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LINCOLN APPLIED GEOLOGY, INC.

March 8, 1989

Commissioner Patrick Parenteau
Department of Environmental Conservation
Agency of Natural Resources
103 South Main Street
Waterbury, Vermont 05676

Dear Commissioner Parenteau:

Please find enclosed a summary report regarding the on-going hydrogeologic investigation and ground water remediation at Charley's Quick Stop in Enosburg Falls, Vermont. This report is submitted by Lincoln Applied Geology, Inc. on behalf of S.B. Collins, Inc.

After your review of this report please forward it to Mr. Reginald A. LaRosa and Mr. Richard Spiese for their subsequent review.

If you have any questions or concerns in regard to the above matter, please do not hesitate to give me a call at 453-4384.

Sincerely,

Stephen Revell, C.P.G.S.

SR: da

Steve Revell, C.P.G.S.
Geologist - Hydrogeologist

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Hydrogeologic and Contaminant Evaluation
of
Charley's Quick Stop
Enosburg Falls, Vermont
March 6, 1989

Prepared for:
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I. Introduction

A. Background History

On 12/12/88, a 400 gallon inventory loss was recorded for the 4,000 gallon regular gasoline underground storage tank at Charley's Quick Stop (CQS) in Enosburg Falls. On 12/14/88, the suspect tank took on 9-inches of water. On 12/16/88, 12-inches of water was measured in the tank. On 12/17/88, several residents of the town reported gasoline fumes in their homes. The Vermont Department of Environmental Conservation (VDEC) was promptly informed by town officials of the situation. The VDEC immediately screened all of the homes and businesses in the area for petroleum fumes with an HNU photoionization device. Seven residences and one business were found to be affected by fumes. It was also determined by the VDEC that the fumes were entering the subject buildings by way of the sanitary sewer, and that the buildings affected were those without proper sewer vapor traps. The VDEC promptly evacuated the residents of the affected homes until the concentrations of petroleum fumes were decreased to a safe level.

The VDEC informed S.B. Collins, Inc. (SBC), the owner of the suspect tank, that the tank must be pumped free of product and that remediation activities in regard to the sewer vapor problem and potential product migration off the CQS property be initiated promptly. On 12/17/88, SBC placed a large exhaust fan in the sanitary sewer manhole located in the center of the intersection of Main and Depot St., adjacent to the CQS site. On 12/18/88, SBC retained Lincoln Applied Geology, Inc. (LAG) to perform a hydrogeologic evaluation of the site which would define the extent and degree of petroleum contamination and to design a product recovery/ground water remediation system. The VDEC also requested that LAG screen the affected buildings with an HNU on a daily basis until the proper sewer traps were installed.

B. Location

The CQS is located on the northeast corner of Route 108 (Main St.) and Depot Street intersection in the center of Enosburg Falls, Vermont. Enosburg Falls is located in the north-central portion of Franklin County. It's general location is shown on Figure 1. The property has been historically used as a convenience type retail grocery and fuel retail store. The property is bounded on: the north by a private residence, the east by the Aubuchon Hardware building, the south by Depot Street, and the west by Route 108. A detailed set of plans showing the CQS, streets, and adjacent properties is shown on Figure 2.

The site can topographically be described as gently sloping towards the south at a rate of 2 to 3 feet across the CQS property. The elevation of the site is approximately 430 feet above mean sea level. Since the surface of the property is completely covered by cement and asphalt, all precipi- tation falling on the site will flow as sheet flow towards the south and main Street into storm drains. Because of this, the ground water system beneath the property is not recharged through surface related processes

B. Location Cont.

associated with the CQS property. Instead the ground water system is recharged almost entirely by upgradient surface and subsurface processes.

II. Scope of Investigation

A. Objectives

The objectives of the study were to:

1. define the subsurface hydrogeology of the site,
2. define the physical extent and magnitude of petroleum contamination beneath the site,
3. design and assist with the installation of a product recovery/ground water remediation system, and
4. continually monitor the affected residences on a daily basis until the appropriate sewer related repairs were complete.

B. Methodology Utilized to Accomplish Objectives

The definition of the subsurface and the assessment of the contamination problem associated with the site area included:

1. The placement and construction of one 4-inch and six 2-inch PVC monitoring wells.
2. The proper development of the monitoring wells to insure the collection of representative ground water elevation and chemical water quality data.
3. The installation of a laterally extended, large diameter recovery well.
4. The installation and operation of a ground water depression pump in the recovery well.
5. The removal of the suspect leaking underground storage tank.
6. Installation of a leach field type recharge gallery for ground water recycling.
7. The conduction of site surveys relative to the location and elevation of monitoring wells, the recovery well, buildings and any other features in order to prepare a site map.
8. Collection of ground water elevation and product thickness measurements.

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B. Methodology Utilized to Accomplish Objectives Cont.

9. Generation of ground water and overall liquid contour maps which are used to determine ground water gradients and flow directions.

10. Collection and analysis of ground water samples from each monitoring well not containing free product.

11. Research pertaining to regional surficial and bedrock geology.

12. Compilation and evaluation of all data collected.

Monitoring of the gasoline fume affected residences included:

1. Daily measurement of HNU readings in the living areas and basement areas of each residence.

2. Daily HNU readings of the exhaust from the sanitary sewer manhole in front of CQS.

3. Daily HNU readings of the influent pipe at the head works of the Enosburg Falls Sewage Treatment Plant.

4. Daily communications with Treatment Plant operator Samuel Gates to report findings of the HNU survey and address any additional reports of fumes in residences.

The conduction of these tasks was initiated by LAG on 12/18/88 and has continued to date. Daily fume (vapor) monitoring of effected buildings was conducted daily until the sewer traps were installed and shown to eliminate the fume problem.

III. Results of Investigation

Each of the 7 monitoring wells were installed utilizing hollow stem auger methods. First a 6-inch diameter borehole was drilled to its depth of completion. For monitoring well #1 (MW-1) the augers were removed and a well consisting of 10 feet of 4-inch Sch. 40, 20 slot PVC well screen was installed. An artificial silica sand packing material was placed in the annular space between the borehole walls and the well screen. The well was sand packed to within 3 feet of grade. A one foot bentonite seal was placed directly on top of the packing, and the remainder of the hole was filled with drilling cuttings and finished flush to grade with an 8-inch accessway. The remaining 6 monitoring wells were drilled to depth in the same manner as MW-1. These wells were constructed of 5 to 10 feet of 2-inch Sch. 40, 20 slot PVC well screen and 5 feet of 2-inch Sch. 40 solid PVC riser pipe. The wells were silica sand packed to, at least, one foot above the screen. A one foot bentonite seal was placed on top of the packing and the hole was

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III. Results of Investigation Cont.

finished as mentioned above. The locations of the wells are shown on Figure 2a Figures 3a through 3g graphically show the geology and well construction details for all seven monitoring wells.

Because of the shallow depth of well construction, the limited amount of ground water encountered, and the contrast in soil types, split spoon type soil samples were not taken during drilling activities. Total well depth was determined to be complete when a sticky grey clay was encountered. The soils and soil contacts beneath the site were identified by examining the borehole walls during drilling and by evaluating drill cuttings and spoil left on the auger flights as they were removed. The soils encountered beneath the COS site can generally be described as sand and gravel fill over a medium brown, to yellow-brown, fine to medium grained sand overlying a coarse, grey sand and gravel which directly overlies a dense impeding layer of sticky grey clay. The coarse, grey sand layer is the water bearing layer in each of the wells. The detailed lithology of each well is presented as Figures 3a through 3g. The soils found beneath the site agree with the regional surficial geologic description by Doll, 1970 which indicates that Enosburg Falls should be underlain by recent alluvium and silty to clayey lake bottom deposits. Doll 1961 describes the bedrock beneath the area as a grey to buff schistose greywacke of the Pinnacle formation, a member of the Cambrian age Camel's Hump Group. It should be noted that bedrock is present at considerable depth below the area. It was not encountered during the investigation and is not considered as having been impacted by the gasoline spill.

Olfactory screening of the cuttings from each well indicated that only the soils associated with MW-1 and MW-4 contained significant fresh gasoline odors. The soils associated with MW-2 indicated a moderate weathered petroleum odor, and the remaining four monitoring wells did not have any gasoline or petroleum odor associated with them.

Utilizing the lithological data acquired during drilling activities, two geologic cross sections of the site were generated. The locations of cross sections A-A' and B-B' are indicated on Figure 2. The cross sections are presented as Figures 4a and 4b. Figure 4a is cross section A-A', which bisects the site from the south to the north utilizing MW-1, 5, and 7. The cross section shows the top of the impeding clay layer steeply sloping towards the south. Figure 4a also shows the coarse sands (which is defined as the principal water bearing and water transmitting layer) sloping towards the south. Figure 4b is cross section B-B', which bisects the site from the east to the west utilizing MW-3, 4 and 6. The cross section shows that the clay impeding layer is generally flat in between MW-6 and MW-4. However, between MW-3, and MW-4, the clay dips steeply towards the west. However, cross section B-B' also shows a silty, fine, sand layer is present between MW-4 and MW-3. Since these materials have a much lower permeability than the medium to coarse sands, they will tend to shunt ground water and product towards the east and into the heart of the site.

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III. Results of Investigation Cont.

Following well construction, the wells were developed by continuous pumping methods. The well development consisted of pumping each well in a non-turbulent fashion with a peristaltic pump until clear water was recovered. During development of the monitoring wells, at least, ten well volumes of water were pumped from each. Following their development, the monitoring wells were then allowed to fully recover. The results of well development indicate that well recharge (the yield of the unconsolidated materials) is low.

On December 20, 1988 a large diameter recovery well, shown as RW-1 on Figure 2, was placed downgradient of the suspected leaking tank. The recovery well was constructed using a ten foot long, 30-inch diameter metal culvert. The culvert was slotted vertically from one end for 8 feet of its length, and placed in the center of a 4 x 4 x 11 foot excavation. The recovery well was placed 4 feet into the impeding clay layer as a means of creating an effective sump, and then surrounded by clean stone to a point 2 feet below grade. In an attempt to affect a greater area of the site, the well was laterally extended with two interceptor trenches, also shown on Figure 2. The trenches run from the recovery well towards the north and east respectively. Each trench was excavated, at least, 2 feet into the clay impeding layer at the recovery well, and then gently sloped upwards towards the farthest end of the trench. As each trench was constructed, care was taken to insure that they were properly and continuously keyed into the clay layer throughout their full length. In this way, a sloped trough (for ground water and product to flow towards RW-1) was formed. During the excavation of the north-south trench, the sanitary sewer service pipe connecting the CQS to the sanitary sewer main was encountered. It was observed by LAG personnel that free product was traveling along the sides of the service pipe towards the sewer main. During trench excavation it was also observed that ground water beneath the site was principally associated with the coarse sand lens, which is perched directly on the clay layer. Evidence of mottling indicates that ground water flow is also associated with the medium sands, when ground water levels rise 2 to 3 feet above the clay layer in response to significant recharge events (i.e. spring runoff).

Once the trench excavation was complete, a 2 to 3 foot clean stone layer was placed in each of the trenches. The stone was covered with untreated construction paper and the remainder of the excavation was filled with uncontaminated soil. The construction paper was placed in order to prevent the clogging of the trenches with fine grained sediment from above.

Following the completion of the recovery well, a ground water depression system was installed. The system consists of a sump-type pump and a double-float switching system. Figure 5 presents a vertical cross section through the recovery well showing the pumping system details. The sump pump removes ground water from the well creating a cone of depression which induces flow of ground water and product towards the well. In this way, the fugitive product can be contained on-site and manually recovered from the well. The floats are adjusted to turn the pump on and off at the optimum level of drawdown. The floats are also adjusted in such a way that

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the sump pump will remain submerged in ground water at all times. This insures that free product is both never in contact with the pump, or accidentally pumped from the well. All ground water pumped from the recovery system is being filtered by two activated carbon canisters connected in series to remove the dissolved petroleum. The treated water is then discharged into the local storm sewer. The treated ground water is monitored regularly as per the 1272 discharge permit issued by the Agency of Natural Resources Permits and Compliance Division.

The suspected leaky tank was removed on 12/20/88. The tank had a 4,000 gallon capacity and stored regular gasoline. The tank was found to be severely pitted. Several areas exhibited such dense pitting that the pits overlapped forming a gash or split in the tank. After removal, the tank was purged of fumes and transported off-site for disposal. The soils associated with the tank excavation were found to be highly contaminated with free gasoline and gasoline vapors.

Following tank removal and the return of grossly contaminated soil to the excavation, a leach field type recharge gallery was placed in the former regular gasoline tank area (see Figure 2). The gallery will serve as the discharge area for waters pumped from RW-1 when frost no longer exists in the ground this spring. By re-injecting the pumped ground water, the soils in the area will be effectively washed of residual free product as the injected water flows towards the recovery well. The gallery will also create a mounding effect on the ground water surface, thereby, increasing the ground water gradient towards the recovery well. This condition will increase the rate at which product and ground water flows towards the recovery well.

The recharge gallery is constructed of a closed loop of 4" perforated PVC drain pipe surrounded by a total of 18" of 1 to 1.5 inch diameter clean stone. The stone was covered with untreated construction paper before the remainder of the excavation was filled with clean sand. The bottom of the gallery is approximately 4 ft. below grade. Pumped ground water introduced to the gallery will flow through 2 to 4 feet of unsaturated soil before it reaches the water table.

During the construction of the laterally extended recovery well and recharge gallery, approximately 50 cubic yards of moderately to highly petroleum contaminated soil could not be replaced in the excavations. This soil has been stockpiled on and covered by plastic at the north end of the site shown on Figure 2. The soil will be evaluated in the spring to determine the most appropriate method of disposal.

A site survey to locate and determine the elevation of each well was performed. This data was used to generate the detailed site map presented as Figure 2. The site map was also utilized when generating the ground water and liquid contour maps presented with this report.

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Ground water elevation and product thickness measurements have been taken on, at least, a weekly basis since the completion of monitoring well installation activities. The data collected to date is presented as Table A-1 of Appendix A. The elevation data for each well is also presented in graphical form as Figures A-1 through A-8 of Appendix A.

Figures A-1 through A-8 of Appendix A show that, in general, each of the wells on-site equilibrated quickly and have given representative ground water and product measurements. MW-3 and 4 are the exceptions. As can be seen on Figure A-3 of Appendix A, MW-3 initially gave abnormally depressed ground water elevations. In an attempt to break the ground water surface tension in the surrounding soils, and achieve a more representative ground water elevation, five gallons of water were introduced to MW-3. As a result, the surface tension effects were eliminated and more representative ground water data has been collected.

Figure A-4 of Appendix A shows how drilling into the underlying clay created a sump-like condition in MW-4. The majority of liquid present in each well on-site enters from the 6-8" thick water/product bearing layer perched on the top of the clay surface. In the area surrounding MW-4, the liquid present is principally free product. Therefore, when MW-4 was installed, free product flowed into the well at a great rate. The top of the overall liquid surface equilibrated at a point higher than the surrounding ground water elevation. This condition effectively prevented ground water associated with the coarse sand from entering the well. Therefore, an anomalously low ground water elevation was measured. In an attempt to achieve accurate ground water measurements, product was removed from MW-4 on January 4, 1989. As can be seen on Figure A-4, of Appendix A, by the end of January 1989 ground water and product levels had equilibrated properly.

Also presented in Appendix A are graphs relating product thickness measurements versus time for MW-1, MW-4, and RW-1 which are labeled as Figures A-9, A-10 and A-11 respectively. These three wells have continually contained significant amounts of free product. Figure A-9 shows that product thickness is slightly increasing in MW-1. This fact indicates that a significant amount of product is collecting in the area of MW-1 due to the operation of RW-1. Figure A-10 helps to further exhibit the sump effect seen in MW-4. Six feet of product was removed from MW-4 on January 4, 1989, product thickness measurements after this date have not exceeded .40 feet. Also, product thickness decreased slightly in MW-4 throughout the month of February, which may be an indication that product thickness upgradient of RW-1 is thinning. Figure A-11 shows how product recovery by SBC has kept product thickness in RW-1 to less than .10 feet.

