SOUTH CAROLINA ELECTRIC & GAS

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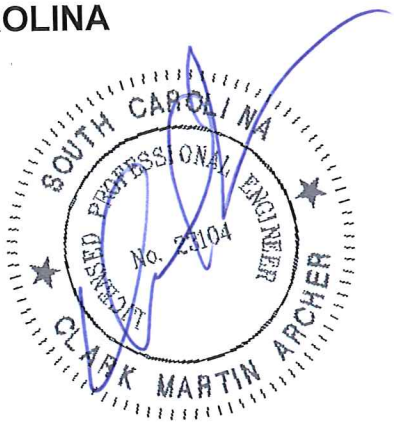
HAZARD POTENTIAL CLASSIFICATION ASSESSEMENT

FOR THE

WILLIAMS STATION FGD POND

BERKELEY COUNTY, SOUTH CAROLINA



SEPTEMBER 2016

WILLIAMS STATION FGD POND 1 & 2 HAZARD POTENTIAL CLASSIFICATION ASSESSEMENT

SURFACE IMPOUNDMENT DESCRIPTION

The FGD POND 1 & 2 is located at the South Carolina Electric and Gas (SCE&G) Williams Station coal fired power generating facility in Berkeley County, South Carolina. Pond 1 & 2 are manmade impoundments constructed above existing ground, in an area above the 500-yr floodplain and with no wetlands nearby. The Pond bottom is concrete Fabriform placed on a HDPE constructed atop compacted clay fill. Pond 1 & 2 have surface areas of approximately 0.8 acres and 0.7 acres respectively with average depths of 4.5 feet and 1.5 feet of freeboard. Inner slopes range from 4:1 to 8:1. Outer slopes are no steeper than 3:1 with a maximum height of 10 feet. Top width of berm ranges from 10 to 20 feet with separation berm width of 6 feet.

Pond 1 & 2 alternately receive a single wastewater stream generated from the FGD scrubber system. Purge pumps discharge the wastewater from the secondary hydroclone overflow distribution tank to Pond 1 & 2. Solids are removed from the wastewater by settling in the Ponds. Pond 1 & 2 have volumes of approximately 0.6 million gallons and 0.5 million gallons, respectively. With a maximum average influent flowrate of 130 gpm, the residence times in Pond 1 and Pond 2 is approximately 4 days. Flow continues to Settling Pond D and then accumulates in Settling Pond until it is pumped out to the Cooling Tower Blowdown Basin. The wastewater pond are maintained periodically by dewatering to remove accumulated particulate material as well as inspect the concrete bottom.

REGULATION

§ 257.73 (a) (2) – Periodic hazard potential classification assessments.

(i) The owner or operator of the CCR unit must conduct initial and periodic hazard potential classification assessments of the CCR unit according to the timeframes specified in paragraph (f) of this section. The owner or operator must document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. The owner or operator must also document the basis for each hazard potential classification.

(ii) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial hazard potential classification and each subsequent periodic classification specified in paragraph (a)(2)(i) of this section was conducted in accordance with the requirements of this section.

CLASSIFICATION SYSTEM

A primary purpose of any classification system is to select appropriate design criteria. In other words, design criteria will become more conservative as the potential for loss of life and/or property damage increases. However, postulating every conceivable circumstance that might remotely place a person in the inundation zone whenever a failure may occur should not be the basis for determining the conservatism in dam design criteria.

This hazard potential classification system categorizes dams based on the probable loss of human life and the impacts on economic, environmental, and lifeline interests. Improbable loss of life exists where persons are only temporarily in the potential inundation area. For instance, this hazard potential classification system does not contemplate the improbable loss of life of the occasional recreational user of the river and downstream lands, passer-by, or non-overnight outdoor user of downstream lands. It should be understood that in any classification system, all possibilities cannot be defined. High usage areas of any type should be considered appropriately. Judgment and common sense must ultimately be a part of any decision on classification. Further, no allowances for evacuation or other emergency actions by the population should be considered because emergency procedures should not be a substitute for appropriate design, construction, and maintenance of dam structures.

