PUBLIC UTILITIES COMMISSION

Bethel Municipal Center, 1 School Street
Bethel, Connecticut 06801 Telephone: (203) 794-8501

RECEIVED
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TOWN OF BETHEL
TOWN CLERK

REGULAR MEETING

Monday, March 3, 2014
4:00 p.m.
C.J. Hurgin Municipal Center – Meeting Room "A"

Present: First Selectman Matthew Knickerbocker; Selectmen Richard Straiton, Paul Szatkowski and Commissioner Peter Valenti. Also in attendance were Town Comptroller Robert Kozlowski, Town Attorney Martin Lawlor, Public Works Director Andrew Morosky and Utility Supervisor Kelly Curtis.

Absent: Commissioner Michael Gribbin

Call to Order: First Selectman Knickerbocker called the Regular Meeting to order at 4:00 p.m. and led the Pledge of Allegiance.

Public Input: None

Correspondence: None

Meeting Minutes from Special Meeting February 10, 2014 Selectman Straiton made a motion, which was seconded by Selectman Szatkowski to approve the minutes as presented. Vote, All in Favor Motion Approved.

Meeting Minutes from Special Meeting February 24, 2014 Selectman Szatkowski made a motion, which was seconded by Selectman Straiton to approve the minutes as presented. Vote, All in Favor Motion Approved.

New Business:

- **Plumtrees Pump Station:** Mr. Tom Kovacs and Ms. Wanda McGarry of Kovacs Construction addressed the Commission regarding the change order request for the wetwell demolition work and recounted the timeline of events that led to the project being completed over a year past the date in the contract. Mr. Kovacs indicated that the concrete fillet was cured much harder than anticipated. An additional 282 hours with 3 laborers was needed to complete the cutting versus what they had carried in their bid price. They noted that the change request did not include a number of items that would normally be included. Mr. Kovacs would like a resolution. First Selectman Knickerbocker stated the Commission will not vote today to resolve this issue but review their request. Commissioners inquired as to the communications between Roald Haestad, the Contractor and the Town with respect to the change order notification.

- **Parklawn Drive:** Mr. Roy Steiner, representing the applicant, briefed the Commission on his company's proposal for a new 20,000 square foot (SF) building on an existing

empty lot, adjacent to the Bethel Healthcare facility. Per his engineer's preliminary calculations, Mr. Steiner will be seeking an additional 1169 gallons per day of sewage allocation for this location. Per the Sewer Allocation Study, conducted in 2012, the allocation for this 2.77 acre lot was 831 gallons per day (gpd) but the proposed use is projected to be 2,000 gpd. Mr. Morosky noted that it appears the applicant will have to pay for the additional allocation if the Commission approves the application. Mr. Morosky noted that there is sufficient sewage available in Bethel to accommodate this request but that the Interlocal Agreement with Danbury limits the Berkshire Pump Station contribution to 80,000 gpd. The current average flow from the Berkshire station is approximately 49,000 gpd. Mr. Steiner indicated that the original pump station design only included residential lots to the east up to Vail Road. Commissioner Valenti indicated that the allocation to the park should not be impacted by additional residential sewage flows that were not anticipated.

First Selectman made a motion, which was seconded by Commissioner Valenti, to send a letter to Planning and Zoning indicating there is sewer available for this location. Vote: All in Favor (Selectman Straiton Abstained), Motion Approved.

- **1 & 3 Berkshire Blvd.; Berkshire Industrial Corporation:** Mr. Roy Steiner representing himself discussed the proposed development on 1-3 Berkshire Blvd., which is referred to as 23 Berkshire Blvd. in the Assessor's records. The existing building consists of 23,600 SF of manufacturing and 12,800 SF of office space. The 15,000 SF addition will house office space and the old office space will be converted into manufacturing. Mr. Steiner's engineer estimates an additional 1835 gallons a day additional is needed. (See memo from Mr. Morosky) Discussion took place.

First Selectman made a motion, which was seconded by Selectman Straiton to send a letter to Planning and Zoning indicating there is sewer available for this location. Vote: All in Favor (Selectman Straiton Abstained), Motion Approved.

Old Business:

- **Transfer Station:** Mr. Morosky indicated he has received a quote from S&S Electric for upgrading the electrical at the transfer station building. CL&P has proposed a new transformer at the Highway Garage and a second at the Transfer Station to provide adequate power. Two other quotes are required, further discussion is needed after reviewing all quotes.

- **Water and Sewer Line Protection:** First Selectman Knickerbocker distributed material from HomeServeUSA and Safety Valve(Aquarion) . See attached. Further discussion will be required prior to proceeding with either company.

- **PUC Capital Project Status Summary:**
  - Mariusz Jedrychowski, P.E. of Wright Pierce engineering presented to the Commission and gave an overview of the progress to date on the Capital Improvement Plan, see attached.
  - Brian Washburn, P.E., of HRP Associates, presented an update to the Commission regarding the draft results of the Level A Aquifer Mapping for the East Swamp Aquifer, see attached.

Financial Report:

- **Water and Sewer Financials:** Mr. Kozlowski distributed the financials for the Commissioners' review. See Attached.

- **Invoices:**

Invoices for PUC Approval

3/3/14

Item #	Vendor	Inv. Date	Amount	Description	Account
1	Offshore Construction	12/31/2014	$72.96	Chestnut Treatment Roof	Water Dept.
2	Martin Lawlor	3/1/2014	$1,182.50	Prof. Services	Water Dept.
3	Martin Lawlor	3/1/2014	$838.50	Prof. Services	Sewer Dept.
4	Martin Lawlor	3/1/2014	$153.08	Prof. Services	Sewer Proj.
5	Martin Lawlor	3/1/2014	$128.55	Prof. Services	Transfer Station
	Total		**$2,375.59**		

First Selectman Knickerbocker made a motion, which was seconded by Commissioner Valenti to approve the invoices in the amount of $2,375.99 Discussion took place. Vote, All in Favor, Motion Approved.

Engineering / Utility Consultant Report:

- **Stony Hill Sewer Project:** No news to report.

- **Stony Hill Sewer Project Easements:** Attorney Lawlor updated the Commission on the progress of obtaining outstanding easements.

- **Supervisor's Report:** Mr. Curtis informed the Commission that there were two recent sewer backups; one at Berry School which Pembroke Plumbing cleared, and the second on Judd Ave. On the water side they were two main breaks; one on Crestview and the other on Midway Drive. Mr. Curtis indicated with the unseasonably cold weather they have been very lucky that there have not been more water main breaks. Mr. Curtis distributed to the Commission an overview of responsibilities of the Water and Sewer Department personnel in response to questions at earlier PUC meetings.

Adjourn: ***As there was no further business on the agenda First Selectman Knickerbocker made a motion, which was seconded by Selectman Straiton to adjourn the meeting at 6:00 p.m. Vote: All in Favor, Motion Unanimously Approved.***

Respectfully submitted,

Tracy Rogalski, Recording Secretary

DEPARTMENT OF PUBLIC WORKS
Clifford J. Hurgin Municipal Center, 1 School Street, Bethel, CT 06801
Telephone (203) 794-8549 Fax (203) 794-8767

Memo

To: Matthew S. Knickerbocker, Chairman, Public Utilities Commission

From: Andrew Morosky, Town Engineer / Public Works Director

CC: File

Date: March 3, 2014

Re: March 3, 2014 Regular Meeting – Status Update

Capital Improvement Plan – Wright-Pierce will be present at the March 3rd meeting to discuss their progress to date and timeline to completion.

East Swamp Aquifer – HRP Associates has completed a draft report for the Level A Mapping of the East Swamp Aquifer. The report has been shared with Inland Wetlands staff and comments from the Town are anticipated to be returned to HRP in March. The full draft is over three hundred pages. I've attached the front end of the report to this memo for your review. HRP is anticipated to be present for the March 3rd meeting to discuss their work.

South Street Pump Station – Project is out to bid. Pre-bid meeting will be held on Mar Current cost estimate is now approximately $550,000. This higher estimate is primarily due to recently estimated costs associated with Yankee Gas service to the facility, relocating the gas service to the Fire Museum and new communications equipment to link the pump station to the police station.

