



## INTERDEPARTMENTAL COMMUNICATION

Acton Board of Health - Telephone 978-264-9634 - Fax 978-264-9630

August 22, 2003

TO: Don Johnson, Town Manager  
John Murray, Assistant Town Manager ✓

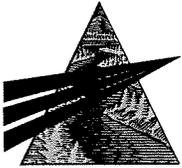
FROM: Doug Halley, Health Director

SUBJECT: Feasibility Study for Sewer System Expansion  
Powder Mill Plaza/ Acton Ford

Attached please find the Draft Letter Report from Woodard & Curran on the Feasibility Study for Sewer Expansion to the Powdermill Plaza and Acton Ford. This study indicates that the project is feasible and recommends proceeding forward with it. Woodard & Curran's recommendations are as follows:

1. The Town should meet with DEP to present the justification for expanding the sewer collection system without exceeding the permitted average daily flow or limiting any of the service connections within the previously approved sewer service area.
2. The Town should meet with the Powdermill Plaza and Acton Ford to discuss the conclusions from this report and determine a plan and schedule for moving forward. Included within the plan should be cost sharing amongst the commercial properties and fees to be collected by the Town. The limits of private versus public sewer infrastructure and expected easements should also be discussed.
3. The Town should formally contact the other commercial properties in the area to determine the probability of their future connection into the pumping station. This data would be used in the pumping station design, as well as, financial models for capital outlay on behalf of the Powdermill Plaza and Acton Ford.
4. All partners should discuss the schedule and timing of the project in order to determine when any design work should be initiated. For example season sensitive work, such as wetland identification may need to be initiated before the winter.

I have reviewed the report and agree with it's findings. It would be my recommendation that we proceed forward with Woodard & Curran's recommendations as soon as possible. Please let me know how you would like to proceed.



August 21, 2003

AUG 22 2003

Doug Halley, Director of Health  
Board of Health  
Town of Acton  
472 Main Street  
Acton, MA 01720

RE: DRAFT Letter Report  
Feasibility Study for Sewer System Expansion  
Acton, Massachusetts

Dear Mr. Halley:

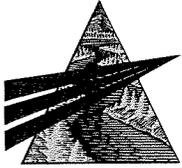
We are pleased to submit this DRAFT Letter Report on the Feasibility Study for adding the commercial properties located at the intersection of High Street and Massachusetts Avenue (Powdermill Plaza and Acton Ford, but not the Concord Rental Center) to the Acton sewer collection system. This report does not detail every required task, nor does it guarantee the commercial properties may join the sewer collection system, but it identifies those issues that Woodard & Curran (W&C) sees as the key concerns and tasks to be considered if the commercial properties are to connect to the sewer collection system. This study entails the preliminary assessment into the technical, regulatory, and construction components required for sewerage these commercial properties.

### **Technical Issues**

W&C has reviewed the expected average daily and peak daily flows from the commercial properties. We have reviewed Powdermill Plaza's wastewater treatment facility (WWTF) flow and waste characteristics data from February 2000 to March 2003 and summarized this information in the table below. We have also reviewed Acton Ford's water meter readings for the past 3 years and assumed their waste quality is typical for a sanitary sewer collection.

The Powdermill Plaza average daily flow based upon the data is 1,750 gallons per day (gpd) while the existing Powdermill Plaza WWTF has a Massachusetts Department of Environmental Protection (MADEP) discharge permit limit of 12,000 gpd. The actual peak daily flow according to the data is approximately 2,800 gpd while the existing Powdermill Plaza WWTF is permitted for 24,000 gpd peak daily flow. The flows at the WWTF are significantly lower than the permitted limits and we have confirmed with the Powdermill Plaza's management that the existing water use is representative of the maximum future usage since no expansion or use change is anticipated. Due to this fact and the historic peak daily flow of 2,800 gpd, we have assumed a future peak daily flow of 4,000 gpd for the purposes of discussion and conceptual design.

Acton Ford's water consumption, and subsequent assumed wastewater generation, has been averaged between 600 and 700 gpd over the past 3 years based upon water meter records. Assuming the facility does not expand, an estimated peak daily flow of 1,000 gpd is reasonable for the purposes of discussion and conceptual design.



The waste characteristics for Powdermill Plaza, based upon the historic monthly data, are within typical ranges. The waste characteristics from Acton Ford are expected to be typical of standard sanitary waste since the Town of Acton does not allow industrial or process waste, such as oil, solvent, or lubricants, into the Acton sewer system. Therefore, existing oil/water separators and floor drain systems at both Acton Ford and Powdermill Plaza are assumed to be properly maintained to separate out these products.

A summary of the influent flows and loadings based upon this analysis at the Powdermill Plaza and at Acton Ford are as follows:

	<b>Powdermill Plaza</b>	<b>Acton Ford</b>
Current Average Daily Flow	1,750 gpd	680 gpd
Historic Peak Daily Flow	2,800 gpd	825 gpd
Estimated Future Peak Daily Flow	4,000 gpd	1,000 gpd
Average Biochemical Oxygen Demand (BOD)	922 mg/l	300 mg/l*
Average Total Suspended Solids (TSS)	244 mg/l	300 mg/l*

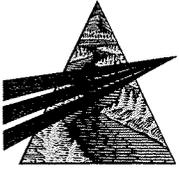
\*Based upon typical value due to site specific information not being available.

The Acton WWTF is a 250,000 gpd average daily flow Sequence Batch Reactor (SBR) facility, with a 500,000 gpd peak daily flow permit limitation via Groundwater Discharge Permit GW#0-656-T#W003143. The specific discharge limitations of the permit are as follows:

- Biochemical Oxygen Demand (BOD), 5 Day, 20 C = 20 mg/l
- Total Suspended Solids (TSS)= 20 mg/l
- Oil and Grease = 15 mg/l
- Fecal Coliform = 200 org/100 ml
- Total Nitrate-Nitrogen = 10 mg/l
- Total Nitrogen (TKN + NO<sub>3</sub> + NO<sub>2</sub>) = 10 mg/l
- Total Phosphorus
  - 0.5 mg/l maximum daily limit until facility reaches 125,000 ADF or March 1, 2004, whichever is sooner;
  - thereafter, 0.2 mg/l average monthly limit with a 0.5 mg/l maximum daily limit.

In order to meet these effluent characteristics the Acton WWTF contains the following process capabilities and equipment:

- Influent screening
- Grit removal
- SBRs and associated components
  - Chemical Feed Systems
  - Aeration System
  - Pre and Post -Equalization



- Filtration via cloth media
- Ultraviolet (UV) Disinfection
- Sludge handling and disposal
- Process Instrumentation and Controls via a SCADA system

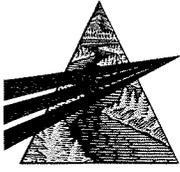
Effluent from the Acton WWTF is pumped to one of six rapid infiltration basins (RIBs) located adjacent to the facility on Adams Street near High Street (just north of Acton Ford). Discharge from the facility is controlled via a flow distribution vault on the RIBs site where the effluent is routed to the “active” basin.

