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June 1, 2009

UN#09-262

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

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Transmittal of Supplemental Information in Support of Site Geology Audit
Calvert Cliffs Nuclear Power Plant, Unit 3

The purpose of this letter is to respond to an NRC request for supplemental information in support of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Geology Audit that took place February 24-25, 2009.

Enclosure 1 contains input data files used in the liquefaction analysis. Due to the volume of data being transmitted, this information is being supplied electronically via compact disk. These data files consist of input data files for site liquefaction analyses that were derived from an existing calculation.

Enclosure 2 contains requested site seismic response input and response data that addresses the following:

- Input Response Spectra Used in Site Response Calculations
- Base-case Shear Wave Velocity Profiles and Uncertainties
- Base-case Shear Modulus Reduction and Damping Curves and Uncertainties
- Site Response Amplification Factors

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If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 495-2436.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 1, 2009



Greg Gibson

- Enclosures:
- 1) Data Files for Liquefaction Analysis, Supplemental Information in Support of Geology Audit, Calvert Cliffs Nuclear Power Plant, Unit 3
 - 2) Data Files for Seismic Site Response Input and Response, Supplemental Information in Support of Geology Audit, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: John Rycyna, NRC Project Manager, U.S. EPR COL Application
Laura Quinn, NRC Project Manager, Environmental Projects Branch 2
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

Enclosure 1

**Data Files for Liquefaction Analysis,
Supplemental Information in Support of Geology Audit,
Calvert Cliffs Nuclear Power Plant, Unit 3
(One Disk)**

Enclosure 2

**Data Files for Seismic Site Response Input and Response,
Supplemental Information in Support of Geology Audit,
Calvert Cliffs Nuclear Power Plant, Unit 3**

The 10^{-4} , 10^{-5} , and 10^{-6} rock input response spectra corresponding high frequency (HF) and low frequency (LF) controlling earthquakes used for site response calculations are documented in Table 2-1.

Table 2-1 - 10^{-4} , 10^{-5} , and 10^{-6} HF and LF Rock Input Response Spectra Used for Site Response Calculations

Freq	HF 10^{-4}	LF 10^{-4}	HF 10^{-5}	LF 10^{-5}	HF 10^{-6}	LF 10^{-6}
100	7.66E-02	6.03E-02	2.71E-01	1.60E-01	8.45E-01	3.85E-01
90	8.54E-02	6.55E-02	3.01E-01	1.74E-01	9.38E-01	4.18E-01
80	1.00E-01	7.46E-02	3.51E-01	1.98E-01	1.09E+00	4.76E-01
70	1.22E-01	8.84E-02	4.27E-01	2.34E-01	1.33E+00	5.64E-01
60	1.52E-01	1.06E-01	5.25E-01	2.80E-01	1.64E+00	6.75E-01
50	1.82E-01	1.22E-01	6.27E-01	3.24E-01	1.95E+00	7.80E-01
45	1.96E-01	1.29E-01	6.71E-01	3.41E-01	2.09E+00	8.20E-01
40	2.07E-01	1.33E-01	7.08E-01	3.53E-01	2.21E+00	8.50E-01
35	2.17E-01	1.36E-01	7.37E-01	3.60E-01	2.30E+00	8.68E-01
30	2.24E-01	1.37E-01	7.58E-01	3.64E-01	2.36E+00	8.76E-01
25	2.28E-01	1.37E-01	7.67E-01	3.63E-01	2.39E+00	8.75E-01
20	2.15E-01	1.34E-01	7.22E-01	3.57E-01	2.21E+00	8.61E-01
15	1.91E-01	1.29E-01	6.38E-01	3.42E-01	1.90E+00	8.28E-01
12.5	1.73E-01	1.24E-01	5.74E-01	3.30E-01	1.69E+00	8.00E-01
10	1.49E-01	1.17E-01	4.93E-01	3.11E-01	1.42E+00	7.59E-01
9	1.42E-01	1.13E-01	4.63E-01	3.02E-01	1.32E+00	7.37E-01
8	1.34E-01	1.08E-01	4.30E-01	2.91E-01	1.22E+00	7.11E-01
7	1.25E-01	1.03E-01	3.94E-01	2.77E-01	1.10E+00	6.80E-01
6	1.14E-01	9.70E-02	3.53E-01	2.61E-01	9.79E-01	6.43E-01
5	1.02E-01	8.94E-02	3.09E-01	2.42E-01	8.46E-01	5.98E-01
4	8.39E-02	7.98E-02	2.54E-01	2.16E-01	6.98E-01	5.39E-01
3	6.35E-02	6.68E-02	1.92E-01	1.83E-01	5.32E-01	4.61E-01
2.5	5.20E-02	5.83E-02	1.57E-01	1.60E-01	4.38E-01	4.08E-01
2	3.94E-02	5.13E-02	1.19E-01	1.40E-01	3.35E-01	3.47E-01
1.5	2.65E-02	4.07E-02	8.00E-02	1.10E-01	2.27E-01	2.65E-01
1.25	2.02E-02	3.40E-02	6.10E-02	9.18E-02	1.74E-01	2.16E-01
1	1.43E-02	2.69E-02	4.32E-02	7.22E-02	1.24E-01	1.66E-01
0.9	1.21E-02	2.53E-02	3.65E-02	6.95E-02	1.05E-01	1.60E-01
0.8	1.01E-02	2.35E-02	3.02E-02	6.59E-02	8.69E-02	1.52E-01
0.7	8.09E-03	2.14E-02	2.43E-02	6.13E-02	7.00E-02	1.42E-01
0.6	6.26E-03	1.91E-02	1.88E-02	5.56E-02	5.42E-02	1.29E-01
0.5	4.59E-03	1.64E-02	1.37E-02	4.88E-02	3.97E-02	1.14E-01
0.4	3.09E-03	1.20E-02	9.19E-03	3.59E-02	2.68E-02	8.46E-02
0.3	1.81E-03	7.94E-03	5.33E-03	2.39E-02	1.56E-02	5.69E-02
0.2	7.86E-04	4.26E-03	2.29E-03	1.29E-02	6.82E-03	3.13E-02
0.15	4.06E-04	2.64E-03	1.18E-03	8.03E-03	3.53E-03	1.98E-02
0.125	2.58E-04	1.92E-03	7.42E-04	5.84E-03	2.25E-03	1.45E-02
0.1	1.42E-04	1.27E-03	4.05E-04	3.87E-03	1.24E-03	9.69E-03