Transfer Station Electrical Upgrade – A quote was received from S&S Electric that includes a new 200 amp service to the Transfer Station from the Highway Garage main distribution panel. This quote includes the cost of a new transformer to replace the existing transformer at the corner of the Highway Garage. Losito Electric and Rizzo Electric are also supplying quotes for this work

3 Berkshire Boulevard – The proposed development consists of the addition of a 15,000 SF building on the existing building at 1-3 Berkshire Boulevard, also referred to as 23 Berkshire Boulevard in the Assessor's records. The existing building consists of 23,600 SF of manufacturing and 12,800 SF of office space. The new addition will house the office space and the existing office space will be converted to manufacturing. Roy Steiner is anticipated to be present for today's meeting.

Calculations provided by Mr. Steiner's engineer at the end of February indicate an estimated current use of 4,230 gpd and a proposed use of 6,065.

A summary of the usage at the existing facility based on their bills from the Tax Collector's office and a discussion of their allocation follows:

3 Berkshire Boulevard 1 (Memry)
Sewer Use

Date	Reading	Consumption	# Days	Average Use
1/5/2011	19960519			
4/7/2011	19994628	34109	92	371
8/8/2011	20187687	193059	123	1570
10/18/2011	20387137	199450	71	2809
1/24/2012	20428397	41260	98	421
4/16/2012	149900	149900	83	1806
7/24/2012	363300	213400	99	2156
10/23/2012	537000	173700	91	1909
1/16/2013	641700	104700	85	1232
4/15/2013	738300	96600	89	1085
7/16/2013	845300	107000	92	1163
10/15/2013	941600	96300	91	1058
1/15/2014	1029000	87400	92	950

Per the calculations used for the Sewer Allocation Study in 2012, the allocation for the Memry Building, based on 300 gal/day/acre in the IP Zone, at 3.53 acres is 1,059 gpd.

Further analysis is needed to determine what, if any, charges will need to be collected assuming the expansion is approved.

Parklawn Drive – The proposed development consists of the construction of a 20,000 SF building on an existing empty lot on Parklawn Drive, adjacent to the Bethel Healthcare Facility. The building is anticipated to be 10,000 SF office space and 10,000 SF Industrial space. Per calculations provided by Mr. Steiner's engineer, received on February 28, 2014, each use is estimated to generate 1,000 gallons per day for a total of 2,000 gallons per day. Per the parameters used for the Sewer Allocation Study, the allocation for this 2.77 acre lot would be 831 gallons per day.

Further analysis is needed to determine what, if any, charges will need to be collected assuming the expansion is approved.

HRP Associates, Inc.

Creating the Right Solutions Together

Draft

February 27, 2014

Mr. Andrew Morosky
Town of Bethel Water Department
1 School Street
Bethel, Connecticut 06801

RE: LEVEL A AQUIFER MAPPING REPORT, EAST SWAMP AQUIFER, BETHEL, CONNECTICUT (HRP #BET7006.WM)

Dear Mr. Morosky:

Attached for your review is the Aquifer Mapping Report prepared by HRP Associates, Inc. (HRP) for the site referenced above.

If you have any questions or require additional information, please feel free to contact me at your earliest convenience. Thank you for the opportunity to be of service.

Sincerely,

HRP ASSOCIATES, INC.

Tom Sicilia
Project Geologist

Brian P. Washburn, P.E., LEP
Senior Project Manager

Attachment
TS/BPW/dld

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DRAFT

LEVEL A AQUIFER MAPPING REPORT

EAST SWAMP AQUIFER, BETHEL, CONNECTICUT

HRP #BET7006.WM

February 2014

Prepared For:
Town of Bethel Water Department
1 School Street
Bethel, Connecticut

Prepared By:
HRP Associates, Inc.
197 SCOTT SWAMP ROAD
FARMINGTON, CT 06032

Tom Sicilia
Project Hydrogeologist

Brian P. Washburn, P.E., LEP
Senior Project Manager

Issued On: **February 27, 2014**

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1.0 INTRODUCTION

The town of Bethel retained HRP Associates, Inc (HRP) to complete level A mapping of the East Swamp Aquifer located in the northern portion of Bethel, Connecticut (Figure 1). The town of Bethel is located in southwestern Connecticut, and has a population of roughly 18,500 citizens. The municipal water system is owned and operated by the town. The primary source of potable water is the Maple Ave well field (Figure 1), with a supplemental supply from Eureka Lake and Chestnut Ridge reservoirs. The Maple Ave well field consists of two public water supply wells (Maple-1 and Maple-2), which withdraw groundwater from the stratified drift, East Swamp Aquifer. The wells were drilled in 1967, and registered with the state in 1983. The registered maximum flow rates are 440 and 485 gallons per minute for Maple-1 and Maple-2, respectively. The Maguire Group completed Level B mapping of the Maple Ave well field in June 1990 (Appendix A).

The scope of the level A mapping included:

- Installation of 3 observation wells, 4 piezometers, and 3 stream gauging stations,
- Performance of an aquifer pump test on Maple-1, and
- Groundwater flow modeling to complete aquifer mapping.

This report documents completion of these activities as proposed in the *Revised Level A Mapping Data Collection Plan* (HRP, April 2013). The Connecticut Department of Energy and Environmental Protection (CT DEEP) approved the plan on August 9, 2013. This report documents conformance with the requirements of Level A mapping specified in CGS section 22a-354b-1 and is submitted to CT DEEP for review and approval.

2.0 GEOGRAPHIC SETTING

The East Swamp Aquifer underlies a large 900-acre swamp approximately one mile north of downtown Bethel (Figure 1). This extensive wetland, known as East Swamp is approximately 0.5 miles wide and 2 miles long extending to the north beyond the Danbury-Bethel town line and the confluence of East Swamp Brook and Lime Kiln Brook. East Swamp is located in a hilly, residential area, surrounded by cultural features including:

- Industrial facilities and a landfill to the north,
- Meckauer Park and a CL&P substation to the northeast,
- Berry High School, Bethel High School, Bethel Middle School, Anna H. Rockwell Elementary School, and R.M.T Johnson School to the east, and
- One soccer field and two baseball fields to the east and south.

2.1 Topography

East Swamp occupies a large lowland depression (Figure 2) in the northern end of the East Swamp Brook (sub-regional drainage basin no. 6605). Topography is nearly level with an average elevation of 288-ft above mean sea level (AMSL). The swamp is characterized by 2-24 inches of standing water and prevalent phragmites. Two gravelly, wooded "islands" (Bergstrom Park and Ivy Island) are located near the central portion of the swamp.

Two streams flow through East Swamp. East Swamp Brook enters the east central portion of the swamp and generally flows to the north where it discharges into Lime Kiln Brook (Sub-regional drainage basin no. 6606). Eckerts Brook enters from the south and flows into East Swamp Brook in the west central area of the swamp (Figure 2). Art Mauger of the DEEP reported the 7Q10 of East Swamp Brook as 0.25 cubic feet per second (CFS). Stream flow measured during the study period was generally consistent with this value, and was largely below the detection limit of the gauging device.

Local surface water drainage divides surrounding East Swamp include the following topographic features (Figure 2).

- The confluence of East Swamp Brook and Lime Kiln Brook to the north,
- A local divide marked by a gently rise in land to a low saddle (250-ft AMSL) in the south,
- A moderate rise of hummocky terrain to a series hill crests in the east (Figure 2) with a maximum elevation of 450- ft AMSL, and
- A prominent bedrock controlled cliff rising sharply to elevations of 710-ft AMSL in the west.

2.2 Geology

The geology of East Swamp area consists of stratified drift or till overlying bedrock (Figure 3). Glacial till typically mantles the bedrock surface and is exposed at the ground surface on hills and ridges. Thick sequences of stratified drift fills low lying valleys overlying thin deposits of till and bedrock. Bedrock underlying the swamp is mapped as Stockbridge Marble and Ratlum Mountain Schist (Stone, 1985). The topography of the bedrock beneath East Swamp resembles a spoon (Figure 4). In the southern portion of the swamp, bedrock has been encountered at depths as much as 160-ft below grade (bg). Beneath the northern half of the swamp, bedrock was noted at shallower depths, about 70 ft bg.