The Acton WWTF has been operating since February 2002. The facility services approximately 15% of the Town of Acton (the Town), which equates to approximately 920 residences. The flow for those 920 residences, based upon Title 5 estimates prepared during the design and permitting of the WWTF and sewer collection system, was 250,000 gpd. It is this 250,000 gpd average daily flow limit that defined the extent of the sewer collection area and the Town was not permitted to add more than the 920 connections due to the potential of allowing more than 250,000 gpd average flow into the facility.

Since the WWTF started-up in February 2002 and the actual flows have been less than the Title 5 estimated flow. In reality, now that approximately 330 services have been connected, it is clear that the Title 5 estimated flows are very conservative. Figure A compares the expected flows based upon the Town’s database of users connected as of June 30, 2003 versus the actual average daily flow being received at the facility on a week-by-week basis since February 2002. As illustrated in Figure A, the expected flows, as based upon Title 5 estimates, are conservative and actual flows have been 25 to 40% lower. For example, in the month of June 2003 the estimated Title 5 flow was 162,000 gpd while the actual daily flows from ranged from 74,190 gpd to 115,540 gpd with an average daily flow of 89,200 gpd for the month.

In summary, the limiting factor for the number of connections to the Acton WWTF is the facility capacity of 250,000 gpd which equates to 920 connections based upon conservative Title 5 estimates. However, actual numbers at this time illustrate that approximately 60,000 gpd of capacity exists. This 60,000 gpd or a portion thereof could be utilized by new connections without the potential of allowing more than 250,000 gpd average daily flow into the facility or preventing any of the preexisting 920 approved service connections from flowing into the system.

The combined average daily flow of Powdermill Plaza and Acton Ford, based on current flows, is 2,610 gpd. The estimated combined future peak daily flow is 5,000 gpd. Both of these flows are within the 60,000 gpd available capacity of the facility. Based upon this analysis, sufficient capacity exists at the Acton WWTF to accept average and peak daily flows from Powdermill Plaza and Acton Ford.



Currently the influent loadings and effluent characteristics at the Acton WWTF are within the following ranges:

	<b>Typical Influent Range</b>	<b>Average Influent Concentration</b>	<b>Permitted Effluent Concentration</b>	<b>Average Effluent Concentration</b>
BOD (mg/l)	240 – 310	250	30 or below	Below 5
TSS (mg/l)	70 – 260	200	30 or below	Below 5
Ammonia Nitrogen (mg/l)	15 – 50	40	10 or below	Below 5
Phosphorus (mg/l)	5 – 10	7	0.5 or below	Below 0.2

The potential impact of the Powdermill Plaza and Acton Ford loading on the Acton WWTF are not significant. The facility is operating well within its design parameters and is consistently meeting permit limits for effluent quality. The additional BOD and TSS will not adversely affect the WWTFs ability to meet discharge permit limitations in the future. In fact, the increased BOD load is expected to aid the biological phosphorus removal process.

### Conveyance System

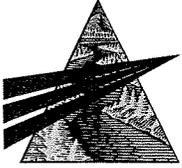
Three conveyance system options were conceptually reviewed prior to forming a recommendation for the connection of the two commercial properties. Each of the three options had advantages and challenges, and each had factors that were more beneficial to either commercial property. The alternatives were reviewed for factors making a best fit scenario. The screening criteria for reviewing alternatives include the following:

- Need for land ownership versus easements or land purchase;
- Need to remove and replace existing sewers and to bypass pump wastewater to keep the Powdermill Plaza and Acton Ford open during construction;
- Ease of constructability without impacting business operation (vehicle and pedestrian traffic, etc.) of the plaza or Acton Ford;
- Maximum use of existing infrastructure to reduce possible capital costs;
- Maximum future use by others (ease in other commercial properties in the area connecting)
- Meeting Town and industry standards for pumping and conveyance systems (Figure B is a conceptual sketch of the Town of Acton standard submersible pumping station)

A brief summary of each of the three scenarios for collection and conveyance systems are detailed below.

### Scenario 1: Converting the existing Powdermill Plaza WWTF into a Pumping Station

This scenario consist of converting the existing tankage and pumps at the Powdermill Plaza WWTF into a pumping station while adding infrastructure to allow Acton Ford to flow to the existing Powdermill Plaza collection system and a force main to connect the pumping station to the Acton sewer collection system on Adams Street.



One key advantage to converting the existing Powdermill Plaza WWTF into a pumping station is that all of the existing sewers from the plaza already flow to the WWTF therefore no existing sewers would need to be removed and replaced at the plaza. Another key advantage is the existence of 3 phase power and a telephone service connection which may be utilized. However upon review of the existing WWTF equipment and layout it is clear that the existing wetwell outside the facility (in front of the access door) does not have sufficient capacity to store the required volume of incoming waste nor are the existing pumps (Myers WG20 pumps) sufficient to pump the wastewater up to Adams Street. These are both strong disadvantages. Although Powdermill Plaza owns the property and therefore no land acquisition is necessary and easements are assumed to be easily obtained, a majority of the equipment and tankage inside the Powdermill Plaza WWTF is not useable for the purposes of creating a pumping station.

If the Powdermill Plaza WWTF were to be converted into a pumping station, Acton Ford would be required to convey their wastewater flow into the plaza gravity flow system (most likely behind Dunkin' Donuts) or to pump into the proposed force main in High Street. The more appropriate option appears to be for Acton Ford to pump into the plaza gravity flow system because it will allow Acton Ford to utilize lower power pumps and lower discharge pressure pumps. It will also allow Acton Ford the ability to perform this connection to the sewer system after the plaza has completed their conversion as opposed to concurrently.

Due to the inability to reuse the tankage and pumps at the Powdermill Plaza WWTF, this scenario is ~~now~~<sup>+</sup> recommended and a cost analysis was not performed.

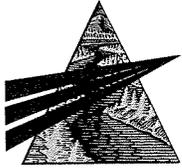
#### Scenario 2: Create a new pumping station on High Street near the Powdermill Plaza driveway

This scenario consists of building a new submersible type pumping station that meets the Town standards, on the west side of Powdermill Plaza in the grass area adjacent to the plaza driveway on High Street and to have Acton Ford flow across High Street via a gravity collection system. Powdermill Plaza shall maintain their existing influent pumps and wetwell outside their facility (in front of the access door) and pump through a new 2-inch force main into the pumping station. The pumping station would then pump the wastewater up High Street to Adams Street. Figure C illustrates Scenario 2.

The advantages of this scenario include reducing impacts to plaza operation and traffic flow, since it will not need to remove and relay sewer pipes, eliminating the need for the plaza to install a by-pass pump wastewater during construction, allowing Acton Ford to have a gravity service connection and eliminate the need to pump effluent into the septic field, and the pumping station location is more accessible to future users in the area.

The new pumping station may be located in the grass strip at the plaza driveway just outside the 100 foot (ft.) jurisdiction of the Acton Conservation Commission. It appears that Acton Ford could reach this station via gravity flow by crossing under High Street with an 8-inch service pipe.

