Progress Energy

Serial: NPD-NRC-2009-055
April 1, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 2 AND 3
DOCKET NOS. 52-022 AND 52-023
SUPPLEMENT 1 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 010 RELATED TO GROUNDWATER

References:
1. Letter from Manny Comar (NRC) to James Scarola (PEC), dated September 18, 2008, "Request for Additional Information Letter No. 010 Related to SRP Section 02.04.12 for the Harris Units 2 and 3 Combined License Application"
2. Letter from James Scarola (PEC) to U. S. Nuclear Regulatory Commission (NRC), dated October 31, 2008, "Response to Request for Additional Information Letter No. 010 Related to Groundwater," Serial: NPD-NRC-2008-056

Ladies and Gentlemen:

Progress Energy Carolinas, Inc. (PEC) hereby submits a supplemental response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter (Reference 1).

A revised response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Shearon Harris Nuclear Power Plant Units 2 and 3 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

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

Executed on April 1, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosures/Attachments

Progress Energy Carolinas, Inc.
P.O. Box 1551
Raleigh, NC 27602

D094
NRO

cc : U.S. NRC Director, Office of New Reactors/NRLPO
U.S. NRC Office of Nuclear Reactor Regulation/NRLPO
U.S. NRC Region II, Regional Administrator
U.S. NRC Resident Inspector, SHNPP Unit 1
Mr. Manny Comar, U.S. NRC Project Manager

bc : Robert Kitchen, Manager-Nuclear Plant Licensing
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Shearon Harris Nuclear Power Plant Units 2 and 3
Supplement 1 to Response to NRC Request for Additional Information Letter No. 010
Related to SRP Section 02.04.12 for the Combined License Application,
dated September 18, 2008

NRC RAI #	Progress Energy RAI #	Progress Energy Response
02.04.12-1	H-0048	October 31, 2008; Serial NPD-NRC-2008-056
02.04.12-2	H-0436	Revised response enclosed – see following pages
02.04.12-3	H-0437	Revised response enclosed – see following pages
02.04.12-4	H-0438	Revised response enclosed – see following pages

Attachments/Enclosures	Associated NRC RAI #	Pages Included
Figure 1	02.04.12-2	1 page
Figure 2	02.04.12-2	1 page
Figure 3	02.04.12-2	1 page
Figure 4	02.04.12-2	1 page
Figure 5	02.04.12-2	1 page
Figure 6	02.04.12-2	1 page
Figure 7	02.04.12-2	1 page
Figure 8	02.04.12-2	1 page
Figure 1	02.04.12-3	1 page

NRC Letter No.: HAR-RAI-LTR-010

NRC Letter Date: September 18, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.04.12-2

Text of NRC RAI:

Describe the impact that the changes in site conditions will have on the post-construction piezometric heads and provide sufficient detail to support this impact. Some of these changes may result in a decrease the piezometric head elevation relative to current conditions and other factors may result in increase in the piezometric head elevation. The factors that could result in changes to the piezometric head include (but are not restricted to) the following: increase in Main Reservoir pool elevation, site grading, backfill, stormwater drains, and changes in recharge.

PGN RAI ID #: H-0436

PGN Response to NRC RAI:

The development of the HAR site will effectively change the current site conditions, resulting in changes to groundwater elevations once construction is complete. The changes that are expected to have an impact on post-construction piezometric heads include the following:

1) The 20-foot increase of the Main Reservoir pool elevation from 220 to 240 feet NGVD29: The primary impact of this change will be a decrease in the hydraulic gradient from the Auxiliary Reservoir (pool elevation of 252 feet NGVD29) to the Main Reservoir. Since the pool elevation of the Auxiliary Reservoir will not change, the decrease in hydraulic gradient across the HAR site will reduce groundwater velocities and associated transport times.
2) Mechanical redistribution of surficial soil and bedrock associated with construction: This will result in a reduction in soil permeability that will effectively decrease recharge to the surficial aquifer.
3) Increase in impervious surface area: Figure 1 illustrates proposed impervious areas of the developed site. The developed area of the HAR site will be approximately 178 acres, with about 55 acres of this area being impervious. Therefore, approximately 31 percent of the total HAR site area will be impervious to recharge. Figure 1 also shows the safety-related drainage area as defined by the dashed line. Of this area (approximately 111 acres), about 51 acres or 46 percent will be impervious. These impervious surfaces will eliminate direct recharge in those areas and, therefore, significantly reduce the potential for localized groundwater mounding beneath the safety-related structures.
4) The construction of a network of stormwater drainage ditches around and within the site: These drainage ditches will direct stormwater and intercepted groundwater away from the developed area of the HAR site. This is expected to reduce the potentiometric head associated with higher topographic elevations that currently exists to the north of the HAR site.

   Figures 2 through 8 illustrate the estimated impact that the proposed stormwater drainage ditches will have on groundwater levels. Figures 2 and 3 are based on water level data collected from the surficial and bedrock aquifers during the wet season on February 28, 2007, when the highest groundwater levels were observed during a 1-year period. As illustrated on Figures 2 and 3, in the absence of the construction of the proposed drainage ditches, water level elevations greater than the safety-related groundwater elevation of 259 feet NGVD29 are located within the construction area for HAR 2 and HAR 3. Figure 4 illustrates the estimated maximum post-construction groundwater elevations. The estimated groundwater elevations were obtained by adjusting the February 28, 2007, potentiometric surface lines, using engineering judgment, to account for surface water pool elevation changes, topographical changes, and the addition of stormwater drainage ditches across the project site. Figure 4 illustrates the following:

- Potentiometric contour lines greater than 260 feet NGVD29 will be completely captured by drainage ditches.
- Potentiometric contour lines between 250 and 260 feet NGVD29 will be partially captured or affected by drainage ditches.
- Groundwater elevations in the vicinity of HAR 2 and HAR 3 are between 250 and 255 feet NGVD29.
- The direction of groundwater flow from HAR 2 and HAR 3 is to the east in the direction of the Main Reservoir.
- The gradient from HAR 2 and HAR 3 to the Main Reservoir is significantly reduced.

Figures 5, 6, 7, and 8 depict cross-sectional views of potential changes in water table elevation resulting from the construction of the stormwater drainage ditches and impervious areas on the site. Figure 5 shows the location of the cross-section reference line (line A-B on the figure). Figures 6 and 7 illustrate a cross-section of groundwater levels in the surficial and bedrock aquifers beneath the site using the water level data collected on February 28, 2007. The water level in the surficial aquifer intercepts the safety-related elevation of 259 feet NGVD29 near HAR 2. Figure 8 shows the estimated post-construction groundwater elevations following the installation of the impervious structures and areas and the stormwater drainage ditches. As illustrated, after construction there is a significant decrease in groundwater levels in both the surficial and bedrock aquifers, with water levels approximately 5 feet lower than the safety-related elevation of 259 feet NGVD29. Additionally, Figure 8 illustrates the following:

- The post-construction HAR site surface is lower than the existing topography.
- The post-construction HAR site surfaces are graded to divert overland flow to multiple unlined drainage ditches, thus limiting standing water and reducing groundwater mounding effects. Unlined stormwater drainage ditches will be sloped at 0.5 vertical foot per 100 horizontal feet to facilitate off-site flow.
- The post-construction unlined stormwater drainage ditches effectively intersect the existing surficial and bedrock potentiometric surfaces.
- The post-construction unlined stormwater drainage ditches are expected to lower the existing groundwater elevation of 270 feet NGVD29 in the undisturbed area north of the HAR site to an elevation of approximately 254 feet NGVD29 beneath HAR 2 and HAR 3. This groundwater elevation is approximately 5 feet below the safety-related elevation of 259 feet NGVD29.
- The ground surface associated with the nominal grade elevation of 260 feet NGVD29 at HAR 2 and HAR 3 will be designed to be impervious to infiltration of precipitation. This

will eliminate groundwater mounding in the vicinity of the safety-related structures and reduce groundwater variability and uncertainty.