Utilizing the ground water and product elevation data presented in Appendix A, ground water and overall liquid contour maps were generated. Figure 6a and b are the ground water and overall liquid contour maps for December 29, 1988. The ground water contour map indicates the presence of a 4 to 5 foot depression with its center being MW-4. This is due to the

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anomalously large product thickness measured in MW-4. The overall liquid level map, Figure 6b, indicates that liquid flows from the north towards the south. The contour lines bend slightly towards the west and MW-3 due to the abnormally low initial ground water elevation created by surface tension effects.

Ground water and overall liquid level contour maps for January 11, 1989 are presented as Figures 7a and b. This data represents the midway point of MW-4's ground water equilibration after the initial 6 feet of product was removed. Both the ground water and overall liquid maps indicate an un-natural depression surrounding MW-4. However, the maps do indicate how flushing has remedied the tension effects which were causing the low ground water measurements in MW-3.

Once MW-4 had fully recovered from the product removal event, truly representative contour maps could be generated. Figure 8a and b represent the ground water and overall liquid contour maps for February 14, 1989. These maps indicate a 2 foot cone of depression associated with the recovery well. The depression is distorted due to the presence of the interceptor trenches. In this regard, the trenches are preferred ground water/product flow areas and are effected by the pumping activities more dynamically than the surrounding soils. This results in the distortion of the cone of depression. The contour map jointly indicates that the current ground water depression activities appear to be affecting the tank area, the interceptor trenches, and up to 20 feet away from the trenches towards Route 108 and Depot Street.

Utilizing the February 14, 1989 contour map, an average ground water gradient across the site of 0.060 ft/ft can be calculated. When combined with an estimated porosity of 35%, an estimated permeability range of 10 to 50 feet/day, and a travel distance of 60 feet, the ideal time for ground water to travel from the former regular gasoline tank area to RW-1 can be estimated to range from 8 to 42 days. Taking into account the fact that petroleum generally flows at a slower rate than ground water, and preferred flow paths are present, it appears that the travel time range closely corresponds with the number of days between the documented loss of product, and the presence of gas fumes in the sewer system as well as, the appearance of measurable amounts of free product in MW-1.

On 1/11/89 ground water quality samples were taken from each well on-site not containing free product. Each sample was analyzed by Endyne Laboratory Service Inc. for benzene, toluene, ethyl benzene, xylenes, aromatics and aliphatics. The results for each well sampled along with results for the effluent from the two carbon canisters are presented as Appendix B. Table B-1 of Appendix B shows the total hydrocarbon concentrations for each well sampled. (Please note that a sample of the ground water being pumped from the recovery well was also procured to help determine carbon canister break through times). MW-2 was the only well sampled with quantifiable amounts of contamination. As was mentioned above,

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the soils associated with MW-2 had a faint old petroleum smell. It is also believed that the area adjacent to MW-2 also contained underground storage tanks at one time.

The total hydrocarbon data and a detailed site map were used to delineate estimated limits of the free product and dissolved petroleum plumes as shown on Figure B-1 of Appendix B. The free product plume appears to be contained to the area of the site affected by the recovery system. The dissolved petroleum plume is also fairly well contained within the site area.

In regard to monitoring the petroleum vapors entering homes in the area, Figure 9 is a map locating the affected homes which also lists the names of the residents or owners of each home. The fumes were being created by gasoline product entering the sanitary sewer where it volatilized and traveled into homes without proper vapor traps. HNU readings were taken of the ambient air in each of the home's living and basement areas on a daily basis. This work was initiated by the VDEC on December 16, 1988. At that time, the residents of each building were evacuated due to positive HNU readings in the living areas. An exhaust fan was placed in the manhole at the center of the intersection of Depot Street and Route 108 on December 16, 1988 to vent fumes from the sanitary sewer. The VDEC took HNU readings of the residences on December 17 and December 19, 1988 to confirm the fact that the exhaust fan was keeping vapor levels in the homes to a minimum. In this regard, HNU data collected by the VDEC as well as that collected by LAG is presented as Table 1. The HNU readings decreased significantly once the exhaust fan was placed into operation. The VDEC requested that readings from each house, the exhaust fan, and the local treatment plant's influent pipe be procured daily until repairs could be performed at each residence. LAG performed this work utilizing a 10.2eV HNU photoionization detector. Once work was completed at a residence, daily HNU readings were stopped. On December 27, 1988 each of the affected residences had new vapor traps installed. On December 28, 1988, HNU readings were taken from the living area, basement area, and at both the sewer and house sides of the vapor traps at each residence. The exhaust fan was then turned off and HNU readings were taken again. It should be noted that the sump area HNU readings on December 28, 1988 December 29, 1988, and January 16, 1989 are measurements of the fumes on the sanitary sewer side of the vapor traps. Each area was checked again on December 29, 1988 and January 16, 1989 to insure that no fumes were entering the residences. Measurable amounts of vapor have not entered the homes or the house-side of the vapor traps since the repairs have been completed. All sewer related repair work was completed on January 17,1989 with the placement of a vapor trap at Simple Tastes, shown on Figure 9.

Recovery of free product from RW-1 has been performed by SBC on a regular basis and has resulted in the collection of 247 gallons of gasoline to date.

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IV. Conclusions

In light of the findings of investigation, the following conclusions are made:

1. On December 12, 1988 approximately 400 gallons of regular gasoline product was released from a leaking 4000 gallon underground storage tank at Charley's Quick Stop located in Enosburg Falls, VT.

2. The release resulted in significant amounts of free gasoline product floating on the ground water beneath the site.

3. The release resulted in gasoline entering the sanitary sewer system where it volatilized creating gasoline vapors. Because of the absence of vapor traps, the vapors entered one business and several local residences.

4. The source of the gasoline release has been removed.

5. Vapor migration into the affected residences ceased when proper vapor traps were installed.

6. The soils associated with the site consist primarily of sands over massive clay.

7. The ground water encountered beneath the site is associated with a thin, perched sand type aquifer which resides directly on the massive clays.

8. The clay surface is sloped towards the south and west.

9. Ground water flow will tend to follow the clays to the south and west. Ground water flow to the south will be promoted and flow to the west inhibited by the presence of silty, fine sand which slopes from west to east between MW-3 and MW-4.

10. Ground water flows from north to south through the site on an average gradient of .060 ft/ft.

11. Active ground water pumping from the laterally extended recovery well has created a substantial cone of depression. The cone is effectively containing the free product on-site.

12. Laboratory analysis of ground water samples indicate that no significant amounts of dissolved petroleum exist in the monitoring wells off-site.

13. Product recovery efforts have collected 247 gallons of gasoline from RW-1.

14. Approximately 50 cubic yards of contaminated soil remains properly stockpiled on-site.

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V. Recommendations

Utilizing the knowledge gained from the findings and conclusions to date, the following recommendations are submitted:

1. Continue operation of the ground water depression system in RW-1. Adjustment of pumping rates and drawdown depths should be made to maximize drawdown and recovery of product.

2. Continue utilizing the activated carbon treatment system for discharging recovered and treated ground water to the storm sewer.

3. Continue recovery of product on a regular basis. Product thickness in RW-1 must be kept to an absolute minimum.

4. Utilize the recharge gallery for discharge of untreated ground water when the spring thaw begins.

5. Continue weekly monitoring of ground water and product elevations on-site. Screening of the sanitary sewer manhole adjacent to the site and the influent to the treatment plant should also be performed at the same time.

6. Continue generating ground water and liquid contour maps to help insure that proper water table drawdown and product recovery is taking place.

7. Ground water quality samples should be collected and analyzed from all wells on a quarterly basis to help ensure that dissolved product is being contained on-site.

8. Once thawed, the contaminated soil stockpile should be screened with an HNU to determine the most appropriate disposal method.

9. Reports should be generated by LAG, on a quarterly basis, which present and summarize all data acquired to date, and which recommend any additional work necessary to insure an efficient site clean-up.

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VI. References

Doll, C.G., Stewart, D.P., and MacClintock, P. (1970), Surficial Geologic Map of Vermont, Vermont Geologic Society.

Doll, C.G., Cady, W.M., Thompson, J.B., and Billings, M.P., (1961), Centennial Geologic Map of Vermont, Vermont Geologic Society.

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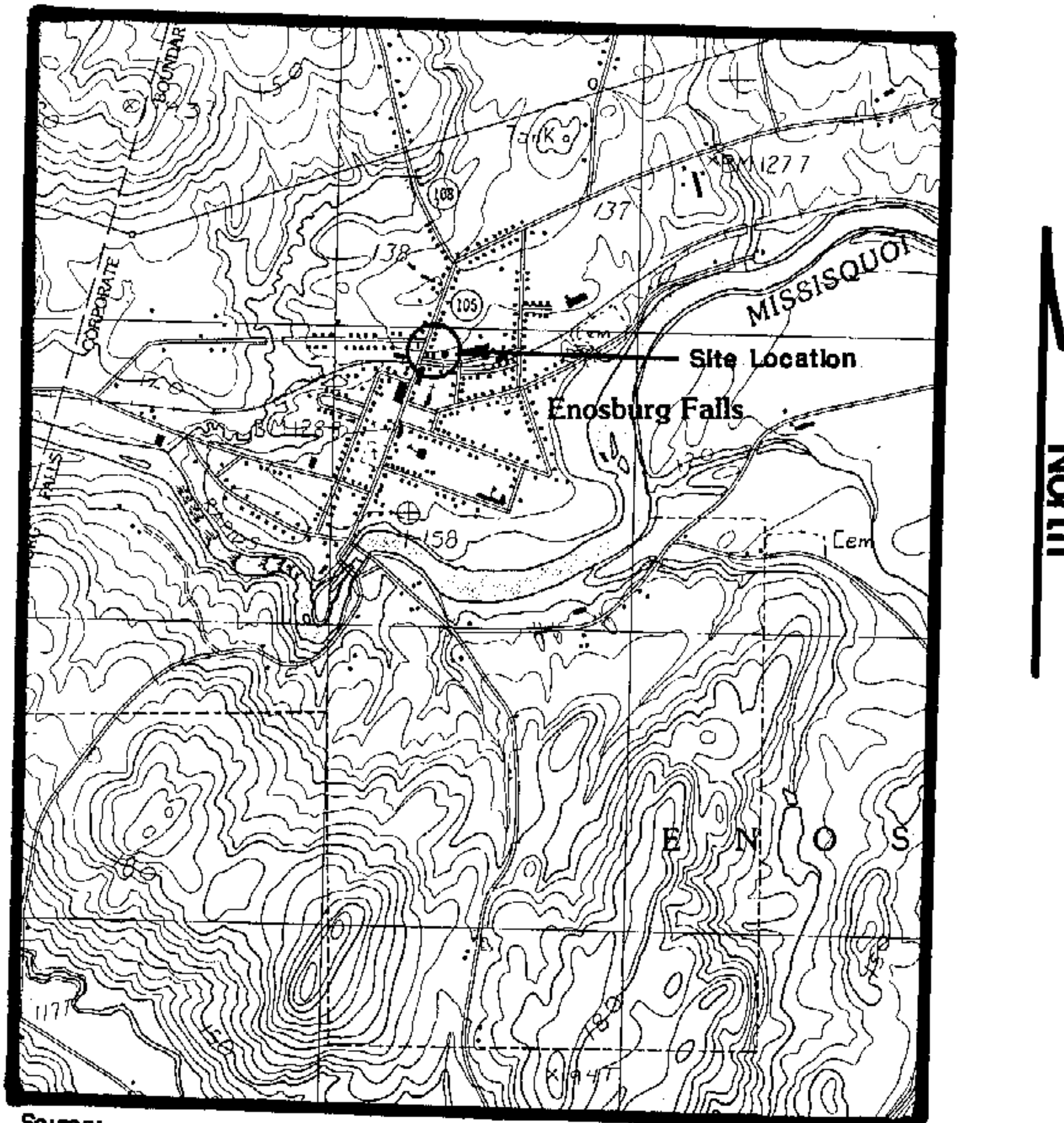
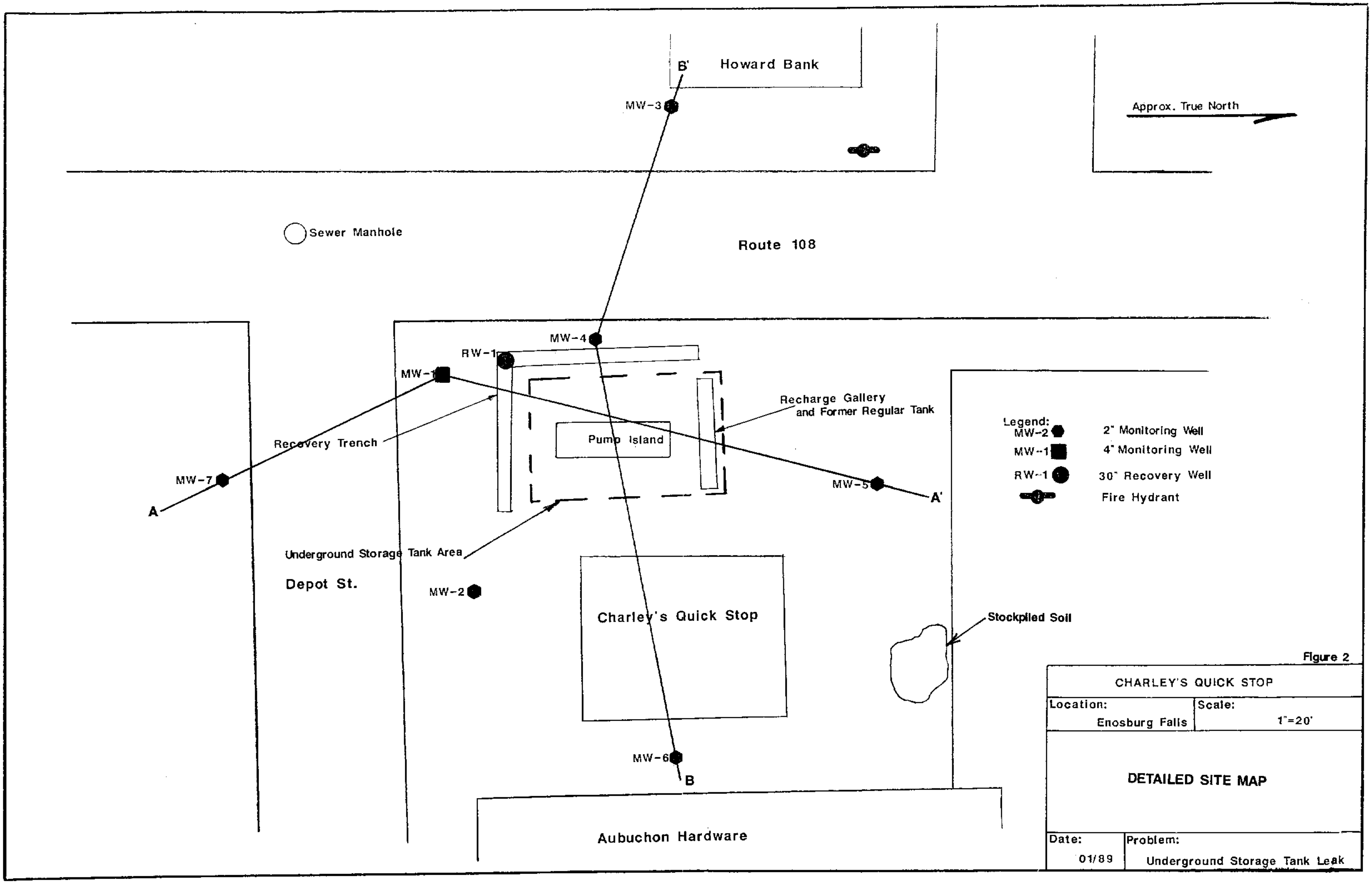
GENERAL LOCATION MAP