A business decision that must be made by Powdermill Plaza is whether to keep the existing influent pumping station at their WWTF and reroute the force main to the new pumping station. The existing Myers WG20 pumps have sufficient capability to pump through 900 feet (ft.) of 2-inch force main and currently have a control and alarm system inside the Powdermill Plaza WWTF which must be maintained or relocated. However, the wetwell does not meet Acton's industry standards for pumping station



storage therefore; the Town of Acton may not chose to take over the responsibility and maintenance for these influents pumps. If Powdermill Plaza wanted to flow to the new pumping station by Gravity, approximately 800 ft. of existing sewer collection system at Powdermill Plaza would have to be reinstalled to flow away from the plaza WWTF toward High Street. Most of this construction would be behind the plaza with the exception of the sewer service from the remote building (currently an eye doctors office) which may need to be rerouted across the parking lot to minimize elevation impacts on the rerouted sewers or to have an individual grinder pumping station installed.

Another key advantage to this pumping station location is that it is more accessible to the remaining Town of Acton properties in this section of Town. The town lines with Concord and Maynard limit the number Acton properties in the area and many properties would be required to flow or pump under the Assabet River on Powdermill Road, however the location on High Street is significantly more accessible than behind Powdermill Plaza at the existing WWTF.

Scenario 2 Conceptual Cost Estimate

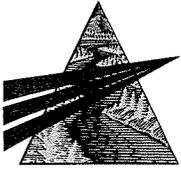
The Design and Construction component of the project has been subdivided into three segments for the conceptual cost estimate:

1. The Powdermill Plaza property service effort;
2. Acton Ford gravity service and pump & tank decommissioning effort.
3. The pumping station, force main and High Street effort;

Figure C illustrates the Scenario 2 conceptual collection and conveyance system.

Program level costs for this scenario are as follows:

<u>Direct Costs</u>	<b>Conceptual Unit Cost</b>	<b>Estimated Quantity</b>	<b>Conceptual Extended Cost</b>
Powdermill Plaza Property effort			
Force Main (LF)	\$25	900	\$22,500
Special Manholes (Ea)	\$4,000	1	\$4,000
Trench Paving (SY)	\$8	600	\$5,000
Decommission Existing WWTF & Reuse of Influent Pumps & Wetwell	\$10,000	1	\$10,000
Powdermill Plaza Property		Subtotal:	\$41,500
Acton Ford effort			
Gravity Service Connection (LF)	\$60	100	\$6,000
Manholes (Ea)	\$3,000	1	\$3,000
Decommission Existing Septic System	\$3,000	1	\$3,000
Acton Ford Property		Subtotal:	\$12,000
High Street Effort			
Pumping Station (Ea)	\$160,000	1	\$160,000
Force Main (LF)	\$30	1,400	\$42,000
Trench Paving (SY)	\$8	1,200	\$9,500
Overlay Paving (SY)	\$4	7,500	\$30,000
Remove & Relay Watermain (LF)	\$80	50	\$4,000



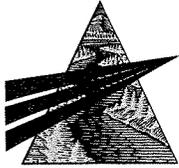
<u>Direct Costs</u>	Conceptual Unit Cost	Estimated Quantity	Conceptual Extended Cost
Remove & Relay Drain Pipe (LF)	\$30	35	\$1,000
	High Street Effort	Subtotal:	\$246,500
<b>Direct Construction Costs</b>			<b>Subtotal:</b>
			<b>\$300,000</b>
 <u>Indirect Costs</u>			
Permitting, Design & Construction Engineering (30%)			\$90,000
Administration (Police, Financing, Legal, & Town fees) (5%)			\$15,000
Land Acquisition & Easements (0%)			\$0
Contingency (15%)			\$45,000
<b>Indirect Costs</b>			<b>Subtotal:</b>
			<b>\$150,000</b>
<b>Scenario 2 Total Conceptual Project Cost:</b>			<b>\$450,000</b>

Assumptions on Scenario 2 conceptual costs

- The pumping station \$160,000 cost estimate is based upon bid costs for Town of Acton's Pumping Station #6 and #8 and the station have future capacity for other properties in the area but a starting peak daily flow of 5,000 gpd. Conceptual costs should be revised once actual equipment is selected. For example, currently undetermined equipment which will impact cost include permanent auxiliary power generator, odor control pumps and manner of installation (public bid with state wages or private installation)
- Pumping station wet well shall be set at a depth to allow Acton Ford to be serviced by gravity, and potential future Powdermill Plaza gravity service.
- Powdermill Plaza shall maintain private operation of their existing influent pumping station at the existing WWTF and only inactive processes at the WWTF shall be decommissioned.
- Buried pipe installation, such as sewers and force mains, assume no ledge shall be encountered on the selected route.
- On High Street 50 LF of water main relocation and 35 LF of drainage pipe relocation have been included in the estimates to account for the possibility of encountering these existing utilities during construction.

Scenario 3: Create a New Pumping Station Adjacent to the Existing Powdermill Plaza WWTF

This scenario consist of building a new submersible type pumping station that meets the Town standards, next to the existing Powdermill Plaza WWTF and to have Acton Ford pump across High Street into the plaza gravity collection system. The pumping station would pump into a 3 or 4-inch force main back across the Powdermill Plaza property and up High Street to Adams Street. Figure D illustrates Scenario 3.



The advantages of this scenario include minimizing impacts to plaza operation and traffic flow, no need to remove and relay existing sewer pipes, eliminating the need for the plaza to install a by-pass pump wastewater during construction, since the new pumping station influent pipe can be connected in less than 1 day, and reusing of the existing power and telephone connections. It will also allow the reuse of a portion of the existing WWTF building for storage of an auxiliary power generator and chemical feed systems for odor control, if required.

The disadvantages of this scenario include the fact that the location may limit other properties in the area from reaching the pumping station via gravity and it may require other properties to obtain easement from Powdermill Plaza for access. Another disadvantage is that Acton Ford must pump their existing wastewater to the Powdermill Plaza gravity system and heavily modify their existing system.

Acton Ford has a relatively new septic system consisting of a 2,500 gallon septic tank, a 1,500 pump chamber containing two Myers SRM4 effluent pumps, and a leaching field that receives the discharge from the Myers pumps. Currently Acton Ford wastewater flows by gravity to the septic tank.

A pumping station behind Powdermill Plaza will require Acton Ford to change the existing pumps to grinder type pumps and modify the tanks. Acton Ford would be required to change their existing Myers SRM 4 pumps with Myers grinder pumps, or equal, because these pumps can grind and pump solids whereas the existing Myers SRM4 pumps pump effluent (liquid) only. For suitable long term storage, the 2,500 gallon septic tank and 1,500 gallon pump chamber may be combined by adding two connection pipes of 12 to 18-inch diameter at the invert (bottom) of both tanks. This would allow both tanks to act a single 4,000 gallon tank and allow solids to flow toward the proposed grinder pumps located in the sump of the pump chamber (see Figure E for a conceptual sketch).

