APPENDIX I

TAILRACE TUNNEL DRAIN TO TDCS

Contents of Appendix I

CONNECTION TO TAILRACE TUNNEL

A drain from the existing Tailrace Tunnel to the TDCS was made though the well casing of the monitoring well HF-303 which had previously been severed during the excavation of Workroom 1-1. As a result, the HF-303 well head was relocated from the tailrace tunnel to TDCS Workroom 1-1 in July 2008. In February 2010 the former well head for HF-303 in the tailrace tunnel was cut down to the invert level of the tailrace tunnel to provide gravity drainage from the tailrace tunnel to the TDCS and allow shutdown of the tailrace tunnel lift station pump and to allow all tailrace tunnel recovery wells to flow directly into the new gravity drain to the TDCS.

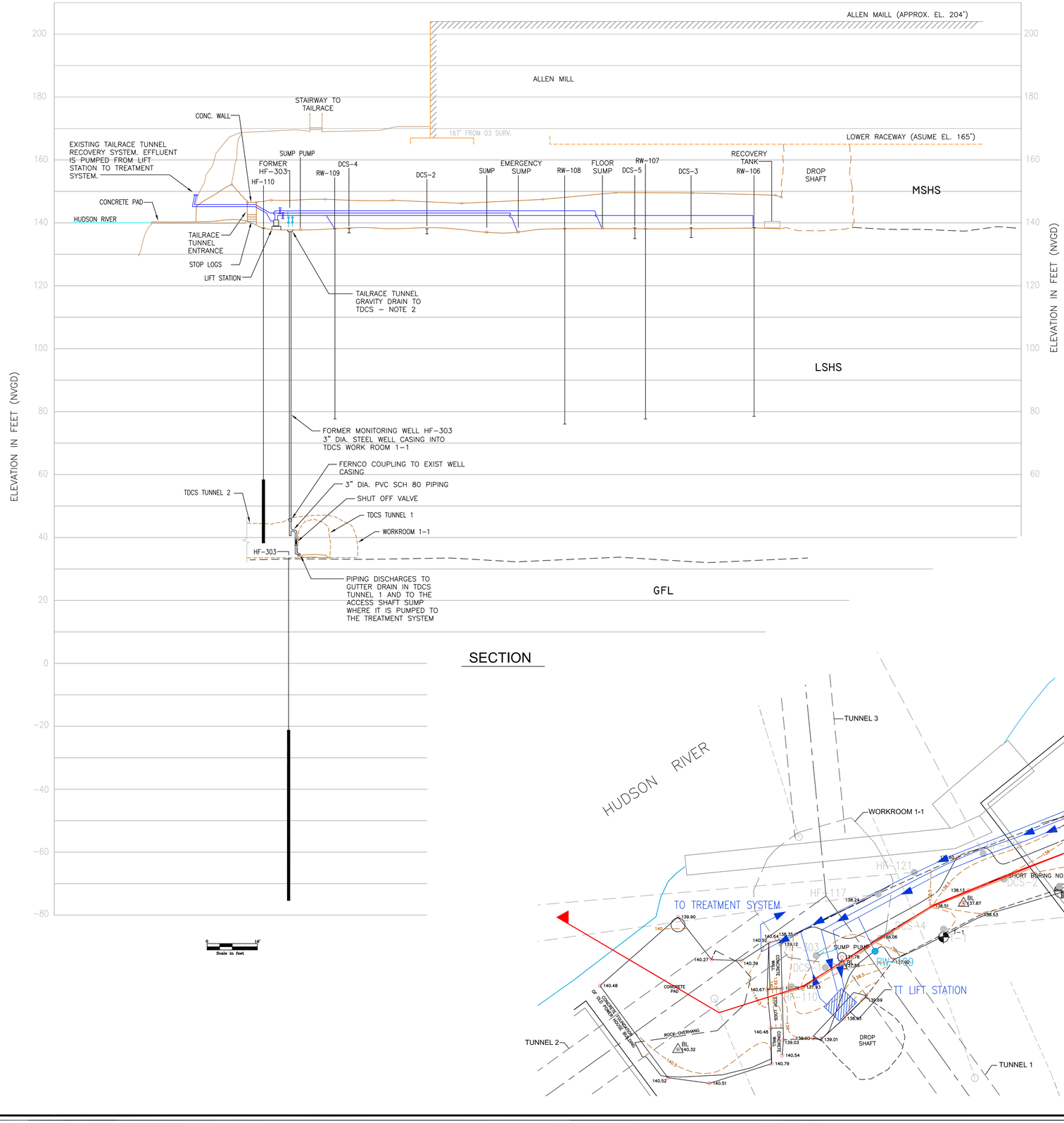
MONITORING WELL HF-303

Monitoring well HF-303 well was cased from the well head in the Allen Mill Tailrace Tunnel down to the top of the open interval (159.6 ft bgs) which is about 50 feet below the invert of Workroom 1-1. The 3-inch diameter steel casing passed through the excavation for Workroom 1-1 and was severed by drilling for the blasting. The potentiometric head in HF-303 was about 100 feet above the TDCS invert elevation and therefore water flowed out-of the well into the TDCS at an estimated rate of 30 gallons per minute for about one week. The well casing was initially sealed with a temporary mechanical packer that was replaced by a temporary pneumatic packer and ultimately the casing was sealed permanently by placing quickset (hydraulic cement) grout above the top of the packer. In addition, a vibrating-wire pressure transducer was installed on the top of the 1-inch diameter packer pipe and the signal cable incorporated into the TDCS piezometer automated data acquisition system in order to monitor the potentiometric head in the limestone beneath the TDCS.