The proposed changes in site conditions that will be associated with plant construction and operation (including the increase in the pool elevation of the Main Reservoir) have been used to provide a qualitative assessment of post-construction piezometric groundwater elevations. However, uncertainties associated with the impacts of these changes preclude definitive estimates of post-construction groundwater elevations. Given these uncertainties, FSAR Subsection 2.4.12.5 will be revised to include a reference to a groundwater elevation monitoring program that will be designed and implemented to monitor the effectiveness of the surface water drainage system for HAR 2 and HAR 3. The groundwater monitoring program will be designed to monitor both up-gradient and side-gradient groundwater elevations in the vicinity of HAR 2 and HAR 3 and to identify any potential groundwater mounding issues in the vicinity of safety-related structures. This program will begin prior to operations and will be incorporated into the overall groundwater monitoring program for HNP and HAR. Progress Energy will continually evaluate the results of the monitoring program, and a mitigation plan will be created if groundwater elevations at the safety-related structures threaten to exceed the DCD groundwater criteria.

Associated HAR COL Application Revisions:

The following paragraph will be added to the end of FSAR Subsection 2.4.12.5:

"A pre-operational and operational groundwater monitoring program will be designed and implemented to monitor the effectiveness of the surface water drainage system for HAR 2 and HAR 3. The groundwater monitoring program will monitor both up-gradient and side-gradient groundwater elevations in the vicinity of HAR 2 and HAR 3 to identify any potential groundwater mounding issues near the safety-related structures. This program will begin prior to operations and will be incorporated into the overall groundwater monitoring program for HNP and HAR. The results of the monitoring program will be continually evaluated, and a mitigation plan will be created if groundwater elevations near the safety-related structures threaten to exceed the DCD groundwater criteria."

Attachments/Enclosures:

Figure 1 - Site Drainage Map and Impervious Areas (Post-construction)

Figure 2 - Potentiometric Surface Lines Within the Surficial Aquifer as Measured on February 28, 2007 and Post-construction Site Drainage Map

Figure 3 - Potentiometric Surface Lines Within the Bedrock as Measured on February 28, 2007 and Post-construction Site Drainage Map

Figure 4 - Site Drainage Map and Estimated Potentiometric Surface Lines (Post-construction)

Figure 5 - Site Drainage Map and Cross-section Reference Line (Post-construction)

Figure 6 - Cross-section of Water Levels Within the Surficial Aquifer as Measured on February 28, 2007

Figure 7 - Cross-section of Water Levels Within the Bedrock as Measured on February 28, 2007

Figure 8 - Cross-section from A to B: Estimated Water Levels After Construction of HAR 2 and HAR 3

NRC Letter No.: HAR-RAI-LTR-010

NRC Letter Date: September 18, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.04.12-3

Text of NRC RAI:

Describe the recharge to the aquifer based on the post-construction environment. A number of different types of surfaces and grading are planned for the site including impervious surfaces and gravel surfaces which will have different recharge relative to the current conditions. Unlined stormwater drains may intersect the aquifers during high water table conditions or result in water loss during lower water table conditions. The natural soil will be removed in portions of the site for site grading and replaced for backfill in other places. Gravel covered parking lots (overlying the bedrock aquifer) will be used in other portions of the site. The recharge estimates under post-construction conditions should be compared to recharge estimates under current conditions that correspond to the 2006/2007 water level measurements collected at the site.

PGN RAI ID #: H-0437

PGN Response to NRC RAI:

Aquifer recharge in the region occurs by percolation of precipitation through the overburden, as described in FSAR Subsection 2.4.12.1.1. However, most of the precipitation is either returned to the atmosphere through evapotranspiration or flows off-site as surface runoff. The predominance of surface and near-surface deposits with extremely low permeability results in rapid runoff of the majority of precipitation. Previous studies conducted in the region indicate that an average of only 15 percent of precipitation in Wake County is typically recharged to the aquifer, and within the Triassic Basin where the HAR site is located, the recharge rate is typically less than 6 percent. This indicates that the current soil and bedrock conditions at the site dictate that natural recharge to the aquifer occurs at a very low rate.

Post-construction site conditions will reduce the current recharge rate of the aquifer at the HAR site. Site changes that will have an impact on the recharge process and recharge rates will include the following:

1) Construction of the Facility: This will require the removal and stockpiling of surficial soil and bedrock during site grading activities. These stockpiles will eventually be used as fill for areas below the HAR site nominal grade. This fill material will be a mixture of on-site soil and bedrock and will require compaction for possible use as a foundation for some facility structures, parking areas, and laydown areas. Soil compaction will impact the natural soil structure through deformation and create conditions that will effectively reduce the amount of recharge to the aquifer.
2) Permanent Impervious Surfaces: The as-built facility will include a variety of impervious surfaces that will reduce recharge to the aquifer. These areas include buildings, structures, and paved surfaces, such as roads and parking lots. The total area of the developed HAR site will be about 178 acres, of which approximately 55 acres (31 percent) will be impervious to recharge. Within the general area of the safety-related structures (approximately 111

acres), about 51 acres will be impervious. Therefore, approximately 46 percent of the area in the vicinity of the safety-related structures will be impervious to recharge.

3) Impervious Areas Resulting from Construction Activities: Areas of the site that are used during the construction process (i.e., parking and office areas, laydown areas, etc.) will be covered with gravel and compacted for use during extended construction activities. Aside from the possible addition of overburden for landscaping after construction is complete, these areas will typically not be restored to their original state of permeability, and therefore, there will be a reduction in the potential for recharge in these areas.

4) Use of Stormwater Drainage Ditches across the Site: A series of stormwater drainage ditches and conveyances will be constructed around and within the site to direct stormwater and intercepted groundwater away from the developed area of the HAR site, effectively reducing the amount of recharge to the surficial and bedrock aquifers.

Current site conditions (which correspond to 2006/2007 water level measurements) were made during a period of above-average precipitation from September 2006 through January 2007 for the Raleigh area and, as such, are considered to be more favorable for increased recharge rates than the proposed post-construction site conditions outlined above. Since the existing site is mostly undisturbed, forested land with a thick mulch layer, more infiltration of precipitation into the soil is expected to occur now than after the site is developed. The proposed location of HAR 2 is the only area of the plant site that is not forested, being topographically level and covered with grass. Recharge within this area is also expected to be higher now than during post-construction conditions because of slow overland flow and a lack of the type of impervious areas that will be constructed on the site. Therefore, current site conditions, when compared with post-construction site conditions, will have higher recharge estimates.

The proposed changes in site conditions that will be associated with plant construction and operation (including the increase in the pool elevation of the Main Reservoir) have been used to provide a qualitative assessment of post-construction piezometric groundwater elevations. However, uncertainties associated with the impacts of these changes preclude definitive estimates of post-construction groundwater elevations. Given these uncertainties, FSAR Subsection 2.4.12.5 will be revised to address this issue; the associated revisions are described in RAI 02.04.12-2 (H-0436).

In addition, a HEC-RAS analysis was performed to determine overland flow velocities and to assess the erosion potential near HAR 2 and HAR 3 due to overland flow during a local Probable Maximum Precipitation (PMP) event. The analysis was performed with two computer model runs. Based on grading and drainage plans for HAR 2 and HAR 3, an area of 81 acres east of the center line of the reactors was modeled, using 12 cross-sections and an area of 49 acres west of the center line of the reactors was modeled using 11 cross-sections. A plan showing the area and location of cross-sections is presented in Figure 1. A time of concentration of 15 minutes for the east area and 17 minutes for the west area were used. The peak flow from the east area is 3143 cfs, and the peak flow from the west area is 1784 cfs. Conservative Manning's roughness values (n values) of 0.025 for paved surfaces in the power block area and 0.035 for other gravel and grass surfaced areas were used in the model. Water levels, velocities, and Froude numbers at each cross-section were computed. The results are presented in Table 1.