The base-case shear-wave velocity (V_s) profile is shown in Figure 2-1. The uncertainty in V_s , characterized as the logarithmic standard deviation of V_s , is shown in Figure 2-2. Numerical values of these parameters vs. depth are contained in Table 2-4.

Figure 2-1 - Shear-Wave Velocity as a Function of Depth

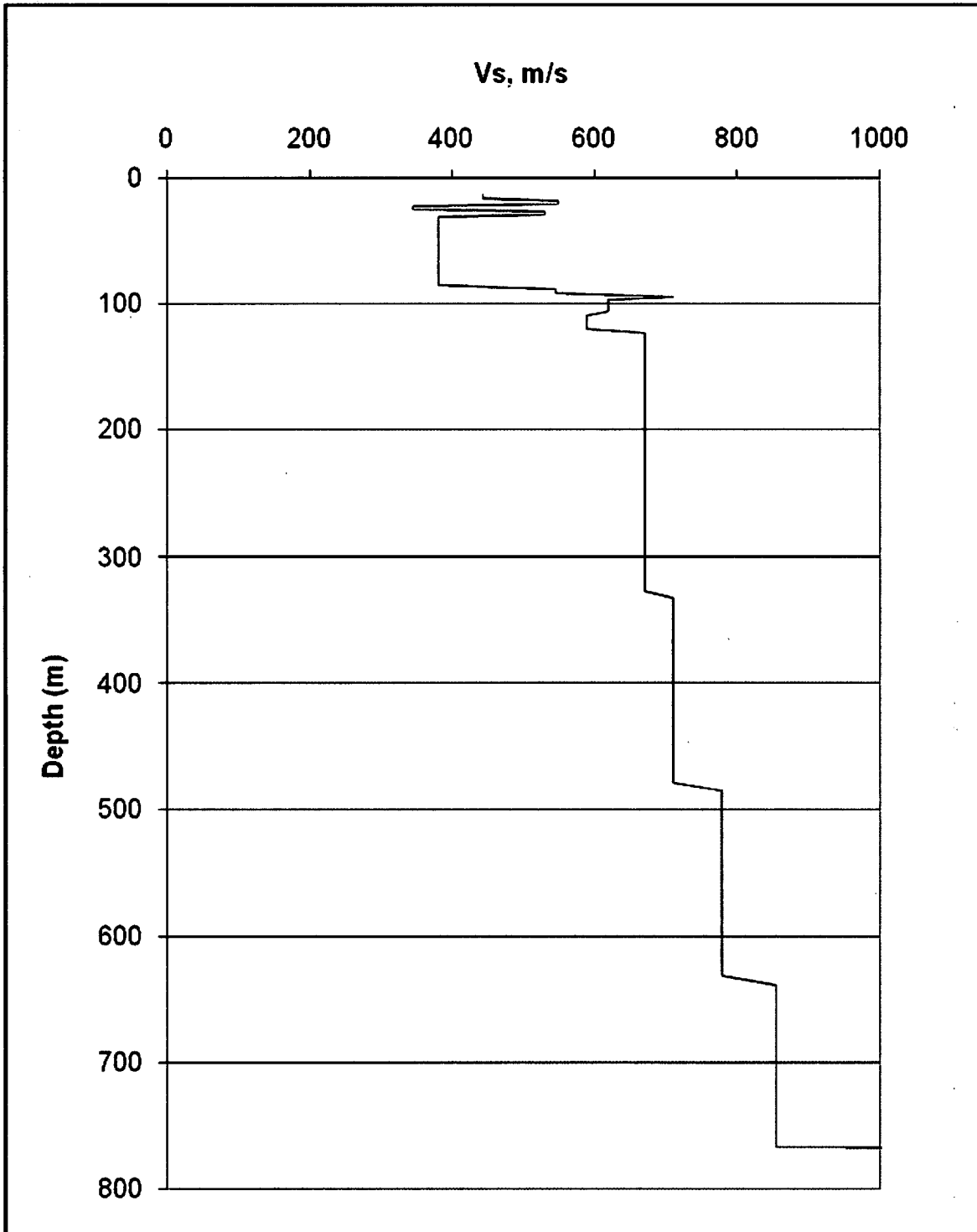
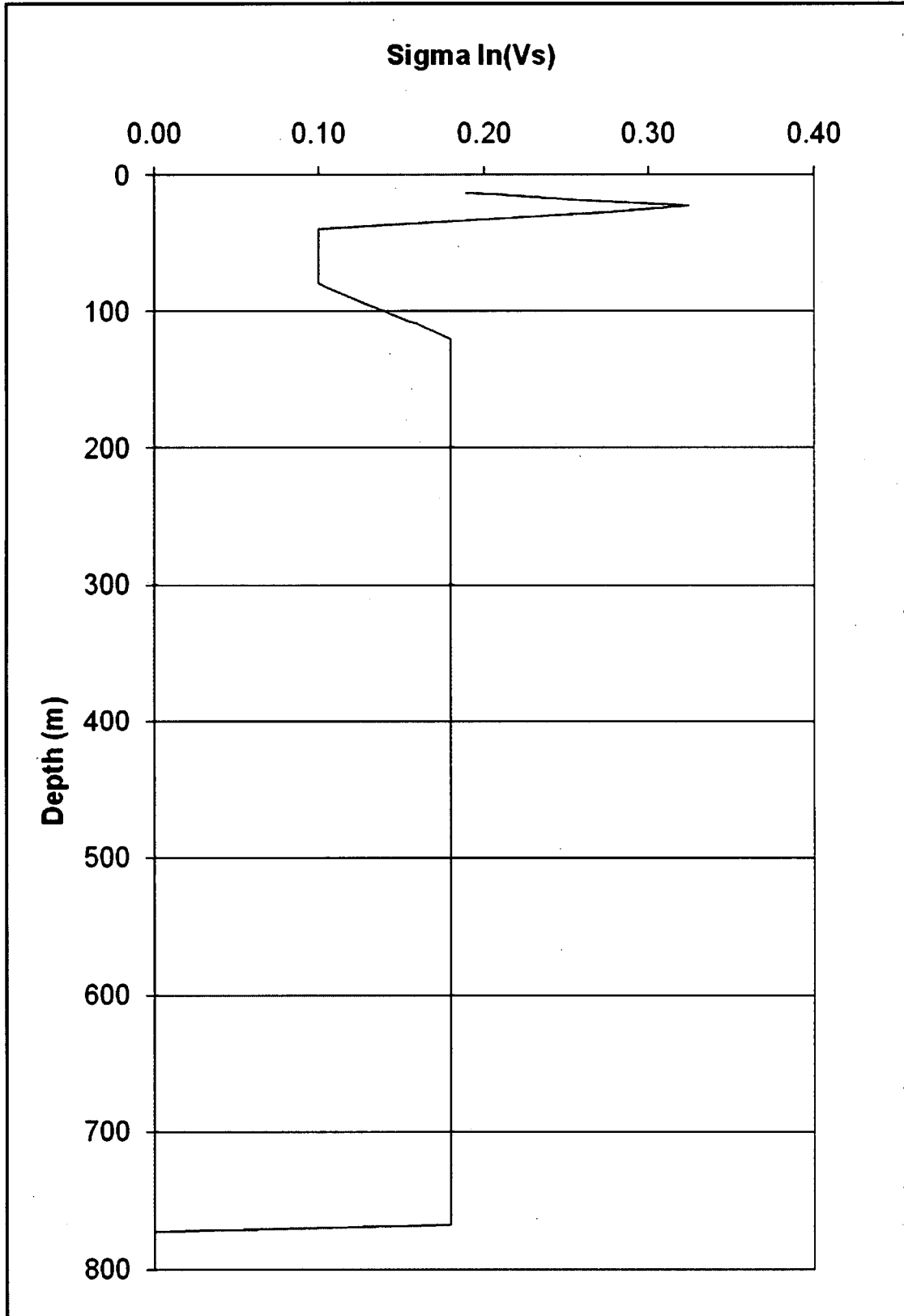


Figure 2-2 – Uncertainty as a Function of Depth



Median modulus-reduction and damping curves and uncertainties are given in Table 2-2. Uncertainties are characterized by the logarithmic standard deviation of G/G_{max} and damping. Values are given for Soil Curves 2, 3, and 4, which are keyed to individual soil profile layers in Table 2-4. Note that Soil Curve 4 represents the granite bedrock, which is assumed to have $G/G_{max}=1$ with no uncertainty.

