Exelon.
Generation

NP-11-0026
June 23, 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
Response to Request for Additional Information Letter No. 10
NRC Docket No. 52-042

Attached are responses to NRC staff questions included in Request for Additional Information (RAI) Letter No. 10, dated May 24, 2011, related to Early Site Permit Application (ESPA), Part 2, Sections 02.05.04, 02.05.05, 11.02 and 11.03. NRC RAI Letter No. 10 contained thirty-six (36) Questions. This submittal comprises a partial response to RAI Letter No. 10, and includes responses to the following eight (8) Questions:

02.05.04-1	02.05.05-5	11.02-5	11.03-2
02.05.04-3	02.05.05-10		
02.05.04-11	02.05.05-11		

When a change to the ESPA is indicated by a Question response, the change will be incorporated into the next routine revision of the ESPA, planned for no later than March 31, 2012.

Attachment 7A of this letter contains proprietary information. Accordingly, it is requested that Attachment 7A be withheld from public disclosure in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." A redacted, non-proprietary version is provided in Attachment 7. An affidavit certifying the basis for this application for withholding as required by 10 CFR 2.390(b)(1) is included as Attachment 7B.

The responses to RAI Questions 02.05.05-11, 11.02-5, and 11.03-2 include electronic data files provided on enclosed CDs. Two copies of the electronic data CDs are enclosed, one CD for submission to the Public Document Room and one CD for NRC staff use.

[This letter contains proprietary information. When Attachment 7A is separated from the letter, the letter is uncontrolled]

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The response to RAI Questions 02.05.04-2, 02.05.04-4, 02.05.04-6, 02.05.04-7, 02.05.04-8, 02.05.04-9, 02.05.04-12, 02.05.04-16, 02.05.05-4, 02.05.05-7, 02.05.05-13, and 02.05.05-14 will be provided by July 8, 2011. The response to RAI Questions 02.05.04-5, 02.05.04-10, 02.05.04-15, 02.05.04-17, 02.05.05-1, 02.05.05-6, 02.05.05-9, 02.05.05-12, 02.05.05-15, 02.05.05-16, and 02.05.05-17 will be provided by July 22, 2011. The response to RAI Questions 02.05.04-13, 02.05.04-14, 02.05.05-2, 02.05.05-3, and 02.05.05-8 will be provided by August 5, 2011. These response times are consistent with the response times described in NRC RAI Letter No. 10, dated May 24, 2011.

Regulatory commitments established in this submittal are identified in Attachment 9.

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 23rd day of June, 2011.

Respectfully,

Marilyn C. Kray

Marilyn C. Kray
Vice President, Nuclear Project Development

Attachments:
1. Question 02.05.04-1
2. Question 02.05.04-3
3. Question 02.05.04-11
4. Question 02.05.05-5
5. Question 02.05.05-10
6. Question 02.05.05-11
7. Question 11.02-5 (Non-Proprietary Version) (129 Pages)
7A. Question 11.02-5 (Proprietary Version) (129 Pages)
7B. Question 11.02-5 Affidavit
8 Question 11.03-2
9. Summary of Regulatory Commitments
10. CD-R labeled: SLOPE/W Input Files (Two copies)
11. CD-R labeled: LADTAP I/O Files 25352-000-M0C-HARA-00003, Rev. 4 (Two copies)
12. CD-R labeled: GASPAR I/O Files 25352-000-M0C-HARA-00003, Rev. 4 (Two copies)

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)

RAI 02.05.04-1:

Question:

SSAR Subsection 2.5.4.2.1.3.2.3 states that the maximum, minimum, and average corrected N-values are listed in Table 2.5.4-8. In accordance with 10 CFR 100.23(d)(4), explain how the average values shown in the table were calculated. In addition provide a sample calculation for the Sand 4 layer.

