RYERSON STATION DAM
DATA REPORT

1. Chronology

1.1 The following section contains notes outlining the timeline of events starting with the design of the dam in 1957 and ending in September 2005. The information was extracted from a document prepared by the Pennsylvania Department of Environmental Protection (PADEP), Bureau of Waterways Engineering, Division of Dam Safety.

Time Period	Observation
1957	Design by Swindell-Dressler Corporation of Pittsburgh
1960	Construction completed by Seabright Construction Company
1960-2005	Dam performs well with minor seepage and cracks present
1997	Mining of less than 50% extraction is proposed in the area of the dam, but not directly below the dam
April 13, 2005	Park Manager reports to DCNR Bureau of Facility Design and Construction that normally wet areas at the downstream of the left side of dam are showing signs of increased amounts of seepage and water movement on the ground surface. Some seepage noted through construction joint located just above the ground surface. Reported to DEP Dam Safety on April 14.
April 18, 2005	DCNR engineer inspects dam. Seepage through wall drain on left side of dam is more than observed in previous inspections. Ground downstream of right side of dam reported as “a little wet”. Seal of historical vertical crack in right side of dam, which was performed in 2003, is in good shape. Mine maps were reviewed with DEP California District Mining representative at this inspection.
April 21, 2005	DCNR submits report of April 18 inspection and proposes to DEP Dam Safety a conceptual plan to collect seepage from left side of dam. Conclusion is that seepage is a combination of flows from the dam and from the high water table currently present in the abutments due to wet spring. Drawdown of lake and construction of drain is to take place after Labor Day. All seepage will continue to be monitored.

April 27, 2005 Concept approved by DEP Dam Safety and request made for detailed plans and specifications to include provisions to monitor seepage amounts.

June 15, 2005 Park measures seepage at drain on right side of dam at 20 gallons per minute (gpm) at a location where seepage was reported as 15 gpm in April. New crack noted on left side of dam near spillway training wall.

July 13, 2005 Park measures seepage at drain on right side of dam at 35 gpm with no apparent reason for this increase. New crack first noted on left side of dam on June 15 appears to have increased. Historical vertical repair on right side of dam has opened up near base of dam.

July 19, 2005 DCNR reports findings of July 13 inspection to DEP Dam Safety and requests a July 26th joint inspection.

July 26, 2005 Joint inspection of dam by DCNR Parks and Central Office engineers as well as DEP Dam Safety, Regional Office Soils and Waterways, District Office Monitoring and Compliance and District Office Surface Subsidence personnel. Seepage at right side of dam is estimated at 60 gpm. Transition zone between mining site and dam will continue to be monitored by DEP California Office. Park will install crack gauges on the dam.

July 27, 2005 Findings of July 26 inspection relayed to DEP Dam Safety Chief. Dam Safety staff is directed to immediately set up a meeting with County and local emergency management officials to distribute and review inundation maps and responsibilities should a precautionary or required evacuation of downstream areas be necessary due to deteriorating conditions at the dam. Meetings were scheduled and staff person on the road to Greene County by late morning and met with County EMA personnel that evening.

July 28, 2005 Meeting is held at the dam site in regards to Inundation Mapping and evacuation responsibilities of EMA and other local officials. Attendees include DEP Dam Safety, DCNR Parks, Greene County Commissioner's Office, Greene County EMA, Greene County Sheriff, Richhill Township, Richhill Township VFD, West Finley VFD, Graysville VFD, Center Township VFD, Pennsylvania State Police, West Greene School District, Marshall County (WV) EMA, Marshall County Sheriff and Texas Eastern.

Team from Gannett Fleming performs inspection of dam for an initial assessment of the dam's structural stability and to determine an appropriate scope of work for further monitoring and analysis of the

condition of the dam and its foundation. Crack gauges installed by Park personnel were observed.