The stratified drift deposits coincide with the low land portions of East Swamp and some hillsides to the northeast, south, and southwest (Figure 4). Glacial till borders these deposits on hilltops on all sides. The stratified drift was deposited in a glacio-fluvial setting and extends to depths up to 160 feet bg (Figures 4, 4a, 4b). In the area of East Swamp, the stratified drift is comprised of six inter-layered deposits (USGS, 1995), described below (Figure 3):

- Sand and Gravel (SG) outcrops on hillsides to the south and west of East Swamp. The sand and gravel layer extends at depth covering bedrock beneath the swamp.
- Sand deposits (S/SG) cover the sand and gravel (SG) at lower elevations of hillsides to the south, east, and west. The sand deposits also extend beneath the swamp, overlying sand and gravel (SG). The sand overlies fine sediments along the northwest margin of the swamp at the base of the bedrock cliff.
- Swamp deposits (SW/S/SG) overlie the sand (S/SG) and sand and gravel (SG) in the low lying wetland area of East Swamp to depths of 5-20 ft bg. In the very northern portions of the swamp, the deposits overlie fine sediments (SWF).
- Gravel deposits (G) outcrop in three small areas in the central portion of the swamp. These deposits, known locally as Bergstrom and Ivy Islands are up to 25 feet thick.

The 4 interlayered deposits of stratified drift represent the hydrostratigraphic units of the East Swamp Aquifer.

Field observations

As part of the project, six investigative borings (B-1, P-1, P-2, M-1, M-2, M-3) were installed to determine depth to bedrock and overburden materials in the vicinity of East Swamp (Figure 3). Monitoring wells were completed at five locations (P-1, P-2, M-1, M-2, M-3) to collect drawdown data during pump tests. Monitor wells P-1 and P-2 were completed using 1-inch diameter materials and 20-ft of PVC well screen. Wells M-1, M-2, and M-3 were completed at depths consistent with the Maple Ave productions wells (Maple-1, Maple-2). Overburden materials observed during drilling were consistent with those described in the published surficial materials map of the area (Figure 4). The boring logs for the investigative borings are provided in Appendix B. Generalized descriptions of soils encountered during drilling of these borings in addition to several others (Bergstrom, Maple-1, Maple-2, Meckauer, HRP) are compared below to the surficial materials mapped at each corresponding location.

Wells	Observed Materials	Depth Interval	Mapped Surficial Materials
Maple-1	Sand & gravel Fine-medium sand with varying amounts of silt and clay Coarse sand & gravel	0-10 ft 10-80 ft 80-145 ft	Sand over Sand & Gravel (S/SG)
Maple-2	Swamp muck Fine to coarse sand with varying amounts of silt and clay Coarse sand & gravel	0-10 ft 10-130 ft 130-157 ft	Swamp deposits over sand over sand & gravel (SW/S/SG)
M-1	Fine-medium sand with varying amounts of silt, gravel Medium-coarse sand & gravel	0-136 ft 136-155 ft	S/SG
M-2	Fine-coarse sand with varying amounts of silt and cobbles Fine-coarse sand & gravel	0-115 ft 115-165 ft	SW/S/SG

Wells	Observed Materials	Depth Interval	Mapped Surficial Materials
M-3	Fine-coarse sand & gravel with varying amounts of silt	0-144 ft	Sand & gravel (SG)
P-1	Black very fine-coarse sand with varying amounts of silt, organics Very fine-coarse sand with varying amounts of silt, gravel	0-6 ft 6-68 ft	SW/S/SG
P-2	Very fine-coarse sand with varying amounts of silt	20-60 ft	SW/S/SG
B-1	Very fine-coarse sand with varying amounts of silt, gravel	0.5-67.5 ft	S/SG
HRP	Fine-coarse sand with trace silt	0-7 ft	Gravel (G)
Bergstrom	Sand & gravel	0-50 ft	G
Meckauer	Fill Very fine-fine sand and silt	0-2.5 ft 2.5-24.5 ft	S/SG

A conceptual model of subsurface materials was developed from available data. This model is presented in cross sections A-A' and B-B' (Figures 3, 4a, 4b). Shallow swamp deposits (SW) overly a thick, stratified sand (S) which has inter-bedded silt and clay lenses. The sand unit overlays a coarse sand and gravel (SG), which extends at depth to a low permeability till or bedrock. Both Maple Ave wells are screened across this coarse sand and gravel unit (SG).

2.3 Hydrogeology

The East Swamp Aquifer is comprised of the stratified drift and swamp deposits underlying and surrounding East Swamp (Figure 3). Aquifer boundaries occur at significant geological and geographical features, such as:

- Contacts between geological units with significant contrasts in permeability,
- Surface water drainage divides, and
- Large rivers or lakes.

The boundaries of the East Swamp Aquifer consist of the surrounding geological and topographical features, including:

- The contact between the highly permeable stratified drift and low permeability glacial till mapped along the west and southeastern margins of the wetland.
- Surface water drainage divides to the northeast and south.

The base of the aquifer is marked by the contact between the stratified drift and underlying glacial till or bedrock (Stockbridge Marble, Ratlum Mountain Schist).

As a low lying wetland, East Swamp receives water from direct precipitation and surface run-off from ridges to the west and rolling hills to the east. East Swamp Brook and Eckerts Brook could also provide

recharge during flood periods or remove water from the wetland during dry periods. In a similar manner, East Swamp Aquifer likely receives recharge in the following ways:

- Infiltration through the sand and sand & gravel deposits mapped along the southern, eastern, and western areas of the aquifer
- Recharge from East Swamp Brook and Eckerts Brook where the stream channels cross sand and sand & gravel deposits to the south and east
- Recharge through gravel deposits mapped in the central portion of the swamp
- Seepage through the swamp deposits

Transmissivity values for the stratified drift materials are available from previous pump tests completed by the Maguire Group (Maguire) and HRP. As part of the Level B mapping project in 1990, Maguire evaluated 1967 pump test data to evaluate transmissivity at the Maple Ave well field (Maple-1, Maple-2). During evaluation, Maguire noted a two slope curve in drawdown. The second steeper slope was thought to have represented interference from the second pumping well (Maple-2) or an aquifer boundary. Maguire evaluated the initial drawdown slope, which may represent an over-estimation of the aquifer transmissivity. HRP completed a subsequent pump test to evaluate water resource productivity in the area of Bergstrom Park in 2005. HRP pumped a test well (BW-1) and monitored drawdown at three locations (BW-2, OW-1, and BT-51). The transmissivity (T) and hydraulic conductivity (K) results from these tests (tabulated below) ranged from 600 ft^2/day to 6,720 ft^2/day.

Well ID	T (Ft^2/Day)	K (FT/Day)	Aquifer Material Surrounding Well Screen
Maple-1	6,720	130	Sand & gravel (SG)
Maple-2	6,720	130	Sand & gravel (SG)
BW-2	1,640	10	Not available
OW-1	1,140	7	Fine-coarse sand, trace silt (G)
BT-51	600	4	Very fine-fine sand and silt (G)

Specific yield was also estimated from the Maguire and HRP tests. The values ranged from 0.2 (Maguire) to 0.665 (HRP).

Groundwater flow within the East Swamp Aquifer has been inferred from

- ground topography,
- recharge areas, and
- The anticipated interactions of the swamp and brooks that flow through the wetland.

Groundwater flow is anticipated to be generally northward with potential local mounding in the areas of the isolated gravel islands in the central portion of the wetland. Additional mounding may occur in the vicinity of East Swamp Brook and Eckerts Brook where these watercourses traverse outcropping sand deposits in the southern and eastern portions of the area,

3.0 INDUCED INFILTRATION TEST

HRP completed an aquifer pump test in November 2013 to collect data to assist the Level A mapping of the Maple Ave well field. The Maple Ave well field consists of two public water supply wells (Maple-1,

Maple-2) located at the southern end of the East Swamp Aquifer. During the test groundwater and surface water levels were monitored in order to determine:

- The extent of drawdown induced by pumping,
- Aquifer constants (K, T, S),
- Pumping effects on the shallow swamp deposits, and
- The extent of infiltration from East Swamp Brook and Eckerts Brook induced by pumping.

The test set-up and results are provided below.

3.1 Monitoring Locations

During the test, surface water or groundwater was monitored at the following 17 locations to assess the pumping affects on the East Swamp Aquifer (Figure 2).

- 10 observation wells (Maple-1, Maple- 2, M-1, M-2, M-3, P-1, P-2, USGS, HRP, Test-1, Test-2)
- 4 piezometers (PZ-1, PZ-2, PZ-3, PZ-4).
- 3 stream gauges (SG-1, SG-2, SG-3)

Groundwater levels were recorded automatically with pressure transducers installed in all the observation wells except Maple-1 and Maple-2. Groundwater depths in Maple-1 and Maple-2 were collected by hand using an electronic interface probe because well construction did not allow the installation of transducers.