If the existing Myers SRM4 pumps are replaced with new grinder pumps only the 2-inch discharge piping exiting the effluent chamber may be reused. Grinder pumps that macerate any solids prior to pumping have larger power requirements and typically discharge into 1 to 1 ¼-inch piping (since the solids have been macerated) therefore the discharge piping from the pump will have to increase from 1 or 1 ¼ inch diameter pipe to the 2 inch piping currently existing the effluent tank. Grinder pumps also typically have a different configuration, or “footprint”, than effluent pumps therefore a majority of the existing pump equipment mounted on the floor of the pump chamber would most likely have to be replaced.

The 2-inch force main currently exiting the effluent tank may be rerouted to cross High Street and a portion of the Powdermill Plaza parking lot to an existing manhole behind Dunkin’ Donuts. At this point the 2-inch diameter force main can discharge and the Acton Ford wastewater will flow by gravity to the proposed Powdermill Plaza pumping station.

### Scenario 3 Conceptual Cost Estimate

The Design and Construction component of the project has been subdivided into three segments for the conceptual cost estimate:

1. The Powdermill Plaza property service effort;
2. Acton Ford force main and pump and tank modification effort.
3. The pumping station, force main and High Street effort;

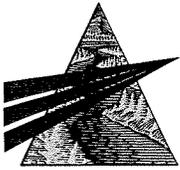


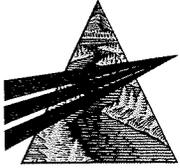
Figure D illustrates the Scenario 3 conceptual collection and conveyance system.

Program level costs for this scenario are as follows:

<u>Direct Costs</u>	<b>Conceptual Unit Cost</b>	<b>Estimated Quantity</b>	<b>Conceptual Extended Cost</b>
Powdermill Plaza Property effort			
Gravity Sewer (LF)	\$60	50	\$3,000
Manholes (Ea)	\$3,000	1	\$3,000
Trench Paving (SY)	\$8	60	\$500
Decommission Existing WWTF	\$15,000	1	\$15,000
Powdermill Plaza Property Service		Subtotal:	\$21,500
Acton Ford effort			
New Pumps and Reconfigured Tanks	\$20,000	1	\$20,000
Small diameter force main	\$15	300	\$4,500
Acton Ford Property		Subtotal:	\$24,500
High Street Effort			
Pumping Station (Ea)	\$160,000	1	\$160,000
Force Main (LF)	\$30	2,200	\$66,000
Trench Paving (SY)	\$8	2,000	\$16,000
Overlay Paving (SY)	\$4	7,000	\$28,000
Remove & Relay Watermain (LF)	\$80	50	\$4,000
Remove & Relay Drain Pipe (LF)	\$30	35	\$1,000
High Street Effort		Subtotal:	\$275,500
<b>Direct Construction Costs</b>		<b>Subtotal:</b>	<b>\$321,000</b>
 <u>Indirect Costs</u>			
Permitting, Design & Construction Engineering (30%)			\$96,500
Administration (Police, Financing, Legal, & Town fees) (5%)			\$16,000
Land Acquisition & Easements (0%)			\$0
Contingency (15%)			\$48,500
<b>Indirect Costs</b>		<b>Subtotal:</b>	<b>\$161,000</b>
<b>Scenario 3 Total Conceptual Project Cost:</b>			<b>\$482,000</b>

Assumptions on Scenario 3 conceptual costs

- The pumping station \$160,000 cost estimate is based upon bid costs for Town of Acton's Pumping Station #6 and #8 and the station have future capacity for other properties in the area but a starting peak daily flow of 5,000 gpd. Conceptual costs should be revised once actual equipment is selected. For example, currently undetermined equipment which will impact cost include permanent auxiliary power generator, odor control pumps and manner of installation (public bid with state wages or private installation)



- The Acton Ford 2-inch diameter force main will be in the same trench from High Street to behind Dunkin' Donuts as the Powdermill Plaza force main and left capped and dry. Acton Ford then will finish the connection at High Street and at an existing manhole behind Powdermill Plaza at some future date.
- Buried pipe installations, such as sewers and force mains, assume no ledge shall be encountered on the selected route.
- On High Street 50 LF of water main relocation and 35 LF of drainage pipe relocation have been included in the estimates to account for the possibility of encountering these existing utilities.

### **Recommended Conceptual Collection and Conveyance System: Scenario 2**

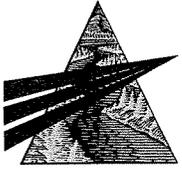
Scenario 2 is the recommended alternative as a best fit for all stakeholders in the process. The factors that were advantageous and made Scenario 2 the recommendation are:

- Lower conceptual total project cost;
- Minimize impacts to the Powdermill Plaza and Acton Ford operation and traffic flow;
- Eliminates the need for the Powdermill Plaza or Acton Ford to install a by-pass pump wastewater during construction;
- Acton Ford has a gravity service connection and eliminates the need to pump effluent into the septic field;
- Achieved town of Acton and industry standards;
- The pumping station location is more accessible to future users in the area.

The recommended pumping station is a submersible type similar to the existing Town of Acton Pumping Station #6 on Railroad Street. The pumping station would consist of the below listed components and equipment and Figure B is a typical pumping station layout:

- 8 ft. diameter concrete wetwell for storage of wastewater;
- Two (2) submersible pumps within the wetwell; 40-50 gpm for this application;
- Masonry block building to house electrical system and process controls
- Auxiliary generator (internal to building, external on a slab with enclosure or pigtail connection for portable power) with appropriate transfer switch;
- Ultrasonic level controls and secondary mechanical float bypass system for pump operation;
- Process instrumentation and controls via a SCADA system utilizing the Town's I-Net system and a dedicated line connection to the Town WWTF.

The detailed design of the pumping station must factor existing flows from Powdermill Plaza and Acton Ford with future flows to the station. Given the estimated future peak daily flow of 5,000 gpd and the possible peak daily flows from the remaining properties in the area, design considerations such as a partitioned wetwell and two separate sized pumps may have to be considered during the detailed design to ensure proper operation.



## Regulatory Components

A key factor in the potential connection of these commercial properties to the Acton WWTF is the required regulatory approvals to authorize the connection, the construction, and the decommissioning of the existing WWTF. The regulatory components have been divided into state/federal and Town of Acton discussions.

### State & Federal Permits

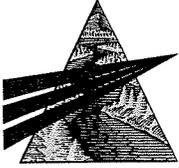
A MADEP Bureau of Resource Protection Water Pollution Control Sewer Connection/Extension permit shall be required. The expected permit shall be the MADEP Minor Sewer Extension/Sewer Connection with Pump Station (MADEP code MADEP WP 14). This permit is applicable for sewer discharges where the extension is under 2,500 ft. and where flows are less than 50,000 gpd, or where there is a connection with a pumping station. This proposed project satisfies all three of these criteria. The permit application consists of a MADEP form to be completed by the Engineer and signed by both of the Owners and Town. In addition, the permit application requires the submittal of 95% complete design drawings for the pumping station and piping system. The permit application fee is currently \$435 and the approval MADEP published schedule is as follows, although in our experience we have found approval typically requires less time:

<u>Activity</u>	<u>Max Duration</u>
Administrative Comment Period	30 days
Technical review #1	90 days
Technical review #2 (if necessary )	90 days
Public Comment Period	<u>90 days</u>
Total Duration*	300 days

\* In our experience with pumping stations of this size and complexity we have achieved permit approvals in as little as 90 days. 300 days is not a typical approval duration.

