

BOSTON

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GROUNDWATER TRUST

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ANNUAL OPERATING REPORT  
Fiscal Year 2001

- A. Work Tasks Completed for Year 2001
- B. Work Tasks for Coop Researchers
- C. Estimated Annual Operating Budget
- D. Capital Improvements Budget
- E. Estimated Costs for Phase I Observation Wells Installation,  
35 Groundwater Wells.

## WORK TASKS COMPLETED FOR YEAR 2001

Groundwater Level Monitoring Program for  
Back Bay, Fenway, South End, Beacon Hill and Chinatown Areas of Boston

- 1) **Measurement and Recording of Groundwater Elevations:** Continued to measure all operable observation wells about three times per semester (approximately 9 readings per year). Continued to update database with new data from these readings, data generally entered within one week of the readings. Using the data from the well readings, developed study area plans to summarize potential “problem” areas where groundwater levels were measured to be below Elev. +6 BCB; updated as each new set of groundwater level data was entered into the data base.
- 2) **Prepared Proper Documentation for Application to Install New Wells:** Completed permit applications for the installation of 35 new observation wells in the Fenway and Back Bay areas. Worked to complete these permit submittals in a manner to address PIC concerns. Application included AutoCAD drawings for each well location showing known utilities (water and sewer). Funding for this capital expense is planned from the two \$25,000 linkage grants received by the Trust (\$50,000 total).
- 3) **Building Permits Search at Inspectional Services:** Research building jackets at ISD to determine areas of wood pile foundations at the perimeter of the principal study area, and which will also be included in further study of groundwater levels.
- 4) **BRA:** Contact BRA upon receipt of all Project Notification filings to insure that groundwater wells are included in construction documents.
- 5) **Base Plans:** Continued to work on the plans, to make sure that all wells are shown in correct locations. Contacted BWSC and BRA to obtain updated databases, as may be available, to correct building locations, however, there is no update available as of yet.
- 6) **Collection of Groundwater Level Data from Public and Private Parties:** Updated database with new well data that was obtained from various developers, building owners and city agencies that had previously been agreed to being in the program. Expanded the database to allow including groundwater level data from previous years, prior to the commencement of the present program.
- 7) **Locating Additional Existing Observation Wells:** Continued to search for other existing observation wells, which either were not identified in the 1990 report by Stone & Webster, or have been recently installed. Determined ground surface elevations at each new well by surveying from known benchmarks. Some of these wells were located based on additional information provided by other parties (from No. 6 above).
- 8) **Website Development:** Worked with the web designer to launch an interactive base plan on the website. Provided BCB elevations of groundwater levels in wells, that are posted on the web for each set of readings. Continued to post news articles to website.

## WORK TASKS FOR CO-OP STUDENTS

Groundwater Level Monitoring Program for  
Back Bay, Fenway, South End, Beacon Hill and Chinatown Areas of Boston

- 1.) **Measurement of Groundwater Elevations:** Continue to measure all operable observation wells at three to four times per semester. Continue to update database with new data from these readings, within one week of the readings. Develop study area plans on CAD to summarize “problem” areas with groundwater levels below Elev. +6 and +5 BCB, for each set of new groundwater elevations as they are gathered.
- 2.) **Monitor the Installation of New Observation Wells:** During the installation of new observation wells in the Fenway/Symphony and Back Bay areas, monitor the drilling contractor’s installation of new wells and document details of each installation in the database.
- 3.) **Building Permits Search at Inspectional Services:** Continue to research files/permit jackets as ISD to determine areas of wood pile foundations, the elevations of tops of wood piles and where wood pile repairs have been made. This data helps to identify portions of the study area where different “critical groundwater levels” may be established.
- 4.) **Base Plans:** Continue work on the plans to make sure that all wells are properly located. Obtain updated databases from BWSC (or BRA) as available to correct building locations.
- 5.) **Collection of Groundwater Level Data from Public and Private Parties:** Update database with new groundwater level data from the wells (data that is provided by various developers, building owners and city agencies). Add to an expanding database as necessary to allow including groundwater level data from previous years.
- 6.) **Locating Additional Existing Observation Wells:** Continue to search for other existing observation wells, and incorporate those found into the program. Determine ground surface elevations by level surveying for newly found wells.