Table 2-2 - Layer Modulus Reduction and Damping Curves, With Uncertainties

Soil Curve No. 2					Soil Curve No. 3				
% strain	Median G/G_{max}	Sigma G/G_{max}	Median Damp	Sigma Damp	% strain	Median G/G_{max}	Sigma G/G_{max}	Median Damp	Sigma Damp
1.00E-04	1.000	0.000	0.011	0.389	1.00E-04	1.000	0.000	0.013	0.365
3.00E-04	1.000	0.000	0.011	0.389	3.00E-04	1.000	0.000	0.013	0.365
1.00E-03	1.000	0.000	0.011	0.389	1.00E-03	1.000	0.000	0.014	0.362
3.00E-03	1.000	0.000	0.012	0.388	3.00E-03	0.989	0.004	0.016	0.355
1.00E-02	0.990	0.004	0.012	0.385	1.00E-02	0.937	0.024	0.022	0.339
3.00E-02	0.940	0.022	0.015	0.373	3.00E-02	0.812	0.071	0.032	0.318
5.48E-02	0.870	0.047	0.020	0.359	5.48E-02	0.711	0.110	0.043	0.302
1.00E-01	0.800	0.073	0.025	0.348	1.00E-01	0.612	0.149	0.054	0.288
1.73E-01	0.716	0.103	0.033	0.331	1.73E-01	0.513	0.189	0.069	0.273
3.00E-01	0.633	0.134	0.042	0.317	3.00E-01	0.415	0.229	0.084	0.261
4.24E-01	0.569	0.158	0.050	0.305	4.24E-01	0.361	0.252	0.095	0.251
6.00E-01	0.505	0.182	0.059	0.296	6.00E-01	0.307	0.275	0.106	0.237
1.00E+00	0.407	0.220	0.075	0.280	1.00E+00	0.249	0.301	0.122	0.194

Soil Curve No. 4				
% strain	Median G/G_{max}	sigma G/G_{max}	Median Damp	sigma Damp
1.00E-04	1.0	0.0	0.01	0.0
1.00E-03	1.0	0.0	0.01	0.0
3.00E-03	1.0	0.0	0.01	0.0
1.00E-02	1.0	0.0	0.01	0.0
3.00E-02	1.0	0.0	0.01	0.0
1.00E-01	1.0	0.0	0.01	0.0
1.73E-01	1.0	0.0	0.01	0.0
3.00E-01	1.0	0.0	0.01	0.0
4.24E-01	1.0	0.0	0.01	0.0
6.00E-01	1.0	0.0	0.01	0.0
7.75E-01	1.0	0.0	0.01	0.0
1.00E+00	1.0	0.0	0.01	0.0

Median site amplification factors are presented in Table 2-3 for the 10^{-4} , 10^{-5} and 10^{-6} HF and LF input rock spectra. Table 2-3 also includes the logarithmic standard deviations for each motion.

Table 2-3 - Median Amplification Factors and Uncertainties for Each Input Motion

Calvert-Cliffs 10^{-4} HF Rock Input - Site Amplification Results for Depth(ft)= 41.0 – Outcrop												
Freq. (Hz)	10^{-4} HF Median Factor	Log Sigma	10^{-4} LF Median Factor	Log Sigma	10^{-5} HF Median Factor	Log Sigma	10^{-5} LF Median Factor	Log Sigma	10^{-6} HF Median Factor	Log Sigma	10^{-6} LF Median Factor	Log Sigma
0.1	2.35	0.08	1.44	0.09	2.51	0.07	1.45	0.10	2.39	0.07	1.47	0.11
0.125	2.21	0.09	1.64	0.14	2.31	0.08	1.66	0.15	2.26	0.08	1.73	0.17
0.15	2.30	0.14	1.95	0.21	2.36	0.12	1.99	0.23	2.38	0.13	2.12	0.26
0.2	3.12	0.29	3.03	0.34	3.14	0.26	3.10	0.33	3.23	0.25	3.22	0.30
0.3	2.95	0.28	2.91	0.28	2.87	0.29	2.76	0.30	2.70	0.31	2.49	0.32
0.4	1.91	0.18	1.82	0.20	1.89	0.17	1.76	0.18	1.84	0.15	1.67	0.16
0.5	1.89	0.17	1.77	0.18	1.92	0.18	1.77	0.20	1.98	0.22	1.83	0.24
0.6	2.52	0.32	2.39	0.33	2.54	0.31	2.37	0.32	2.56	0.29	2.35	0.28
0.7	2.86	0.23	2.76	0.24	2.81	0.23	2.65	0.24	2.71	0.24	2.50	0.26
0.8	2.92	0.26	2.84	0.26	2.86	0.26	2.72	0.26	2.74	0.26	2.55	0.26
0.9	2.93	0.21	2.86	0.21	2.86	0.20	2.72	0.19	2.76	0.17	2.56	0.17
1	3.05	0.19	2.99	0.17	2.97	0.19	2.81	0.17	2.83	0.19	2.49	0.17
1.25	3.15	0.20	3.09	0.20	3.01	0.20	2.88	0.20	2.76	0.20	2.58	0.20
1.5	2.62	0.14	2.58	0.14	2.48	0.14	2.38	0.15	2.21	0.16	2.08	0.19
2	1.84	0.16	1.82	0.16	1.73	0.17	1.67	0.18	1.56	0.19	1.47	0.20
2.5	1.60	0.18	1.59	0.17	1.51	0.19	1.44	0.18	1.36	0.20	1.25	0.22
3	1.67	0.22	1.64	0.21	1.56	0.22	1.47	0.23	1.37	0.25	1.25	0.27
4	1.61	0.25	1.57	0.25	1.43	0.27	1.33	0.28	1.13	0.31	1.03	0.34
5	1.25	0.26	1.21	0.25	1.09	0.28	1.02	0.29	0.85	0.32	0.77	0.34
6	1.16	0.29	1.13	0.29	0.99	0.31	0.92	0.32	0.73	0.35	0.66	0.37
7	1.02	0.26	1.00	0.26	0.85	0.29	0.80	0.30	0.60	0.34	0.56	0.35
8	0.90	0.27	0.89	0.27	0.74	0.30	0.70	0.30	0.51	0.36	0.49	0.36
9	0.81	0.28	0.80	0.28	0.65	0.32	0.63	0.31	0.44	0.36	0.44	0.34
10	0.74	0.28	0.74	0.27	0.59	0.31	0.57	0.30	0.39	0.37	0.40	0.33
12.5	0.59	0.33	0.61	0.29	0.45	0.36	0.48	0.30	0.29	0.39	0.34	0.31