Response:

The four sets of N-values given in SSAR Table 2.5.4-8 are the N-values obtained in the Unit 1 Area, the Unit 2 Area, Inside Power Block Area (the Unit 1 plus Unit 2 Areas) and Outside Power Block Area. These were obtained during the initial site subsurface investigation (prior to the supplemental subsurface investigation presented in SSAR Appendix 2.5.4-A). The average values provided in SSAR Table 2.5.4-8 are calculated as arithmetic mean values.

The N-values in SSAR Table 2.5.4-8 are given in terms of the corrected N-value $(N_1)_{60}$. The N_1 part of the correction is for overburden pressure and other factors. The adjusted N-value, N_1, was determined using the following equation (SSAR Equation 2.5.4-1):

$N_1 = N \times C_n \times C_r \times C_b \times C_s$

where:

N_1 = adjusted N-value for overburden and other factors, in blows per foot (bpf)

N = SPT value measured in the field (bpf)

C_r = correction factor for rod length, ranging from 0.75 to 1.00, increasing with sample depth. For rod length, Youd et al (2001) suggests C_r = 1.0 for lengths over 10 m (33 ft).

C_b = correction factor for borehole diameter. C_b = 1.05 (6-in diameter) or 1.00 (4-in diameter), depending on borehole diameter,

C_s = correction factor for soil sampler. C_s = 1.1 for split-spoon without liner

C_n = correction factor for overburden which varies with depth and with maximum equal to 1.7 and a minimum value equal to 0.4 and is calculated using the following equation:

$C_n = 2.2 / (1.2 + \sigma_v')$ (SSAR Equation 2.5.4-2)

where σ_v' = effective vertical stress at depth of SPT sample interval (tsf).

Youd et al (2001) gives a slight variation on this equation, which is used herein, to make it non-dependent on units:

$C_n = 2.2 / (1.2 + \sigma_v'/P_a)$ where Pa = atmospheric pressure = 100 kPa (2.09 ksf).

For cases of sample refusal, or greater than 50 blows per 6-inch interval, the field N-value obtained was linearly extrapolated to blows per foot (bpf). For example, a blow count of 50 for 3 inches is 200 bpf.

As described in SSAR Section 2.5.4.2.1.3.2.2, the "60" subscript in $(N_1)_{60}$ refers to the efficiency of a traditional SPT hammer (that is, a hammer operated with a rope and cathead). The amount of energy assumed to be transferred to the hammer in this method is 60 percent of the theoretical energy. Many of the standard relationships in geotechnical engineering involving N-values are based on these traditional hammers. With the advent of the more efficient automatic SPT hammers, corrections need to be made to the field measured values to make them equivalent to the 60 percent efficiency of the traditional hammer. All of the automatic hammers used in the various VCS subsurface investigations were measured for efficiency in accordance with ASTM D 4633, and the hammer energy measurements (expressed as energy transfer ratio, or ETR) were obtained. The resulting energy correction factor, C_e, is expressed as ETR/60. Thus,

$(N_1)_{60} = N \times C_n \times C_r \times C_b \times C_s \times C_e$

Average corrected N-Value for Sand 4 Stratum

For each stratum, each of the measured N-values in the stratum was converted into $(N_1)_{60}$. Referring to SSAR Table 2.5.4-8, for the Sand 4 stratum there were 140 N-values measured in the Unit 1 Area. The mean of the 140 computed $(N_1)_{60}$ values is the average value of 58 bpf given in Table 2.5.4-8.

The following is a typical computation of $(N_1)_{60}$ in the Unit 1 Area. Take sample SS39 from boring B-2177 close to the center of the reactor building. This sample is in the Sand 4 stratum. It is described in the boring log as light yellowish-brown moist clayey sand and is classified as SC. Ground elevation at B-2177 is El. 79.6 ft (NAVD88). The depth of the top of the sample is 96 ft, i.e., El. -16.4 ft (NAVD88). As noted in SSAR Section 2.5.4.6.1, for engineering purposes, the groundwater table in the power block area can be taken as El. 48 ft (NAVD88). Borehole B-2177 was typical of the boreholes drilled to obtain split-barrel samples, i.e., approximately 4 in. in diameter. The split barrel sampler had no liner.