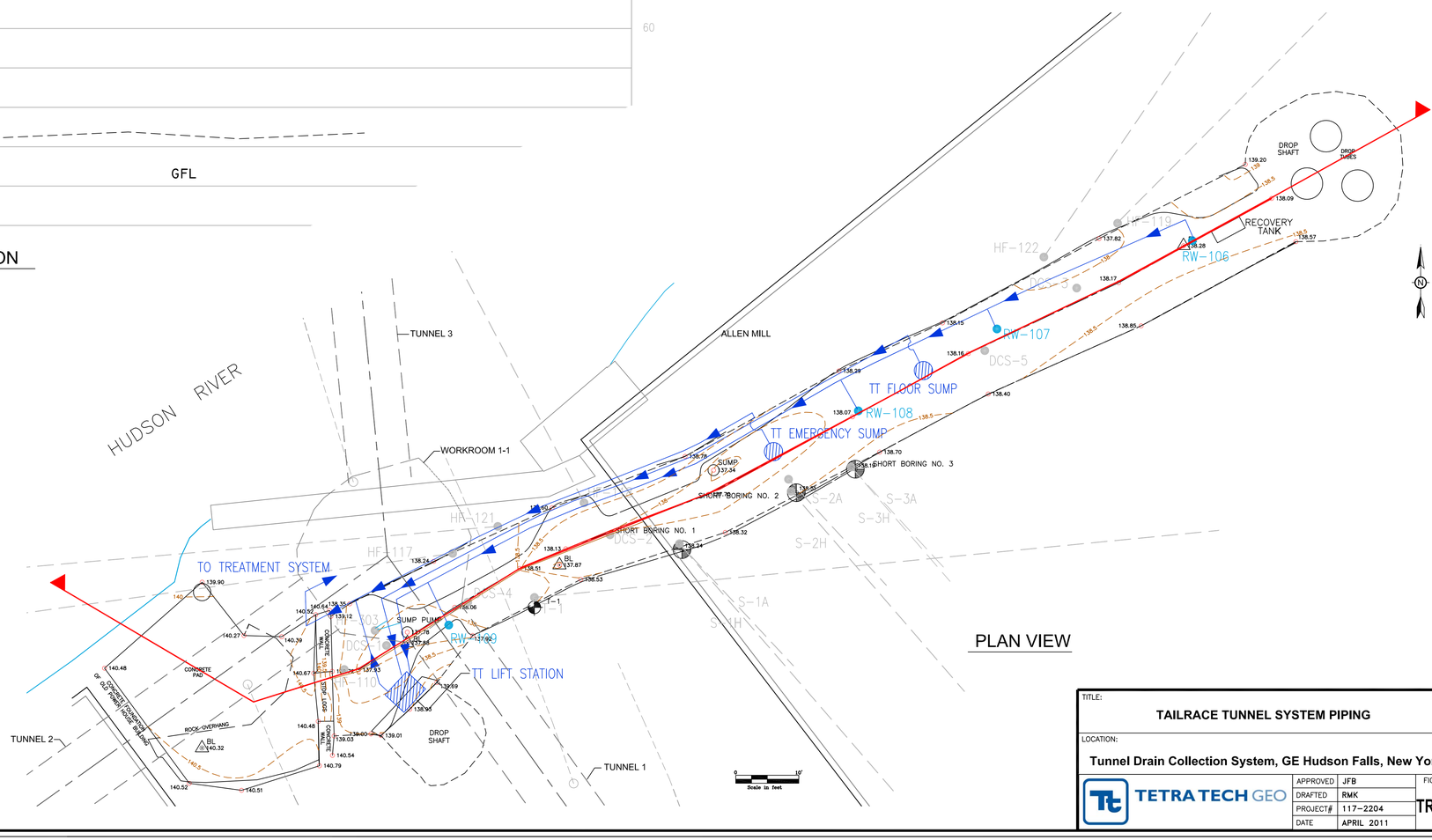
TAILRACE TUNNEL PIPING MODIFICATIONS

The portion of the HF-303 well casing above the TDCS to the Tailrace Tunnel was left open for future use as a conduit to provide for gravity drainage from the Tailrace Tunnel floor. In Workroom 1-1 permanent piping (3-inch diameter PVC Sch. 80) was connected to the 3-inch diameter steel well casing with a band coupling and fitted with a tee, for straight-through clean-out capability (plug installed in bottom of tee) and a ball valve and the piping was fastened to the concrete invert and outlet flow directed to the Tunnel 1 gutter drain that runs to the sump. On February 18, 2010, the well head for HF-303 in the floor of the tailrace tunnel was reconfigured

and the tunnel invert around the casing was excavated to create a low area for water to collect and drain to the TDCS by gravity. The wellhead consists of a 3-inch diameter casing with a 2-inch diameter steel mechanical pipe packer at the top of the well casing. The tailrace tunnel lift station pump was shut off and the flows from recovery wells RW-106, RW-107, RW-108, RW-109 and