Table 2-3 - Median Amplification Factors and Uncertainties for Each Input Motion (Cont'd)

Calvert-Cliffs 10⁻⁴ HF Rock Input - Site Amplification Results for Depth(ft)= 41.0 – Outcrop												
Freq. (Hz)	10⁻⁴ HF Median Factor	Log Sigma	10⁻⁴ LF Median Factor	Log Sigma	10⁻⁵ HF Median Factor	Log Sigma	10⁻⁵ LF Median Factor	Log Sigma	10⁻⁶ HF Median Factor	Log Sigma	10⁻⁶ LF Median Factor	Log Sigma
15	0.49	0.40	0.53	0.32	0.37	0.41	0.42	0.31	0.24	0.41	0.31	0.30
20	0.37	0.40	0.45	0.30	0.28	0.39	0.36	0.28	0.18	0.37	0.28	0.27
25	0.32	0.39	0.41	0.28	0.24	0.37	0.34	0.25	0.15	0.33	0.26	0.25
30	0.29	0.33	0.38	0.24	0.22	0.32	0.32	0.23	0.15	0.30	0.26	0.24
35	0.28	0.31	0.37	0.23	0.22	0.29	0.32	0.22	0.15	0.28	0.26	0.23
40	0.28	0.28	0.37	0.21	0.22	0.27	0.32	0.21	0.15	0.27	0.26	0.23
45	0.29	0.27	0.38	0.20	0.23	0.26	0.33	0.21	0.16	0.26	0.27	0.23
50	0.31	0.26	0.40	0.20	0.24	0.26	0.35	0.20	0.17	0.26	0.29	0.23
60	0.36	0.25	0.46	0.19	0.29	0.25	0.40	0.20	0.20	0.26	0.33	0.22
70	0.45	0.24	0.54	0.19	0.35	0.25	0.48	0.20	0.25	0.26	0.39	0.22
80	0.54	0.24	0.64	0.19	0.43	0.25	0.57	0.20	0.31	0.26	0.47	0.22
90	0.63	0.24	0.73	0.19	0.50	0.25	0.65	0.20	0.36	0.26	0.53	0.22
100	0.71	0.24	0.79	0.19	0.55	0.24	0.70	0.20	0.40	0.26	0.58	0.22

Table 2-4 represent the base-case shear-wave velocity (V_s) profile and uncertainty in V_s plotted in Figure 2-1 and 2-2, respectively. This data in Table 2-4 is also referenced in Table 2-2.

It should be noted that the top of layer 1 corresponds to elevation of basemat of nuclear island. Material above layer 1 is not included in GMRS calculation.