Measured N-value is 52 bpf.

$\sigma_v' = 8.23$ ksf.

$C_n = 2.2 / (1.2 + 8.23/2.09) = 0.43$.

For rod length, Youd et al (2001) suggests $C_r = 1.0$ for lengths over 10 m (33 ft). Thus, $C_r = 1.0$.

$C_b = 1.0$ for 4-in. diameter borehole.

$C_s = 1.1$ for split-spoon sampler without liner.

The average ETR measured on the hammer used in boring B-2177 was 72.5% (the hammer was on a CME 750 ATV rig). Therefore, $C_e = 72.5/60 = 1.21$.

Thus,

$(N_1)_{60} = N \times C_n \times C_r \times C_b \times C_s \times C_e$

$= 52 \times 0.43 \times 1.0 \times 1.0 \times 1.1 \times 1.21$

$= 30$ bpf.

There are three other samples of Sand 4 in B-2177, namely SS38, SS40 and SS41, with $(N_1)_{60}$ values of 94 bpf, 145 bpf and 285 bpf, respectively. The four $(N_1)_{60}$ values in Sand 4 in B-2177 are added to the 136 $(N_1)_{60}$ values in 36 other borings in the Unit 1 Area and divided by 140 to obtain the average $(N_1)_{60}$ value of 58 bpf given in SSAR Table 2.5.4-8 for Sand 4 for the Unit 1 Area. A similar process is followed for Sand 4 in the Unit 2 Area (143 samples from 35 borings) to obtain the average $(N_1)_{60}$ value of 52 bpf given in SSAR Table 2.5.4-8. The 283 values of $(N_1)_{60}$ for the Unit 1 and 2 areas are averaged to obtain the average value of 55 bpf for Sand 4 in SSAR Table 2.5.4-8 for Inside Power Block Area. The 14 samples of Sand 4 from 5 borings from Outside Power Block Area are averaged to the average $(N_1)_{60}$ of 35 bpf given in SSAR Table 2.5.4-8.

Response Reference

Youd, T.L., et al (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 National Center of Earthquake Engineering Research (NCEER) and 1998 NCEER/National Science Foundation (NSF) Workshops on Evaluation of Liquefaction of Soils," *ASCE Journal of Geotechnical and Environmental Engineering,* Vol. 127, No. 10, October 2001.

Associated ESPA Revision:

SSAR 2.5.4.2.1.3.2.2 will be updated for clarity in a future revision of the ESPA, as indicated:

$C_n = 2.2/(1.2 + \sigma_v')$ Equation 2.5.4-2

where, C_n = the depth correction factor, which is applied together with the other factors, above, to the uncorrected SPT N-value to yield the normalized SPT N_1-value. The value of C_n is limited to a maximum of 1.7. C_n decreases with depth, becoming less than 1.0 at $\sigma_v' > 1$ ton per square foot (tsf), and has a minimum value of 0.4 (Reference 2.5.4-9)

σ_v' = the effective overburden pressure at the depth of the SPT sample interval in tsf

Reference 2.5.4-69 gives a slight variation on this equation, which is used herein, to make it non-dependent on units:

$C_n = 2.2 / (1.2 + \sigma_v'/P_a)$ where P_a = atmospheric pressure = 100 kPa (2.09 ksf).

SSAR 2.5.4.13 will be updated in a future revision of the ESPA as indicated:

2.5.4-69 Youd, T.L., et al (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 National Center of Earthquake Engineering Research (NCEER) and 1998 NCEER/National Science Foundation (NSF) Workshops on Evaluation of Liquefaction of Soils," *ASCE Journal of Geotechnical and Environmental Engineering*, Vol. 127, No. 10, October 2001.

