

**BETHPAGE WATER DISTRICT**  
**2012 ADDENDUM TO THE CAPITAL IMPROVEMENT PLAN**  
**MARCH 2012**

Recent increases in the volatile organic compounds (VOCs) and nitrates impacting several of the water supply wells of the Bethpage Water District (District) have required that treatment be provided to remove these contaminants. In July of 2009, on behalf of the Bethpage Water District, Holzmacher, McLendon & Murrell, P.C. (H2M) issued a Capital Improvement Plan (Plan), which described the work planned to address these and other infrastructure issues facing the District. In addition to providing the required treatment, the Plan also included provisions for the construction of new supply facilities, updating of the District's outdated control system and construction of new storage and garage facilities. In total, the capital cost of these projects presented in the Plan was \$15,500,000, of which the portion of the funding allocated through the Town of Oyster Bay was \$13,900,000.

Since the approval of the Plan, the District has implemented numerous improvements as outlined in the Plan, including the construction of treatment facilities for the removal of increasing VOCs from the water supply at its Plant 4 and 6 well sites, and construction of a treatment system for the reduction of nitrates from the water supply at Plant 1. Work at each of the plant sites has included various renovations, upgrades and new installations as required to address the degrading raw water quality of the aquifer from which the district draws its drinking water to ensure the delivery of the highest quality water to the Bethpage community. The District has also begun the preliminary design and approval process of constructing a new supply well at its newly acquired South Park Drive site, as well as the upgrade of its existing outdated analog communication and control system with a modern computer based supervisory control and data acquisition program (SCADA).

The District has taken significant strides towards the completion of the overall goals of the Capital Improvement Plan. However, during the design and construction phases of these projects, it became necessary to deviate from the scope of work outlined in the Plan due to the emergence of new water quality data in VOC contamination, unforeseen conditions, preparing for future water quality degradation, and planning for facility expansions and upgrades. Consequently, the anticipated costs of the projects will exceed the costs originally budgeted in the District's Capital Improvement Plan.

The following summaries describe the work performed or planned to be performed at each of the plant sites, as well as any necessary revised scope of each project and the associated costs.

**PLANT NO. 1:**

The Capital Improvement Plan budgeted \$3,900,000 for the construction of a new treatment facility to address the increasing levels of nitrates in Well Nos. 7 and 8. As nitrate concentrations approach the drinking water standard of 10 mg/l, the Nassau County Department of Health requires water suppliers to plan for nitrate reduction in distribution. The scope of work anticipated for this project and included in the Plan was as follows:

1. Site work improvements and modifications
2. Drainage improvements
3. Water main modifications
4. Sanitary sewer connection
5. Building foundations
6. Treatment building
7. Well and well pumps
8. Chemical treatment system
9. Nitrate treatment system
10. Salt storage and regeneration system
11. Piping systems
12. Instrumentation and control system
13. Building electrical and power system

During the detailed design and construction of the project, certain additions and alterations to the scope of the project were necessary to support the overall needs of the District. The changes to the scope of work resulted in an increase to the overall capital cost of the project. The changes in scope included the following work:

1. The size of the treatment system was increased by 25% to allow the District to treat more water and account for possible future increases in nitrate levels in the two supply wells beyond those initially contemplated. The District desired a factor of safety in treatment capacity so that no future modifications to the system would be necessary should nitrate concentrations become more excessive.
2. The Plan initially called for an exterior brine silo to be located adjacent to the new nitrate treatment building. For security, maintenance and aesthetic concerns, the District elected to install the silo within the new building. This required an increase in the footprint of the building to accommodate the interior space required for the storage silo.
3. The Plan recommended that the existing Well No. 9, which has not operated for almost 30 years, not be included in the treatment process due to excessive nitrate and VOC levels.

Initially, the well and well station was to remain. However, with the proximity of the well station to the new treatment building, the District was concerned about the space availability on the site and elected to include the abandonment of the well and demolition of the well station into the scope of the project.

4. Plant 1 is not only the site of the existing supply wells and new treatment system, but is also the site of the District administration building and garages. The District has future plans to renovate and improve its administrative facilities. For this site, there is a single electric service to the property that supplies power to all water and administrative facilities. With future plans in mind, the existing electric service and power distribution was inadequate to supply the new treatment facility, as well as future renovation work. Since a portion of the scope for this project was power distribution upgrades, it was more cost effective to upgrade the electric service and power distribution as part of this major project.

