USEPA RAC – VESTAL, NEW YORK PROJECT SITE
Extension of Treatment Works Overflow Pipe
July 2004

By Tetra Tech FW, Inc.

1. Background

Tetra Tech FW, Inc. (TtFW) is currently providing long-term operation and maintenance support to the USEPA under the RAC Contract at the Vestal, New York Project Site (Site). At the present time, various parcels of the Vestal Site are owned by the Town of Vestal and by the NYSDPW (Owners).

At this pump and treat Site, groundwater is being extracted and treated primarily by air stripping in a water treatment system with a maximum capacity of 1150 gpm. The typical operating flow rate is 550 gpm. The treated water is discharged to surface water at locations proximal to the treatment system.

Once treated, the groundwater is pumped to the north through a 10-inch diameter cast iron outfall pipe, over a flood control berm, and into the Susquehanna River. A 12-inch diameter cast iron overflow pipe serves as a secondary discharge option for use during emergency and maintenance activities, and it drains by gravity to the south and into a flood management area, and subsequently into the Susquehanna River.

The 12-inch overflow pipe runs underground at an approximate 1% slope from the treatment facility to an existing headwall that is about 95-feet from the facility. After passing through the headwall, the pipe terminates in a flange fitting with a check valve assembly. The invert elevation of the check valve assembly is about +823'. From the check valve, discharged water flows into a riprap-lined swale and runs down-swale about 95 feet to the flood management area. Based on a certified topographic survey by Rettew Engineering & Surveying, P.C. in December 2003, the edge of water in the flood management area was about +813'- +814'. Based on flood management data provided by the USEPA, a flood event is called when the water elevation in the flood management area reaches +818' and flood management pumping is started when the water elevation approaches +820'. Based upon the results of a field investigation undertaken by TtFW, dense glacial till soils underlie the existing swale and the edge of existing riprap bordering the flood management area is at about elevation +817'.

2. Purpose of the Overflow Pipe Extension

The primary outfall pipe is expensive to use because it requires pumping, and the overflow (secondary) pipe is gravity drained. Therefore, there is an incentive to re-designate the pipes, with the 12-inch gravity drained pipe becoming the primary outfall and the 10-inch pumped pipe becoming the overflow (secondary) pipe. In addition, the Owners would like to see the overflow pipe discharge swale filled in because it interferes with mowing and other landscaping activities.

Based on discussions between the USEPA and the Owners, the existing overflow pipe is to be extended about 90' to the edge of the flood management area, is to terminate in a new headwall with a gravity check valve at the end of the pipe, and is to discharge into the riprap-lined swale that is a part of the flood management area. Upon completion of the extension work, the treatment facility operators will re-designate the extended pipe as the primary outfall and the existing outfall will become the overflow pipe. The net result will be reduction in power consumption, and elimination of the swale as an obstacle to mowing and landscaping the site.

3. Design Life and Phased Approach

The pipe extension is to have a design life of 20-years and is to conform with the existing design to the extent practical.

4. Pipe Extension Approach

Based on the USEPA comments received and the additional data recently obtained, the pipe extension approach has been slightly revised but is still essentially the same as the conceptual design approach that was previously provided.

The pipe extension approach is as follows:

1) Remove the existing gravity check valve from the end of the overflow pipe, remove and dispose of the existing headwall, cut-off of the existing pipe to a new fresh endpoint and if necessary fit with a special connection fitting, connect a new bell and spigot pipe to the existing pipe, extend the new pipe to the south to a new termination point at a new headwall location, install the new headwall, and install a new riprap-lined swale that drains to the flood management area swale.