Table 2-4 - Soil Profile for Calvert Cliffs

Layer Number	Soil Curve Number	Thick (m)	Depth ¹ (m)	Depth ² (m)	Median V_s (m/s)	Log. Sigma V_s ³	Layer Description
1	3	1.22	12.50	13.72	441.96	0.19	Chesapeake Cemented SAND
2	3	1.52	13.72	15.24	441.96	0.21	Chesapeake Cemented SAND
3	3	1.52	15.24	16.76	441.96	0.23	Chesapeake Cemented SAND
4	3	2.29	16.76	19.05	548.64	0.26	Chesapeake Cemented SAND
5	3	2.29	19.05	21.34	548.64	0.29	Chesapeake Cemented SAND
6	3	2.29	21.34	23.62	344.42	0.32	Chesapeake Cemented SAND
7	3	2.29	23.62	25.91	344.42	0.30	Chesapeake Cemented SAND
8	3	2.29	25.91	28.19	530.35	0.27	Chesapeake Cemented SAND
9	3	2.29	28.19	30.48	530.35	0.24	Chesapeake Cemented SAND
10	3	2.13	30.48	32.61	381	0.21	Chesapeake CLAY/SILT
11	3	2.13	32.61	34.75	381	0.18	Chesapeake CLAY/SILT
12	3	2.13	34.75	36.88	381	0.16	Chesapeake CLAY/SILT
13	3	2.13	36.88	39.01	381	0.13	Chesapeake CLAY/SILT
14	3	2.13	39.01	41.15	381	0.10	Chesapeake CLAY/SILT
15	2	3.05	41.15	44.20	381	0.10	Chesapeake CLAY/SILT
16	2	3.05	44.20	47.24	381	0.10	Chesapeake CLAY/SILT
17	2	3.05	47.24	50.29	381	0.10	Chesapeake CLAY/SILT
18	2	3.05	50.29	53.34	381	0.10	Chesapeake CLAY/SILT
19	2	3.05	53.34	56.39	381	0.10	Chesapeake CLAY/SILT
20	2	3.05	56.39	59.44	381	0.10	Chesapeake CLAY/SILT
21	2	3.05	59.44	62.48	381	0.10	Chesapeake CLAY/SILT
22	2	3.05	62.48	65.53	381	0.10	Chesapeake CLAY/SILT
23	2	3.05	65.53	68.58	381	0.10	Chesapeake CLAY/SILT
24	2	3.05	68.58	71.63	381	0.10	Chesapeake CLAY/SILT
25	2	3.05	71.63	74.68	381	0.10	Chesapeake CLAY/SILT
26	2	3.05	74.68	77.72	381	0.10	Chesapeake CLAY/SILT
27	2	3.05	77.72	80.77	381	0.10	Chesapeake CLAY/SILT
28	2	3.05	80.77	83.82	381	0.10	Chesapeake CLAY/SILT
29	2	3.05	83.82	86.87	381	0.11	Chesapeake CLAY/SILT
30	3	3.05	86.87	89.92	545.59	0.12	Nanjemoy SAND
31	3	3.05	89.92	92.96	545.59	0.12	Nanjemoy SAND
32	3	3.05	92.96	96.01	710.18	0.13	Nanjemoy SAND
33	3	3.05	96.01	99.06	618.74	0.14	Nanjemoy SAND
34	3	3.05	99.06	102.11	618.74	0.14	Nanjemoy SAND

¹ Depth, in meters, from top of profile to top of layer

² Depth, in meters, from top of profile to bottom of layer

³ Logarithmic Sigma of V_s

Table 2-4 - Soil Profile for Calvert Cliffs (Cont'd)

Layer Number	Soil Curve Number	Thick (m)	Depth ¹ (m)	Depth ² (m)	Median Vs (m/s)	Log. Sigma Vs ³	Layer Description
35	3	3.05	102.11	105.16	618.74	0.15	Nanjemoy SAND
36	3	3.05	105.16	108.20	618.74	0.15	Nanjemoy SAND
37	3	2.74	108.20	110.95	588.26	0.16	Nanjemoy SAND
38	3	2.74	110.95	113.69	588.26	0.16	Nanjemoy SAND
39	3	2.74	113.69	116.43	588.26	0.17	Nanjemoy SAND
40	3	2.74	116.43	119.18	588.26	0.18	Nanjemoy SAND
41	3	2.74	119.18	121.92	588.26	0.18	Nanjemoy SAND
42	3	3.05	121.92	124.97	670.56	0.18	Nanjemoy CLAY/SILT
43	3	3.05	124.97	128.02	670.56	0.18	Nanjemoy CLAY/SILT
44	3	3.05	128.02	131.06	670.56	0.18	Nanjemoy CLAY/SILT
45	3	3.05	131.06	134.11	670.56	0.18	Nanjemoy CLAY/SILT
46	3	3.05	134.11	137.16	670.56	0.18	Nanjemoy CLAY/SILT
47	3	3.05	137.16	140.21	670.56	0.18	Nanjemoy CLAY/SILT
48	3	3.05	140.21	143.26	670.56	0.18	Nanjemoy CLAY/SILT
49	3	3.05	143.26	146.30	670.56	0.18	Nanjemoy CLAY/SILT
50	3	3.05	146.30	149.35	670.56	0.18	Nanjemoy CLAY/SILT
51	3	3.05	149.35	152.40	670.56	0.18	Nanjemoy CLAY/SILT
52	3	3.96	152.40	156.36	670.56	0.18	Aquia-Brightseat SAND
53	3	3.96	156.36	160.32	670.56	0.18	Aquia-Brightseat SAND
54	3	3.96	160.32	164.29	670.56	0.18	Aquia-Brightseat SAND
55	3	3.96	164.29	168.25	670.56	0.18	Aquia-Brightseat SAND
56	3	3.96	168.25	172.21	670.56	0.18	Aquia-Brightseat SAND
57	3	3.96	172.21	176.17	670.56	0.18	Aquia-Brightseat SAND
58	3	3.96	176.17	180.14	670.56	0.18	Aquia-Brightseat SAND
59	3	3.96	180.14	184.10	670.56	0.18	Aquia-Brightseat SAND
60	3	3.96	184.10	188.06	670.56	0.18	Aquia-Brightseat SAND
61	3	4.27	188.06	192.33	670.56	0.18	Aquia-Brightseat SAND
62	3	4.27	192.33	196.60	670.56	0.18	Patapsco SAND
63	3	4.57	196.60	201.17	670.56	0.18	Patapsco SAND
64	3	4.57	201.17	205.74	670.56	0.18	Patapsco SAND
65	3	4.57	205.74	210.31	670.56	0.18	Patapsco SAND
66	3	4.57	210.31	214.88	670.56	0.18	Patapsco SAND
67	3	4.57	214.88	219.46	670.56	0.18	Patapsco SAND
68	3	4.57	219.46	224.03	670.56	0.18	Patapsco SAND
69	3	4.57	224.03	228.60	670.56	0.18	Patapsco SAND
70	3	4.57	228.60	233.17	670.56	0.18	Patapsco SAND
71	3	4.57	233.17	237.74	670.56	0.18	Patapsco SAND
72	3	4.57	237.74	242.32	670.56	0.18	Patapsco SAND
73	3	4.57	242.32	246.89	670.56	0.18	Patapsco SAND
74	3	4.57	246.89	251.46	670.56	0.18	Patapsco SAND
75	3	4.57	251.46	256.03	670.56	0.18	Patapsco SAND
76	3	4.57	256.03	260.60	670.56	0.18	Patapsco SAND
77	3	4.57	260.60	265.18	670.56	0.18	Patapsco SAND
78	3	4.57	265.18	269.75	670.56	0.18	Patapsco SAND