Piezometers were installed by hand in the soft sediment lining the channels of Eckerts Brook (PZ-1, PZ-2) and East Swamp Brook (PZ-3, PZ-4) to evaluate the influence of pumping. Water levels were recorded automatically by transducer where sufficient water columns covered the transducer probe. Water levels were recorded manually with an electronic interface probe at locations with small water columns.

Stream flow was measured at three stream gauging locations established in East Swamp Brook (SG-1, SG-2) and Eckerts Brook (SG-3). Manual measurements of stream depth, width, and flow velocity were recorded at each location.

A weather station also monitored precipitation throughout all phases of the test.

3.2 Aquifer Pump Test

The Maple-1 water supply well was used as the test well for the pump test. The pump test consisted of three phases:

- Pre-test,
- Pumping, and
- Recovery.

During all three phases, Maple-2 pumped at a constant rate of 285 gallons per minute (GPM) in order to maintain public water service for Bethel residents. In anticipation of the test, Maple-1 was shut off on November 4, 2013 and only Maple-2 was operated for approximately 4-days prior to the pre-test phase. This was completed so that pumping interferences from the normal cycling of the two water supply wells dissipated and background levels due to the constant operation of Maple-2 could be established.

3.2.1 Pre-Test Phase

The pretest phase began on November 8, 2013 and continued until November 11, 2013. The

pre-test phase was completed to document background conditions and ambient groundwater trends prior to pumping. Data was recorded manually or by automated transducer over this 72-hr period to document ambient trends and background conditions.

A slight decreasing trend was observed in groundwater depths during the pre-test phase. On average, groundwater depths declined 0.04-ft during this 72-hr period. No discernible change to stream infiltration or flow was noted.

3.2.2 Pumping Phase

Pumping of Maple-1 at 385 gpm began at noon on November 11, 2013 and continued for 48-hrs. Groundwater measurements were recorded in the observation wells to identify the degree and extent of drawdown to the aquifer. Piezometer and stream flow measurements were recorded to assess the influence of pumping on stream flow and infiltration. Water level measurements are presented in Appendix C.

3.2.3 Recovery Phase

Pumping at Maple-1 was stopped on November 13, 2013 at 2:00 PM. Groundwater measurements were collected in the observation wells to record drawdown recovery. Piezometer and stream flow measurements were recorded to identify possible influence of pumping on stream flow and infiltration. The recovery phase measurements continued through November 15, 2013 at 2:00 pm. The water level measurements are included in Appendix C.

3.3 Stream Measurements

Stream measurements included collection of water level data at 4 piezometers (PZ-1, PZ-2, PZ-3, PZ-4) and stream flow measurements at 3 stream gauge locations (SG-1, SG-2, SG-3). The data was used to assess the potential influence of pumping on stream infiltration and flow.

Piezometers

The piezometers were installed in stream channels prior to the pump test. Two piezometers were installed in Eckerts Brook (PZ-1, PZ-2) and two in East Swamp Brook (PZ-3, PZ-4). The construction consisted of 5 feet of 3-inch diameter PVC casing inserted at least 2 feet into stream sediments. In advance of the pump test, a slug test was conducted at each piezometer to identify the hydraulic conductivity of the stream sediments. Each piezometer was filled to the top with water, and the recovery was measured over a 4-hour period. The water level data was analyzed using Hvorslev's 1951 equation to determine hydraulic conductivity (K). Test results are summarized below and the calculations are provided in Appendix D.

Piezometer ID	K (FT/Day)
PZ-1	0.004
PZ-2	N/A
PZ-3	0.002
PZ-4	0.002

Daily recordings were made at the 4 piezometers to measure surface water conditions throughout all

test phases. Stream stage was also measured outside of each piezometer. The difference between the internal water level of the piezometer and the stream stage was used to evaluate the upward or downward gradient in the stream bed materials. There was a slight upward gradient in every piezometer location throughout the study period.

Stream Gauge Stations

Stream gauging stations were established at 3 locations along East Swamp Brook (SG-1, SG-2) and Eckerts Brook (SG-3). Stream depth and flow measurements were recorded daily at two up-stream (SG-1, SG-3) and one down-stream (SG-3) locations. Flows were generally low, consistent, and below the sensitivity of the stream flow meter (Table 2). No discernible influence from pumping was identified.

3.4 Observed Drawdown

Groundwater level data recorded during the pumping phase was corrected for ambient trends observed prior to the pumping of Maple-1. Graphs of drawdown/recovery data from the various observation wells are provided in Appendix C. At the completion of the pumping phase, drawdown was observed in four wells (M-1, M-2, P-2, Maple-1), as presented on the following table:

Well	Distance From Maple-1 (FT)	Observed Drawdown (FT)
Maple-1	0	66.98
M-1	50	5.99
M-2	50	4.61
P-2	400	0.86

Prior to the end of the pumping phase, the transducers installed in wells M-1, M-2, and M-3 malfunctioned. The transducers were replaced and data collection resumed. As a result, limited data is available from these three wells prior to the recovery phase.

Historical measurements from Maple-2 indicate that approximately 1-ft of drawdown was to be expected. However, noise in the manual measurements recorded at this location masked observation of this drawdown.

3.5 Transmissivity and Hydraulic Conductivity

Drawdown and recovery data were corrected for ambient trends and analyzed to estimate hydraulic conductivity. Data obtained from Maple-1, M-1, M-2, and P-2 was used to estimate aquifer transmissivity (T) and hydraulic conductivity (K).. Calculations are presented in Appendix D and results are summarized below.

Well ID (Test Phase)	Analysis Method	T (Ft^2/Day)	K (FT/Day)	Surficial Materials Unit
P-2 (Recovery)	Neumann-Witherspoon	0.15	0.02	S

Maple-1 (Drawdown)	Time Drawdown	320	6	SG
M-1 (Recovery)	Recovery	3,980	75	SG
M-2 (Recovery)	Recovery	6,640	130	SG
Maple-1, M-1, M-2 (Drawdown)	Distance-Drawdown	380	7	SG

4.0 NUMERICAL GROUNDWATER FLOW MODEL

HRP generated a numerical groundwater flow model of the East Swamp Aquifer using Groundwater Vistas as a graphical user interface (GUI) for MODFLOW. The conceptual model of the geographical setting and hydrogeology of the East Swamp Aquifer (Sections 2 and 3) was used as the basis for constructing the groundwater model, including:

- Published geological information,
- Previous reports regarding hydrogeology of the East Swamp Aquifer prepared Maguire and HRP,
- Stratigraphy data obtained during the installation of borings and observation wells (Maple-1, Maple-2, M-1, M-2, M-3, P-1, P-2, B-1, HRP[OW-1], USGS[BT-51]),
- Slug test results from 4 piezometers (PZ-1, PZ-2, PZ-3, PZ-4), and
- November 2013 aquifer test results from Maple-1.

A transient groundwater flow model was calibrated and verified to conditions occurring at the conclusion of the pre-test and pumping phases for the Maple-1 pump test. Once calibrated, the model was operated in a steady-state mode to assess the contribution area of the well field.

4.1 Model Parameters

The parameters used to construct a groundwater flow model include the domain or study area, the finite-difference grid, boundary conditions, aquifer parameters, and pumping schedules

4.1.1 Modeling Domain

The study area (model domain) representing the East Swamp Aquifer consists of the low-lying wetland region surrounding the Maple Ave well field portrayed on Figure 3. The model domain edges were established as the aquifer boundaries identified through interpretation of the area hydrogeology (Section 2), including:

- Fine grained materials mapped to the north along Shelter Rock Road.
- Surface water drainage divides to the northeast and south,
- Glacial till-stratified drift contacts to the east, and
- The break in slope characteristic of the bedrock uplands to the west.

Three active layers were used in the model (Figures 5a, 5b, 5c) to represent the 5 hydrostratigraphic units of the East Swamp Aquifer (Section 2). Layer thickness and properties vary across the domain corresponding to the hydrostratigraphy, based on surficial mapping and the conceptual subsurface model (Figures 3, 4a, 4b). A fourth model layer represents the bedrock, the bottom of the aquifer. The model layer, corresponding hydrostratigraphic units, and thickness are summarized below.