From the HEC-RAS analysis, the maximum flow velocity in the east area near the power block is less than 2 feet/sec, and the maximum velocity down slope of the power block area is approximately 4 feet/sec. Similarly for the west area, the maximum flow velocity in the power block area is less than 1 foot/sec and less than 4 feet/sec for areas down slope. The computed

Froude number at the peripheral road of the power block is 0.73 in Zone A and 0.34 in Zone B, which indicates sub-critical flow. From the analysis, the Froude number at any given cross-section is less than or equal to 1.

Based on the above analysis, the velocity of overland flow due to a local PMP event is less than 4 feet/sec outside the power block area and is less than 2 feet/sec within the power block area near the safety-related facilities. Therefore, the potential for erosion near the safety related-facilities is minimal. Minor erosion due to 4 feet/sec velocity will occur at locations far away from safety-related facilities and therefore, will not impact the safety-related plant buildings and facilities.

Froude number value of 1 or less indicates critical or sub-critical flow, and therefore, there is no potential for a hydraulic jump near any cross-section associated with HAR 2 and HAR 3.

The stormwater drainage ditches and conveyances will be maintained to be free of large debris and obstructions. It is not anticipated that any debris will be stockpiled near the safety-related buildings that could affect the local PMP flood levels near these buildings.

Based on the analysis described above and the good housekeeping practices that will be employed at the site, the potential for erosion near the safety-related facilities is considered to be minimal.

TABLE 1							
ZONE A				ZONE B			
Cross-Section (Down-stream to upstream)	Velocity (feet/sec)	Froude Number	Water Level (feet)	Cross-Section (Down-stream to upstream)	Velocity (feet/sec)	Froude Number	Water Level (feet)
0	3.57	1.00	256.64	0	3.64	1.00	260.41
120	1.35	0.24	257.19	155	0.72	0.09	260.70
220	3.43	0.72	257.31	340	0.50	0.07	260.72
320	2.20	0.41	257.97	470	0.50	0.07	260.73
420	1.88	0.34	258.25	645	0.29	0.03	260.74
535	1.06	0.18	258.42	750	0.25	0.03	260.74
685	1.14	0.20	258.51	890	1.86	0.71	260.71
840	2.94	1.00	259.95	955	0.75	0.22	260.87
987	1.32	0.38	260.88	1070	0.43	0.12	260.92
1140	0.48	0.09	260.94	1185	0.08	0.02	260.92
1300	0.29	0.06	260.96	1295	0.00	0.00	260.92
1502	0.00	0.00	260.96	-	-	-	-

Associated HAR COL Application Revisions:

Revisions to FSAR Subsection 2.4.12.5 are described in RAI 02.04.12-2 (H-0436).

Attachments/Enclosures:

Figure 1 - Grading Drainage and Cross Sections Location Plan for HEC-RAS analysis.

NRC Letter No.: HAR-RAI-LTR-010

NRC Letter Date: September 18, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.04.12-4

Text of NRC RAI:

Describe how the water level measurements collected during drought conditions in 2006/2007 may be representative relative to normal conditions. Describe the patterns of spatial and temporal variability in the water levels that are observed or expected in the surficial and Triassic bedrock wells in the area over a range of conditions (normal and most severe seasonal climatic variations for the period that has been historically reported) for both long and short term.

PGN RAI ID #: H-0438

PGN Response to NRC RAI:

Groundwater elevation measurements collected during four sampling events over a 1-year period in 2006 (August and November) and 2007 (February and May) were used to identify seasonal and annual variations in groundwater levels within the surficial and bedrock aquifers beneath the HAR site. Seasonal elevations representative of the highest recorded water levels during the period were used to characterize the maximum groundwater elevation for the HAR site conceptual model. These water levels correspond to the data collected during the February 28, 2007, gauging event.

In addition to the existing HAR groundwater elevation measurements, a search for additional information was performed to determine if additional documentation was available to support Progress Energy's characterization of the relationship between local rainfall and historical groundwater elevations within the Triassic Basin bedrock. The information that was reviewed included professional geologic and hydrogeologic reports, research studies performed by local universities, and information published by local, state, and federal water resource agencies. The search and review of this information indicated that no additional historical groundwater data were available within the area of interest.

Since no additional historical data were available to characterize groundwater elevations across the site over a longer period, a review of historical precipitation data was performed to determine if the groundwater level measurements in 2006 and 2007 could be considered representative of average or above-average groundwater levels. As published by the National Weather Service, the average annual rainfall in Raleigh, North Carolina, for a period of record of 114 years is 44.55 inches/year. The following table shows the average annual precipitation observed at Raleigh, North Carolina, since the year 2000:

Year	Total Annual Precipitation (inches)
2000	39.34
2001	34.78
2002	47.34
2003	50.01
2004	47.05
2005	37.55
2006	53.69
2007	35.81

The total annual precipitation in the year 2006 was higher than the average amount of rainfall and represents the highest total annual precipitation in the 2000-2007 period. Climatological records available from the National Weather Service also indicate that the Raleigh area had above-average precipitation from September 2006 through January 2007, which would be conducive to above-average water levels within the surficial and bedrock aquifers at the HAR site. Therefore, groundwater elevations measured at the HAR site in late 2006 and early 2007 were not collected during drought conditions, but rather at the end of a period of above-average precipitation. Based on this information, Progress Energy believes the groundwater elevations measured during the February 2007 gauging event are most likely to be representative of average to above-average water levels.

Observed patterns of spatial and temporal variability in the water levels for the surficial and Triassic bedrock wells in the area beneath the HAR safety-related facilities are described in FSAR Subsection 2.4.12.2.2.

Patterns of spatial and temporal variability of water levels for the surficial and Triassic bedrock wells in the area beneath the HAR safety-related facilities after construction are not expected to be variable due to the water surface controls that will be in place. These controls include a large area of impermeable surfaces, a network of stormwater drainage ditches, and the Auxiliary and Main Reservoir pool elevations (as bounding conditions), as described in the response to NRC RAI 02.04.12-2 (H-0436).

Associated HAR COL Application Revisions:

None.

Attachments/Enclosures:

None.