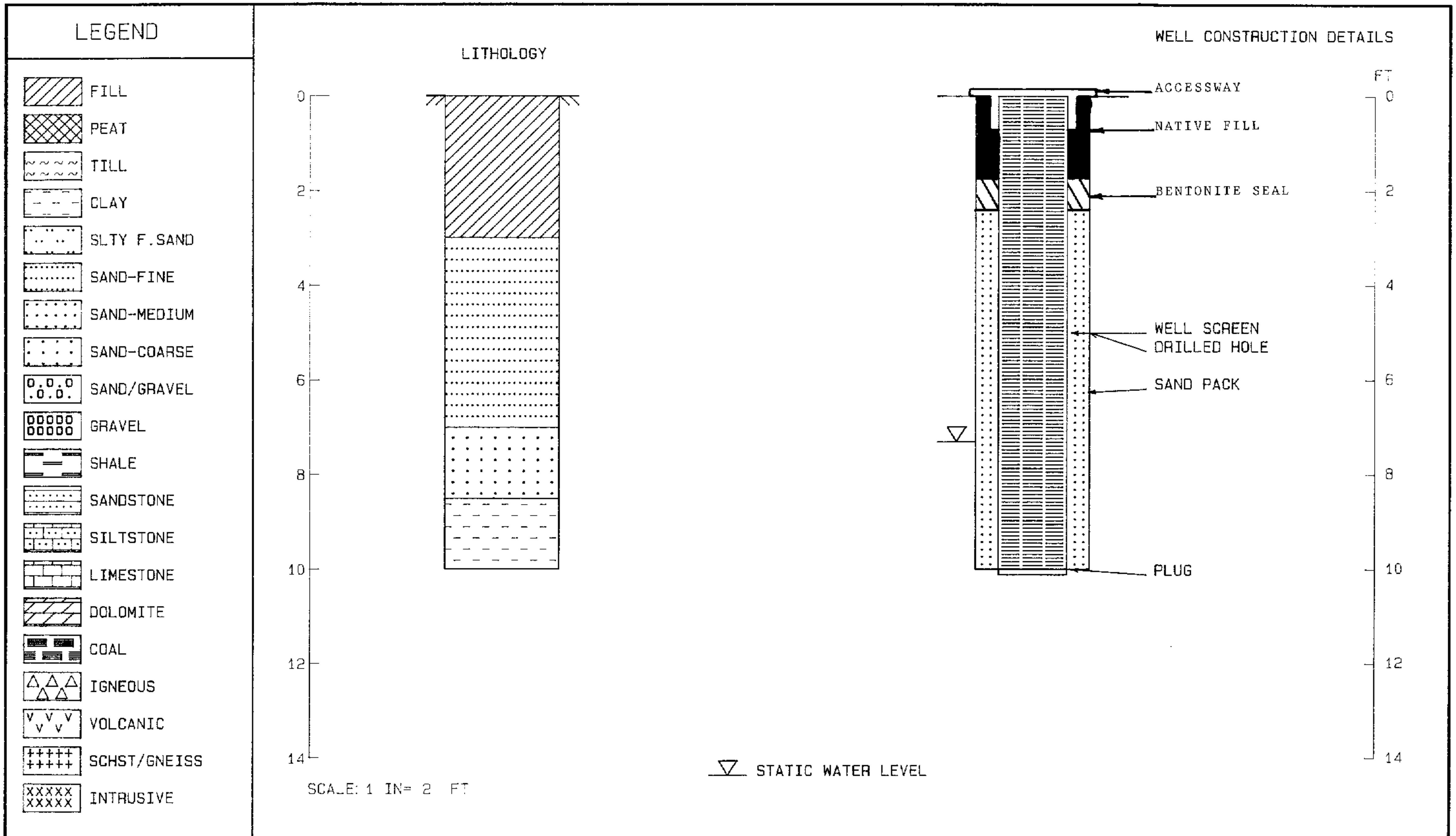


Source:
U.S.G.S. 7.5 Min. Quad. Series
Enosburg Quadrangle

Scale:
1:24,000

Figure 1


Howard Bank
B'
MW-3
Approx. True North
Sewer Manhole
Route 108
MW-4
RW-1
MW-1
Recharge Gallery
and Former Regular Tank
Legend:
MW-2 2" Monitoring Well
MW-1 4" Monitoring Well
RW-1 30" Recovery Well
Fire Hydrant
Recovery Trench
Pump Island
MW-7
MW-5
A
A'
Underground Storage Tank Area
Depot St.
MW-2
Charley's Quick Stop
Stockpiled Soil
Figure 2
CHARLEY'S QUICK STOP
Location: Enosburg Falls
Scale: 1"=20'
DETAILED SITE MAP
MW-6
B
Aubuchon Hardware
Date: 01/89
Problem: Underground Storage Tank Leak

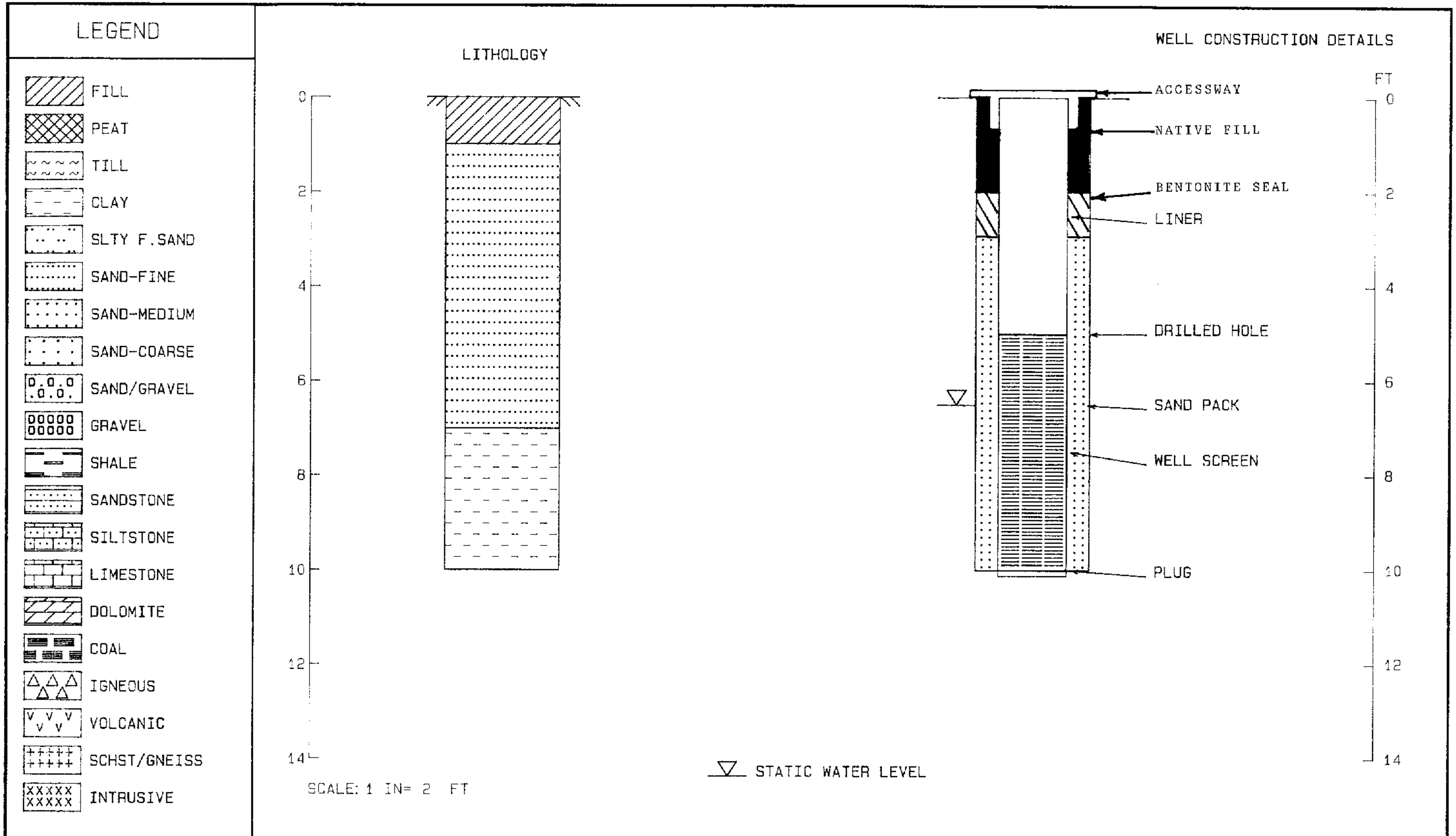


PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/88
LOCATION: ENOSBURG FALLS

MONITORING WELL #1

LINCOLN APPLIED GEOLOGY

FIGURE: 3a

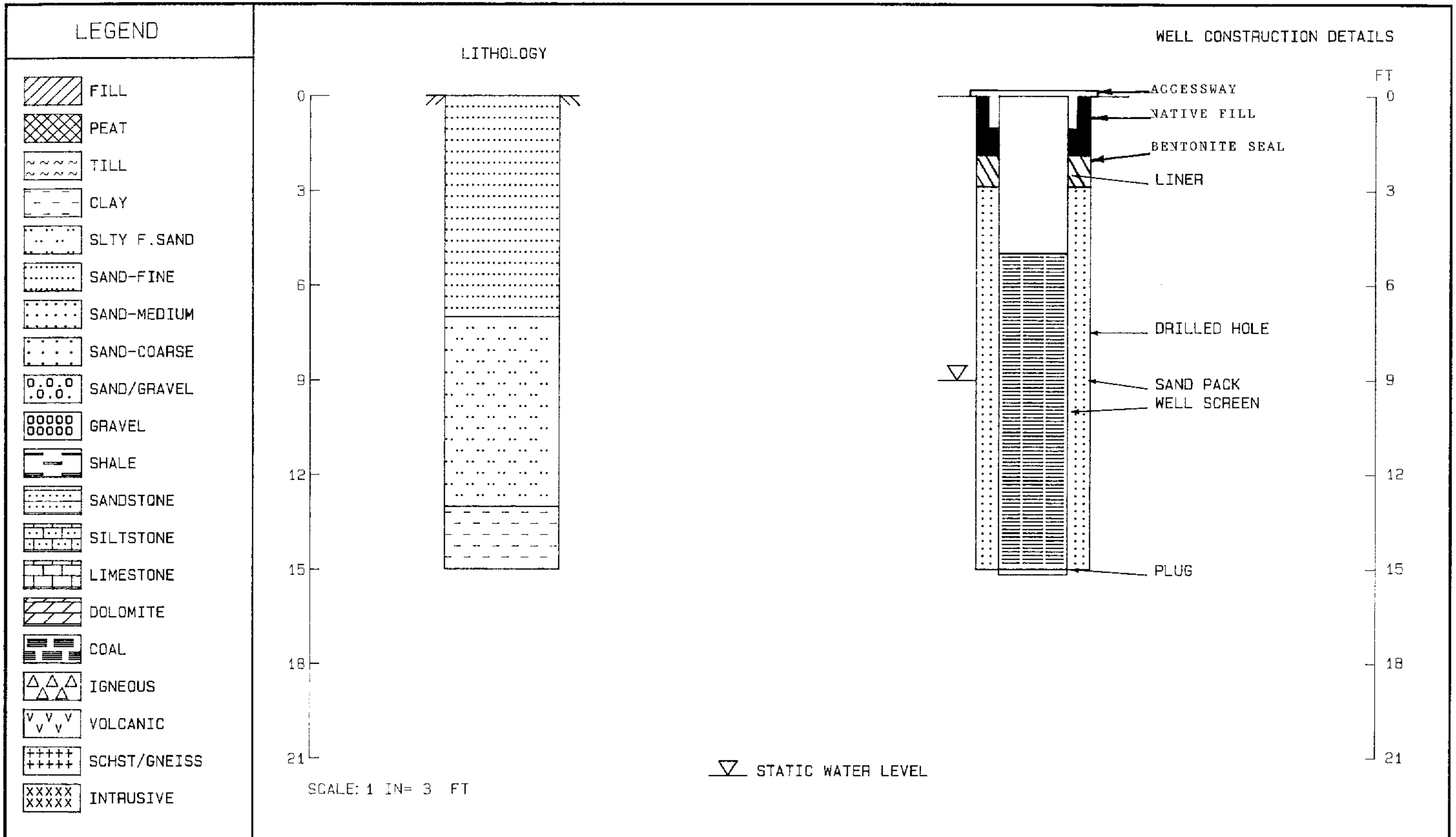


PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/88
LOCATION: ENOSBURG FALLS

MONITORING WELL #2

LINCOLN APPLIED GEOLOGY

FIGURE: 3b

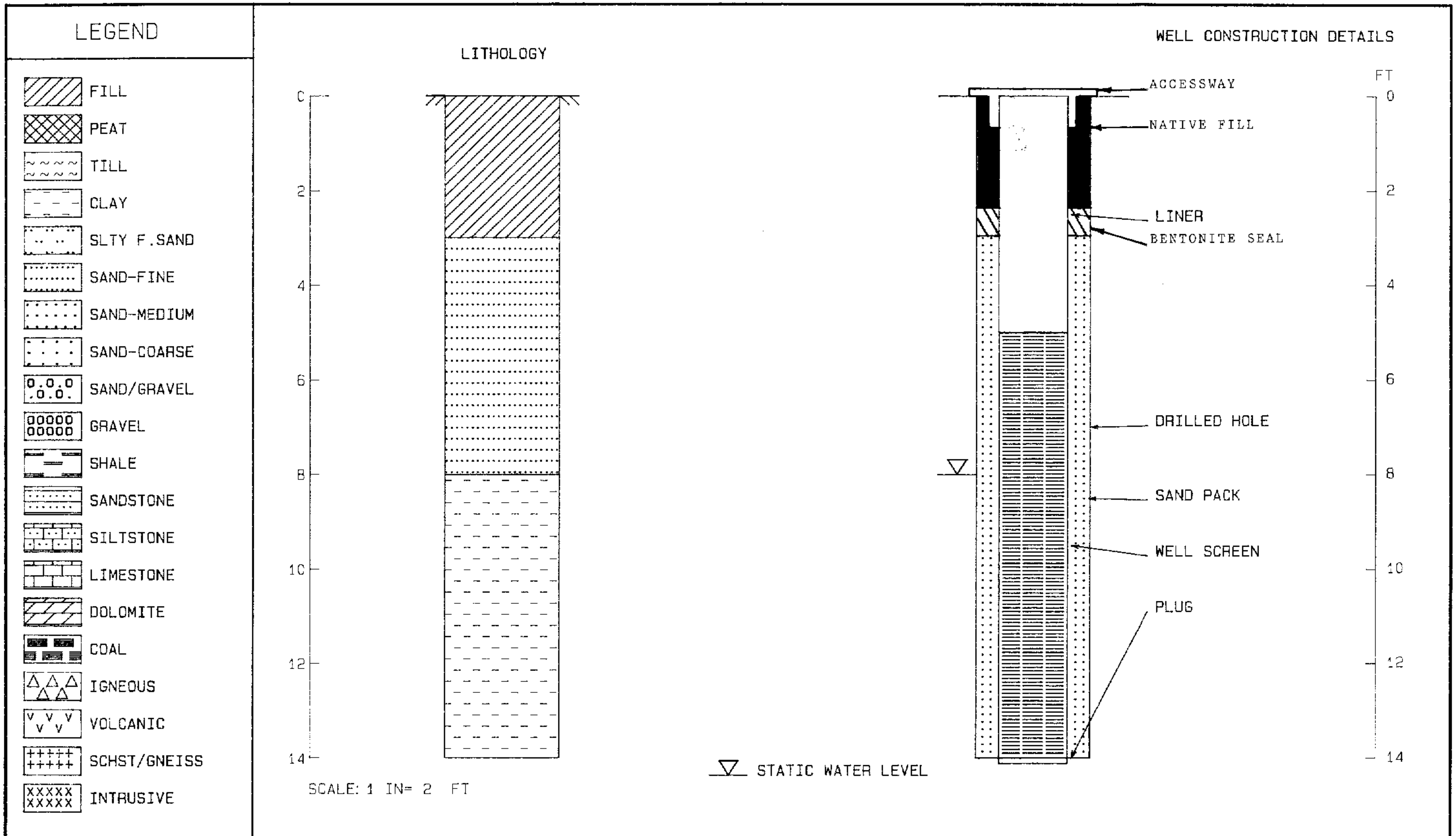


PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/88
LOCATION: ENOSBURG FALLS