The added scope of work described above was at a total capital cost of approximately \$500,000. Therefore, the actual capital cost of the project upon completion will be approximately \$4,400,000, not the original bonded amount of \$3,900,000.

#### **PLANT NO. 4:**

The Capital Improvement Plan budgeted \$3,700,000 for the construction of a new air stripping treatment facility to address the increasing levels of VOCs threatening Well Nos. 4-1 and 4-2. As upgradient remedial investigations and studies associated with the broad Northrop Grumman / Navy contamination plume continue, information regarding groundwater VOC concentrations provided to the District prompted the need for treatment system upgrades in order to continue to provide drinking water free of any VOCs to the community. The scope of work anticipated for this project and included in the Plan was as follows:

1. Demolition of Well 4-2 pump station
2. Site work improvements and modifications
3. Drainage improvements
4. Water main modifications
5. Concrete clearwell
6. Building foundations
7. Treatment building
8. Well and well pumps
9. Chemical treatment system
10. Air stripping treatment system

11. Transfer and booster pumping system
12. Piping systems
13. Instrumentation and control system
14. Building electrical and power system

During the detailed design and construction of the project, certain additions and alterations to the scope of the project were necessary to support the overall needs of the District. Most notably, the emergence of new water quality data of the upgradient portion of the aquifer caused the addition of a secondary VOC treatment process to ensure VOC-free treated water quality. The changes to the scope of work resulted in an increase to the overall capital cost of the project. The changes in scope included the following work:

1. Upgrades to the VOC treatment system at Plant No. 4 were described in the Plan to address excessive VOC contamination upgradient of the wells at Plant No. 4. These contaminants emanate from the former Naval Weapons Industrial Reserve Plant and from the former Grumman settling ponds. Since the Plan was issued in July of 2009, additional groundwater investigations have shown the presence of VOC contaminant levels that would exceed the design for the VOC treatment system. In order to ensure that a non-detect treated effluent is delivered to the community, a GAC polishing system and treatment building was required to be added to the project.
2. During construction, the exterior walls of existing well house 4-1 were found to be structurally deficient and in danger of failure. Upon inspection by structural engineers, it was determined that the building was potentially unsafe and could suffer a major structural failure. Due to the age and condition of the building and building systems, the pump station was required to be demolished and reconstructed.
3. With the additional treatment process required for the site, additional electrical load was created on the existing electric service. For this site, there is a single electric service to the property that supplies power to all water facilities. The existing electric service and power distribution was inadequate to supply the new treatment facility and the additional treatment process. Therefore, a new electric service and main power distribution system was required for the site.
4. With the additional treatment process required for the site, which included a large treatment building, additional site work was required for overall site management. Additional site grading, drainage, piping, pavement and sidewalks were all required to accommodate the GAC treatment building.

The added scope of work described above was at a total capital cost of approximately \$3,600,000. Therefore, the actual capital cost of the project upon completion will be approximately \$7,300,000, not the original bonded amount of \$3,700,000.

**PLANT NO. 6:**

The Capital Improvement Plan budgeted \$2,450,000 for the construction of improvements to the existing air stripping treatment facility to address the increasing levels of VOCs threatening Well Nos. 6-1 and 6-2. As upgradient remedial investigations and studies associated with the broad Northrop Grumman / Navy contamination plume continue, information regarding groundwater VOC concentrations provided to the District, as well as increasing raw water VOC levels, prompted the need for treatment system upgrades in order to continue to provide drinking water free of any VOCs to the community. The scope of work anticipated for this project and included in the Plan was as follows:

1. Site work improvements and modifications
2. Drainage improvements
3. Water main modifications
4. Concrete tower foundation
5. Building modifications
6. Well and well pumps
7. Chemical treatment system
8. Air stripping tower system
9. Piping systems
10. Instrumentation and control system
11. Building electrical and power system

During the detailed design and construction of the project, certain additions and alterations to the scope of the project were necessary to support the overall needs of the District. Most notably, the emergence of new water quality data of the upgradient portion of the aquifer caused the addition of a secondary VOC treatment process to ensure VOC-free treated water quality. The changes to the scope of work resulted in an increase to the overall capital cost of the project. The changes in scope included the following work:

1. The original scope of work included an upgrade to the existing air stripping treatment system. However, raw water quality from the deeper supply well was trending significantly upward, with no data available to describe the water quality in the deeper aquifer zone upgradient of the supply well. The excessive concentrations and uncertainty led away from a simple air stripping system upgrade and towards a secondary treatment process of GAC

polishing. The GAC system would allow the existing air stripping system to “knock down” the high VOC concentrations for complete removal by the secondary system. The GAC system would also provide for a very low risk of system breakthrough, resulting in a high level of treatment reliability. The added scope included the GAC treatment system and treatment building, which was not contemplated in the Plan.

The added scope of work described above was at a total capital cost of approximately \$1,650,000. Therefore, the actual capital cost of the project upon completion will be approximately \$4,100,000, not the original bonded amount of \$2,450,000.

#### **SCADA SYSTEM:**

The Capital Improvement Plan budgeted \$650,000 for the decommissioning of the existing analog control and monitoring system due to age and outdated technology. The Plan called for its replacement with new digital computer based SCADA system capable of monitoring and controlling the operations of each remote facility from a common location. The new SCADA system will provide flexibility in control of the plants, increase operator response time and integrate with the District’s security system.

It is anticipated that the originally budgeted amount of \$650,000 as outlined in the Plan should be sufficient to complete the project.

#### **SOUTH PARK DRIVE WELL SITE:**

The Capital Improvement Plan budgeted \$3,300,000 for the construction of a new well facility at the newly acquired South Park Drive plant site, including the well, building, chemical treatment systems and site work. To date, the District has completed the engineering report and application and provided submissions to the Health Department and DEC. The design or construction has yet to proceed. Receipt of the necessary approvals and the preparation of design documents are expected to proceed within the next two months.

As part of the property acquisition from the New York State Office of Parks, Recreation and Historic Preservation, a cost of \$600,000 was required by the State for the 4 acre property easement. This is part of the capital cost of the project, but was not contemplated as part of the budget prepared for this project in the Plan.

Although the initial amount of \$3,300,000 requested for the construction of the South Park Drive well is sufficient to complete the project as described in the Capital Improvement Plan, the easement cost required by the State of \$600,000 brings the project cost from \$3,300,000 to \$3,900,000.

**GRUMMAN ROAD STORAGE FACILITY:**

The Capital Improvement Plan budgeted \$1,500,000 for the construction of a new pre-engineered storage garage facility at its Grumman Road site. To date, the District has not proceeded with any phase of design or construction regarding this project. The District anticipates that the project will proceed to design and construction in 2013.

It is anticipated that the budgeted amount of \$1,500,000 as outlined in the Plan should be sufficient to complete the project.

**SUMMARY:**

The necessary scope of work revisions, additions and changes to the projects listed in the July 2009 Capital Improvement Plan have resulted in budget increases for four of the six projects in the Plan. The projects will exceed the original budgeted amount of \$15,500,000 by an estimated \$6,350,000; bringing the new total to \$21,850,000 as summarized below:

Project	2009 Capital Improvement Plan Budget	2009 Funding Allocated from Town of Oyster Bay	2012 Capital Improvement Plan Addendum Budget	Difference from Town of Oyster Bay Funding
Plant 1	\$3,900,000	\$3,500,000	\$4,400,000	\$900,000
Plant 4	3,700,000	3,300,000	7,300,000	4,000,000
Plant 6	2,450,000	2,250,000	4,100,000	1,850,000
SCADA	650,000	600,000	650,000	50,000
South Park Drive	3,300,000	2,900,000	3,900,000	1,000,000
Grumman Road	1,500,000	1,350,000	1,500,000	150,000
<b>TOTALS</b>	<b>\$15,500,000</b>	<b>\$13,900,000</b>	<b>\$21,850,000</b>	<b>\$7,950,000</b>

We recommend that the Board endorse this amendment to the Capital Improvement Plan by resolution and forward said resolution to the Town of Oyster Bay to request an increase in the original bond amount of \$13,900,000 to the new amount of \$21,850,000.