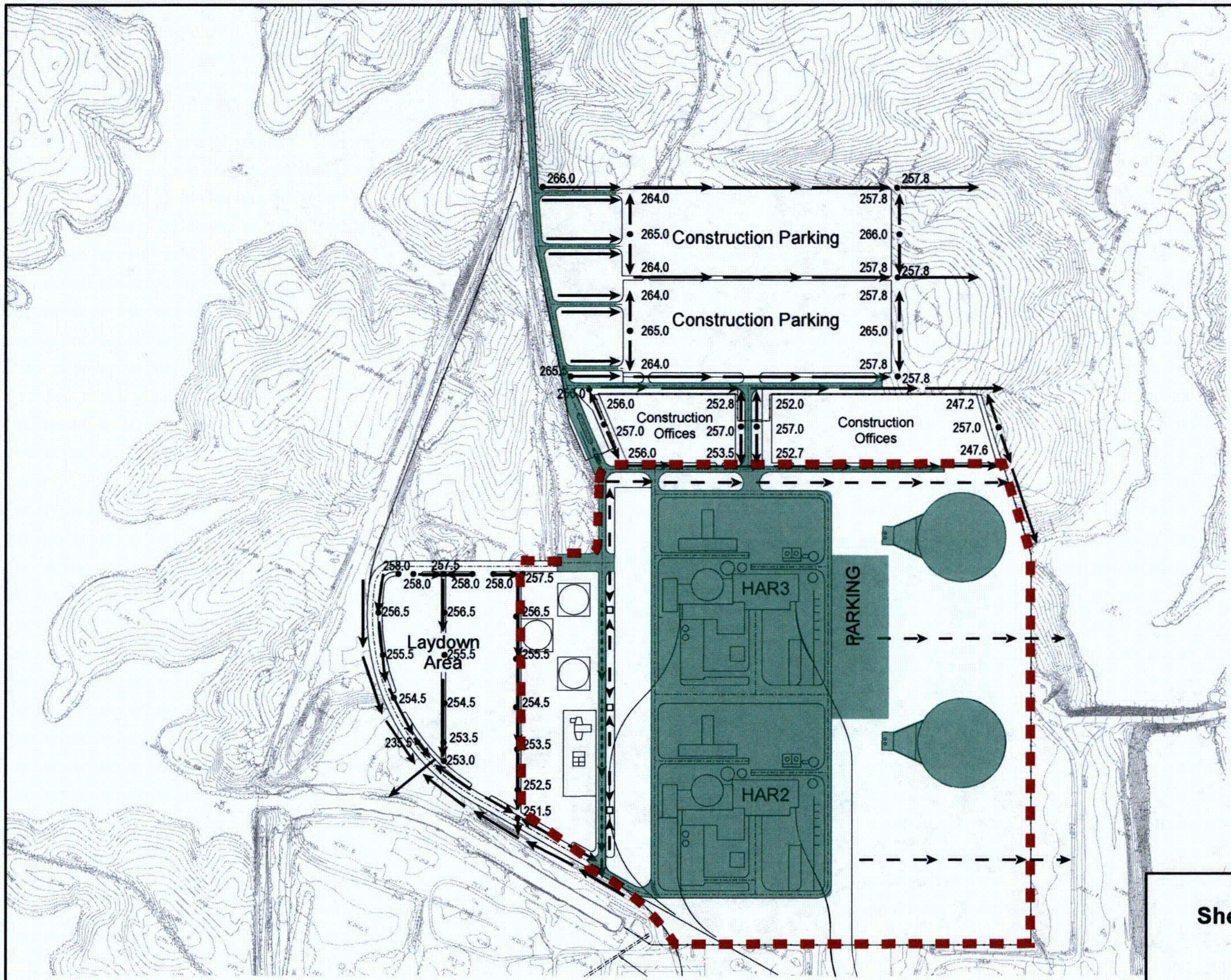
List of Attachments:

NRC RAI # 02.04.12-2 [PGN RAI ID #H-0436]:

1. Figure 1 - Site Drainage Map and Impervious Areas (Post-construction) [1 page]
2. Figure 2 - Potentiometric Surface Lines Within the Surficial Aquifer as Measured on February 28, 2007 and Post-construction Site Drainage Map [1 page]
3. Figure 3 - Potentiometric Surface Lines Within the Bedrock as Measured on February 28, 2007 and Post-construction Site Drainage Map [1 page]
4. Figure 4 - Site Drainage Map and Estimated Potentiometric Surface Lines (Post-construction) [1 page]
5. Figure 5 - Site Drainage Map and Cross-section Reference Line (Post-construction) [1 page]
6. Figure 6 - Cross-section of Water Levels Within the Surficial Aquifer as Measured on February 28, 2007 [1 page]
7. Figure 7 - Cross-section of Water Levels Within the Bedrock as Measured on February 28, 2007 [1 page]
8. Figure 8 - Cross-section from A to B: Estimated Water Levels After Construction of HAR 2 and 3 [1 page]

NRC RAI # 02.04.12-3 [PGN RAI ID #H-0437]:

9. Figure 1 - Grading Drainage and Cross Sections Location Plan for HEC-RAS analysis. [1 page]



LEGEND

- Direction of Surface Water Flow
- Direction of Piped Water Flow
- Ditch High Point
- Ditch Drop Inlet
- 266.0 Ditch Elevation (feet NGVD29)
- Impervious Area
- Safety-related Drainage Area

NOTES

1. HAR 2 and HAR 3 proposed nominal grade elevation is 260-feet NGVD29.
2. Area surfacing will consist of crushed stone in contractor parking, laydown areas, and equipment areas.
3. All plant roads and entrance roads will be asphalt paved.
4. Stormwater Drainage Ditches slope at 0.5 feet per 100 feet.

0 100 200
Meters

0 400 800
Feet

Progress Energy Carolinas

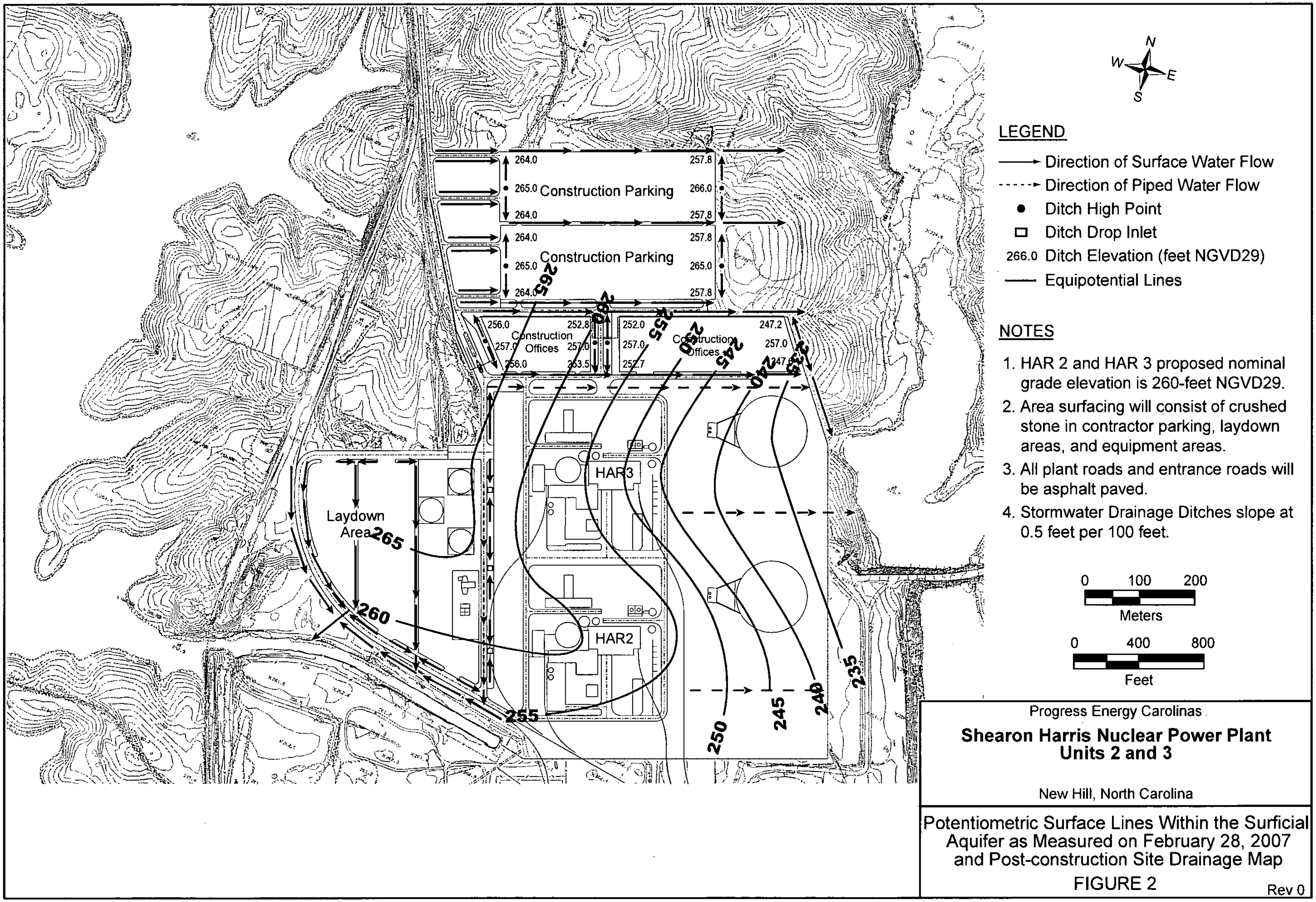
Shearon Harris Nuclear Power Plant Units 2 and 3

