the VCS site it can be deduced that the VCS site groundwater model has the same framework as that of the regional TWDB GAM model and another site-specific groundwater model in the Chicot aquifer (Reference 2.4.12-28).

Original Subsections of the SSAR numbered 2.4.12.3.1.1, 2.4.12.3.1.2, 2.4.12.3.1.3 and 2.4.12.3.1.4 are re-numbered as Subsections 2.4.12.3.1.2, 2.4.12.3.1.3, 2.4.12.3.1.4 and 2.4.12.3.1.5, respectively.

The following reference is added to subsection 2.4.12.6 of the SSAR:

Reference 2.4.12-28 Haug, A; Petrini, R.H.; Grisak, G.E.; and Klahsen, K. (1990). Geostatistical Assessment of Numerically Simulated Groundwater Flow in the Upper Chicot Aquifer Near Port Arthur, Texas. ModelCARE 90: Calibration and Reliability in Groundwater Modeling (Proceedings of the conference held in The Hague, September 1990). IAHS Publ. no. 195, pages 427-437.

A subsection identical to new SSAR subsection 2.4.12.3.1.1 will be inserted into the Environmental Report (ER) as Subsection 2.3.1.2.3.1.1, Site Conceptual Model, with the exception that references will be addressed in the format used throughout the ER. Original ER Subsections numbered 2.3.1.2.3.1.1, 2.3.1.2.3.1.2, 2.3.1.2.3.1.3, and 2.3.1.2.3.1.4 will be re-numbered as Subsections 2.3.1.2.3.1.2, 2.3.1.2.3.1.3, 2.3.1.2.3.1.4, and 2.3.1.2.3.1.5, respectively. ER Subsection 2.3.1.2.4 will be updated to include the applicable references. The ER revisions will be made in the next update of the ESPA.

Information Needs Item No. 47:

NRC Request:

Please provide a figure of the model grid with rows and columns clearly numbered. Figure 2.4.12-C-3 is identified as a cross section through "Model Row 92" with no cross section location information. Also, provide elevation contour maps of the layer surfaces used in the model that delineate data point locations used to derive the surfaces.

Response:

Information item 47 was discussed with the NRC, during the hydrology audit held on November 30 and December 1, 2010. It was determined that the request consisted of three parts, the first two of which Exelon could provide follow-up information and a third that the NRC would consider an "open item" pending its review of the calculation associated with the groundwater model:

1. Revise SSAR Figure 2.4.12-C-2 to include grid numbering (rows and columns).
2. Revise SSAR Figure 2.4.12-C-3 to include "East-West" direction labels.
3. Provide elevation contour maps of the layer surfaces used in the model that delineate field data point locations used to derive the surfaces (open item).

Revisions to Figures 2.4.12-C-2 and 2.4.12-C-3 addressing items 1 and 2 are provided in this response.

Associated ESPA Revision:

Revisions to Figure 2.4.12-C-2 (SSAR page 2.4.12-C-44) and Figure 2.4.12-C-3 (SSAR page 2.4.12-C-45) are provided on the following pages.