2) Implement the pipe extension with 12-inch diameter cast iron bell and spigot pipe in a manner that will maintain conformance with the existing pipe design to the extent practical and that will minimize excavation and filling requirements. Reduce the pipe invert elevation immediately down-gradient of the existing headwall location by 5 feet, implement the reduction in invert elevation by installing two 45-degree elbow fittings with either thrust blocks or rod clamps to provide the minimal thrust restraint that is required, install the new pipe down the axis of the existing discharge swale from the invert elevation reduction location toward the new headwall location, and installation of the new pipe at a slope less than 2%. Excavate and grade the bottom of the existing swale to conform with the planned pipe slope, place a minimum 6-inch thickness of well-graded crushed stone bedding on the swale sub-grade, and install the pipe on the bedding with additional bedding material placed and chinked up to the pipe spring-line. After the bedding installation is complete, place well-graded granular imported backfill in lifts from the pipe spring-line up to final sub-grade as displayed on Drawing CD-1. Provide a minimum two-feet of soil cover over the pipe including topsoil and smooth out the final

contours below elevation +822'. Fine-grade, seed, fertilize, and mulch the ground surface in the construction area.

3) Implement the new headwall and swale installation in a manner that will maintain conformance with the existing pipe design to the extent practical and that will minimize excavation and filling requirements. Install the new headwall at a distance of about 5-10 feet from the edge of the riprap that bounds the flood management area swale. Use a pre-cast concrete headwall with integral footers and wing-wall, and install it on compacted NYDOT Type II stone sub-base material. Fit the end of the new pipe with a gravity check valve, and plan the discharge out onto a riprap-lined trapezoidal swale with consideration to the range of water level elevations that are anticipated in the flood management area. During the swale construction, place geotechnical fabric on the excavated floor of the swale, and place 6-inch median diameter riprap on the fabric and contour to the trapezoidal shape of the swale and contour to the adjacent ground surface and headwall structure. The bottom of swale is to be 4-6 feet in width, and the sides of the swale are to slope up and out from the swale bottom at a 1 on 2 slope. The riprap thickness is to be 18-inches for the base of the swale and 12-inches for the side slopes. The swale is to be extended to meet and conform to the flood management area riprap, and to convey the treated water effluent into the flood management area at low velocities.

5. Required Permits

No permits (e.g. Stream Encroachment, wetlands, local permits, etc.) will be obtained for this project. In addition, it is assumed that filling within a flood plain is not an issue.

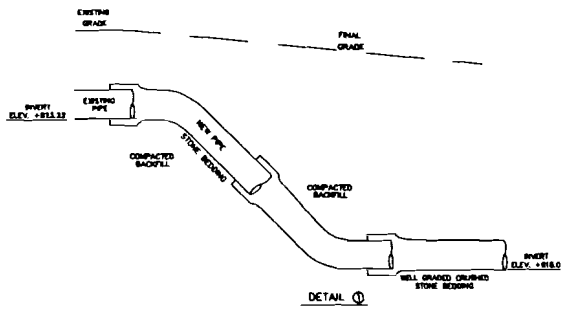
DRAFT
Vestal Well 1-1
Groundwater Treatment System Discharge
Contingency Plan

The Vestal Well 1-1 groundwater treatment system effluent is discharged to a swale located south of the treatment system location. The swale is part of a New York State (State) owned Flood Management Area. As such, during times of high water levels in the Susquehanna River, it may become necessary to re-route the treatment plant effluent to by-pass the Flood Management Area and discharge directly to the Susquehanna River. This Groundwater Treatment System Discharge Contingency Plan has been prepared to identify those entities that may be required to re-route treatment system effluent during periods when the Flood Management Area is used for flood control.

In the event of flooding, the State may require use of the area for flood control, requiring that the treatment system discharge outlet be closed. If this becomes necessary, system effluent will be re-routed so that the effluent is pumped over the dike and discharged directly into the Susquehana River. Upon notification by the State, the following entities, (in order of priority) will re-route the treatment plant effluent:

Priority	Entity	Name	Telephone Number
1	Vestal Water Supply Well treatment operator	Travis Shimer	(607)725-3079
2	Vestal Town Engineer	Gary Campo	(607)725-8514
3	Tetra Tech FW Project Manager	Heidi Roldan	(973)630-8197
4	NYS		

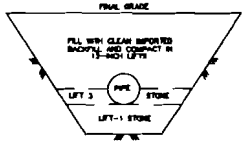
All of the above-listed entities have keys to the Vestal Water Supply treatment facility for access. Detailed instructions to re-route the effluent are posted on the treatment facility wall. All valves and switches are clearly labeled to designate which equipment are effected.