The key challenge to the Sewer Connection/Extension Permit shall be giving a clear explanation of the existing capacity at the Acton WWTF and justifying why the commercial properties should be allowed to connect. The Town will have to document that by allowing the commercial properties to connect, they are not precluding residential users who are currently in the sewer collection area but who have yet to connect, from someday connecting. The Town must also establish the available capacity created by the difference between the estimated flows used in the original Sewer Connection/Extension permits filed for the Middle Fort Pond Brook Sewer Project and the actual flows being received. Figure A provides a graphic justification for the Town's use in these discussions with the MADEP.

We have confirmed with both the MADEP and the Environmental Protection Agency (EPA) that no state or federal permits are required to decommission an existing WWTF or to surrender an existing discharge



permit, however both the MADEP and the EPA request a formal letter from the Owner indicating why and when the facility is being decommissioned and a discussion of where the wastewater is now being treated.

### Local Permits

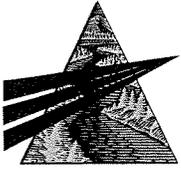
A number of permits will have to be obtained from the Town of Acton during design and prior to construction. These permits are expected to be:

Sewer System Connection Approval – Issued by Board of Health - This permit will be prepared in parallel with the MADEP Sewer Connection/Extension permit described above. The Town will issue the approval prior to signing the MADEP Sewer Connection/Extension permit application. Acton's current Application and inspection charge is \$150 for commercial establishments.

Notice of Intent Application / Order of Conditions – Issued by Conservation Commission-A Notice of Intent (NOI) application will have to be filed with the Town because approximately 540 ft. of the proposed force main behind the building shall be within 100 ft. of a resource area (wetland) under the protective jurisdiction of the Acton Conservation Commission. An NOI is filed with both the MADEP and the local Conservation Commission, but it is administered, reviewed and approved at the local level. The NOI is a MADEP standard form that requires site layout design drawings with sufficient information to establish the limit of the resource area and illustrate the intended impacts, if any, on that resource area. The NOI application fee can be expected to range from \$500 to \$1,200 and is based upon the magnitude of the impacts on the resource area. A typical NOI approval duration is 2 to 3 months for a project this size and requires a public hearing. The approval of the NOI is called an Order of Conditions. The Order of Condition stipulates the Town standard requirements for work adjacent to a resource area and will include any project specific tasks discussed during the public hearing.

Permit to Work in the right of Way (“Road Opening Permit”) – Issued by Acton Highway Department - A permit to work in the High Street right-of-way must be applied for and received prior to the initiation of construction. The permit fee is \$50.00 and a bond, of sufficient value to cover cost of repair(s) to the roadway in case of contractor default, is expected to be required. The bond is to ensure the roadway is returned to preconstruction conditions. If a contractor defaults on the work or does not perform to the Towns standards for roadway repair, the Town collects on the bond to cover their costs of repair. The Road Opening Permit is easily acquired through the Town Engineer and the bond is typically the responsibility of the selected contractor..

Acton Water District Notification - A formal permit from the Acton Water District is not required for the work; however the Water District has a 12-inch water transmission main from the Assabet Well in High Street. The proposed force main will be separated by a minimum of 10 ft. from the existing water main but it will be buried in the ground parallel to the water main for approximately 500 ft. If the Assabet Well water main had to be taken off line, or the pipes were accidentally broken, the Acton Water District will be challenged to provide sufficient water to



service the Town and damage from the water lost during the break could be significant. Due to these concerns we recommend that the Acton Water District be notified of the project.

Town of Acton Easement for Pumping Station and Force Main - It is Town of Acton policy that all wastewater infrastructure under their ownership and control be located on and inside permanent easements which allow the Town access for operation, maintenance and monitoring of their infrastructure. If the Town is to own and operate the Powdermill Plaza pumping station easements must be granted to the Town. Typically the easements have been of sufficient size for pumping stations and buildings and 20 ft. wide over the length of piping, in this case force main, in the ground. The owners of Powdermill Plaza must arrange an easement agreement with the Town of Acton.

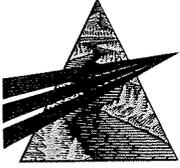
### **Conclusions & Recommendations**

Sufficient capacity exists at the Acton WWTF to handle the Powdermill Plaza and Acton Ford existing average daily flow of 2,610 gpd, future peak daily flow of 5,000 gpd, and the associated waste load characteristics. The additional BOD and TSS waste load will not adversely affect the WWTF's ability to meet discharge permit limitations in the future.

Several feasible scenarios exist to provide a collection and conveyance system from lower High Street area up to Adams Street and the Town of Acton sewer collection system. W&C recommend what is detailed herein as Scenario 2, which involves building a new submersible type pumping station on the west side of Powdermill Plaza, in the grass area adjacent to the plaza driveway on High Street, and to have Powdermill Plaza pump into the station via their existing influent pumps at their WWTF and to have Acton Ford flow across High Street via a gravity collection system into the station. Figure C illustrates Scenario 2.

#### **Recommendations:**

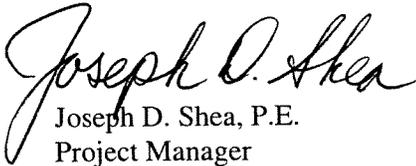
- The Town of Acton to meet with state regulators to present the justification to expand the Acton sewer collection system without exceeding the permitted average daily flow or limiting any of the preexisting 920 approved connections.
- The Town of Acton, Powdermill Plaza and Acton Ford meet to discuss the conclusions from this report and determine a plan and schedule to move forward. Included in that plan should be cost sharing amongst the commercial properties and fees to be collected by the Town. The limits of private versus public sewer infrastructure and expected easements should also be discussed.
- Town of Acton to formally contact the other commercial properties in the area to determine the probability of their future connection into the pumping station. This data will be used in the pumping station design as well as financial models for capital outlay on behalf of the Acton Ford and Powdermill Plaza.
- All partners discuss schedule and timing of the project in order to determine when any design work should initiate. For one example, one key factor is season sensitive work, such as identifying wetlands, which should be initiated prior to winter.



After reviewing this Draft Letter Report contact our office to schedule a meeting to review comments from the shareholders on the project. If you have any questions prior to the meeting, please do not hesitate to contact our office.

Very truly yours,

WOODARD & CURRAN, INC.