RAI 02.05.04-3:

Question:

SSAR Table 2.5.4-20 presents a summary of the undrained shear strength (Su) values obtained from various methods. In accordance with 10 CFR 100.23(d)(4), explain the bases for selecting Su=6 ksf for Clay 7 if this layer was not reached with the CPT, was not tested in laboratory, and a value of Su=5 ksf was determined from the SPT results.

Response:

The N-values used to derive undrained shear strength are $(N_1)_{60}$ values (that is they have been corrected for overburden pressure). This correction involves multiplying the measured N-value by a factor of 0.4 (the maximum reduction recommended by Martin and Lew, 1999). This reduction factor was developed specifically for granular soils and is based on the observation that, for sands with the same relative density, N-values increase with increasing overburden pressure. Thus, applying such a reduction factor to highly overconsolidated clays is conservative, and the average N-value on which the derived Su=5 ksf is based is considered to be conservative. The Su=6 ksf used as the design value in SSAR Table 2.5.4-20 was increased from 5 ksf to account for this conservatism, based on engineering judgment.

An unconsolidated-undrained triaxial test was performed on a sample of Clay 7 for the Supplemental Subsurface Investigation (SSAR Appendix 2.5.4A) and the result is reported in Table 2.5.4-A-20. Sample UD-15, from boring B-3101UD, was taken at a depth from 229 to 231.5 ft, as reported in Part 5 of the ESP application. The recorded undrained shear strength was 6.54 ksf and is reported as 6.5 ksf in Table 2.5.4-A-20. This value supports the Su=6 ksf design value.

Response Reference:

Martin, G.R., and M. Lew (Editors). *Recommended Procedures for Implementation of Division of Mines Geology (DMG), Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California,* Southern California Earthquake Center, University of Southern California, March 1999.

Associated ESPA Revision:

No ESPA revision is required as a result of this response.

RAI 02.05.04-11:

Question:

SSAR Subsection 2.5.4.10.1 presents a table containing foundation dimensions referred to as "typical LWR." Provide an explanation regarding why footnote b references the ESBWR DCD.

Response:

Part of the table in SSAR Section 2.5.4.10.1 presents approximate foundation dimensions, approximate foundation elevations and gross foundation pressures for a "Typical LWR with an Integral UHS." As the ESBWR is one of the largest and heaviest of the designs that include an integral UHS, it is reasonable to use the gross foundation pressures from the ESBWR as representative for the VCS ESPA. The footnote pointed to the ESBWR DCD as the source of these representative values. As is the case of other design and site values, if at the time of the combined operating license application these values are not considered to be bounding, an evaluation will be conducted. However, footnote b will be removed from the table in SSAR Section 2.5.4.10.1 and the table will be revised as shown below.

Associated ESPA Revision:

The table in SSAR Section 2.5.4.10.1 will be updated in a future revision of the ESPA, as indicated.

Structure	Approximate Foundation Dimensions (feet)	Approximate Foundation El. (feet)(a)	Gross Foundation Pressure (ksf)~~(b)~~	Net Foundation Pressure (ksf)~~(c)~~(b)
~~ESBWR~~Typical LWR (with an Integral UHS) Reactor/ Fuel Buildings (Units 1 and 2)	161 by 230	29.4 {8.0}	14.6~~(b)~~	11.1
~~ESBWR~~Typical LWR (with an Integral UHS) Control Buildings (Units 1 and 2)	78 by 99	46.1 {25.0}	6.1~~(b)~~	3.7
~~ESBWR~~Typical LWR (with an Integral UHS) Fire Water Service Complexes (Units 1 and 2)~~(d)~~(c)	66 by 171	87.3	3.5~~(b)~~	3.5
~~ABWR~~Typical LWR (with an Independent UHS) Reactor Buildings	185 by 195	10.0 {-8.0 (Unit 1)} 10.0 {-15.0 (Unit 2)}	15.0	10.3
~~ABWR~~Typical LWR (with an Independent UHS) Control Buildings	80 by 184	20.0 {-8.0 (Unit 1)} 20.0 {-15.0 (Unit 2)}	15.0	10.9