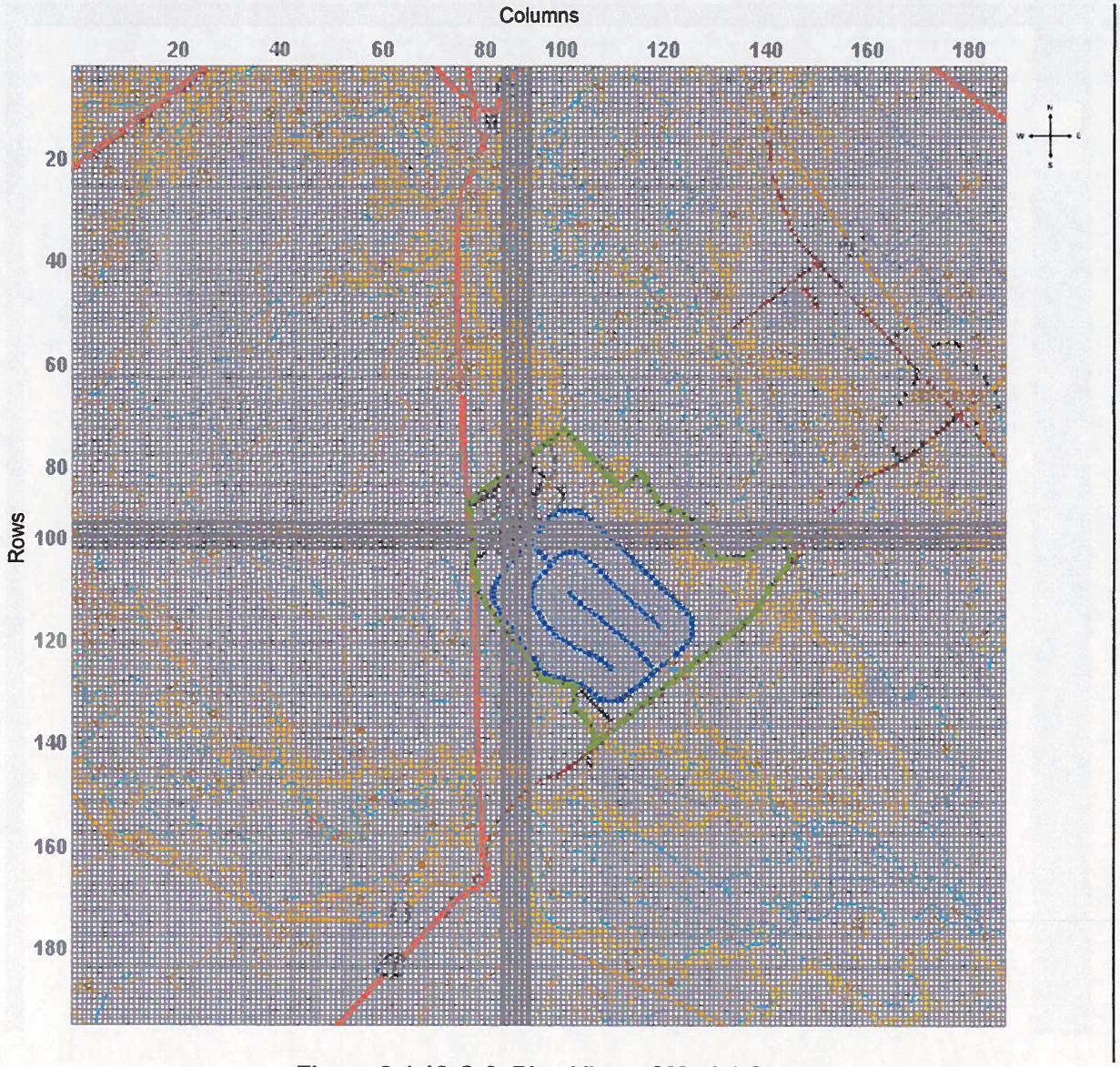

Figure 2.4.12-C-2 Plan View of Model Grid

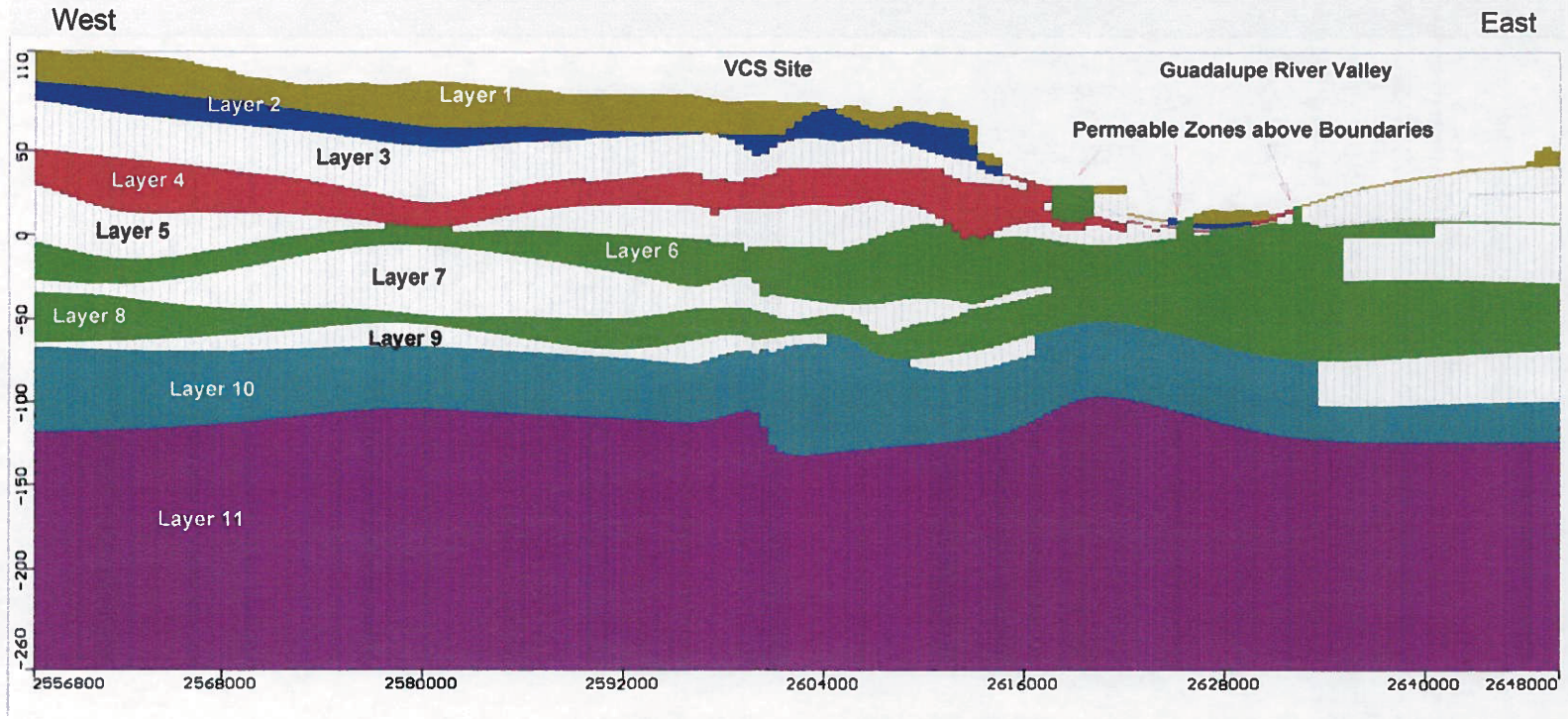

Figure 2.4.12-C-3 Cross-Section of Model Grid (Model Row 92)

ATTACHMENT 3

SUMMARY OF REGULATORY COMMITMENTS

(Exelon Letter to USNRC, NP-11-0013, dated March 21, 2011)

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	Programmatic (Yes/No)
Exelon will revise the VCS ESPA SSAR Section 2.4.12 to incorporate the change shown in the enclosed response to the following NRC Information Needs Request: INH No. 41b (Attachment 1)	Revision 1 of the ESPA SSAR and ER planned for no later than March 31, 2012	Yes	No
Exelon will revise the VCS ESPA SSAR Section 2.4.12 to incorporate the change shown in the enclosed response to the following NRC Information Needs Request: INH No. 47 (Attachment 2)	Revision 1 of the ESPA SSAR planned for no later than March 31, 2012	Yes	No