  
Joseph D. Shea, P.E.  
Project Manager

JDS/ljs  
Project 212553

Enclosures

cc: Anthony Capobianco, Founder, Atlantic Management  
David Abatsis, Vice President, Acton Ford  
Helen Priola, Senior Vice President, Woodard & Curran  
Frank Cavaleri, Vice President, Woodard & Curran  
Bill Luksha, Area Manager, Woodard & Curran  
James Gagliard, Plant Manager, Woodard & Curran

FIGURE A

Town of Acton, MA  
T5 Estimated Flows vs Actual Flows  
Compared with Number of Weekly Connections to the Sewer System

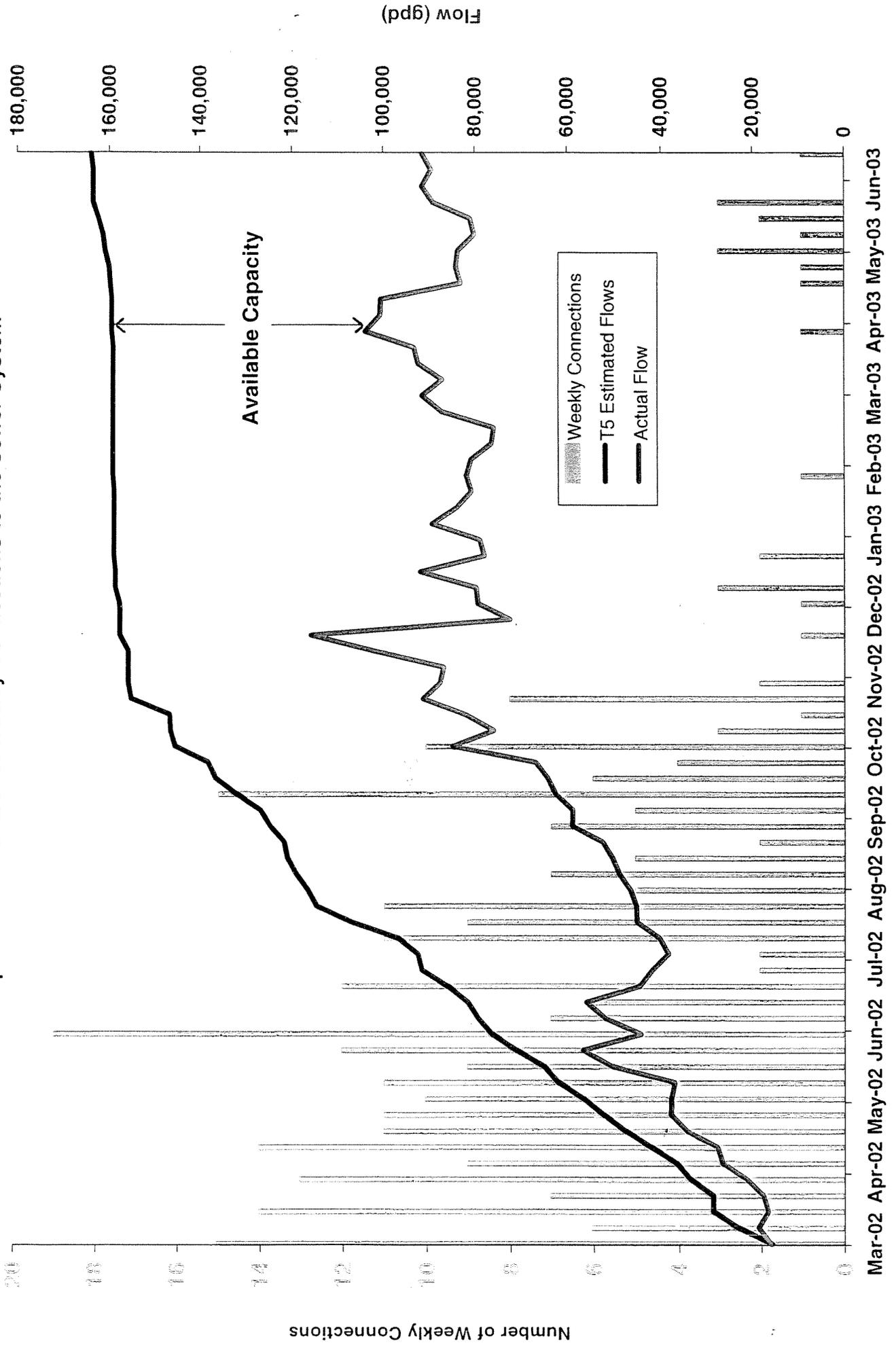
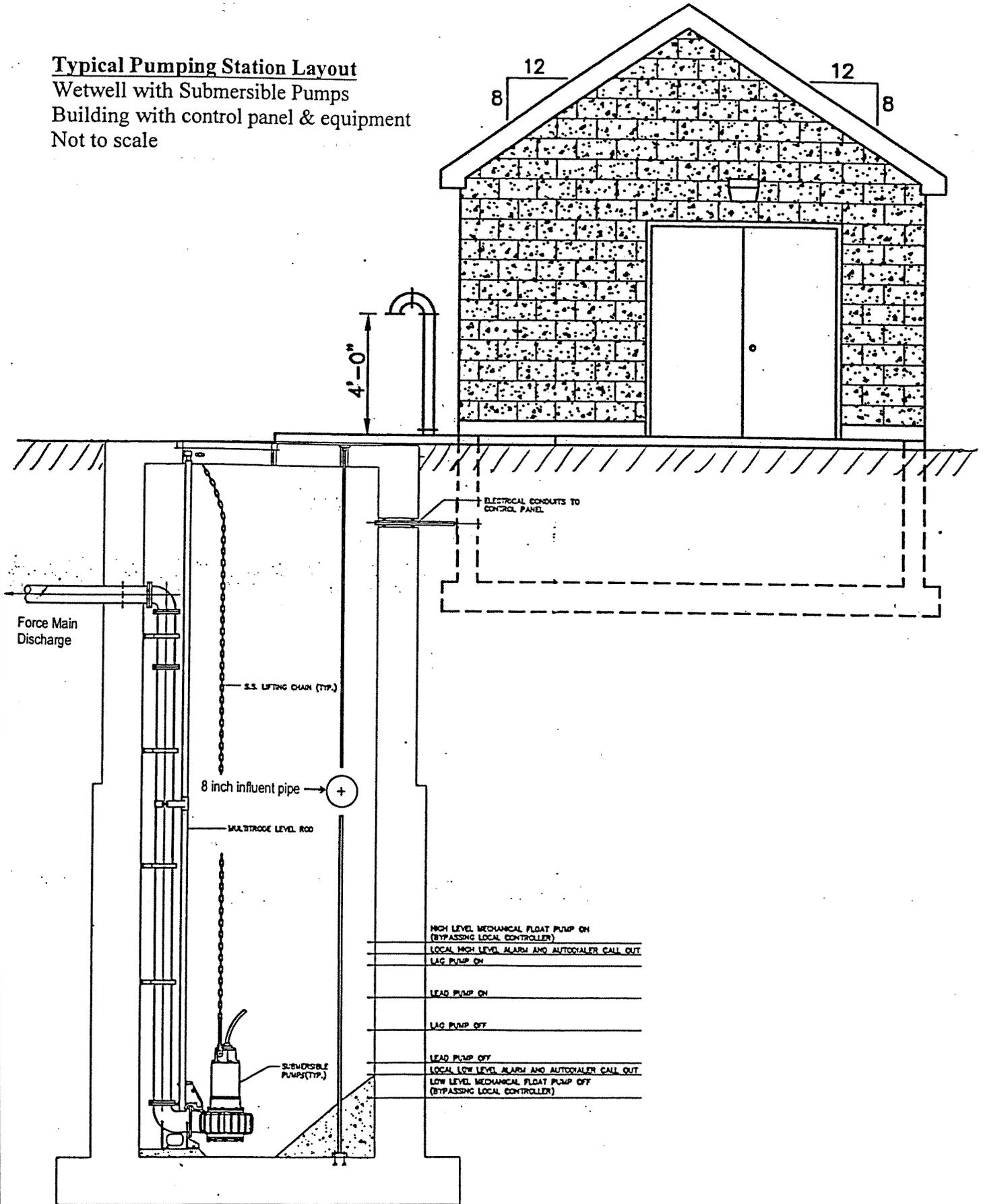