~~APWR Reactor Buildings~~	~~213.3 by 308.9~~	~~56.2 {36.0}~~	~~15.0~~	~~13.2~~
~~AP1000 Containments~~	~~72.5 (diameter)~~	~~56.2 {36.0}~~	~~8.9~~	~~7.1~~
~~mPower Reactor Buildings~~	~~80 (diameter)~~	~~–15.0~~	~~15.0~~	~~8.8~~

(a) Foundation elevations designations shown in "{ }" symbols denote the elevations at the base of significant overexcavation (to reach a suitable bearing stratum) at the particular structure (e.g., at the ~~ESBWR~~typical LWR (with an integral UHS) reactor/fuel buildings [Units 1 and 2], in situ soils are overexcavated approximately 21 feet below the underside of foundations, with overexcavation replaced by structural fill; and at the ~~ESBWR~~typical LWR (with an integral UHS) control buildings [Units 1 and 2], in situ soils are overexcavated approximately 21 feet below the underside of foundations, with overexcavation replaced by structural fill.

~~(b) Reference 2.5.4-53.~~

(b)~~(c)~~ Net foundation pressure is the gross foundation pressure minus buoyancy, with the groundwater level at elevation 85 feet (i.e., the post-construction groundwater level).

(c)~~(d)~~ Fire Water Service Complexes (Units 1 and 2) bear on approximately 7.3 feet of structural fill over in situ soils (natural ground surface at elevation 80 feet before raising power block area to finish grade).

RAI 02.05.05-5:

Question:

SSAR Subsection 2.5.5.2.3, last sentence, indicates that supplemental investigations will provide the means to analyze potential zones of high hydraulic gradient at distance away from the toe of the embankment. In accordance with 10 CFR 100.23(d)(4), please state in the SSAR if these investigations will be conducted at the COL stage.

Response:

The supplemental investigations would be conducted at the COL stage. A commitment will be explicitly included in the SSAR, as described below.

Associated ESPA Revision:

The second paragraph of SSAR Subsection 2.5.5.2.3 will be revised as follows in a future ESPA revision:

Note that at this preliminary stage of design, subsurface and groundwater conditions along the alignment of the embankment dams are defined by investigations (e.g., borings, CPTs) on plan spacings ~~of~~ on the order of 1500 feet center to center. Subsurface and groundwater conditions at locations beyond the outboard toe of the embankment dams (particularly beyond the easternmost dam) would be defined by supplemental investigations. The preliminary engineering analyses reported on here conservatively assume that the groundwater level, to distances considerably beyond the outboard toe of the embankment dams, lies at the ground surface, an assumption which is unlikely to occur. Under these conservative conditions, the analyses show that zones of high hydraulic gradient develop at distances away from the toe of the embankment. If warranted, s~~S~~upplemental investigations, conducted at the COL stage, would provide the means to analyze this potential occurrence in more detail.

RAI 02.05.05-10:

Question:

SSAR Figures 2.5.4-80 through 2.5.4-85 show the general extent of the excavation and the fill for embankment and interior dikes. In accordance with 10 CFR 100.23(d)(4), provide a detailed description of the area of extent of the embankments and dikes.

Response:

The area of extent of the embankments and dikes is generally described in SSAR Subsection 2.5.5. The planned embankment surrounds the cooling basin and has a crest elevation of 102 feet (NAVD 88). The cooling basin also has interior dikes with a crest elevation of 99 feet (NAVD 88). As stated in SSAR Subsection 2.5.5.1.2, the cooling basin embankment slopes are typically 4 horizontal to 1 vertical (4H:1V) inboard (i.e., interior to the basin) and 3H:1V outboard (i.e., exterior to the basin). Interior dikes have 3H:1V slopes on both sides. The embankments (and the interior dikes) are constructed of compacted earth fill. Inboard embankment slopes (and interior dike slopes) are covered by a soil-cement layer, or other suitable material selected at detailed design, to protect against erosion. Outboard embankment slopes are vegetated.