New Hill, North Carolina

Site Drainage Map and Impervious Areas (Post-construction)

FIGURE 1

Rev 0


LEGEND
Direction of Surface Water Flow
Direction of Piped Water Flow
Ditch High Point
Ditch Drop Inlet
266.0 Ditch Elevation (feet NGVD29)
Equipotential Lines
NOTES
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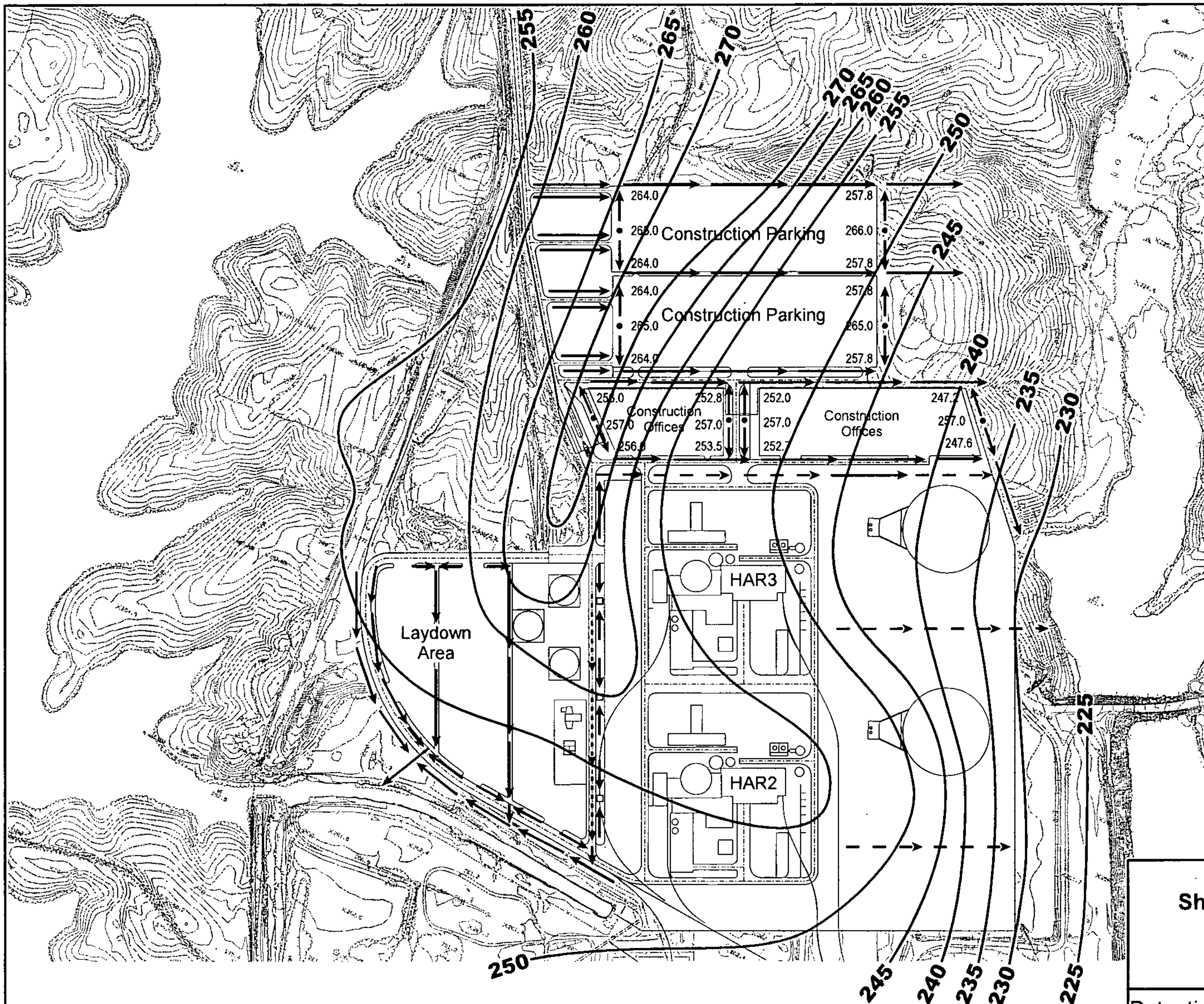
0 100 200
Meters
0 400 800
Feet
Construction Parking
Construction Parking
Construction Offices
Construction Offices
Laydown Area
HAR3
HAR2
Progress Energy Carolinas
Shearon Harris Nuclear Power Plant
Units 2 and 3
New Hill, North Carolina
Potentiometric Surface Lines Within the Surficial Aquifer as Measured on February 28, 2007 and Post-construction Site Drainage Map
FIGURE 2
Rev 0



LEGEND

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- Ditch High Point
- Ditch Drop Inlet
- 266.0 Ditch Elevation (feet NGVD29)
- Equipotential Lines

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0 100 200
Meters

0 400 800
Feet

Progress Energy Carolinas

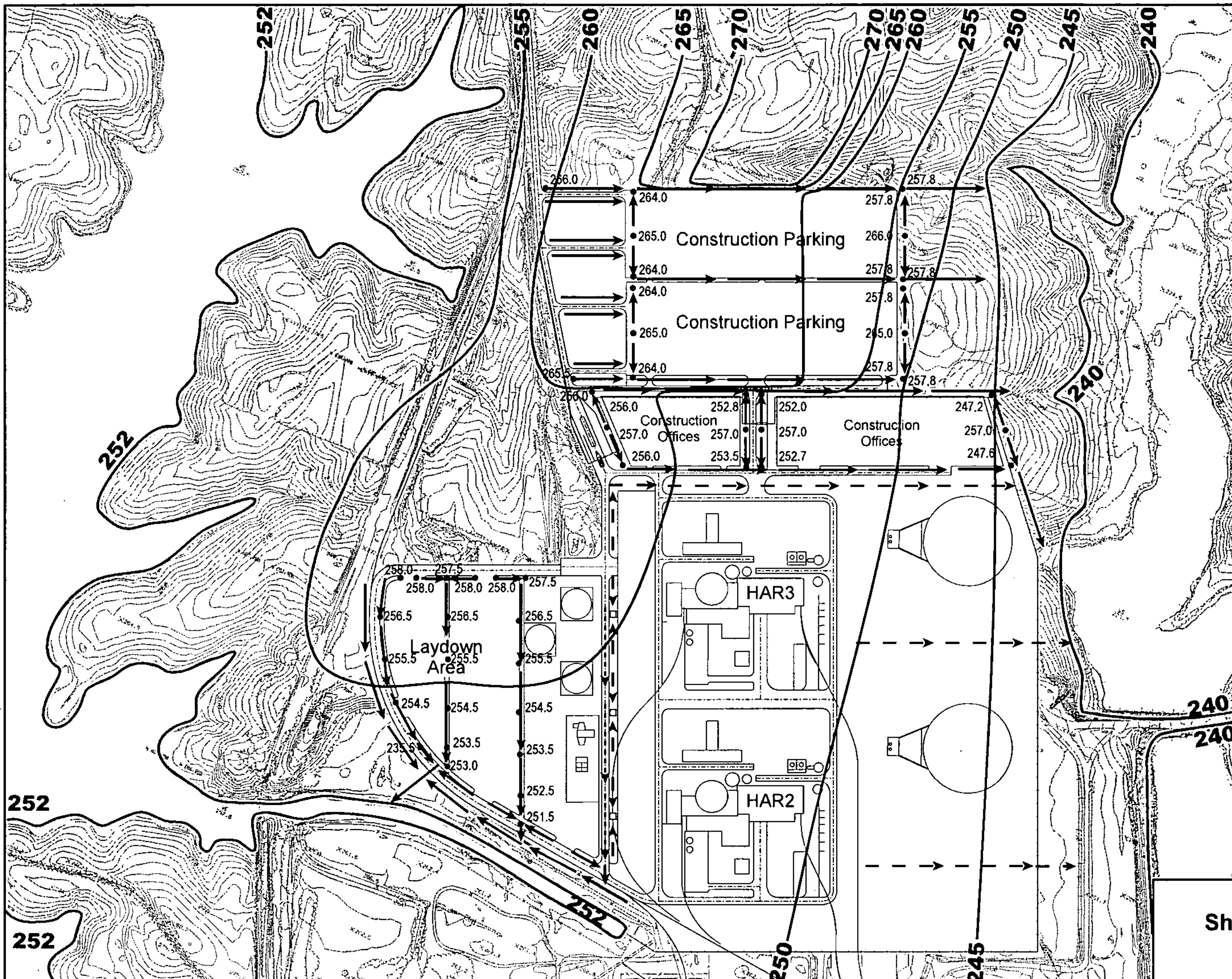
Shearon Harris Nuclear Power Plant
Units 2 and 3