Model Layer	Description	Hydrostratigraphic Unit	Thickness (FT)
1 (Figure 5a)	Uppermost layer- Swamp deposits, sand & gravel, sand, gravel	SW, SG, S, G	10-50
2 (Figure 5b)	Middle layer- sand, sand & gravel	S, SG	30-130

3 (Figure 5c)	Lower layer- sand, sand & gravel	S, SG	10-120

All transient model data files are included as Appendix E.

4.1.2 Finite-Difference Grid

The finite-difference grid defines the cell size throughout the modeling domain (Figures 5a, 5b, 5c). The grid spacing is variable depending on the location and amount of data that is available. The grid spacing is small (50-ft) in the immediate vicinity of the Maple Ave well field where large amounts of drawdown are anticipated. The grid spacing increases with distance away from the well field to a maximum spacing of 100-ft. The grid spacing was also decreased in the vicinity of Bergstrom Park in order to assess expansion of the well field in the future.

4.1.3 Boundary Conditions

Conditions at all edges of the model domain were set to emulate the actual or interpreted state along the edges of East Swamp Aquifer. Identifying boundary conditions for the model domain was complicated by the irregular shape and the wetland covering the majority of the East Swamp Aquifer. A variety of no flow, constant head, and constant flux boundaries were applied as indicated below.

- No-Flow boundaries were set at
  - Drainage divides to the northeast
  - Stratified drift-glacial till contacts to the east
  - Bedrock contact to the northwest and along the aquifer base.
- A Constant Flux boundary was set along the southwest portion of the domain coincident with the cliff base along the southwest edge of East Swamp Aquifer. The flux in each cell along this boundary is 10 cubic feet per day (Figure 5c).
- Constant Head boundaries were placed at the northern and southern edges of the model domain.
  - The swamp at the northern edge was set at a constant head of 285.76-ft (Figure 5a). The head value was extrapolated from water stages observed at the four piezometer locations.
  - Two constant head boundaries were established along the southern limits of the model. In the Layer 1, the head was set at 330-ft based on surface water elevations in a pond observed south of Maple Ave (Figure 5a). The constant head in Layer 3 (332-ft) was determined from water levels observed in M-3 (Figure 5c).

A boundary condition was also established in the area of the swamp deposits (SW) to emulate the standing water in the wetland. A General Head Boundary was placed in this area to simulate standing water present in East Swamp. Head values corresponded to the four water levels measured at the four piezometer locations (Figure 5a).

No stream flow was simulated in the model for the following reasons:

1. Volumetric flow measured in Eckerts Brook and East Swamp Brook was minimal.
2. No affect on the water levels or gradients were noted during the pump test
3. The entire area of the wetland was simulated using a general head boundary.

4.1.4 Aquifer Parameters

Aquifer parameters used in the model include hydraulic conductivity (K), specific storage (Ss), specific yield (Sy), and porosity. The aquifer parameters assigned to each grid cell were distributed throughout the model domain to correspond to the 4 hydrostratigraphic units mapped in the East Swamp Aquifer (Figure 4) and the conceptual model established for the area (Figure 3, 3a, 3b). These units were distributed throughout the 3 layers of the model as shown on Figures 5a, 5b, and 5c. Initial values for hydraulic conductivity were obtained from the variety of pump test data analyzed by HRP or Maguire. Published values were used for the remaining parameters. A summary table of initial values is presented below.

Mapped Hydrostratigrahic Unit	K (FT/Day)	Ss[1]	Sy[2]	Porosity[3]
Sand & gravel, SG	8	0.001	0.32	0.5
Swamp deposits, SW	0.002	0.0013	0.2	0.3
Sand, S	0.02	0.0001	0.33	0.2
Gravel, G	7	0.001	.021	0.4

1. Table 3.4, *Applied Groundwater Modeling*, 2002
2. Table 3.5, *Applied Groundwater Modeling*, 2002
3. Table 3.4, *Applied Hydrogeology*, 2001

4.1.5 Pumping Schedules

The pumping or withdrawal of groundwater from the water supply wells represent stress periods in the groundwater flow model. The following two transient stress periods were incorporated into the model.

- The first stress period simulated the pretest phase. Maple-2 was pumped at a constant rate of 54,862.5 CFD (285 gpm) for 8 days and Maple-1 was not pumping.
- The second stress period included Maple-2 as in the first period, and added Maple-1 pumping at 74,112.5 CFD (385gpm) for a period of two days.

4.2 Model Calibration

The transient groundwater flow model was calibrated to two transient time steps during the November 2013 pump test (Appendix E), corresponding to:

1. A point near the end of the Pre-test Phase when only Maple-2 was operating (11/8 data-time 7.5), and
2. A point near the end of the Pumping Phase when both Maple-1 and Maple-2 were pumping (11/13 data-time 9.75).

Model calibration was completed using the calibration feature included in Groundwater Vistas, which is similar to Parameter Estimation software (PEST). The calibration process varied the hydraulic conductivity values assigned to domain cell until head values converged to stable levels. The table below presents the final hydraulic conductivity values obtained during model calibration:

Unit	Hydraulic Conductivity (FT/Day)	
	Initial	Calibrated
SG	8	234.21
SW	0.002	2e-7
S	0.02	2e-5
G	7	0.0007

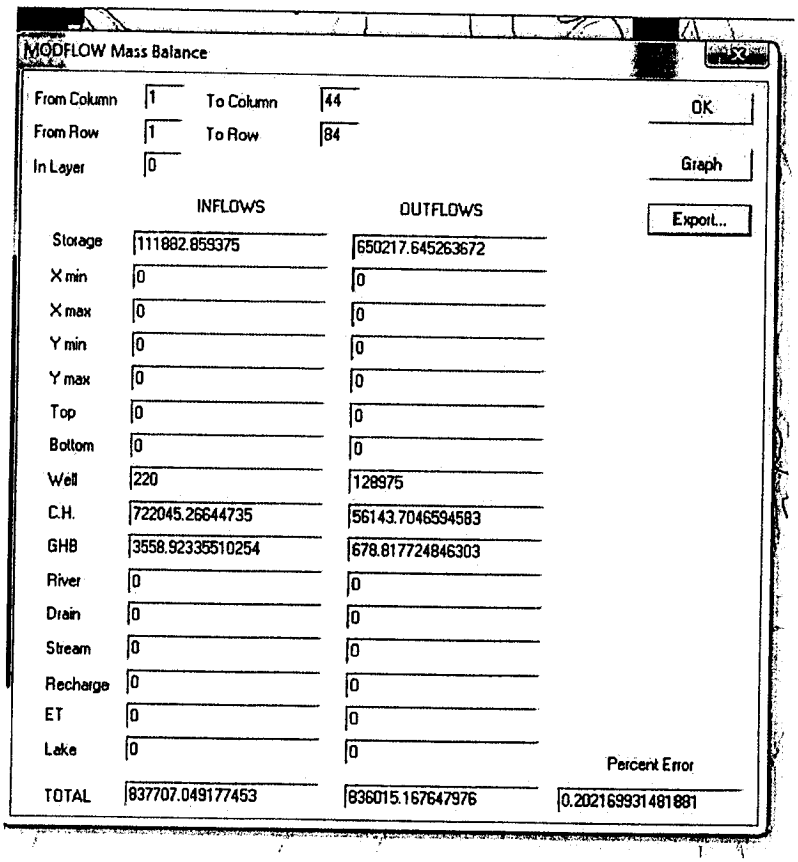
Calibration results were evaluated through analysis of heads and the water budget mass balance. One measure of calibration compared head values simulated by the model to those recorded at monitoring wells during the corresponding time steps of the pump test.

All head differences conform to the standards specified in CGS section 22a-354b-1(e)(1)(D)(iii). Calibration results are summarized below.