MONITORING WELL #3

LINCOLN APPLIED GEOLOGY

FIGURE: 3c

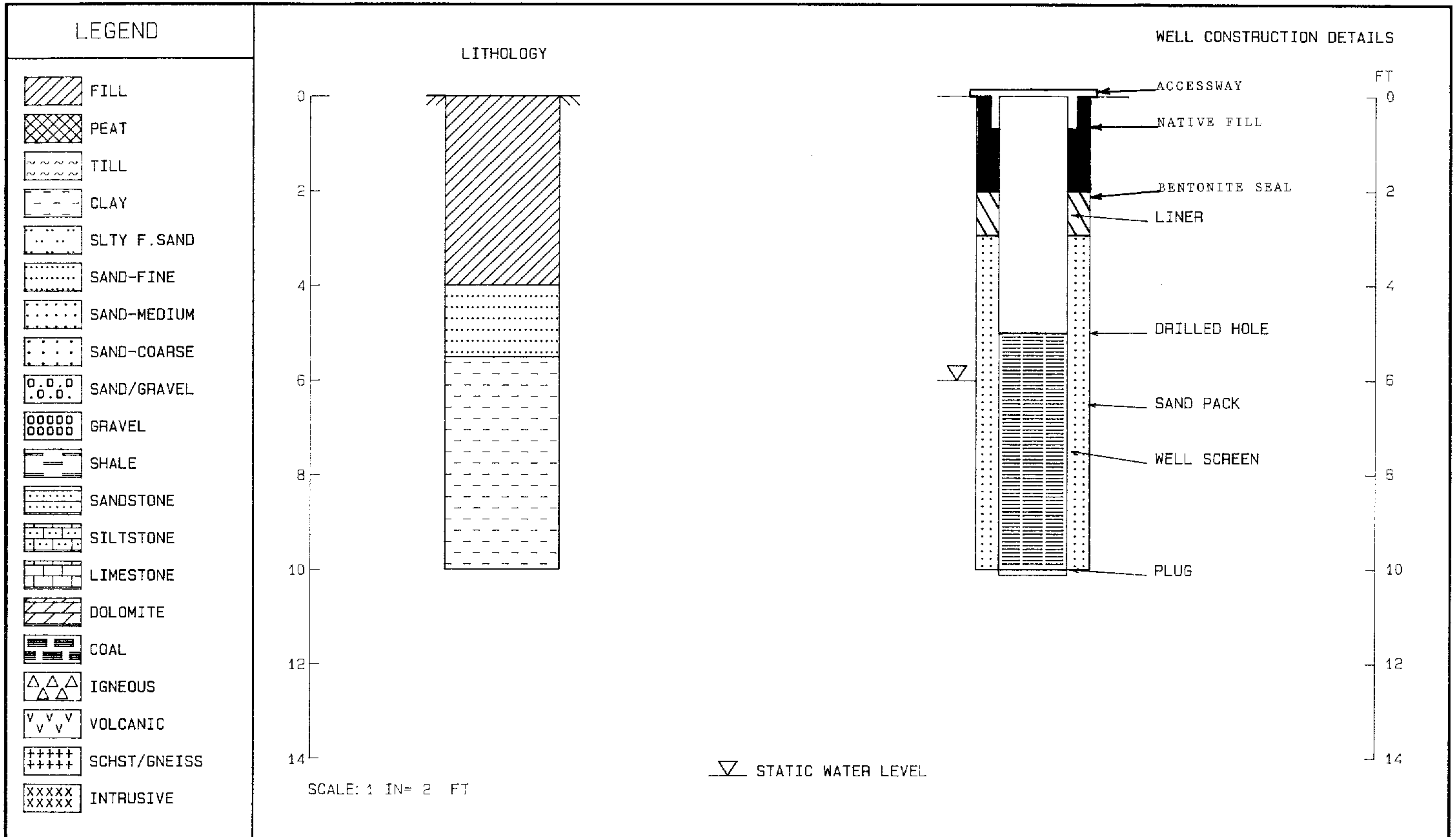


PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/88
LOCATION: ENOSBURG FALLS

MONITORING WELL #4

LINCOLN APPLIED GEOLOGY

FIGURE: 3d

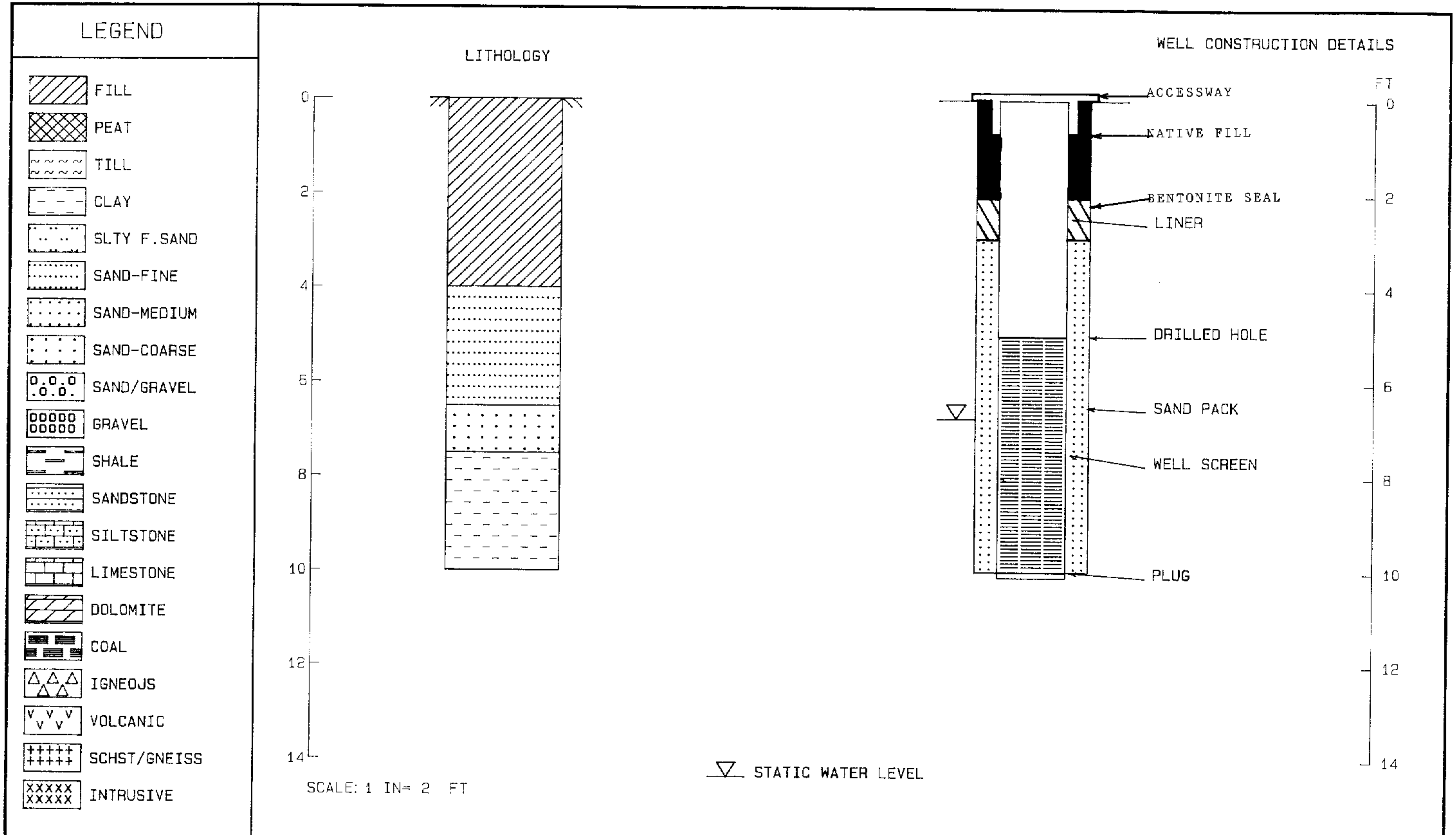


PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/BB
LOCATION: ENOSBURG FALLS

MONITORING WELL #5

LINCOLN APPLIED GEOLOGY

FIGURE: 3e

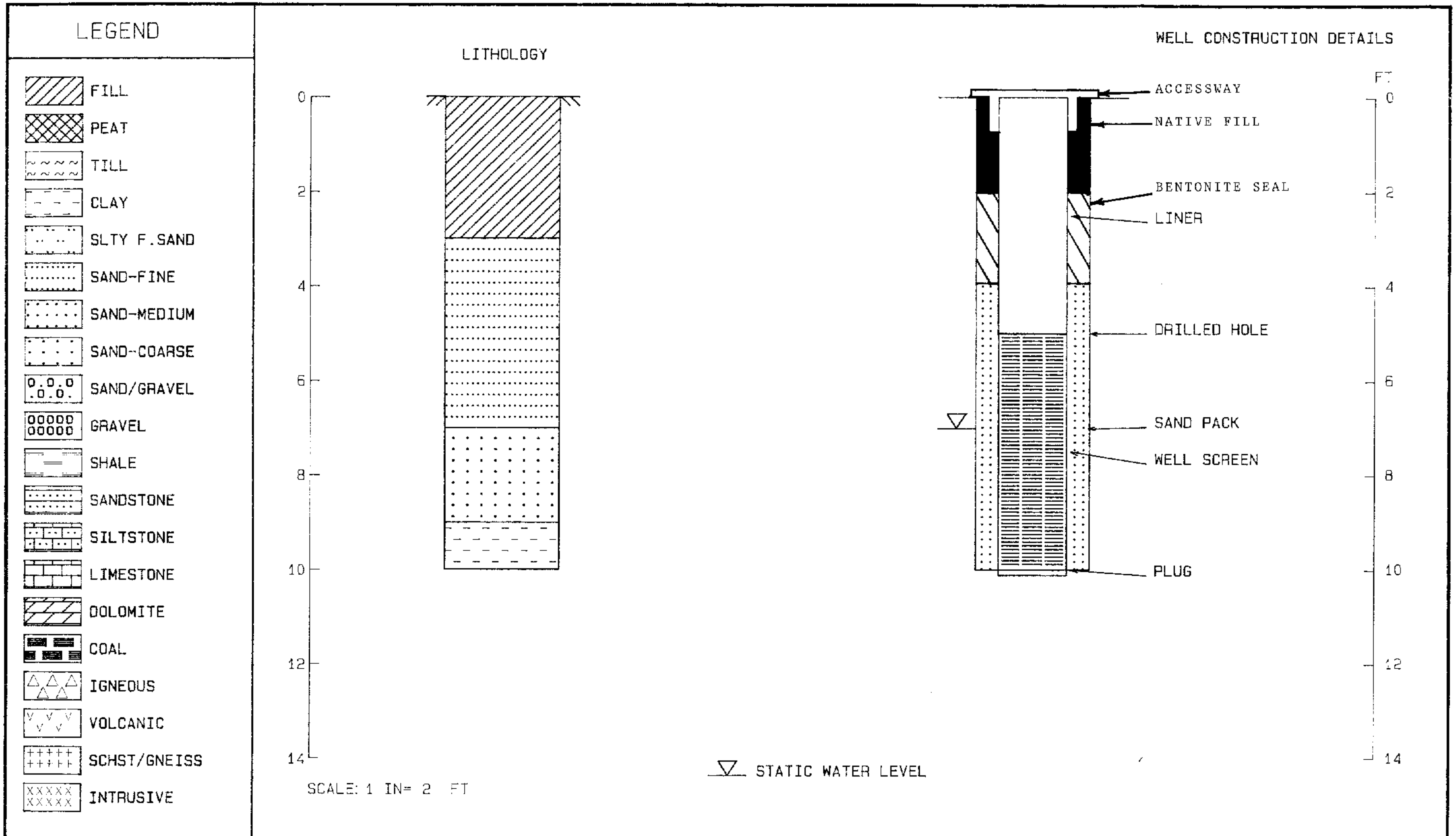


PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/88
LOCATION: ENOSBURG FALLS