Table 2-4 - Soil Profile for Calvert Cliffs (Cont'd)

Layer Number	Soil Curve Number	Thick (m)	Depth ¹ (m)	Depth ² (m)	Median Vs (m/s)	Log. Sigma Vs ³	Layer Description
79	3	4.57	269.75	274.32	670.56	0.18	Patapsco SAND
80	3	4.57	274.32	278.89	670.56	0.18	Patapsco SAND
81	3	4.57	278.89	283.46	670.56	0.18	Patapsco SAND
82	3	4.57	283.46	288.04	670.56	0.18	Patapsco SAND
83	3	4.57	288.04	292.61	670.56	0.18	Patapsco SAND
84	3	4.57	292.61	297.18	670.56	0.18	Patapsco SAND
85	3	4.57	297.18	301.75	670.56	0.18	Patapsco SAND
86	3	4.57	301.75	306.32	670.56	0.18	Patapsco SAND
87	3	4.57	306.32	310.90	670.56	0.18	Patapsco SAND
88	3	4.57	310.90	315.47	670.56	0.18	Patapsco SAND
89	3	4.57	315.47	320.04	670.56	0.18	Patapsco SAND
90	3	5.33	320.04	325.37	670.56	0.18	Patapsco SAND
91	3	5.33	325.37	330.71	670.56	0.18	Patapsco SAND
92	3	4.57	330.71	335.28	710.18	0.18	Patapsco SAND
93	3	4.57	335.28	339.85	710.18	0.18	Patapsco SAND
94	3	4.57	339.85	344.42	710.18	0.18	Patapsco SAND
95	3	4.57	344.42	349.00	710.18	0.18	Patapsco SAND
96	3	4.57	349.00	353.57	710.18	0.18	Patapsco SAND
97	3	4.57	353.57	358.14	710.18	0.18	Patapsco SAND
98	3	4.57	358.14	362.71	710.18	0.18	Patapsco SAND
99	3	4.57	362.71	367.28	710.18	0.18	Patapsco SAND
100	3	4.57	367.28	371.86	710.18	0.18	Patapsco SAND
101	3	4.57	371.86	376.43	710.18	0.18	Patapsco SAND
102	3	4.57	376.43	381.00	710.18	0.18	Patapsco SAND
103	3	4.57	381.00	385.57	710.18	0.18	Patapsco SAND
104	3	4.57	385.57	390.14	710.18	0.18	Patapsco SAND
105	3	4.57	390.14	394.72	710.18	0.18	Patapsco SAND
106	3	4.57	394.72	399.29	710.18	0.18	Patapsco SAND
107	3	4.57	399.29	403.86	710.18	0.18	Patapsco SAND
108	3	4.57	403.86	408.43	710.18	0.18	Patapsco SAND
109	3	4.57	408.43	413.00	710.18	0.18	Patapsco SAND
110	3	4.57	413.00	417.58	710.18	0.18	Patapsco SAND
111	3	4.57	417.58	422.15	710.18	0.18	Patapsco SAND
112	3	4.57	422.15	426.72	710.18	0.18	Patapsco SAND
113	3	4.57	426.72	431.29	710.18	0.18	Patapsco SAND
114	3	4.57	431.29	435.86	710.18	0.18	Patapsco SAND
115	3	4.57	435.86	440.44	710.18	0.18	Patapsco SAND
116	3	4.57	440.44	445.01	710.18	0.18	Patapsco SAND
117	3	4.57	445.01	449.58	710.18	0.18	Patapsco SAND
118	3	4.57	449.58	454.15	710.18	0.18	Patapsco SAND
119	3	4.57	454.15	458.72	710.18	0.18	Patapsco SAND
120	3	4.57	458.72	463.30	710.18	0.18	Patapsco SAND
121	3	4.57	463.30	467.87	710.18	0.18	Patapsco SAND
122	3	4.57	467.87	472.44	710.18	0.18	Patapsco SAND