Well ID	Observed Head (FT)	Simulated Head (FT)	Difference (FT)
Stress Period 1			
TEST-2	294.19	294.66	-0.472
HRP	294.16	294.25	-0.092
USGS	293.88	294.06	-0.177
M-2	293.62	297.93	-4.312
M-1	295.12	298.59	-3.470
P-2	294.75	296.28	-1.527
M-3	326.81	321.30	5.506
PZ-1	295.08	295.08	-0.002
PZ-2	293.99	293.99	0.000
PZ-3	296.05	296.03	0.017
PZ-4	288.10	288.19	-0.086
Stress Period 2			
TEST-2	294.10	294.73	-0.635

Well ID	Observed Head (FT)	Simulated Head (FT)	Difference (FT)
HRP	294.04	294.27	-0.225
USGS	294.04	294.05	-0.013
P-2	293.89	296.56	-2.667
M-1	289.10	296.41	-7.310
M-2	291.66	295.97	-4.312
M-3	326.58	322.50	4.079

Small errors in the water budget mass balance are also an indication of good calibration. The calibrated mass balance percent error (0.202%) is below the 0.5% limit specified in the regulation. The mass balance results are shown below.



4.3 Sensitivity Analysis

A sensitivity analysis was conducted onhydraulic conductivity, specific storage (Ss), and specific yield (Sy). Values were varied using multipliers between 0.5 and 1.5, and the sum of squares for head residuals were recorded. The analysis revealed that the the model was sensitve to hydraulic conductivity in SG and changes in storativity and specific yield in the sand deposits (S). The multiplier for hysraulic conductivity in SG was consistant with the value obtained through calibration. The sensitivity to Ss and Sy resulted in an average head change of +/- 0.15 feet. This variation was determined to be insignificant and published values were preserved in the model. The sensitivity output files are included in Appendix E.

5.0 AQUIFER MAPPING

Using the calibrated groundwater flow model and topographic maps, HRP completed aquifer mapping in accordance with RCSA §22a-354b-1(f). This included determination of the well field:

- Contribution area,
- Direct recharge area, and
- Indirect recharge area.

5.1 Contribution Area

The calibrated transient groundwater flow model data was modified and run in a steady-state mode to provide simulation of the well field contribution area induced by long-term pumping. In the steady-state simulation all of the domain boundary conditions remained the same as assigned in the calibrated transient model. Evapotranspiration and recharge were negligible during the transient simulation. In order to achieve steady-state simulation, these input parameters were modified using values published by the USGS (Appendix G) listed below.

- Evapotranspiration rates- 0.0479 ft/day
- Recharge rates- 0.0959 ft/day

In addition, the pumping rates of the Maple Ave wells (Maple-1, Maple-2) were increased to reflect the maximum flow rates established in 1983 diversion registration. Maple-1 was set at 84,700 CFD (440 gpm), and Maple-2 was modeled at 93,362.5 CFD (485 gpm). All model data files are included in Appendix F.

The steady state model was initialized by running as transient for 200 days. Following initialization, the modal was run as a steady state simulation. Reverse particle traces were used to delineate the area of contribution. Rings of particles were placed around each pumping well in all three layers of the model. The contribution area surrounding the well field extends to the west and is constrained to the southern portion of the aquifer (Figure 6).

5.2 Direct Recharge Area

The area of direct recharge includes the contribution area and surrounding land where overland run-off may flow into the contribution area. Using groundwater flow data and surface topography, the direct recharge area extends up-gradient from the contribution area to the nearest surface water drainage divide. The direct recharge area for the Maple Ave well field (Figure 6) encompasses the contribution area extending to:

- The expanse of East Swamp to the north, and
- Surface water drainage divides, including
    - Limekiln Brook drainage to the northeast
    - Sympaug Brook drainage along the ridge crest to the south and southwest

5.3 Indirect Recharge Area

The indirect recharge area is defined as the area from which overland flow or groundwater discharge is contributed to any surface watercourse that flows into the area of contribution. Eckerts Brook flows through the well field contribution area. The indirect recharge area is an expansion of the direct recharge area. The area of overland flow or groundwater that may discharge to Eckerts Brook expands the area of direct recharge to the south-southeast. The indirect recharge area for the Maple Ave well

field is defined as topographic drainage basin divides (Figure 6).

6.0 SUMMARY OF FINDINGS

On behalf of The Town of Bethel, HRP completed Level A Mapping of the East Swamp Aquifer fulfilling the requirements of RCSA §22a-354b-1. To complete this task, HRP:

- Installed 3 observation wells (M-1, M-2, M-3), 4 streambed piezometers (PZ-1, PZ-2, PZ-3, PZ-4),
- Installed 3 stream gauging stations (SG-1, SG-2, SG-3)
- Designed and implemented a pump test which fulfilled the Level A mapping requirements while ensuring that the town maintained sufficient water supply,
- Completed numerical groundwater flow modeling to evaluate the well field contribution area, and
- Determined the Level A Aquifer Protection Area (Figure 6)

The Maple Ave well field withdraws groundwater from a stratified drift aquifer underlying East Swamp. The stratified drift is characterized by 4 hydrostratigraphic units, including swamp deposits (SW), sand (S), sand & gravel, and gravel. The two Maple Ave wells (Maple-1, Maple-2) are screened in the sand & gravel unit (SG). The boundaries of the aquifer included:

- The contact between the highly permeable stratified drift and low permeability glacial till mapped along the west and southeastern margins of the wetland.
- Surface water drainage divides to the northeast and south, and
- The contact between the stratified drift and underlying glacial till or bedrock (Stockbridge Marble, Ratlum Mountain Schist) at the base of the aquifer.

During level B mapping, Maguire Group evaluated pump test data collected from the Maple Ave well field in 1967. HRP completed two aquifer tests in the East Swamp Aquifer. A 2005 pump test was completed to provide an initial assessment of well field expansion in the area of Bergstrom Park. In 2013, HRP completed a pump test of Maple-1 and slug tests of stream sediment piezometers (PZ-1, PZ-2, PZ-3, PZ-4) to support the Level A mapping of the aquifer. The aquifer testing yielded no measurable influence on Eckerts Brook or East Swamp Brook. Analysis of all the aquifer test data provided ranges of hydraulic conductivity for the 4 hydrostratigrahic units:

- Swamp deposits (SW)- 0.002-0.004 FT/Day
- Sand (S)- 0.02 FT/Day
- Sand & gravel (SG)- 6-130 FT/Day
- Gravel (G)- 4-10 FT/Day

Data obtained from the aquifer testing was combined with geological and topographical information to construct a numerical groundwater flow model using Groundwater Vistas as a graphical user interface for MODFLOW. The transient groundwater flow model was calibrated to groundwater level data collected at the conclusion of the Pre-test phase of the November 2013 pump test. The calibrated model was verified to groundwater elevation data collected at the conclusion of the Pumping phase of the November 2013 pump test. Once calibrated, a steady-state simulation was run to evaluate the well field contribution area induced by the long-term operation of Maple-1 and Maple-2 at the maximum flow rates provided in the 1983 diversion registration (440-gpm and 485-gpm, respectively).

The simulation identified a relatively small contribution area surrounding the well field in the southernmost portion of the East Swamp Aquifer (Figure 6). Further topographical and hydrogeological analysis identified direct and indirect recharge areas. The direct recharge area expanded from the contribution area to the base of the cliff the west in the west, and to the drainage divide to the south (Figure 6). Given the presence of standing water in East Swamp, the direct recharge area incorporated the wetland area to the north. Only Eckerts Brook flows through the well field contribution area. The

indirect recharge area further expanded the direct recharge area to the southeast to account for overland flow and groundwater discharge that may enter Eckerts Brook (Figure 6).

The recommended aquifer protection area coincides with the indirect recharge area.