DETAIL ①

SCALE: 1"=3'-0"

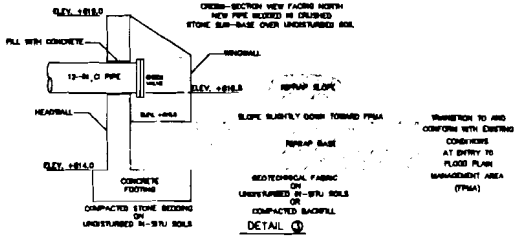
CROSS-SECTION VIEW FACING EAST TRANSITION FROM EXISTING TO NEW 12-INCH DIAMETER CI PIPE



DETAIL ②

SCALE: 1"=3'-0"

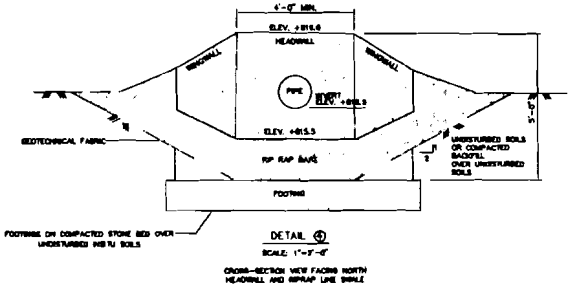
CROSS-SECTION VIEW FACING NORTH NEW PIPE BEDDED IN CRUSHED STONE SUB-BASE OVER UNDISTURBED SOIL



DETAIL ③

SCALE: 1"=3'-0"

CROSS-SECTION VIEW FACING EAST PIPE PENETRATION AT HEADWALL AND RIPRAP LINED SWALE



DETAIL ④

SCALE: 1"=3'-0"

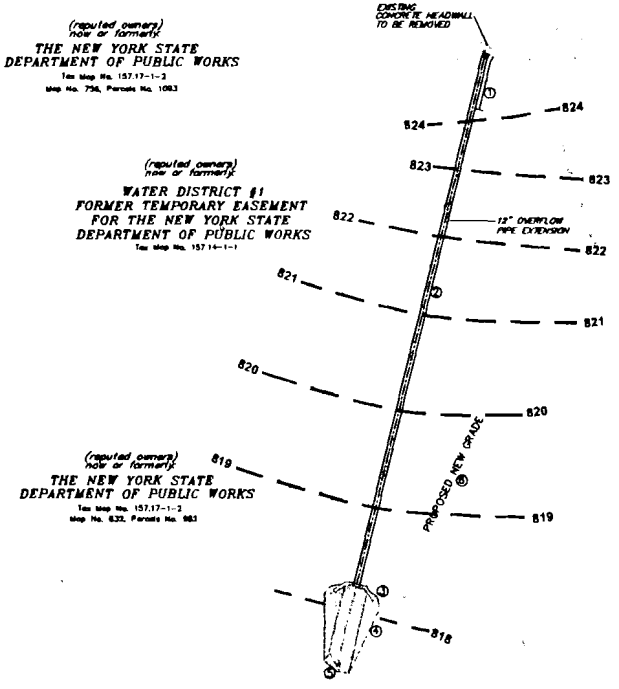
CROSS-SECTION VIEW FACING NORTH HEADWALL AND RIPRAP LINE SWALE

(reputed owners)
now or formerly
TOWN OF VESTAL
WATER DISTRICT #1
Tax Map No. 157.14-1-1

(reputed owners)
now or formerly
THE NEW YORK STATE
DEPARTMENT OF PUBLIC WORKS
Tax Map No. 157.17-1-2
Map No. 736, Parcels No. 1083

(reputed owners)
now or formerly
WATER DISTRICT #1
FORMER TEMPORARY EASEMENT
FOR THE NEW YORK STATE
DEPARTMENT OF PUBLIC WORKS
Tax Map No. 157.14-1-1

(reputed owners)
now or formerly
THE NEW YORK STATE
DEPARTMENT OF PUBLIC WORKS
Tax Map No. 157.17-1-2
Map No. 832, Parcels No. 983



PLAN VIEW OF PIPE EXTENSION ALIGNMENT

SCALE: 1"=10'-0"

SEE NOTE 1

LOCATION MAP

SCALE 1inch=2000ft.