At 10:30 a.m., DEP Dam Safety Chief is informed that the Gannett Fleming team has observed the location and amounts of seepage at the dam. Seepage amounts are estimated to have increased to 80 gpm at right side of dam, up from 60 gpm two days earlier. Chief directs on-site Dam Safety personnel to request DCNR to immediately open the spillway gate and lower the reservoir at least 10 feet. Gate was fully open by 1 p.m. This will lower the pool below the primary horizontal construction joint showing seepage. Evacuation immediately below dam is not necessary, as discharges will be contained within the banks of the stream. DCNR contacted Regional Fish and Boat Commission to inform them of need to immediately lower the lake.

DEP Dam Safety Chief discusses downstream conditions at WV3, a flood control dam in West Virginia, with West Virginia Dam Safety and NRCS personnel from West Virginia. Joint decision made to evacuate recreational users from the pool due to uncertainty of how much the reservoir would rise.

Late afternoon phone call between DEP Dam Safety Chief and Gannett Fleming Team resolved that due to the uncertain condition of the dam and the continuing deterioration of the structure, steps should be taken to permanently eliminate impounding capacity of the dam.

July 29, 2005 DEP Dam Safety staff computes that reservoir will refill from runoff from a relative small runoff event and, thus, determines that reservoir should be fully drained. Dam Safety contacts park and learns that the reservoir was lowered by approximately 11 feet by that morning. DCNR shut gate due to stranded fish and concerns for these fish. Dam Safety directs DCNR to reopen gates to attempt to flush fish downstream and keep gate open due to growing concern for stability of structure. Dam Safety also informs DCNR that a large portion of the dam's spillway must be removed and requests that they initiate steps to contract for this removal. DCNR starts these arrangements.

August 1, 2005 DEP Dam Safety staff completes reservoir routings that determine that 100 feet of the 200-foot spillway must be removed down to at least 14 feet below normal pool elevation to manage downstream risks for events up to and including the 100-year-storm.

A conference call takes place between DEP Dam Safety, DCNR Facility Design and Construction and Gannett Fleming. DCNR is requested to remove at least 14 feet, and more if possible, but to stay one foot above accumulated sediment levels at the upstream face of

the dam to retain as much of the accumulated sediment in the reservoir area. DCNR indicates contractor will be at site by August 15.

August 3, 2005 DEP Dam Safety Chief and other staff inspect dam. Park Manager informs Dam Safety that cracks formed in dam overnight from August 1 to August 2 and pointed these cracks out. Park Manager also shows Dam Safety a heave that formed the same night in the road surface of Bristoria Road (SR 3022) at the right abutment of the dam. This heave is located in line with the dam's alignment, approximately where the dam structure ends in the abutment area. This heave is approximately nine inches to one foot in vertical relief. Park Manager requests that PennDOT not repair this heave to allow for further monitoring for movement. DEP Mining Office is monitoring this area. As a result of the heave and additional cracks observed, Dam Safety Chief calls central office requesting communication be made with DCNR to step up schedule for commencement of spillway removal. Deputy Secretary for Water Management makes this communication to DCNR Facility Design and Construction Bureau Director. Dam Safety Chief also communicates facts about the heave and additional cracking by telephone with Dam Safety staff geotechnical engineer and with Gannett Fleming team member.

Dam Safety Chief and other staff evaluate the stream and its floodplain downstream of the dam for the purpose of identifying critical homes that should be evacuated as a precautionary measure should a runoff event cause the reservoir to refill at or near the normal pool level before the spillway can be demolished. Eleven homes and one restaurant were identified as being critical between the dam and the downstream end of the village of Ryerson Station. One additional home should be evacuated as the access bridge to it may be washed away.

Gannett Fleming and DCNR survey personnel worked together to perform a survey of existing monitoring points for movement of the dam and installation of additional crack monitoring gauges.

August 4, 2005 Governor's Office is briefed by DEP and DCNR of the deteriorating conditions at the dam site and the plan for demolition of the dam's spillway. The need for further study necessary to ascertain what is happening and to determine if and when the dam can be rehabilitated or replaced were also discussed. Governor's Office requests door-to-door contact of the critical structures that may be evacuated as a precautionary measure. DCNR informs all that a contractor will be at the site on August 9.