MONITORING WELL #6

LINCOLN APPLIED GEOLOGY

FIGURE: 3f

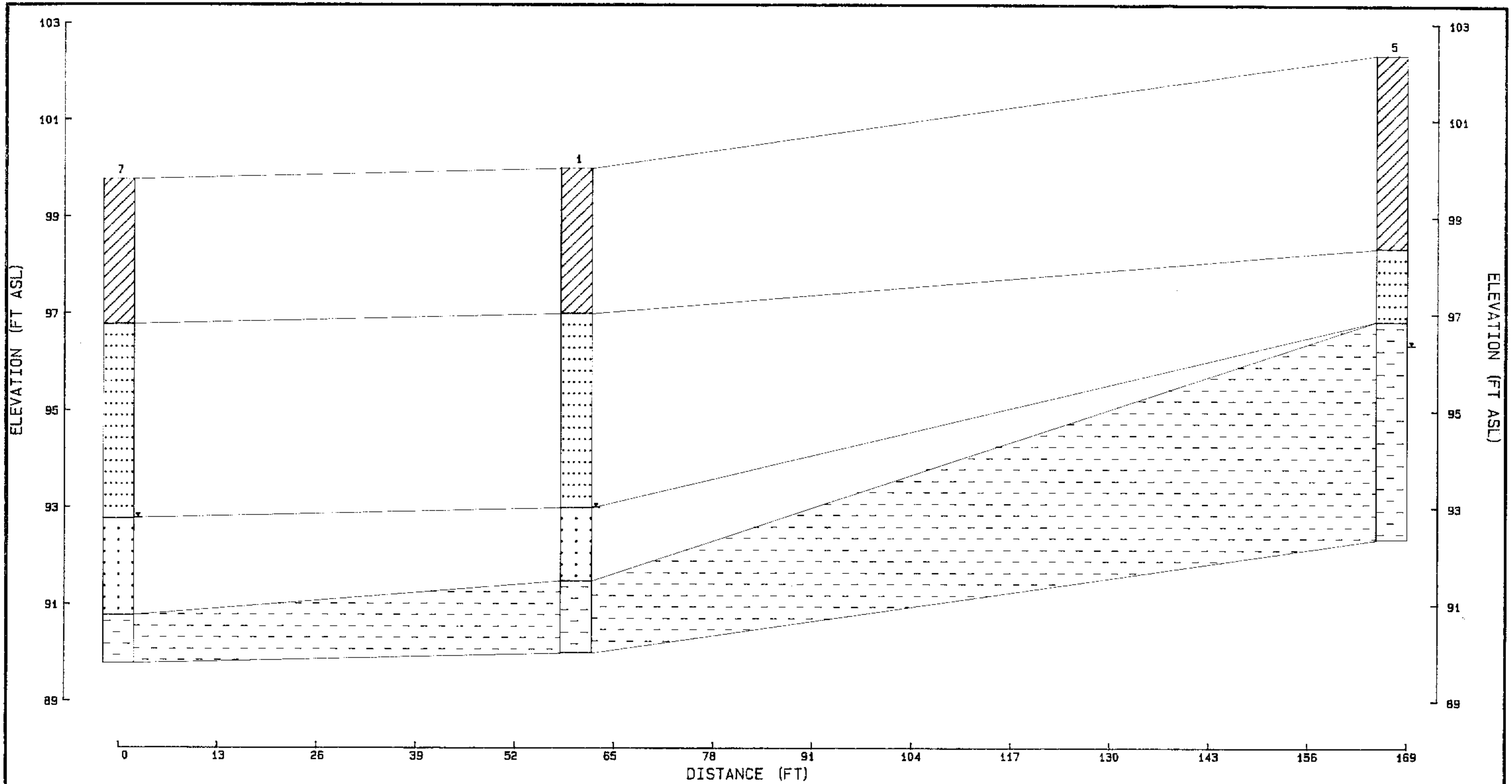


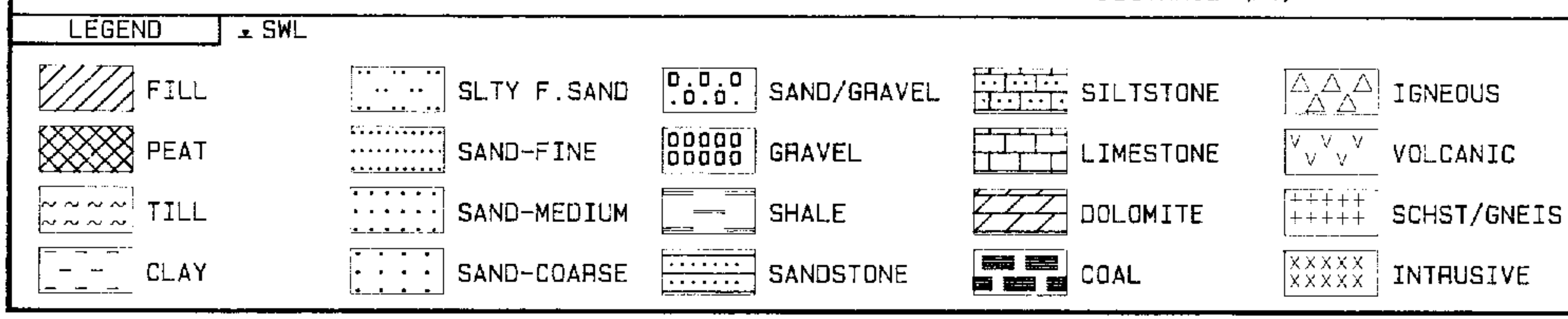
PROJECT: CHARLEY'S QUICK STOP
FILE: LAG/88
LOCATION: ENOSBURG FALLS

MONITORING WELL #7

LINCOLN APPLIED GEOLOGY

FIGURE: 3g





PROJECT: CHARLEY'S QCK STP

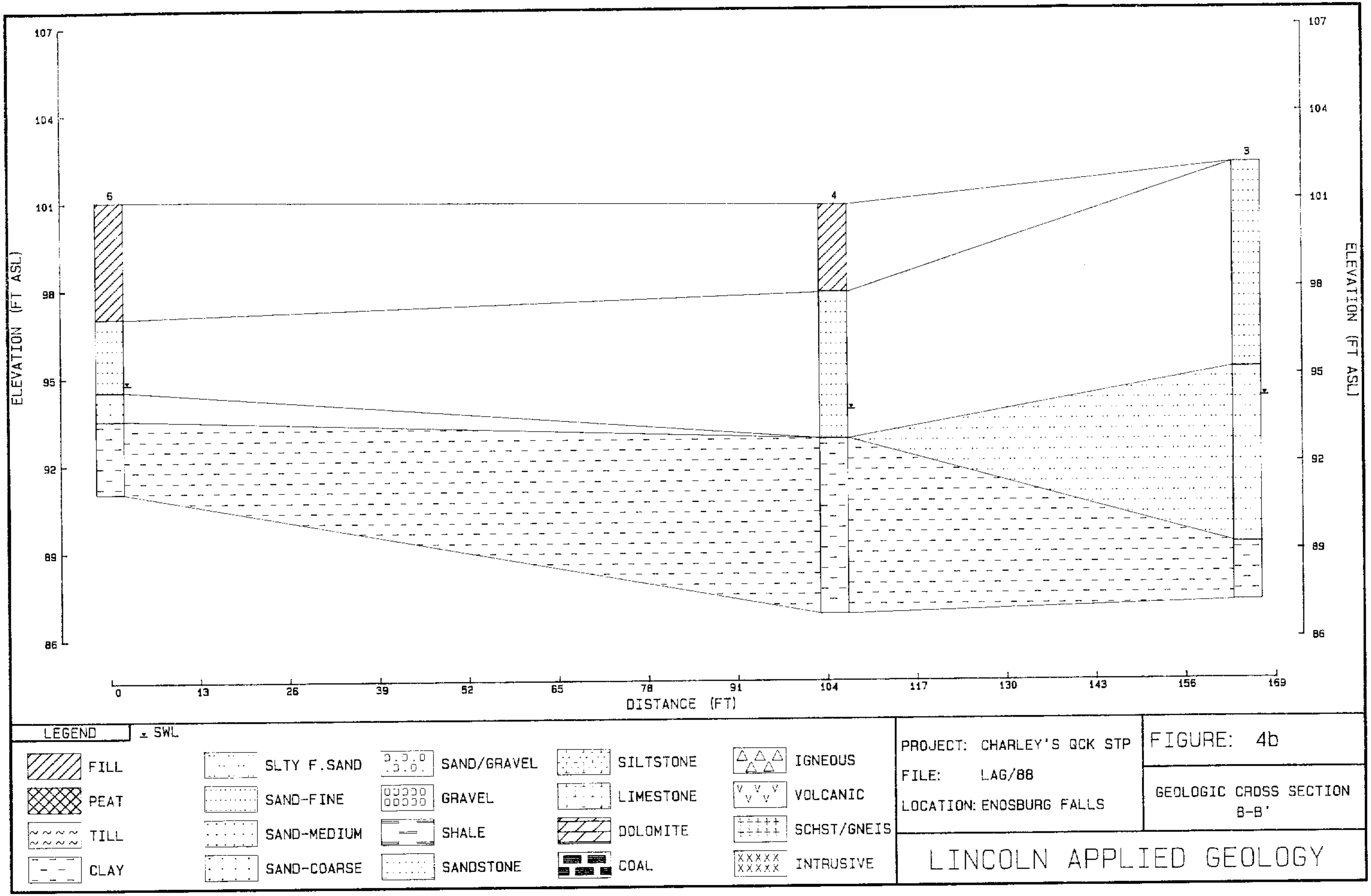
FILE: LAG/88

LOCATION: ENOSBURG FALLS

FIGURE: 4a

GEOLOGIC CROSS SECTION A-A'

LINCOLN APPLIED GEOLOGY



ELEVATION (FT ASL)
107
104
101
98
95
92
89
86
6
4
3
DISTANCE (FT)
0
13
26
39
52
65
78
91
104
117
130
143
156
169
LEGEND
SWL
FILL
PEAT
TILL
CLAY
SLTY F.SAND
SAND-FINE
SAND-MEDIUM
SAND-COARSE
SAND/GRAVEL
GRAVEL
SHALE
SANDSTONE
SILTSTONE
LIMESTONE
DOLOMITE
COAL
IGNEOUS
VOLCANIC
SCHST/GNEIS
INTRUSIVE
PROJECT: CHARLEY'S QCK STP
FILE: LAG/88
LOCATION: ENOSBURG FALLS
FIGURE: 4b
GEOLOGIC CROSS SECTION B-B'
LINCOLN APPLIED GEOLOGY

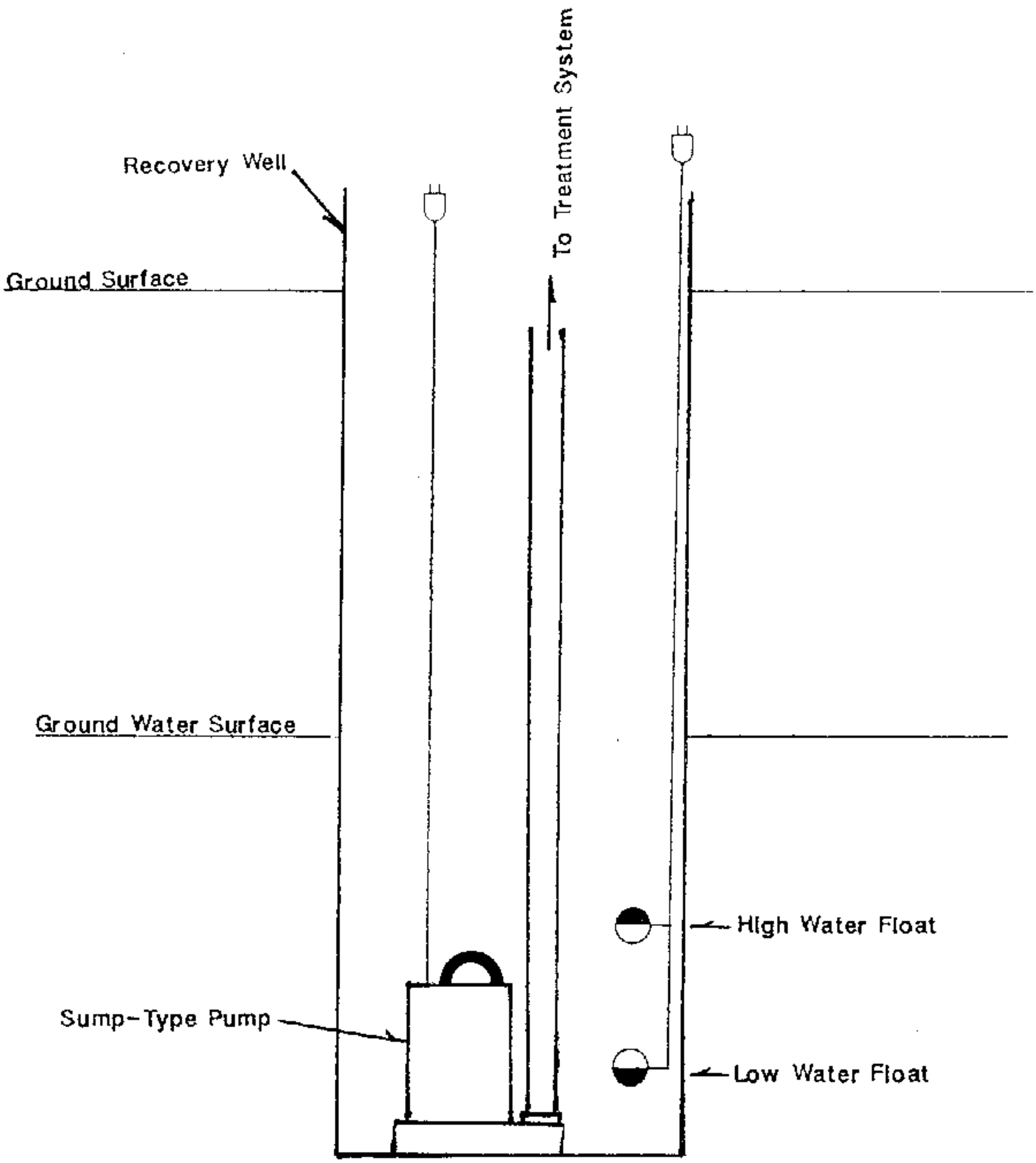
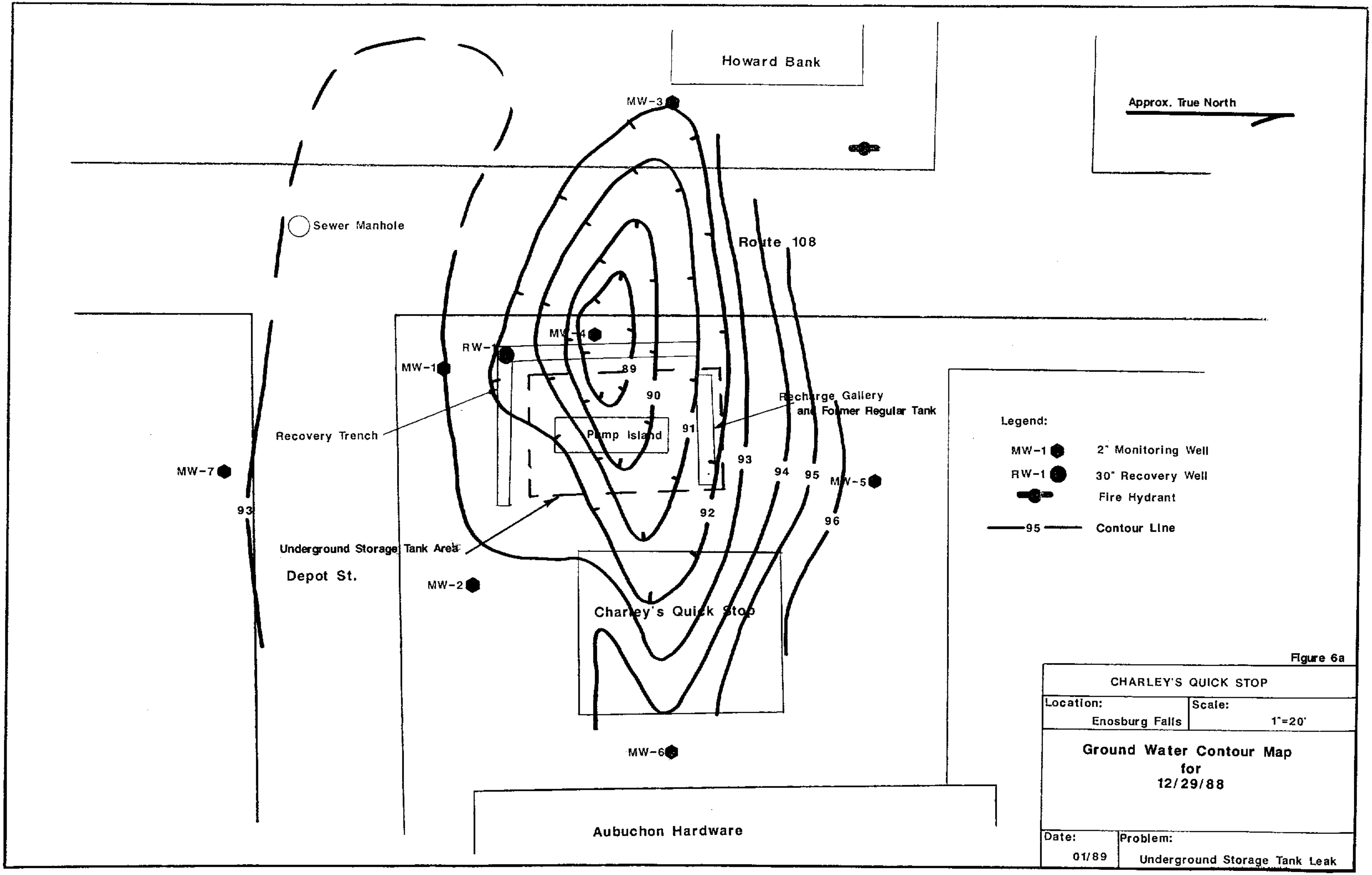


Figure 5

CHARLEY'S QUICK STOP	
Location: Enosburg Falls	Scale: 1"=20'
RECOVERY WELL DETAILS	
Date: 01/89	Problem: Underground Storage Tank Leak