NOTES:

1. BASE MAP ADAPTED FROM RETTEW ENGINEERING & SURVEYING, P.C. DRAWING NO.13 1987 01, DATED JANUARY 13, 2004, ENTITLED TOPOGRAPHIC SURVEY FOR TERRA TECH PW, INC. VESTAL WELL 1-1 SITE, TOWN OF VESTAL COUNTY OF BROOME, NEW YORK.
2. THIS DRAWING SHOULD BE READ AND EXAMINED TOGETHER WITH THE JULY 2004 VESTAL OVERFLOW PIPE EXTENSION NARRATIVE.
2. THE PIPE EXTENSION APPROACH WILL BE ADJUSTED TO DESIGN, FIELD, AND FLOOD MANAGEMENT AREA CONDITIONS PRIOR TO FINALIZATION.
4. ADDITIONAL FILL WILL BE REQUIRED TO IMPLEMENT THE REQUESTED GRADE CHANGES THAT ARE DISPLAYED BY THE ADJUSTED CONTOUR LINES.
5. THIS REVISION "A" DATED 7/16/04 IS ISSUED TO OBTAIN USEPA ACCEPTANCE OF THE PIPE EXTENSION APPROACH.

LEGEND:

① 12-INCH DIAMETER CAST IRON PIPE BEDDED IN COMPACTED CRUSHED SUBBASE STONE, TRANSITION FROM PIPE INVERT 813.33 TO PIPE INVERT 816.00 AND RE-DIRECTION DOWN CENTERLINE OF EXISTING SWALE. SEE DETAIL.

②12-INCH DIAMETER CI PIPE BEDDED IN COMPACTED CRUSHED SUBBASE STONE, SLOPE FROM INVERT 816.00 DOWN TO INVERT 814.50 AT NEW HEADWALL. SEE DETAIL.

③PIPE TERMINATION WITH CHECK VALVE AT OUTLET SIDE OF PRECAST CONCRETE HEADWALL. HEADWALL WITH INTEGRAL FOOTINGS AND WINGWALLS SET IN BED OF COMPACTED CRUSHED SUBBASE STONE OVER UNDISTURBED SUBGRADE SOILS. SEE DETAIL.

④TRAPEZOIDAL SWALE LINED OR ON COMPACTED BACKFILL OVER UNDISTURBED SUBGRADE SOILS WITH GEOTECHNICAL FABRIC ON FINE GRADED SUBGRADE, AND 6-INCH MEDIAN DIAMETER RIPRAP PLACED ON THE FABRIC. RIPRAP TO BE 18-INCHES THICK OR SWALE BOTTOM AND 12-INCHES THICK ON 1:3 SIDE SLOPES. SEE DETAIL.

⑤ NEW SWALE TO CONFORM WITH EXISTING RIPRAP AT ENTRY TO FLOOD MANAGEMENT AREA.

⑥ ELEVATION OF NEW FINAL GRADE AT COMPLETION OF THE WORK. REGRADING TO BE ACCOMPANIED BY PLACEMENT OF TOPSOIL, SEED, FERTILIZER AND MULCH.

—— PROPOSED NEW GRADE TO BE FINALIZED IN BID DOCUMENTS

EXISTING GRADE

PLAN VIEW GRAPHIC SCALE

DETAIL GRAPHIC SCALE

NOT FOR CONSTRUCTION

ENVIRONMENTAL PROTECTION AGENCY

VESTAL, NEW YORK LONG TERM MAINTENANCE

OVERFLOW PIPE EXTENSION

TETRA TECH

DEPT	DESIGNED	PREPARED	CHECKED	APPROVED	DATE
CE	R.A.	DSW	B.S.	V.P.	7/23/04

SCALE:	DRAWING NUMBER:	SH	OF	REV
AS NOTED	CD-1	1	1	A

FWD1R12.DWG

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