New Hill, North Carolina

Potentiometric Surface Lines Within the Bedrock as Measured on February 28, 2007 and Post-construction Site Drainage Map

FIGURE 3

Rev 0



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LEGEND

- Direction of Surface Water Flow
- Direction of Piped Water Flow
- Ditch High Point
- Ditch Drop Inlet
- 266.0 Elevation (feet NGVD29)
- Equipotential Lines

NOTES

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4. Stormwater Drainage Ditches slope at 0.5 feet per 100 feet.

0 100 200
Meters

0 400 800
Feet

Progress Energy Carolinas

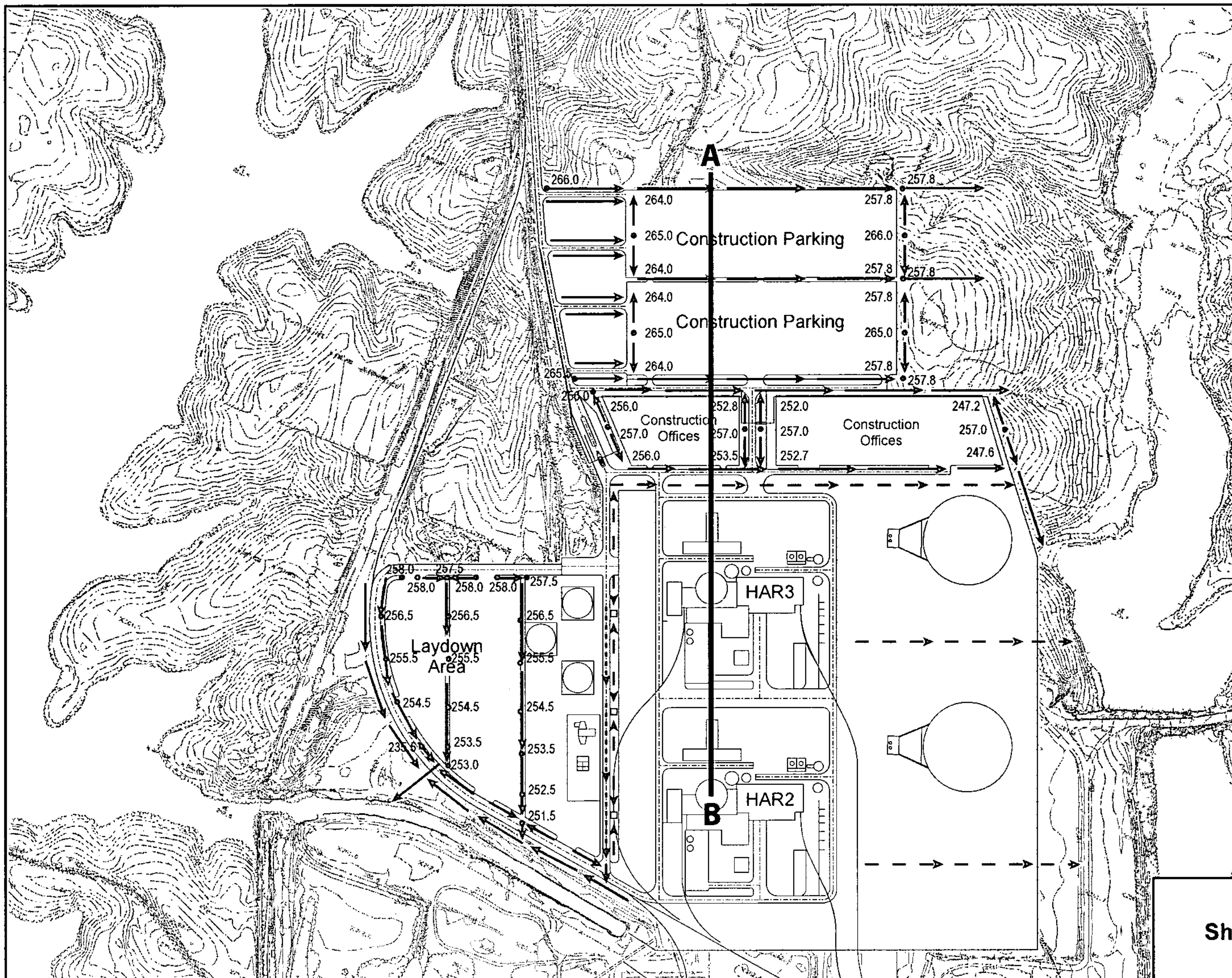
Shearon Harris Nuclear Power Plant Units 2 and 3

New Hill, North Carolina

Site Drainage Map and Estimated Potentiometric Surface Lines (Post-construction)

FIGURE 4

Rev 0



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LEGEND

- Direction of Surface Water Flow
- Direction of Piped Water Flow
- Ditch High Point
- Ditch Drop Inlet
- 266.0 Ditch Elevation (feet NGVD29)