DEP Dam Safety forwarded a map depicting the critical homes to be evacuated as part of a precautionary evacuation to DEP's Environmental Emergency Response Office. This map was then forwarded to Pennsylvania's Emergency Operation's Center for distribution to the Greene County EMA for door-to-door contact at these critical structures.

August 5, 2005 DEP Dam Safety and Environmental Emergency Response Office conference call with PEMA, Greene County EMA and DCNR Regional and Park personnel to discuss Governor's request to conduct door-to-door contact to inform owners of critical homes of the potential for a precautionary evacuation in the event of storm event refilling the reservoir. This will only be necessary until the spillway can be demolished. This took place on afternoon of August 5. Greene County indicated they would make these contacts.

August 8, 2005 Two conference calls took place the morning of August 8, 2005. The first involved Dam Safety, DCNR Facility Design and Construction, Gannett Fleming and Ryerson Station Park. In this call, it was ascertained that some minor movement of the dam occurred between Thursday and Friday. Gannett's survey crew will arrive at the site on the 8th and will continue their work tying in to DCNR's former survey. During this call, the Park was directed to call 911 to activate a precautionary evacuation if the pool level reaches El. 959, six feet below spillway crest. Gannett's survey crew will set a convenient monitoring point at this elevation for the Park's use. Park will contact Greene County EMA to update them on setting of trigger point.

Second conference call included Dam Safety, DCNR Facility Design and Construction, Gannett Fleming and DEP Mining Program. Mining maps showing permitted mining and actual mining have been assembled. This will be forwarded to Dam Safety for distribution to Gannett. Mining downstream and west of dam (Block 2207-160) to start today. A meeting will be held at Park Office on Wednesday, September 7 at 1 p.m. Invited attendees will be DCNR, DEP Mining, DEP Dam Safety, Gannett Fleming, Consol, Texas Eastern.

August 9, 2005 Received confirmation from Ryerson Station Park that equipment is beginning to show up at the dam site.

Updated Mining Map received from DEP Mining Program. Nearest point to mine entryway is 565 feet at an angle of draw of 57.1 degrees. Nearest point to longwall mining is 890 feet at an angle of draw of 57.6 degrees.

August 10, 2005 A Gannett Fleming crew installed 16 movement gauges at different locations on the dam. They indicated the only crack to show movement in the last couple of days is the vertical crack (above mean pool towards right end of dam) that opened after the dam was drained. Gannett Fleming also installed markers at El. 959 ft. for indicators for the Park to trigger a precautionary evacuation.

August 11, 2005 Hydroseeding of the reservoir and construction of an access road to the downstream face of the dam commenced early in the morning.

August 16, 2005 Call from Jim Blair, DCNR Bureau of Facility Design and Construction inspector, and he said that the breach is 12 to 13 feet deep by 60 feet wide.

August 22, 2005 Photos received from Jim Blair, DCNR, indicate the breach is nearing completion at a depth of approximately 18.2 feet.

August 24, 2005 The breach section through the spillway structure is essentially completed. The low-level outlet pipe is open, but quickly silting shut. Silt check dams were installed downstream of dam.

August 25, 2005 A meeting organized by Greene County Conservation District is held at the State Park Office. Purpose of meeting was to begin a dialogue of state, county and local officials on causes of the event, reaction to the event and future of the dam and state park.

Sept. 8, 2005 DEP conducts Ryerson Station Dam Monitoring Status Meeting.

Sept. 29. 2005 Movement near downstream pump station causes concern by PEMA. On Monday, Sept. 26, Texas Eastern (Duke Energy) lines buckled out of ground near the pump station and elsewhere in the area.

1.2 The following section contains notes outlining the timeline of events starting with the quarterly inspection of the dam on 4/4/2005 through 12/16/2005 as recorded by Ryerson Dam State Park personnel.