Table 2-4 - Soil Profile for Calvert Cliffs (Cont'd)

Layer Number	Soil Curve Number	Thick (m)	Depth ¹ (m)	Depth ² (m)	Median Vs (m/s)	Log. Sigma Vs ³	Layer Description
123	3	4.57	472.44	477.01	710.18	0.18	Patapsco SAND
124	3	6.10	477.01	483.11	710.18	0.18	Patapsco SAND
125	3	6.10	483.11	489.20	777.24	0.18	Patapsco SAND
126	3	6.10	489.20	495.30	777.24	0.18	Patapsco SAND
127	3	6.10	495.30	501.40	777.24	0.18	Patapsco SAND
128	3	6.10	501.40	507.49	777.24	0.18	Patapsco SAND
129	3	6.10	507.49	513.59	777.24	0.18	Patapsco SAND
130	3	7.01	513.59	520.60	777.24	0.18	Patapsco SAND
131	3	7.01	520.60	527.61	777.24	0.18	Patapsco SAND
132	3	7.32	527.61	534.92	777.24	0.18	Patuxent/Arundel CLAY
133	3	7.62	534.92	542.54	777.24	0.18	Patuxent/Arundel CLAY
134	3	7.62	542.54	550.16	777.24	0.18	Patuxent/Arundel CLAY
135	3	7.62	550.16	557.78	777.24	0.18	Patuxent/Arundel CLAY
136	3	7.62	557.78	565.40	777.24	0.18	Patuxent/Arundel CLAY
137	3	7.62	565.40	573.02	777.24	0.18	Patuxent/Arundel CLAY
138	3	7.62	573.02	580.64	777.24	0.18	Patuxent/Arundel CLAY
139	3	7.62	580.64	588.26	777.24	0.18	Patuxent/Arundel CLAY
140	3	7.62	588.26	595.88	777.24	0.18	Patuxent/Arundel CLAY
141	3	7.92	595.88	603.81	777.24	0.18	Patuxent/Arundel CLAY
142	3	7.92	603.81	611.73	777.24	0.18	Patuxent/Arundel CLAY
143	3	7.92	611.73	619.66	777.24	0.18	Patuxent/Arundel CLAY
144	3	7.92	619.66	627.58	777.24	0.18	Patuxent/Arundel CLAY
145	3	7.92	627.58	635.51	777.24	0.18	Patuxent/Arundel CLAY
146	3	7.62	635.51	643.13	853.44	0.18	Patuxent/Arundel CLAY
147	3	7.62	643.13	650.75	853.44	0.18	Patuxent/Arundel CLAY
148	3	7.62	650.75	658.37	853.44	0.18	Patuxent/Arundel CLAY
149	3	7.62	658.37	665.99	853.44	0.18	Patuxent/Arundel CLAY
150	3	7.62	665.99	673.61	853.44	0.18	Patuxent/Arundel CLAY
151	3	7.62	673.61	681.23	853.44	0.18	Patuxent/Arundel CLAY
152	3	7.62	681.23	688.85	853.44	0.18	Patuxent/Arundel CLAY
153	3	7.62	688.85	696.47	853.44	0.18	Patuxent/Arundel CLAY
154	3	7.62	696.47	704.09	853.44	0.18	Patuxent/Arundel CLAY
155	3	7.62	704.09	711.71	853.44	0.18	Patuxent/Arundel CLAY
156	3	7.62	711.71	719.33	853.44	0.18	Patuxent/Arundel CLAY
157	3	7.62	719.33	726.95	853.44	0.18	Patuxent/Arundel CLAY
158	3	7.62	726.95	734.57	853.44	0.18	Patuxent/Arundel CLAY
159	3	7.62	734.57	742.19	853.44	0.18	Patuxent/Arundel CLAY
160	3	7.32	742.19	749.50	853.44	0.18	Patuxent/Arundel CLAY
161	3	7.32	749.50	756.82	853.44	0.18	Patuxent/Arundel CLAY
162	3	7.32	756.82	764.13	853.44	0.18	Patuxent/Arundel CLAY
163	3	7.32	764.13	771.45	853.44	0.18	Patuxent/Arundel CLAY
164	4	---	771.45	---	2804.16	0.00	Granitoid Bedrock