Howard Bank
Approx. True North
MW-3
Sewer Manhole
Route 108
MW-4
RW-1
MW-1
89
90
91
92
93
94
95
96
Recharge Gallery
and Former Regular Tank
Pump Island
Recovery Trench
MW-7
MW-5
Underground Storage Tank Area
Depot St.
MW-2
Charley's Quick Stop
MW-6
Aubuchon Hardware
Legend:
MW-1 2" Monitoring Well
RW-1 30" Recovery Well
Fire Hydrant
95 Contour Line
Figure 6a
CHARLEY'S QUICK STOP
Location: Enosburg Falls
Scale: 1"=20'
Ground Water Contour Map for 12/29/88
Date: 01/89
Problem: Underground Storage Tank Leak

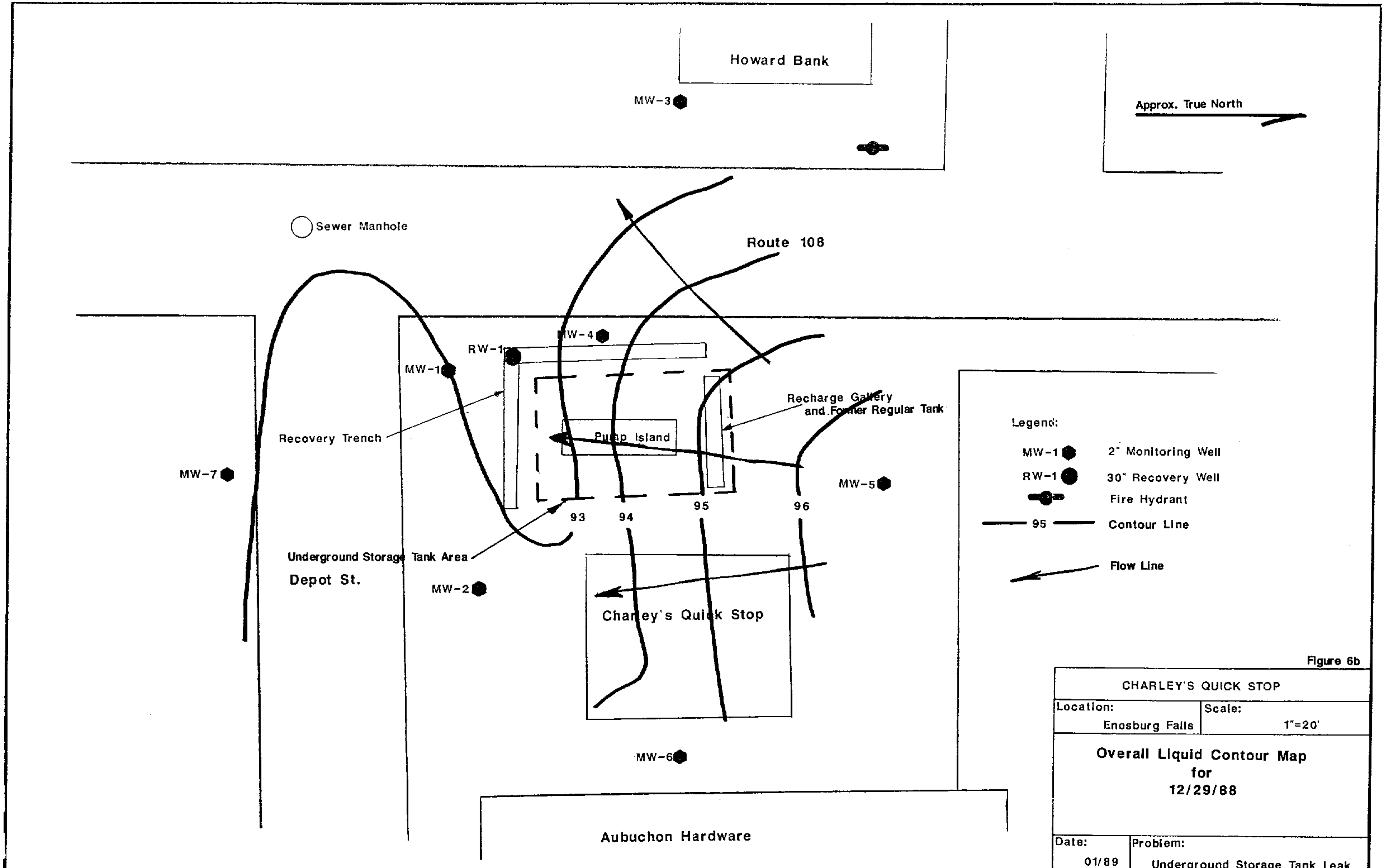
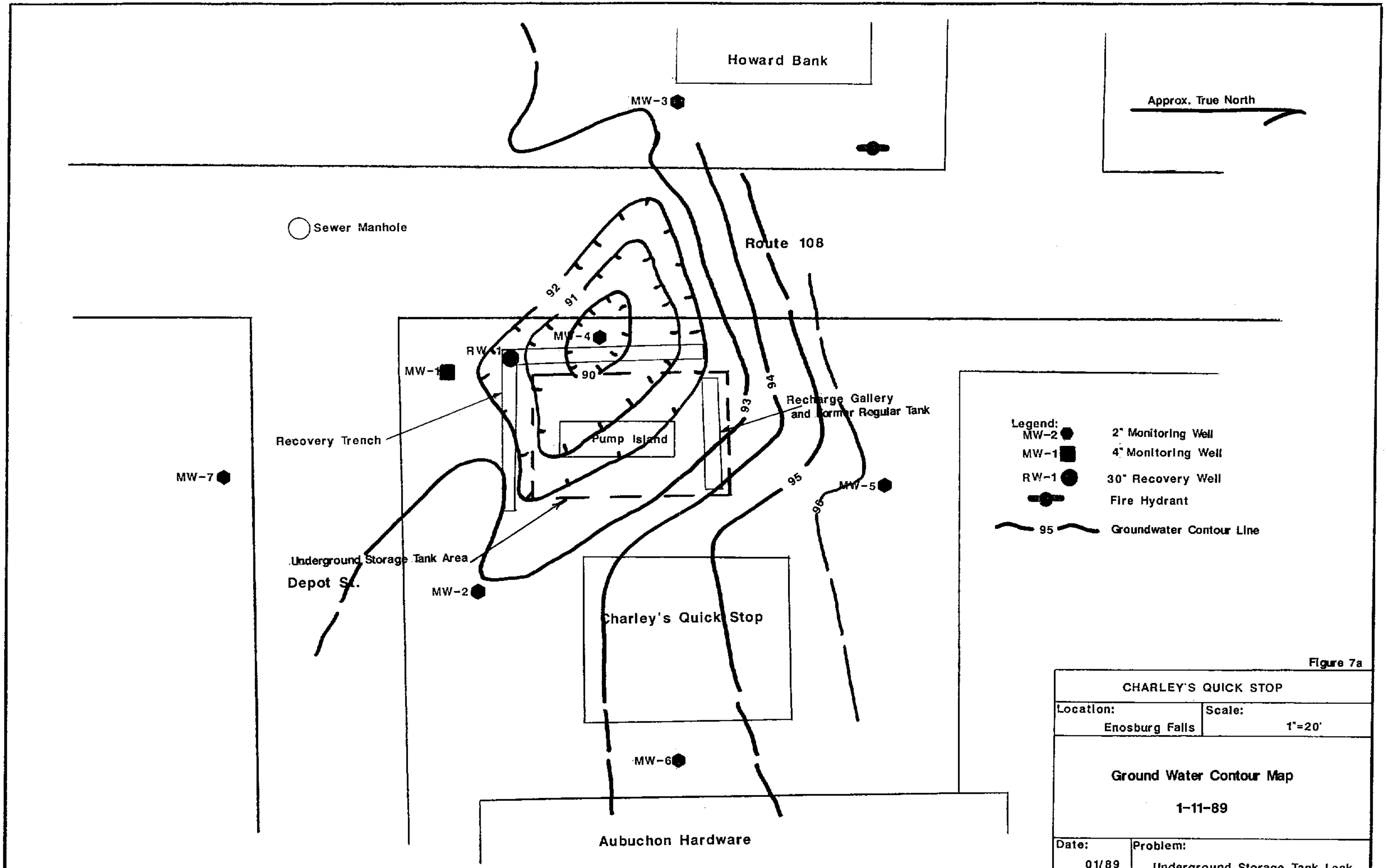


Figure 6b

CHARLEY'S QUICK STOP	
Location: Enosburg Falls	Scale: 1"=20'
Overall Liquid Contour Map for 12/29/88	
Date: 01/89	Problem: Underground Storage Tank Leak



Howard Bank
MW-3
Approx. True North
Sewer Manhole
Route 108
92
91
90
93
94
95
96
MW-4
RW-1
MW-1
Recovery Trench
Recharge Gallery
and Former Regular Tank
Pump Island
MW-7
MW-5
Underground Storage Tank Area
Depot St.
MW-2
Charley's Quick Stop
MW-6
Aubuchon Hardware
Legend:
MW-2 2" Monitoring Well
MW-1 4" Monitoring Well
RW-1 30" Recovery Well
Fire Hydrant
95 Groundwater Contour Line
Figure 7a
CHARLEY'S QUICK STOP
Location:
Enosburg Falls
Scale:
1"=20'
Ground Water Contour Map
1-11-89
Date:
01/89
Problem:

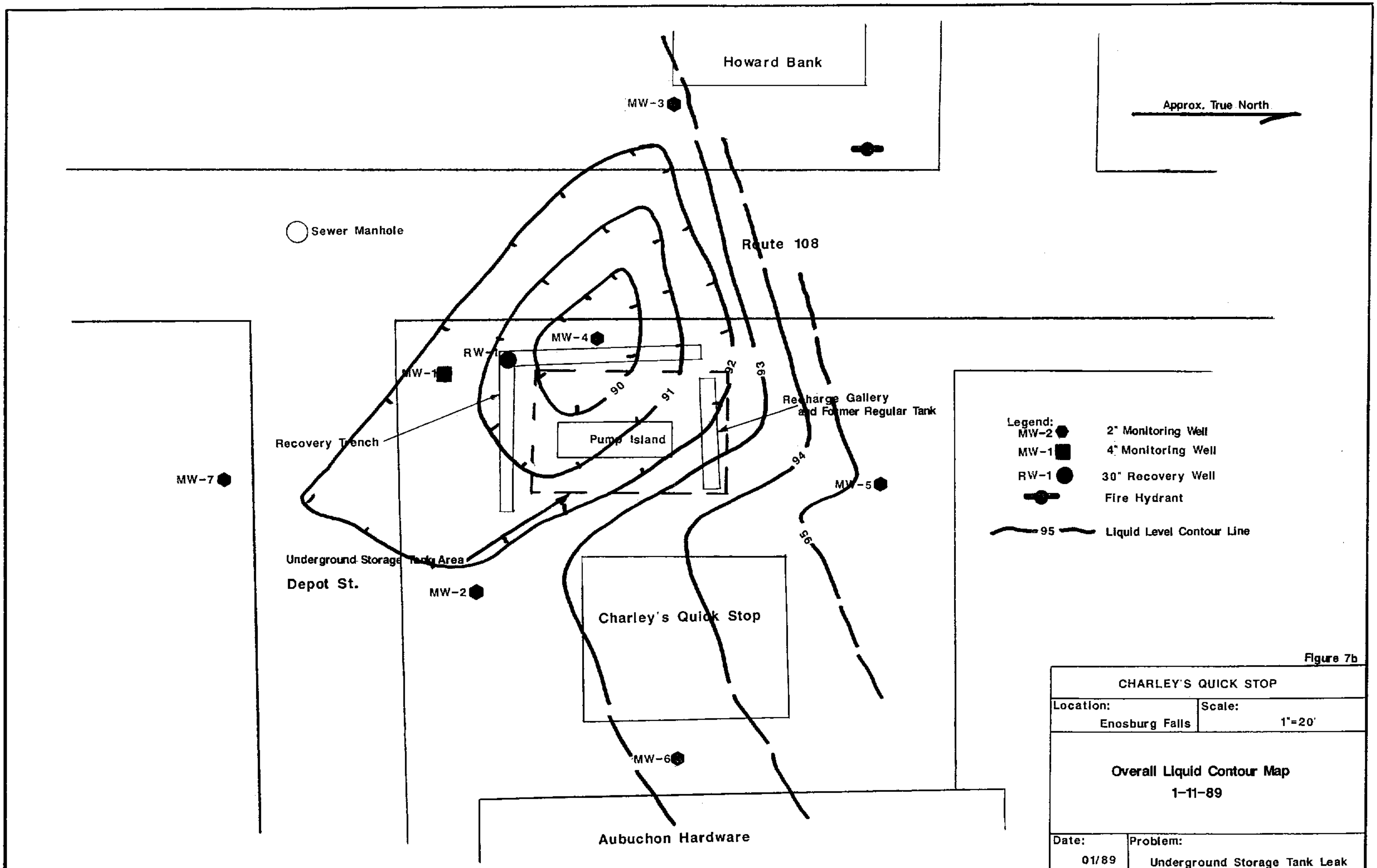
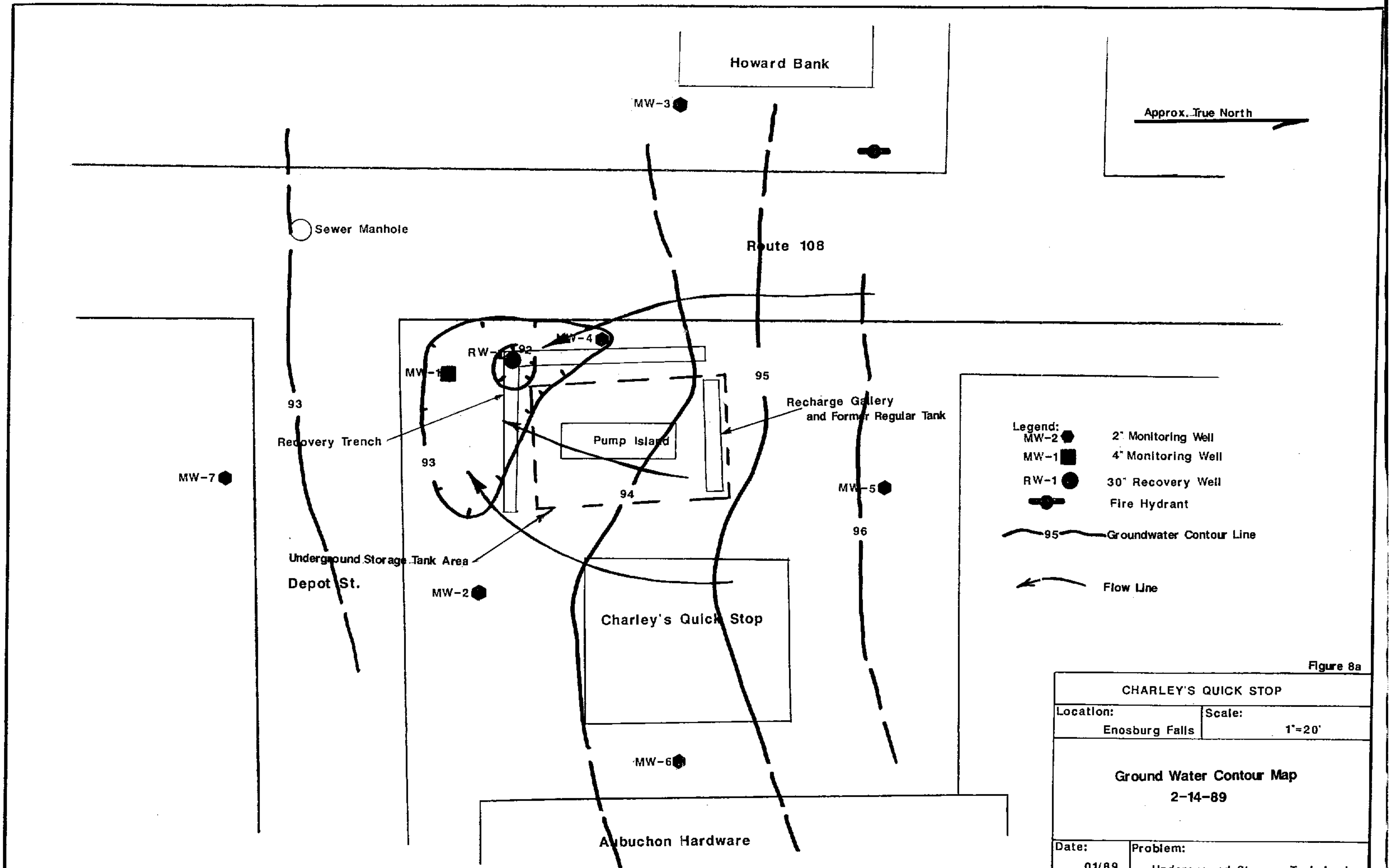