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0 100 200
Meters

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Feet

Progress Energy Carolinas

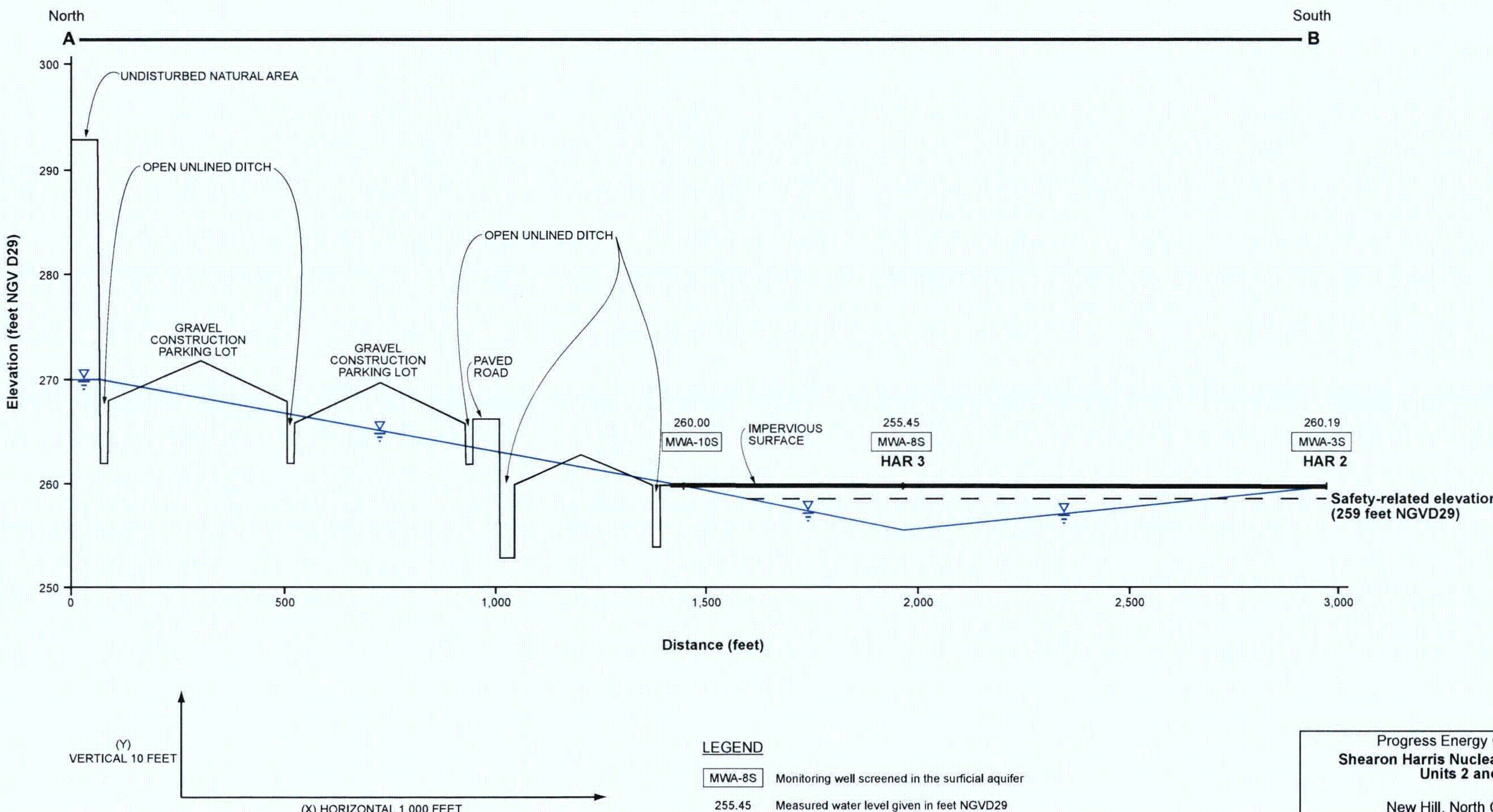
Shearon Harris Nuclear Power Plant
Units 2 and 3

New Hill, North Carolina

Site Drainage Map and Cross-section Reference Line (Post-construction)

FIGURE 5

Rev 0



LEGEND

MWA-8S	Monitoring well screened in the surficial aquifer
255.45	Measured water level given in feet NGVD29
(symbol)	Potentiometric Surface

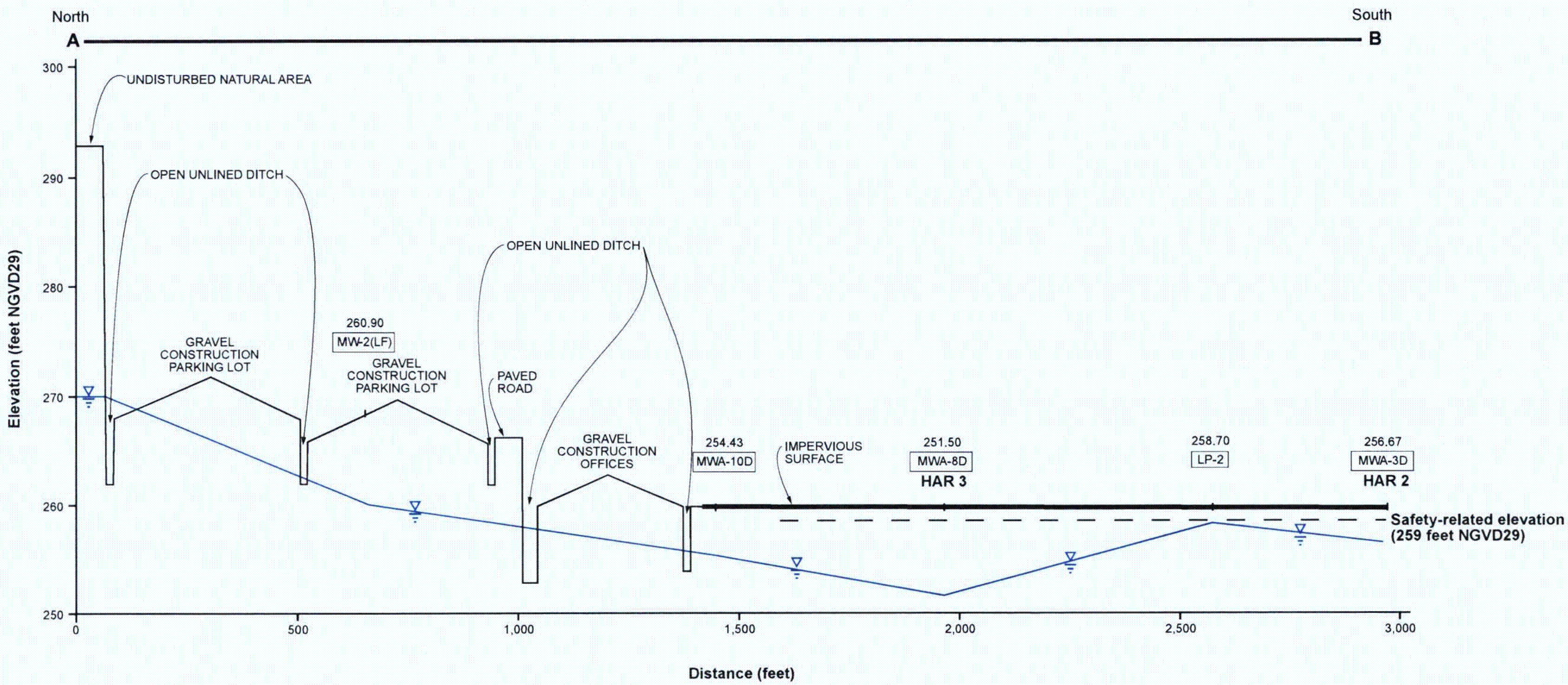
Progress Energy Carolinas
Shearon Harris Nuclear Power Plant Units 2 and 3

New Hill, North Carolina

Cross-section of Water Levels Within the Surficial Aquifer As Measured on February 28, 2007

FIGURE 6

Rev 0



(Y) VERTICAL 10 FEET

(X) HORIZONTAL 1,000 FEET

LEGEND

MWA-8D	Monitoring well screened in the bedrock
251.50	Measured water level given in feet NGVD29
(symbol)	Potentiometric Surface