Three classification levels are adopted as follows: LOW, SIGNIFICANT, and HIGH, listed in order of increasing adverse incremental consequences. The classification levels build on each other, i.e., the higher order classification levels add to the list of consequences for the lower classification levels, as noted in the table on the following page.

This hazard potential classification system is utilized with the understanding that the failure of any dam or water-retaining structure, no matter how small, could represent a danger to downstream life and property. Whenever there is an uncontrolled release of stored water, there is the possibility of someone, regardless of how unexpected, being in its path.

1. LOW HAZARD POTENTIAL

   Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

2. SIGNIFICANT HAZARD POTENTIAL

   Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

3. HIGH HAZARD POTENTIAL

   Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

ASSESSMENT

The hazard potential classification assessment is made using a phased approach utilizing three levels of effort: presumptive, incremental hazard assessment (dam break studies), and risk based assessment. It is intended that the classification determination will proceed from the simplest method (presumptive) using existing data and field reconnaissance, to the most complex (risk based assessment) in a step sequence. In most cases, all three methods will not be required.

PRESUMPTIVE

Based on the design and construction of Pond 1 & 2, the ability to control incoming flow, and the inability for stormwater runoff to enter the surface impoundment; it is presumed that the Hazard Potential Classification would be Low. Structural failure is extremely unlikely unless a catastrophic event occurs. Overtopping occurs between 1 & 2 and then to Settling Pond D passing over a manmade structural spillway.

INCREMENTAL HAZARD

The Berm failure scenario may result in immediate damage to the outer slopes due to high velocities but would dissipate rapidly as the water level decreases. All flooding outside the Pond would occur on open area, roads, and ditches and would be limited to the volume of the impoundment. Flood waters would subside quickly in ditches. Hazard Potential Classification could be considered Low.

RISK BASED

South Carolina recently experience 1000-yr storm event in which no damage was sustained to Pond 1 & 2. The likelihood of any other catastrophic event and its probability of personal injury related to the Ponds is estimated below.

The following scale is used to rank the probability of event as low, significant, or high risk potential.

1% - 33% - Low
34% - 66% - Significant
67% - 99% - High

Earthquake: Probability of a person in the area of the failing berms during a major earthquake (magnitude 7.0) that may result in serious injury or death.

Disaster – 6% chance of 7.0 magnitude earthquake occurring in this area sometime during the next 50 years.
(U.S. Geological Survey 2009 PSHA Model, map included)

Exposure – 2% (30 /1440 Minutes per day) person in area

Vulnerability – 1% chance that constructed berms randomly fail. Berms unlikely to fail but use 1% as a measurable value

.01 x .02 = .0002 → 0.02% - berms fail while person in area

Assume berm failure → 99% - berms fail during an earthquake

.99 x .02 = .0198 → 2% - berms fail during an earthquake and person in area

2% is considered Low risk.

Hurricane: Probability of a person in the area of the failing berms during a major hurricane (category 3 -5) that may result in serious injury or death.

Disaster – 4% chance of major hurricane occurring in this area sometime during the next 50 years.
(U.S. Geological Survey 2009 PSHA Model, map included)

Exposure – 0% person in area (Plant would be evacuated)

Vulnerability – 1% chance that constructed berms randomly fail. Berms unlikely to fail but use 1% as a measurable value