Figure 7b

CHARLEY'S QUICK STOP	
Location: Enosburg Falls	Scale: 1"=20'
Overall Liquid Contour Map 1-11-89	
Date: 01/89	Problem: Underground Storage Tank Leak


Howard Bank
MW-3
Approx. True North
Sewer Manhole
Route 108
RW-1
92
MW-4
MW-1
95
93
Recharge Gallery
and Former Regular Tank
Recovery Trench
Pump Island
Legend:
MW-2 2" Monitoring Well
MW-1 4" Monitoring Well
RW-1 30" Recovery Well
Fire Hydrant
95 Groundwater Contour Line
Flow Line
93
MW-7
94
MW-5
96
Underground Storage Tank Area
Depot St.
MW-2
Charley's Quick Stop
MW-6
Aubuchon Hardware
Figure 8a
CHARLEY'S QUICK STOP
Location:
Enosburg Falls
Scale:
1"=20'
Ground Water Contour Map
2-14-89
Date:
Problem:

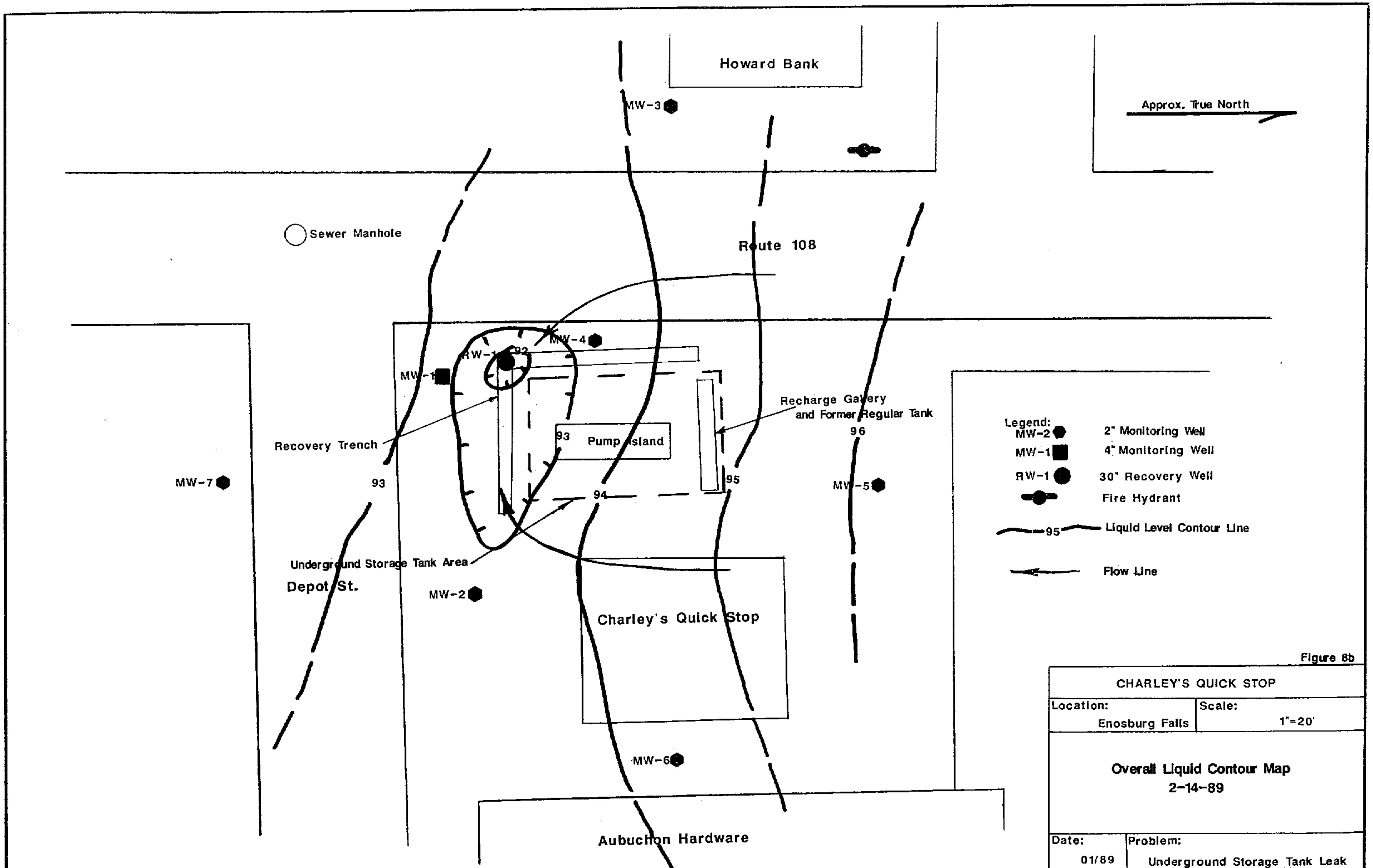
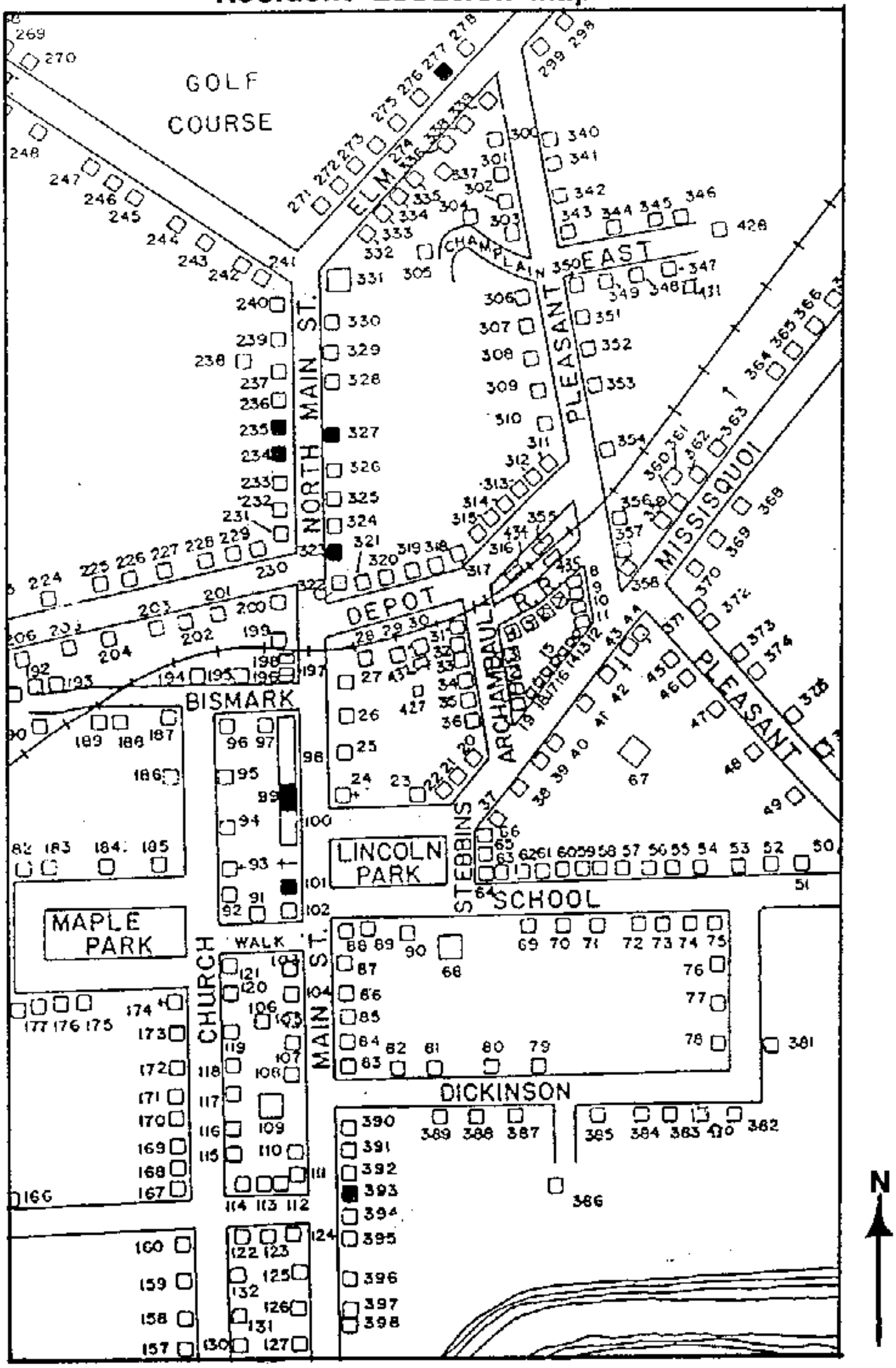


Figure 8b

CHARLEY'S QUICK STOP	
Location: Enosburg Falls	Scale: 1"=20'
Overall Liquid Contour Map 2-14-89	
Date: 01/89	Problem: Underground Storage Tank Leak

Resident Location Map



No Scale

Affected Residents:

277-Graeter	323-Spears Apts.
327-DeCristofaro	99-Simple Tastes
235-Perley	393-Colburne
234-Jenne	101-Bryce

Figure 9

HNU PHOTOIONIZATION DATA FOR AFFECTED RESIDENTS

NAME	SAMPLE POINT	12/16/88	12/17/88	12/19/88	12/20/88	12/21/88	12/22/88	12/23/88	12/24/88	12/26/88	12/27/88	12/28/88		12/29/88	1/16/89
												Before	After		
Graeter	Living Area	5	---	BG	BG	BG	BG	Work Complete	---	---	---	BG	BG	BG	BG
	Basement	20	---	BG	BG	BG	BG	---	---	---	---	BG	BG	BG	BG
	Sump Area	200	---	BG	BG	BG	BG	---	---	---	---	BG	BG	5	7
DeCristofaro	Living Area	2	---	1.5	BG	BG	BG	BG	BG	BG	Work Complete	BG	BG	BG	BG
	Basement	3	---	BG	BG	BG	BG	BG	BG	BG	---	BG	BG	BG	BG
	Sump Area	150	---	4	BG	BG	BG	BG	BG	BG	---	BG	BG	BG	5
Perley	Living Area	2	BG	BG	---	BG	BG	Work Complete	---	---	---	BG	BG	BG	---
	Basement	10	2	BG	---	BG	BG	---	---	---	---	BG	BG	BG	---
	Sump Area	75	60	BG	---	BG	BG	---	---	---	---	BG	BG	BG	---
Jenne	Living Area	1	BG	BG	BG	BG	BG	BG	BG	BG	Work Complete	BG	BG	BG	BG
	Basement	8	1	BG	BG	BG	BG	BG	BG	BG	---	BG	BG	BG	BG
	Sump Area	200	10	BG	BG	BG	BG	BG	BG	BG	---	BG	10	BG	1.5
Spears	Living Area	2	BG	BG	---	---	---	BG	Work Complete	---	---	---	---	---	BG
	Basement	15	BG	BG	---	---	---	BG	---	---	---	---	---	---	BG
	Sump Area	15	BG	BG	---	---	---	BG	---	---	---	---	---	---	BG
Simple Tastes	Living Area	2	1	---	---	BG	BG	BG	---	---	---	---	---	---	BG
	Basement	BG	BG	---	---	BG	BG	BG	---	---	---	---	---	---	BG
	Sump Area	5	BG	---	---	BG	BG	BG	---	---	---	---	---	---	10
Colburne	Living Area	5	---	*---	BG	BG	BG	BG	BG	BG	Work Complete	BG	BG	BG	BG
	Basement	20	---	---	BG	BG	BG	BG	BG	BG	---	BG	BG	BG	BG
	Sump Area	100	---	---	5	BG	BG	BG	BG	BG	---	BG	BG	BG	BG
Bryce	Living Area	BG	---	BG	BG	BG	BG	BG	Work Complete	---	---	BG	---	BG	BG
	Basement	3	---	BG	BG	BG	BG	BG	---	---	---	BG	---	BG	BG
	Sump Area	20	---	BG	BG	BG	BG	BG	---	---	---	BG	---	5	BG
Treatment Plant	Influent	10	4	---	BG	10	BG	BG	BG	BG	BG	BG	BG	BG	BG
Fan	Sewer Line in Str	150/Amb. 5	80/Amb. 20	---	70	40	30	30	20	15	15	10	3.5	BG	BG

*** NOTE:**
--- = Not Sampled
BG = Background Reading on 10.2 eV HNU

Appendix A

Ground Water Elevation/Product Thickness Data

PROJECT Charley's Quick Stop JOB NO. LAG /89

LOCATION Enosburg Falls SHEET 1 OF 2

LINCOLN APPLIED GEOLOGY, INC.

DATA POINT	REFERENCE ELEVATION	GROUND WATER ELEVATIONS							
		DATE	12/29/88	1/3/89	1/11/89	1/16/89	1/27/89	2/3/89	2/7/89
MW-1	100.00		93.00	92.96	.49' 92.57	.50' 92.50	.29' 92.76	.29' 92.76	.33' 92.72
MW-2	99.72		93.29	93.28	93.17	93.15	93.19	93.27	93.34
MW-3	102.26		91.96	93.11	93.71	93.36	93.36	93.68	93.41
MW-4	100.86		5.91' 87.89	5.86' 87.92	.24' 89.19	.19' 92.29	.28' 93.02	.40' 92.96	.38' 92.92
MW-5	102.36		96.94	96.83	96.65	96.56	96.49	96.61	96.49
MW-6	101.05		94.49	94.41	94.40	94.35	94.35	94.51	94.47
MW-7	99.78		92.99	92.95	92.92	92.85	92.83	92.97	92.88
RW-1	101.81		.75' 91.41	.22' 91.93	.05' 91.36	.10' 91.48	.11' 91.81	.05' 91.11	.07' 91.84

Notes: 1)
2)

TABLE A-1

PROJECT Charley's Quick Stop

LOCATION Enosburg Falls

JOB NO. LAG /89

SHEET 2 OF 2

LINCOLN APPLIED GEOLOGY, INC.