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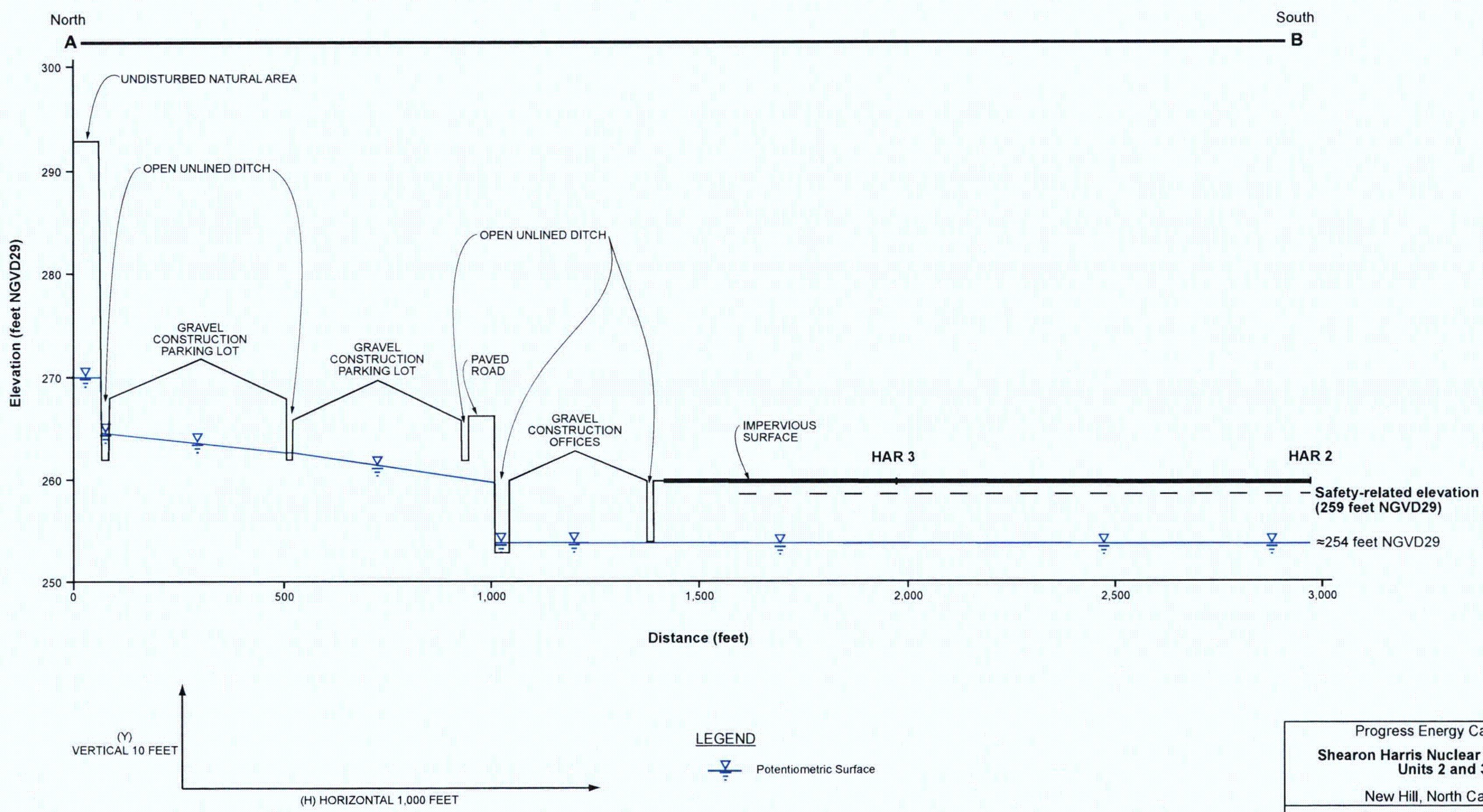
Shearon Harris Nuclear Power Plant Units 2 and 3

New Hill, North Carolina

Cross-section of Water Levels Within the Bedrock As Measured on February 28, 2007

FIGURE 7

Rev 0



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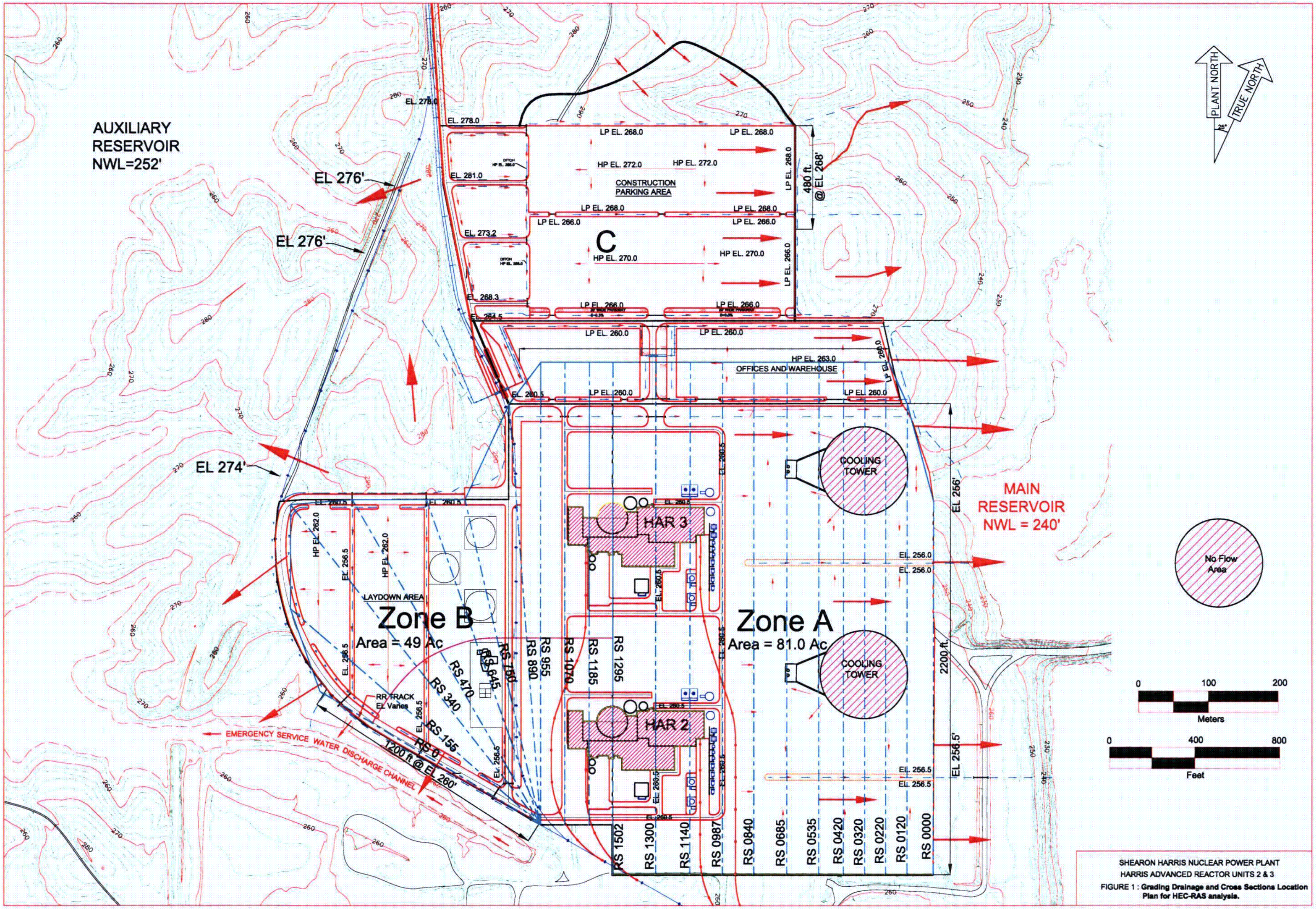
Shearon Harris Nuclear Power Plant Units 2 and 3

New Hill, North Carolina

Cross-section from A to B: Estimated Water Levels After Construction of HAR 2 and HAR 3

FIGURE 8

Rev 0


AUXILIARY
RESERVOIR
NWL=252'
EL 276'
EL 276'
EL 274'
CONSTRUCTION
PARKING AREA
C
OFFICES AND WAREHOUSE
COOLING
TOWER
HAR 3
HAR 2
LAYDOWN AREA
Zone B
Area = 49 Ac
Zone A
Area = 81.0 Ac
MAIN
RESERVOIR
NWL = 240'
No Flow
Area
EMERGENCY SERVICE WATER DISCHARGE CHANNEL
1200 ft @ EL 260'
480 ft.
@ EL 268'
2200 ft.
PLANT NORTH
TRUE NORTH
Meters
Feet
SHEARON HARRIS NUCLEAR POWER PLANT
HARRIS ADVANCED REACTOR UNITS 2 & 3
FIGURE 1 : Grading Drainage and Cross Sections Location Plan for HEC-RAS analysis.