DRAFT

FIGURES

WRIGHT-PIERCE
Engineering a Better Environment

MEMORANDUM

TO:	Bethel Public Utilities Commission Andrew Morosky, PE, Public Works Director/Town Engineer	DATE:	March 3, 2014
FROM:	Mariusz Jedrychowski, PE, W-P	PROJECT NO.:	12829A
SUBJECT:	Town of Bethel Water System Capital Improvements Plan Project Status Report		

The following is a status report for:

Town of Bethel Water System Capital Improvements Plan

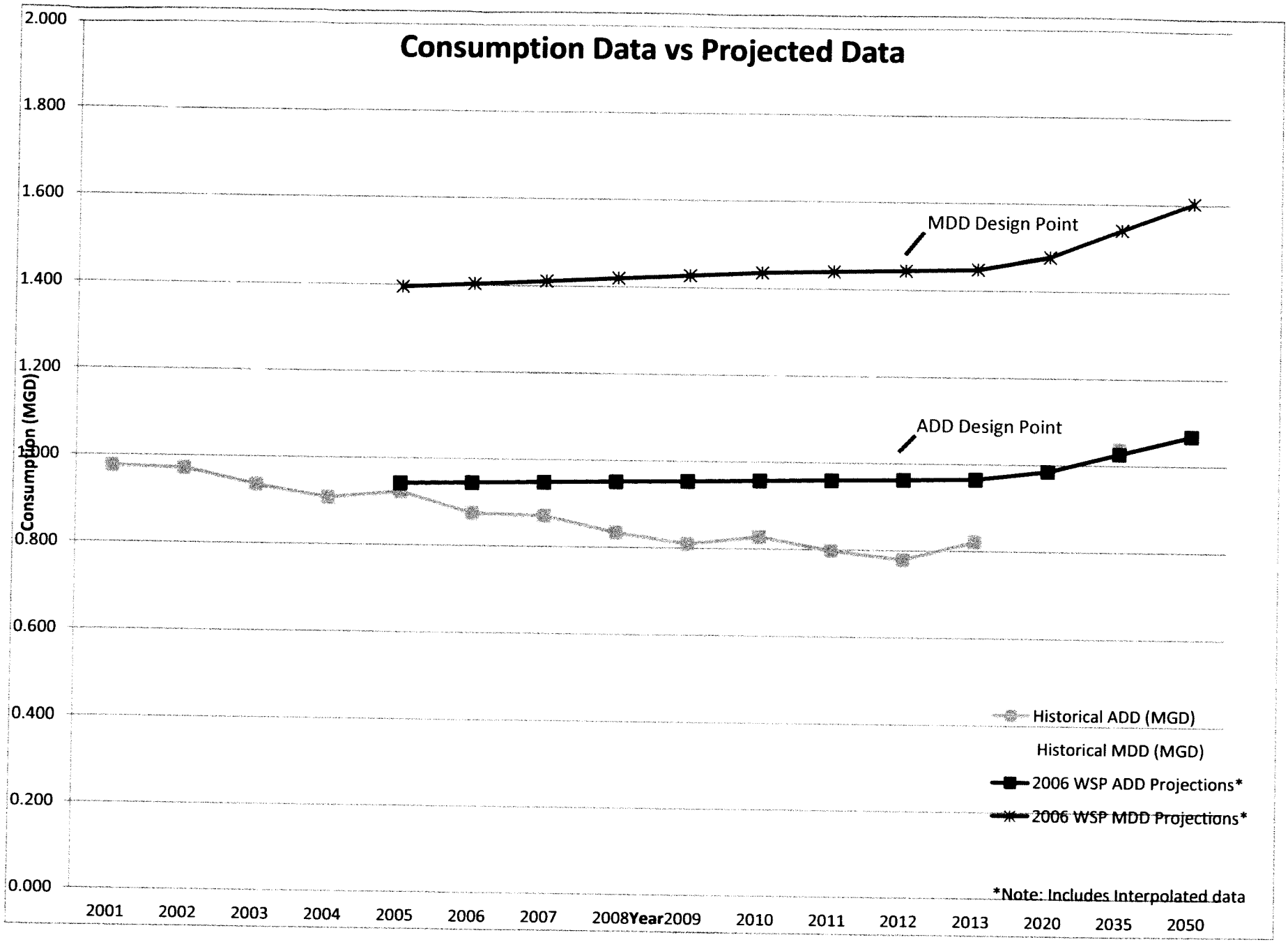
1. ***Preliminary Report Phase***:
   a. **On-going and Completed Work:**
      i. Prepared for & conducted kick-off meeting with Town of Bethel personnel.
      ii. Began CIP report preparation.
      iii. Data collection, review and updates:
         - Completed population growth projections.
         - Completed historical water consumption data review and projections.
         - Completed map line work/water main updates.
         - Compiled recent water main break history data.
         - Completed hydraulic model updates (water mains/pump stations/replacements).
         - Began hydraulic evaluation of system.
         - Began probability and consequence of failure evaluation.
   b. **Work to be Completed in next month:**
      i. Hydraulic modeling evaluation of the system.
      ii. ON-going ISO fire flow modeling/valuations.
      iii. Prioritization of water main replacements.
         - Hydraulics
         - Consequence of Failure
            a. Business Interruption
            b. Traffic Impacts
            c. Criticality
            d. Diameter
         - Probability of Failure
            a. Diameter
            b. Installation Date
            c. Material
            d. Soil Conditions
            e. Static Pressure
            f. Break History

g. Potential for Water Hammer
h. Shallow Mains

iv. Site visits to existing facilities by electrical, architectural and process engineers.
v. Continue report writing and preparation.

c. Project Schedule:

i. Submit draft report to PUC mid-April.


Consumption Data vs Projected Data
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Consumption (MGD)
MDD Design Point
ADD Design Point
Historical ADD (MGD)
Historical MDD (MGD)
2006 WSP ADD Projections*
2006 WSP MDD Projections*
*Note: Includes Interpolated data
2001
2002
2003
2004
2005
2006
2007
2008
Year
2009
2010
2011
2012
2013
2020
2035
2050

S & S Electric
Electrical Contractors
203-748-4776
16 South Street • Bethel, CT 06801
Fax: 203-748-2204

PROPOSAL

4917

TO:
BETHEL PUBLIC WORKS DEPT.
1 SCHOOL ST.
BETHEL CT 06801

PHONE	DATE
203-794-8549	3/3/2014
JOB NAME / LOCATION: TRANSFER STATION POWER	
JOB NUMBER	JOB PHONE

We hereby submit specifications and estimates for:

SUPPLY & INSTALL 3 PHASE POWER TO TRANSFER STATION

CL&P WILL REPLACE EXISTING TRANSFORMER AND VAULT AT PUBLIC WORKS GARAGE.

WE WILL REFEED EXISTING SERVICE ON PUBLIC WORKS GARAGE.

YOU WILL TRENCH FROM TRANSFORMER VAULT TO A NEW PAD MOUNT TRANSFORMER BY TRANSFER BUILDING.

WE WILL SUPPLY & INSTALL CONDUIT AND PULL ROPE FOR CL&P WIRING BETWEEN PAD MOUNT TRANSFORMERS.

CL&P WILL INSTALL WIRING AND A NEW VAULT & TRANSFORMER AT TRANSFER BUILDING.

WE WILL INSTALL A 200 AMP 3 PHASE 4 WIRE SERVICE ON THE TRANSFER BUILDING.

WE WILL SUPPLY & INSTALL PVC CONDUIT FOR PHONE & COMPUTER FROM GARAGE TO TRANSFER BUILDING.

We Propose hereby to furnish material and labor - complete in accordance with the above specification, for the sum of:

[redacted] dollars ($ [redacted]).

Payment to be made as follows:

5000.00 to CL&P at startup, ~~5000.00 to S & S at startup, 0060.00 upon service inspection~~.

All material is guaranteed to be as specified. All work to be completed in a professional manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Our workers are fully covered by Worker's Compensation insurance.

Authorized Signature _____

Note: This proposal may withdrawn by us if not accepted within 30 days.

Acceptance of Proposal - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature _____

Date of Acceptance: _____

Signature _____

TOWN OF BETHEL
SEWER DEPARTMENT

February 28, 2014

				February 4, 2013	Difference 2013 vs 2014	REPORT AS OF: 1/31/14	
						REPORTED	DIFFERENCE
REVENUE			$ 2,770,443.72	2,401,787.46	368,656.26	2,477,566.66	226,394.48
Revenue Detail							-
	Use of Sewer	2,703,961.14		2,370,020.70	333,940.44	-	24.00
	Sewer Assessments	-		-		60,025.00	6,000.00
	Liens	24.00		-	24.00	433.58	(433.58)
	Permits & Installation	66,025.00		25,870.00	40,155.00	-	-
	Interest on Investments	433.58		-		2,538,025.24	232,418.48
	BAN Premium	-		5,896.76	(5,896.76)		
		2,770,443.72		2,401,787.46	368,656.26		
EXPENDITURES							
SALARIES		$ 147,526.03		125,402.83	22,123.20	135,327.73	12,198.30
BENEFITS		46,389.29	193,915.32	44,821.42	1,567.87	46,382.48	6.81
UTILITIES		44,892.18		30,595.31	14,296.87	44,815.92	76.26
SUPPLIES		10,857.24		10,555.99	301.25	10,847.25	9.99
MAINTENANCE		47,483.66		26,804.09	20,679.57	34,400.43	13,083.23
SERVICES		685,192.71		627,434.86	57,757.85	680,784.31	4,408.40
CAPITAL IMPROVEMENT		-		-	-		-
OFFICE		5,243.83		8,470.78	(3,226.95)	5,243.83	-
DEBT SERVICE		1,227,782.07		1,494,942.93	(267,160.86)	1,227,782.07	-
ACCOUNTS PAYABLE-DANBURY				-	-	-	-
		-		-	-		-
ALLOCATED EXPENSE		*60,000.00*		45,000.00	15,000.00	52,500.00	7,500.00
Insurance		-		-	-		-
Allocated Expense- Auditing; IT ETC		-		-	-		-
DEPRECIATION EST		*210,000.00*		183,750.00	26,250.00	183,750.00	26,250.00
			2,485,367.01	2,597,778.21	(112,411.20)	2,421,834.02	63,532.99
NET REVENUE			**$ 285,076.71**	**$ (195,990.75)**	**$ 481,067.46**	116,191.22	168,885.49