As stated in SSAR Subsection 2.5.5.2.5, Figures 2.5.4-13 through 2.5.4-20, Figures 2.5.5-1 through 2.5.5-8, and Table 2.5.5-4 illustrate subsurface conditions and embankment heights along the perimeter of the cooling basin. Considering this information, five cross sections, as presented in SSAR Figures 2.5.4-81 through 2.5.4-85, were selected for slope stability analyses as being representative of the range of conditions. SSAR Figures 2.5.4-81 through 2.5.4-85 correspond to the embankment at C-2302 (north), B-2352 (south), B-2333 (west), B-2337 (east), and B-05 (east).

For slope stability analyses of these selected sections, the following guidelines were used:

A. Use 4H:1V (horizontal to vertical) inboard slopes and 3H:1V outboard slopes.
B. For the embankments founded at, or below, El. 75 ft (NAVD 88), a 30-ft long berm is constructed on the outboard slope toe (e.g., sections B-2352 and B-2337).
C. For the embankments with a basin surface elevation below 69 ft (NAVD 88), backfill the inboard area up to El. 69 ft and extend the fill 100 ft into the cooling basin (e.g., sections B-2352 and B-2337).
D. For the northern embankments facing the power block, excavate the layers Clay 1-top and Sand 1 (approximately down to El. 59.7 ft [NAVD 88]) beneath the inboard slopes and replace with structural fill. The replacement starts from the inboard toe and extends horizontally to 30 ft beyond the inboard crest (e.g., section C-2302).
E. Use 10 ft-deep vertical well drains below the toe of the outboard slope.

For the length of the horizontal drainage blanket at these selected sections, the following guidelines were used:

A. For short embankments founded at El. 75 ft (NAVD 88) or higher, beneath the outboard slope use a 50 ft-long drainage blanket (e.g., B-2333, and B-05).
B. For tall embankments founded below El. 75 ft (NAVD 88) but above El. 60 ft (NAVD 88), beneath the outboard slope use a 80 ft-long drainage blanket (e.g., sections B-2337, B-2352).
C. For the northern embankments facing the power block, where the crest width is approximately 180 ft, beneath the outboard slope use a 20 ft-long drainage blanket (e.g., section C-2302).

Associated ESPA Revision:

No ESPA revision is required as a result of this response.

RAI 02.05.05-11:

Question:

In accordance with 10 CFR 100.23(d)(4), provide the input files for the SLOPE/W software.

Response:

The SLOPE/W input files support the information in SSAR Tables 2.5.5-5, -6, -7, -8, and -10. A total of 30 input files are provided electronically on compact disc in Attachment 10. The titles of input files along with the associated SSAR tables are provided below.

Table 2.5.5-5

Slope Stability Summary, Shortly After Construction Case

Section Analyzed	Factor of Safety Inboard (Bishop Method)	INPUT FILE TITLE	Factor of Safety Outboard (Bishop Method)	INPUT FILE TITLE
B-05	2.98	B05-SAC-INBOARD.gsz	2.62	B05-SAC-OUTBOARD.gsz
B-2333	2.68	B2333-SAC-INBOARD.gsz	2.55	B2333-SAC-OUTBOARD.gsz
B-2337	2.62	B2337-SAC-INBOARD.gsz	2.52	B2337-SAC-OUTBOARD.gsz
B-2352	2.47	B2352-SAC-INBOARD.gsz	2.44	B2352-SAC-OUTBOARD.gsz
C-2302	2.70	C2302-SAC-INBOARD.gsz	2.73	C2302-SAC-OUTBOARD.gsz

Table 2.5.5-6

Slope Stability Summary, Steady-State Seepage Case

Section Analyzed	Factor of Safety (Bishop Method)	INPUT FILE TITLE
B-05	1.84(1)	B05-SS.gsz
B-2333	1.82(1)	B2333-SS.gsz
B-2337	1.69	B2337-SS.gsz
B-2352	1.83	B2352-SS.gsz
C-2302	1.72	C2302-SS.gsz

Note:

(1) SSAR Section 2.5.5.2.5 provides a discussion on calculated versus presented factors of safety.