.01 x 0 = 0.0 → 0% - berms fail while person in area

Assume berm failure → 99% - berms fail during a hurricane

.99 x 0 = 0 → 0% - berms fail during a hurricane and person in area

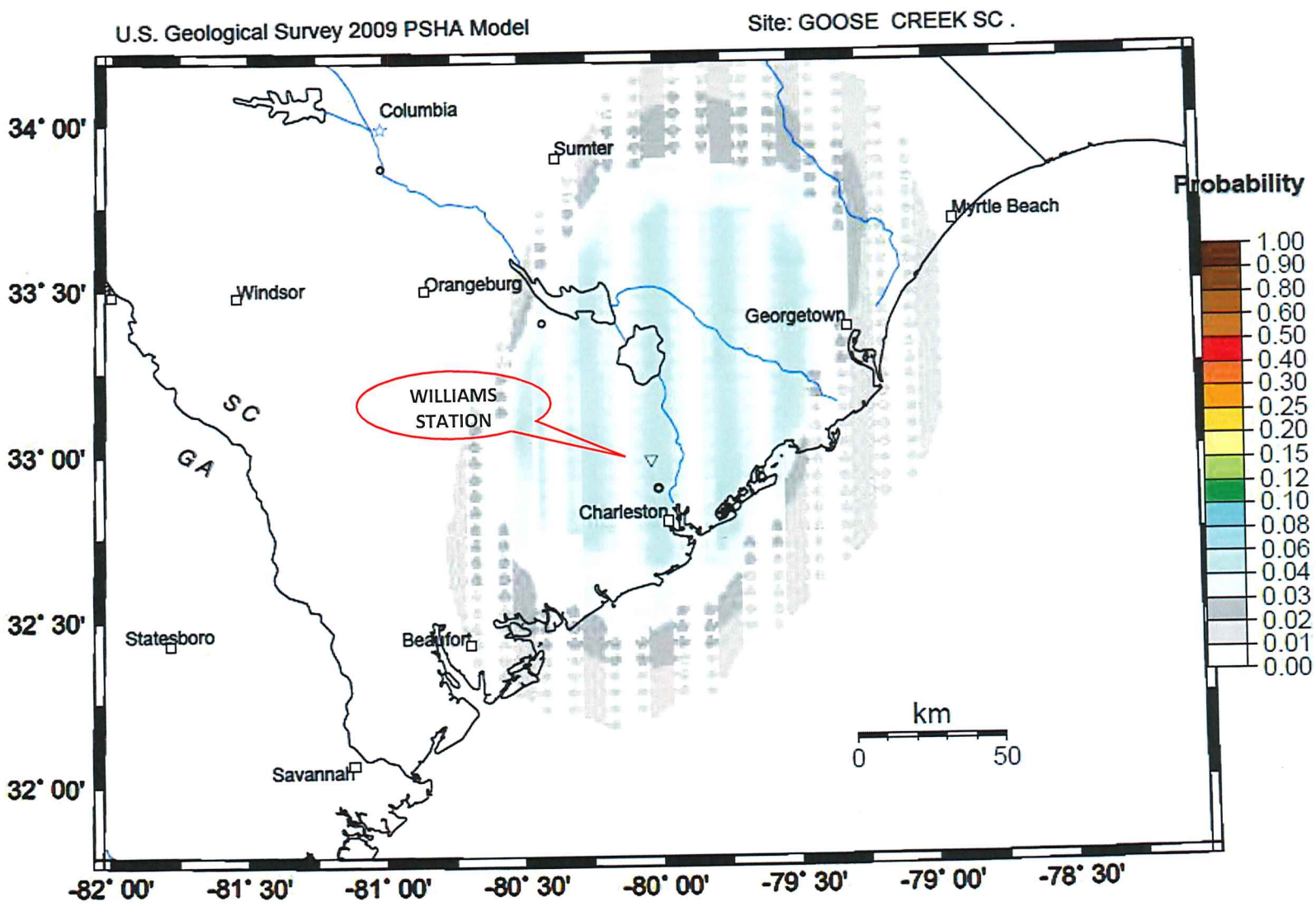
Round up to 1% (no absolute zero risk) and would be considered Low risk.

Due to early warning systems the probabilities of other natural disasters (tornados, flooding) for the location of Ponds 1 & 2 would be equivalent to hurricanes; resulting in probabilities estimated between 0-1%. Risk Based assessment presents Pond 1 & 2 to be Low Hazard Potential Classification.

DETERMINATION

It is determined that FGD Pond 1 & 2 is considered to be a **Low** Hazard Potential. The classification will be reassessed in the event that changes occur associated with the design or with the integrity of the surface impoundment.

Probability of earthquake with M > 7.0 within 50 years & 50 km



Earthquake probabilities from USGS OFR 08-1128 PSHA. 50 km maximum horizontal distance. Site of interest: triangle. Epicenters mb>5 black circles; rivers blue.