WATER DEPARTMENT
February 28, 2014

				February 4, 2013	Difference 2013 vs 2014	REPORT AS OF: 1/31/14	
						REPORTED	DIFFERENCE
REVENUE							
Revenue Detail			$ 772,688.16	847,320.15	(74,631.99)		
	Use of Water	760,864.16		834,414.36		747,363.19	13,500.97
	Liens	24.00		120.00		-	-
	Permits & Installation	11,800.00		10,500.00		11,800.00	24.00
	Interest on Investments	-				-	-
	BAN Revenue	-		2,285.79		-	-
		772,688.16		**847,320.15**		759,163.19	13,524.97
EXPENDITURES							
SALARIES		$ 230,254.09		217,810.91	12,443.18	210,404.36	19,849.73
BENEFITS		79,435.97	309,690.06	71,940.48	7,495.49	79,381.10	54.87
UTILITIES		50,407.18		49,038.64	1,368.54	50,407.18	-
SUPPLIES		40,861.16		38,823.52	2,037.64	39,272.74	1,588.42
MAINTENANCE		104,836.13		40,128.15	64,707.98	52,918.89	51,917.24
SERVICES		123,158.67		38,290.78	84,867.89	86,124.44	37,034.23
CAPITAL IMPROVEMENT		-		5,030.00	(5,030.00)		-
UTILITY COLLECTOR/OFFICE		2,749.56		7,120.42	(4,370.86)	2,749.56	-
DEBT SERVICE					-		-
ALLOCATED EXPENSE		*90,000.00*		78,750.00	11,250.00	78,750.00	11,250.00
INSURANCE		-		-	-		-
DEPRECIATION EST		*83,333.33*		58,333.33	25,000.00	72,916.67	10,416.66
INTEREST EXPENSE		-		-	-	-	-
			805,036.09	605,266.23	199,769.86	672,924.94	112,206.55
NET REVENUE			**$ (32,347.93)**	**$ 242,053.92**	**$ (274,401.85)**	86,238.25	(98,681.58)

TOWN OF BETHEL
SOUTH STREET PUMP STATION

PROJECT AUTHORIZATION.....>						Wright-Pierce		$ 39,900.00
						Engineered Fluid		$ 270,000.00
								-
								-
Authorized.....>		$ 39,900.00	$ 270,000.00					309,900.00
		SERVICES						Project Total
Invoice Date	Contractor	DESIGN	CONSTRUCTION	SITE Work	LEGAL	OTHER		REMAINING
6/17/2013	Wright-Pierce	3,990.00						305,910.00
7/12/2013	Wright-Pierce	2,910.00						303,000.00
8/7/2013	Wright-Pierce	11,055.00						291,945.00
9/19/2013	Wright-Pierce	3,990.00						287,955.00
10/14/2013	Wright-Pierce	1,197.00						286,758.00
1/15/2014	Wright-Pierce	8,250.00						278,508.00
2/14/2014	Wright-Pierce	5,715.00						272,793.00
		-	-	-	-	-	-	
Total Costs.....>		37,107.00	-	-	-	-	-	
Remaining.....>		2,793.00	270,000.00	-	-	-	-	272,793.00
								-

TOWN OF BETHEL

Bethel, CT - Water System CIP (Project 12907 Phase A)

PROJECT AUTHORIZATION.....	Wright - Pierce	$ 35,000.00	
		-	
		-	
		35,000.00	

Invoice Date	Contractor	SERVICES DESIGN	CONSTRUCTION	LEGAL	OTHER	REMAINING
2/14/2014	Wright-Pierce	9,500.00				25,500.00
						25,500.00
						25,500.00
						25,500.00
						25,500.00
		-	-	-	-	-	-
Total Costs		9,500.00	-	-	-	-	-

TOWN OF BETHEL
TRANSFER STATION
February 28, 2014

			REPORT AS OF: February 4, 2013	Difference 2013 vs 2014	REPORT AS OF: 1/31/14 REPORTED	DIFFERENCE
REVENUE		$ 142,620.89	$ 141,901.15	719.74		
Revenue Detail						
Permits	53,655.00				53,615.00	40.00
Bulk Waste	-		51,705.00	1,950.00		-
Dumping Charges	83,080.69		85,920.20	(2,839.51)	77,409.34	5,671.35
Scrap Metal	4,710.20		3,755.95	954.25	4,710.20	-
Brush	1,175.00		520.00	655.00	1,175.00	-
Appliances	-		-		-	-
	142,620.89		141,901.15		136,909.54	5,711.35
EXPENDITURES						
SALARIES	$ 64,772.12		68,547.47	(3,775.35)	59,653.44	5,118.68
BENEFITS	28,373.31		26,721.75	1,651.56	28,373.31	-
UTILITIES				-		-
OFFICE	604.38		105.28	499.10	604.38	-
DEPRECIATION	-			-		-
MATERIALS & SUPPLIES	-		1,336.60	(1,336.60)		-
REPAIRS & MAINTENANCE	-		-	-		-
CONTRACTED SERVICES	40,894.30		29,847.81	11,046.49	38,852.20	2,042.10
INSURANCE	-			-		-
ALLOCATED EXPENSES	*24,000.00*		21,000.00	3,000.00	21,000.00	3,000.00
		158,644.11	147,558.91	11,085.20	148,483.33	10,160.78
NET REVENUE		**$ (16,023.22)**	**$ (5,657.76)**	**$ (10,365.46)**	(11,573.79)	(4,449.43)

This is a brief description all of what my employees are responsible for during on any given day:

Ed Knapp Chief Treatment plant operator (Non Union) is ultimately responsible for the water quality and oversees all aspects of the Plants He takes weekly samples and does all filing to the State of Connecticut. He troubleshoots water quality complaints.

Chris McCollam does the treatment rounds each day. Once in the morning and once in the afternoon. He is doing the treatment rounds every third weekend which gives him a scheduled day off on the following week.

Richard Benzing does all the meter readings and meter repairs as well as the investigation of high use complaints and 10 day reads. He also does the treatment rounds on every third weekend and has a scheduled day off. He does various inspections of water and sewer installations.

Chris Hall does all CBYDs as well as cross connection inspections as well as any day to day requirements. He also does inspections and leak investigations. He currently does not do weekend rounds due to letting his certification lapse.

Norman Cook does the sewer rounds and inspection of the plants. He troubleshoots all issues regarding the sewer plants. He does not do weekend rounds due to letting his certification lapse.

Chris Cudzilo works between the 2 utilities doing everything from ground maintenance to putting weekly enzymes in the wet wells and keeping the wells clear. He maintains the fuel in all the Generators. He also does the weekend water rounds.

Unforeseen duties are breaks and sewer back ups that can not be predicted as well as snow plowing and removal. There are times when they assist highway department when needed. This is paid out of the highway account.

They are required to maintain the plants on Holidays also.

The problem is there may be a lot of down time during the winter, there is a lot to do during the spring summer and fall. The other issue is that, with the exception of Chris Cudzilo, all these employees have 5 weeks vacation, 2 weeks sick time and 2 personal days as well as being one man short one every Friday due to scheduled days off.

I do not feel that I need any more men but I do not feel that I can afford having any less.

I actually would like to create a position of FOG (fats, oils and grease) inspector. This is a mandated issue that seems that no one wants to take charge of within bethel.

I hope this answers any questions regarding my men.

Kelly