Table 2.5.5-7

Slope Stability Summary, Rapid Drawdown Case

Section Analyzed	Factor of Safety (Bishop Method)	INPUT FILE TITLE
B-05	1.89(1)	B05-RDD.gsz
B-2333	1.75	B2333-RDD.gsz
B-2357	1.88	B2337-RDD.gsz
B-2352	1.70	B2352-RDD.gsz
C-2302	1.54	C2302-RDD.gsz

Note:

(1) SSAR Section 2.5.5.2.5 provides a discussion on calculated versus presented factors of safety.

Table 2.5.5-8

Slope Stability Summary, Yield Accelerations

Section Analyzed	Horizontal Yield Acceleration (g) (Bishop Method)	INPUT FILE TITLE
B-05	0.27	B05-YA.gsz
B-2333	0.26	B2333-YA.gsz
B-2337	0.15	B2337-YA.gsz
B-2352	0.18	B2352-YA.gsz
C-2302	0.22	C2302-YA.gsz

Table 2.5.5-10

Slope Stability Summary, Post-Earthquake Case, Outboard Slope

Section Analyzed	Factor of Safety (Bishop Method)	INPUT FILE TITLE
B-05	2.13	B05-PEQ.gsz
B-2333	1.76	B2333-PEQ.gsz
B-2337	1.69	B2337-PEQ.gsz
B-2352	1.63	B2352-PEQ.gsz
C-2302	2.17	C2302-PEQ.gsz

Associated ESPA Revision:

No ESPA revision is required as a result of this response.

RAI 11.02-5:

Question:

Please provide detailed information to enable the NRC staff to validate and verify the estimated liquid effluent doses discussed in the applicant's ESP, Section 11.2.3.2. Liquid Pathway Doses, with respect to the dose objectives of Appendix I to 10 CFR 50, and the dose limits in 10 CFR 20.1301(e).

The information should include the following:

1.) A complete description of how the applicant derived all the values, including all assumptions made;

2.) Citations to any reference material used (for documents not publicly available, please provide a copy at a audit location for the NRC staff's review).

3.) A detailed breakdown of individual doses and maximally exposed individual (MEI) doses by pathway and organ; and

4.) A detailed breakdown of population doses by pathway and organ.

5.) Provide the basis for parameters and values used in the LADTAP II code or equivalent calculation.

6.) Provide the LADTAP II code input/output files used to calculate the liquid effluent doses.

Response:

The attached calculation, "Radiological Impacts of Normal Operation for ESP," Calculation No. 25352-000-M0C-HARA-00003, Revision 004 (128 pages), includes an evaluation of liquid effluent doses. This calculation provides the methodology, assumptions, references, and bases for LADTAP II inputs, as well as a breakdown of the resulting individual and population doses by pathway and organ. Calculation No. 25352-000-M0C-HARA-00003, entitled. "Radiological Impacts of Normal Operation for ESP," contains proprietary intellectual information and is requested to be withheld from public disclosure, as described in the transmittal cover letter. A redacted version is also being provided for public disclosure.

The LADTAP II input and output files that are listed in the calculation are also being provided electronically on compact disc in Attachment 11.

Associated ESPA Revision:

No ESPA revision is required as a result of this response.

Attachment 7
Response to NRC RAI 11.02-5
Radiological Impacts of Normal Operation for ESP
(25352-000-M0C-HARA-00003, Rev. 004)
Non-Proprietary Version
128 Pages