FIGURE B

**Typical Pumping Station Layout**  
 Wetwell with Submersible Pumps  
 Building with control panel & equipment  
 Not to scale



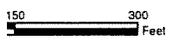
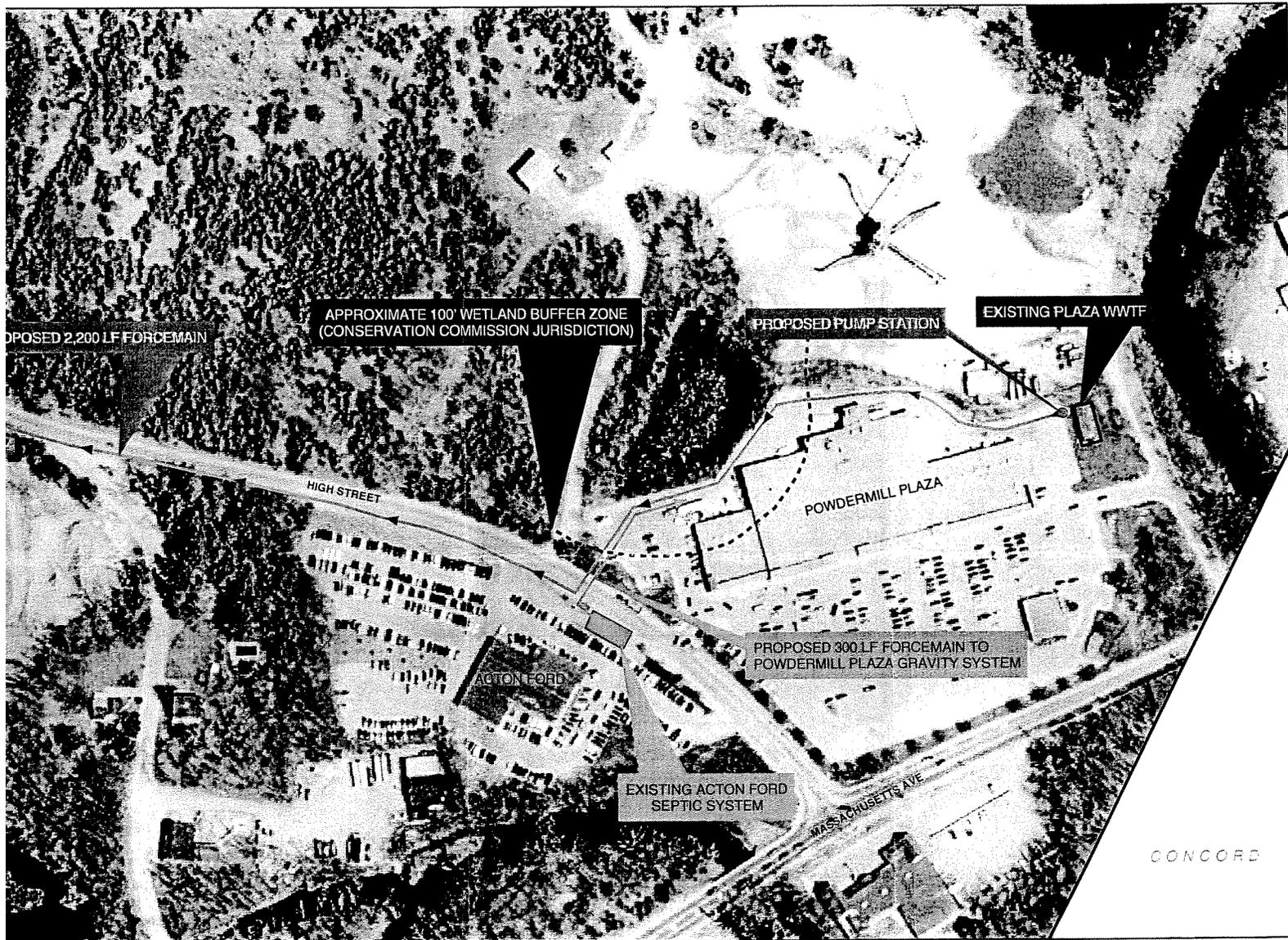
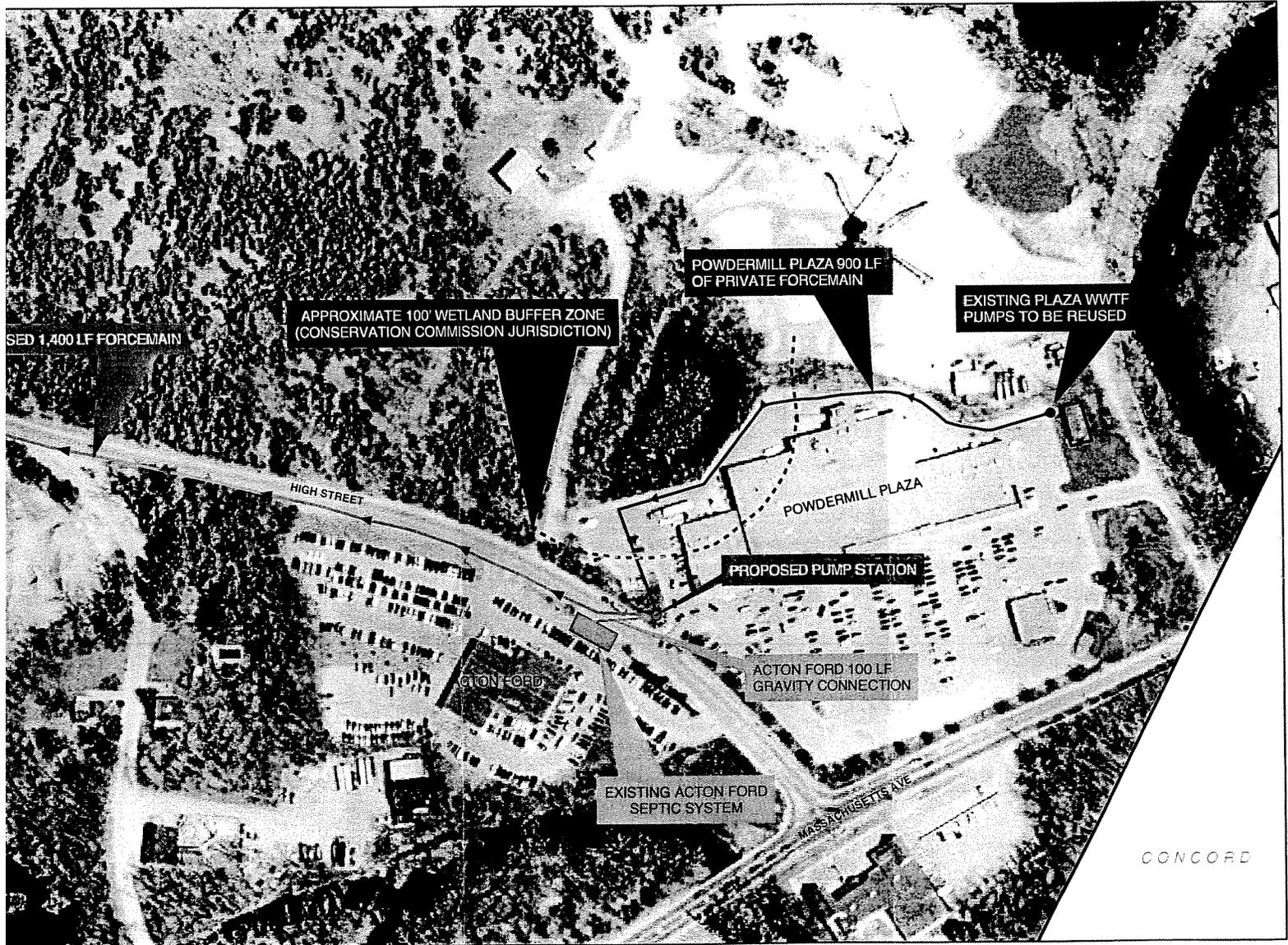
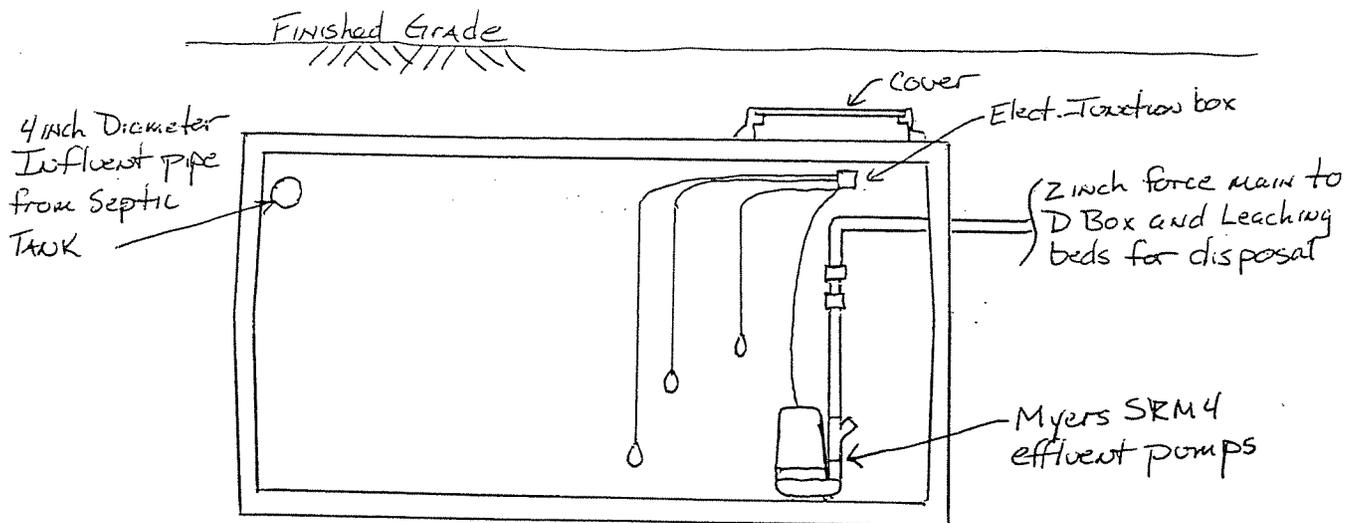