**BOSTON GROUNDWATER TRUST**  
Groundwater Level Monitoring Program Renewal  
for Back Bay, Fenway, South End, Beacon Hill and Chinatown Areas of Boston

**ESTIMATED ANNUAL OPERATING BUDGET**  
Years 2002, 2003

<b>I. WENTWORTH CO-OP RESEARCHERS:</b>	<b><u>\$43,640</u></b>
Two Students @ 3 semester per year @ 17 weeks per semester, averaging @ 40 hrs/wk @ \$16/hr =\$640 dollars/wk x 51 wks=\$32,640 dollars Additional field work = \$11,000 for supervision of new observation well installation.	
<b>II. REIMBURSABLE EXPENSES:</b>	<b><u>\$ 3,900</u></b>
-Field Equipment & Related	\$3,500
-Office Supplies, Reproduction, Postage	\$ 400
<b>III. WEB SITE:</b>	<b><u>\$ 3,500</u></b>
-Updating, Maintenance, Management and misc. fees	
<b>SUB-TOTAL</b>	<b><u>\$51,040</u></b>
<b>10% Contingency Factor</b>	<b>\$ 5,104</b>
<b>TOTAL CALENDAR YEAR OPERATING BUDGET</b>	<b><u>\$56,140</u></b>

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Groundwater Level Monitoring Program Renewal  
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**CAPITAL IMPROVEMENTS BUDGET**  
Years 2001, 2002, 2003, 2004

**Cost Estimate Installation for one (1) well:**

<u>Items:</u>	<u>Cost:</u>
O.W. Material	\$225-\$250
P.I.C. Permit	\$100-\$350
Street Permit	\$250
Rig/Crew Labor	\$600-\$1200
Police Detail	\$160
Utility Clearance	\$100
<b>Total</b>	<b>\$1,210-\$2,310</b>

A request would be made to have this fee lowered by the P.I.C.

**Cost Estimate for Observation Wells Installation Implementation**

**Phase I** (2001) File PIC application to install 35 new monitoring wells in critical Fenway, Back Bay locations

**Phase II** (2002) File PIC application to install approximately 75 New Monitoring Wells at Critical Locations in Back Bay, South End, Fenway and Chinatown

**Phase III** (2003) Re-Institute Observation Well Network Density to that of WPA 1930's Program

Requires approximately 500 new observation well installations to achieve the one well per 2 acres density, as baseline coverage.

At an estimated average cost of \$1,200 to \$2,000 per well,  
TOTAL CAPITAL COST = \$600,000 to \$1,000,000 – Year 2003

**Phase IV** (2004) Investigation of Specific Ares of Lower than Normal Groundwater Levels

As a result of groundwater levels measured in current and soon to be re-established (*Phases I & II*) observation wells, a number of areas will be identified as having groundwater below minimum "safe" levels. Further investigation will require installing additional wells in each specific area to further define the location of lowest groundwater and assess likely cause of the lowering.

Assume that 15 such Low Groundwater Locations are identified in the first two years after the *Phase III* wells have been installed. Use average of 30 wells as being needed to "localize" the point of the lowering and better define the local area of severe impact, which could encompass an area herein assumed to be three blocks (for total of approximately 500 more observation wells).

An estimate of the average cost of \$1,500 to \$2,400 per well is used due to the limited numbers to be installed at any one time, and the cost to mobilize/demobilize for each series of field installations.

At an estimated average cost of \$1,500 to \$2,400 per well.  
TOTAL CAPITAL COST= \$750,000 to \$1,200,000 – Year 2004

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Groundwater Level Monitoring Program Renewal  
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**SCHEDULE OF ESTIMATED INSTALLATION COSTS FOR**  
**35 GROUNDWATER WELLS**

DESCRIPTION	N.H. BORING	GEO LOGIC	CARR DEE
<b>Mobilization/Demobilization</b> Mob/Demob of Truck rig w/OSHA trained crew	<u>500.00</u>	<u>700.00</u>	<u>500.00</u>
<b>Drilling – Footage Rate</b>	<u>26,000.00</u>	<u>28,000.00</u>	<u>33,000.00</u>
<b>Observation Well Installation</b> 1-in diameter piezometer installed	<u>6,500.00</u>	<u>8,500.00</u>	<u>9,000.00</u>
4Standard 4-in diameter roadway box	<u>3,000.00</u>	<u>3,400.00</u>	<u>1,920.00</u>
<b>Optional Items</b> Utility Clearance	<u>8,000.00</u>	<u>8,500.00</u>	<u>10,000.00</u>
Police Detail	<u>5,600.00</u>	<u>5,760.00</u>	<u>5,600.00</u>
<b>TOTAL</b>	<b>\$49,600.00</b>	<b>\$54,860.00</b>	<b>\$60,020.00</b>