the Tailrace Tunnel emergency sump were re-directed (by opening and closing valves on existing piping) from the Tailrace Tunnel lift station sump to the tunnel invert near the new drain to the TDCS. The flow into the TDCS Tunnel 1 gutter was observed during the TDCS entry on February 23, 2010. Refer to Figure TRT-1 for details of the Tailrace Tunnel piping modifications and connection to the TDCS.



SECTION



PLAN VIEW

EXPLANATION

- DCS-3 — MONITORING WELL
- S-1A — ANGLED OR HORIZONTAL MONITORING WELL
- RW-108 — RECOVERY WELL
- EXISTING RECOVERY SYSTEM PIPING AND FLOW DIRECTION
- PROPOSED RECOVERY SYSTEM PIPING AND FLOW DIRECTION
- TAILRACE TUNNEL FLOOR CONTOURS (0.5 FT. INTERVAL)

NOTE:

1. TAILRACE TUNNEL PLAN BASED ON PLAN BY MFG, INC. TITLED "PLAN & SECTIONS, TAILRACE TUNNEL" DATED DEC. 1999
2. RECOVERY SYSTEM DISCHARGE PIPING DIRECTED TO DRAIN TO TDCS INCLUDE: RW-106, RW-107, RW-108, RW-109, AND FLOOR SUMP

TITLE:

TAILRACE TUNNEL SYSTEM PIPING

LOCATION:

Tunnel Drain Collection System, GE Hudson Falls, New York

TETRA TECH GEO

APPROVED	JFB
DRAFTED	RMK
PROJECT#	117-2204
DATE	APRIL 2011

FIGURE TRT-1