Photo Date: April 2001, Woodard & Curran Inc.



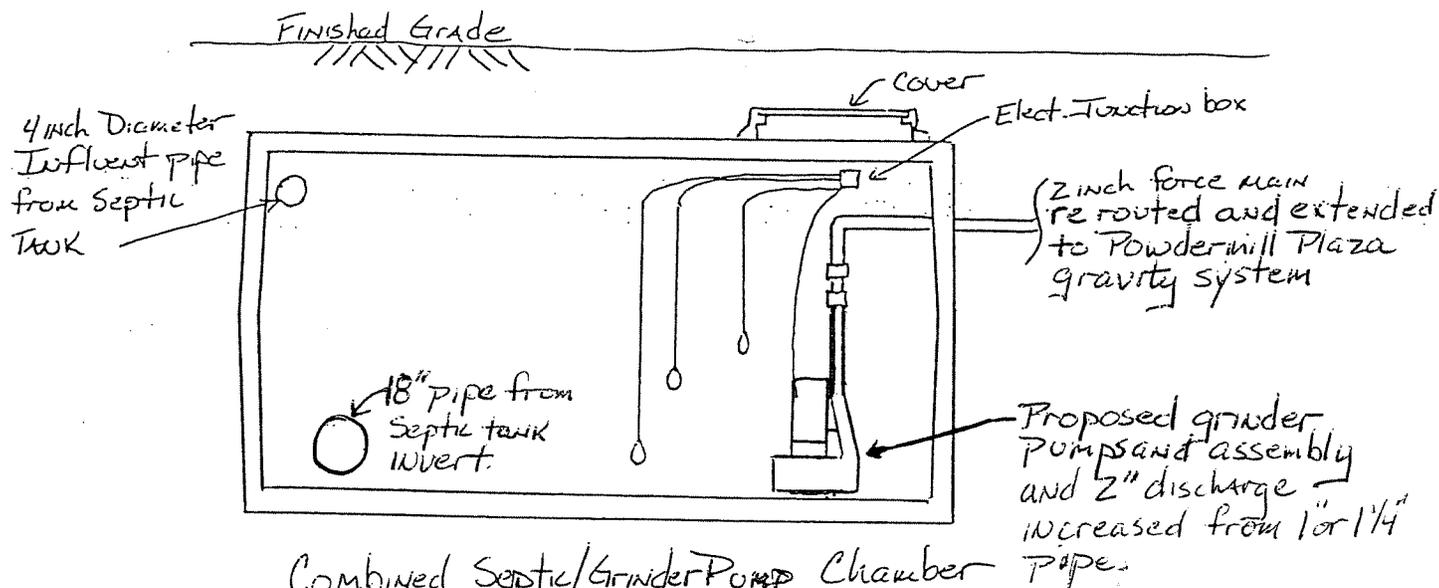
300  
Feet

Photo Date: April 20011 Woodard & Curran Inc



Existing 1500 gallon Pump Chamber  
N.T.S.

Taken from Records on file at Board of Health.



Combined Septic/Grinder Pump Chamber  
N.T.S.