DATA POINT	REFERENCE ELEVATION	GROUND WATER ELEVATIONS							
		DATE	2/14/89						
MW-1	100.00		.40' 92.62						
MW-2	99.72		93.23						
MW-3	102.26		94.30						
MW-4	100.86		.37' 92.93						
MW-5	102.36		96.21						
MW-6	101.05		94.47						
MW-7	99.78		92.77						
RW-1	101.81		.03' 91.93						

Notes: 1)
2)

TABLE A-1

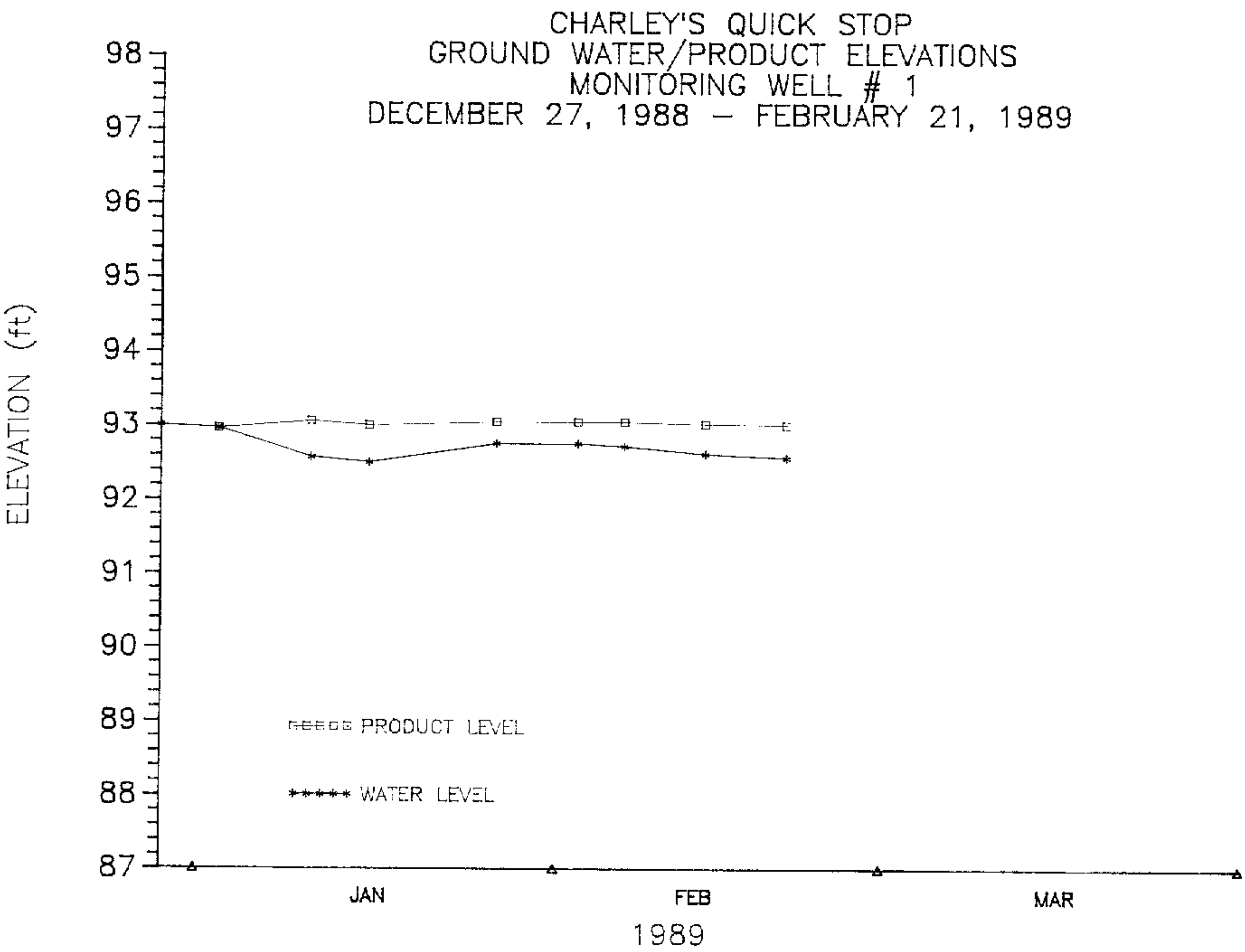

CHARLEY'S QUICK STOP
GROUND WATER/PRODUCT ELEVATIONS
MONITORING WELL # 1
DECEMBER 27, 1988 – FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
PRODUCT LEVEL
WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-1

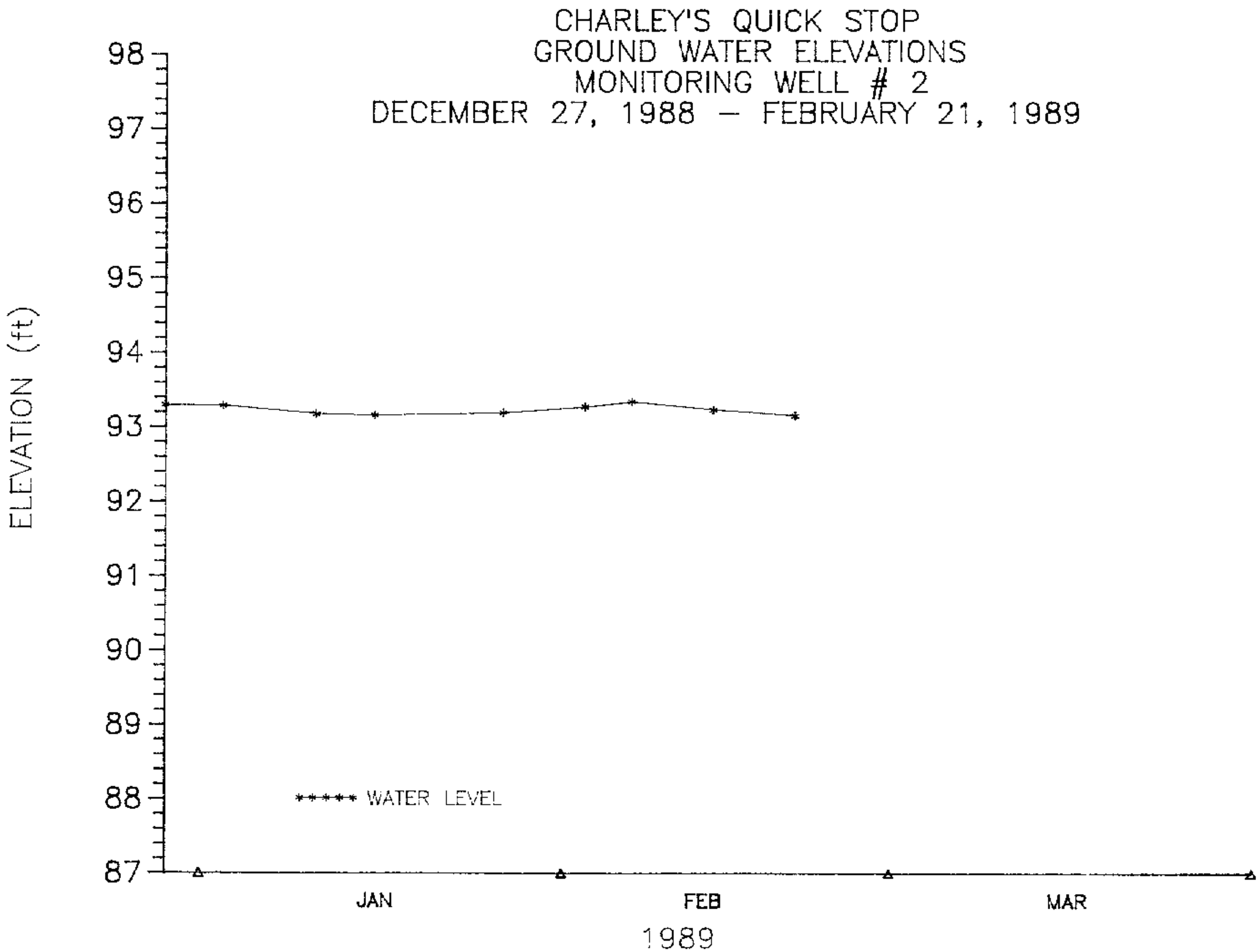

CHARLEY'S QUICK STOP
GROUND WATER ELEVATIONS
MONITORING WELL # 2
DECEMBER 27, 1988 - FEBRUARY 21, 1989
98
97
96
95
94
93
92
91
90
89
88
87
ELEVATION (ft)
***** WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-

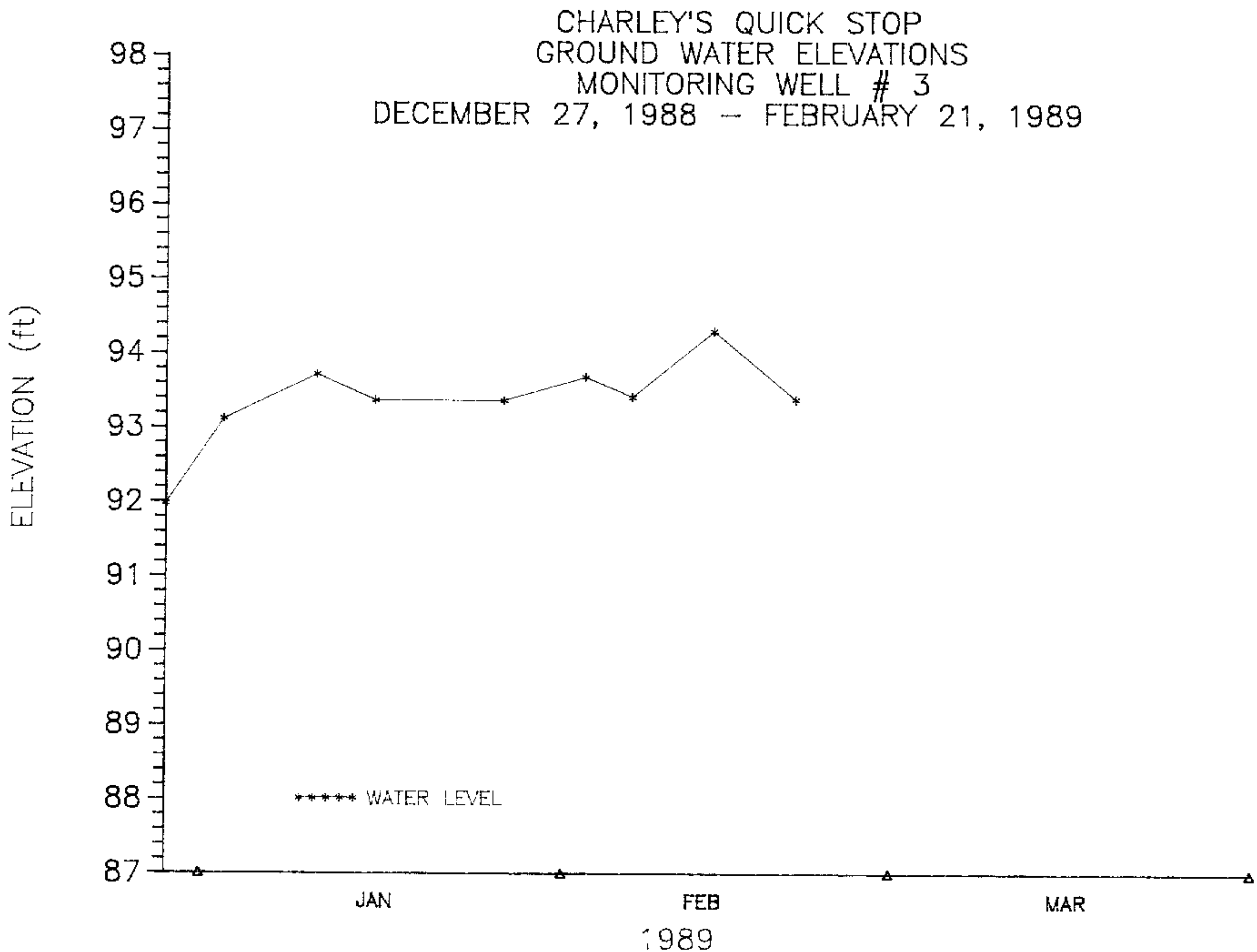

CHARLEY'S QUICK STOP
GROUND WATER ELEVATIONS
MONITORING WELL # 3
DECEMBER 27, 1988 - FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
***** WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-3

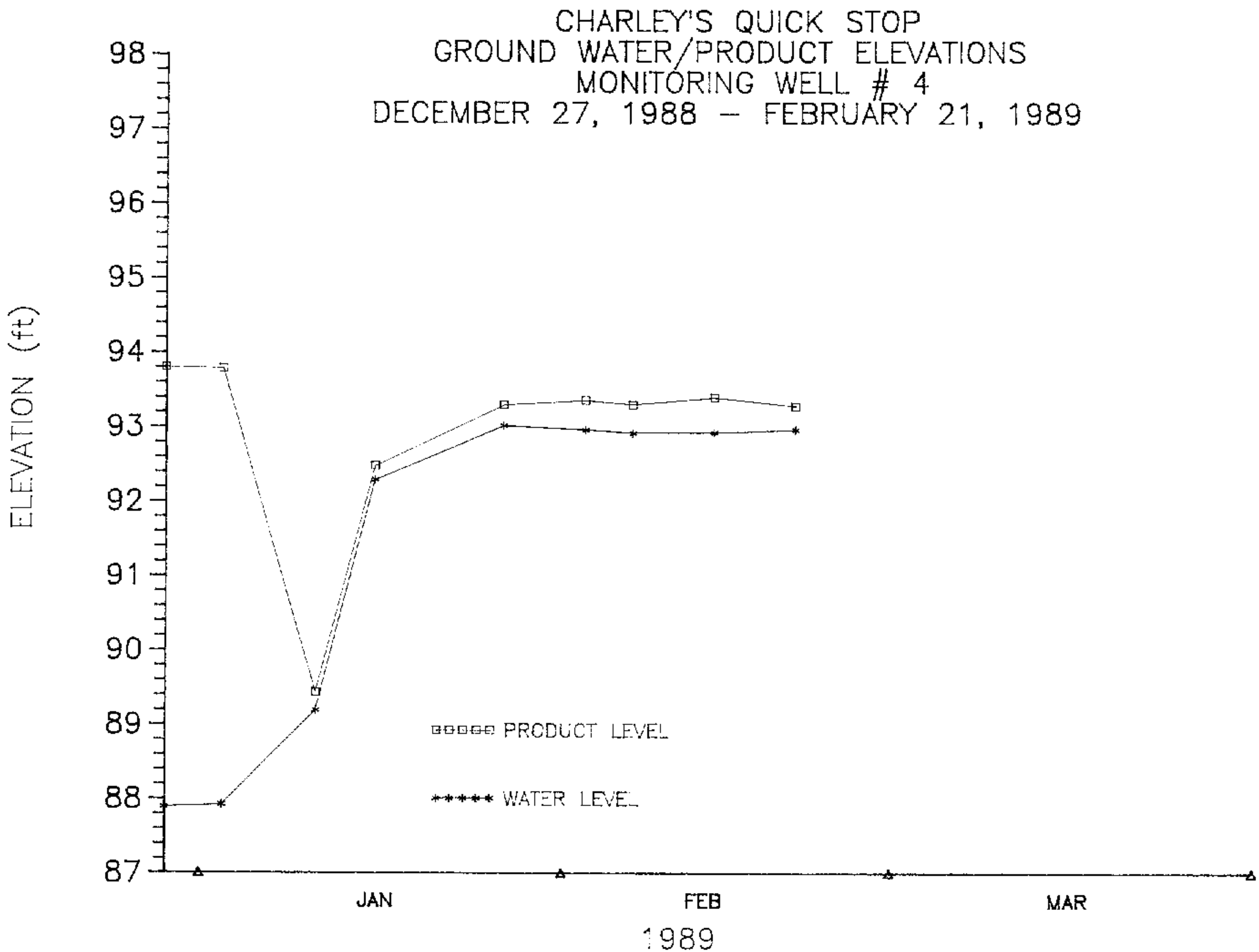

CHARLEY'S QUICK STOP
GROUND WATER/PRODUCT ELEVATIONS
MONITORING WELL # 4
DECEMBER 27, 1988 - FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
PRODUCT LEVEL
WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-

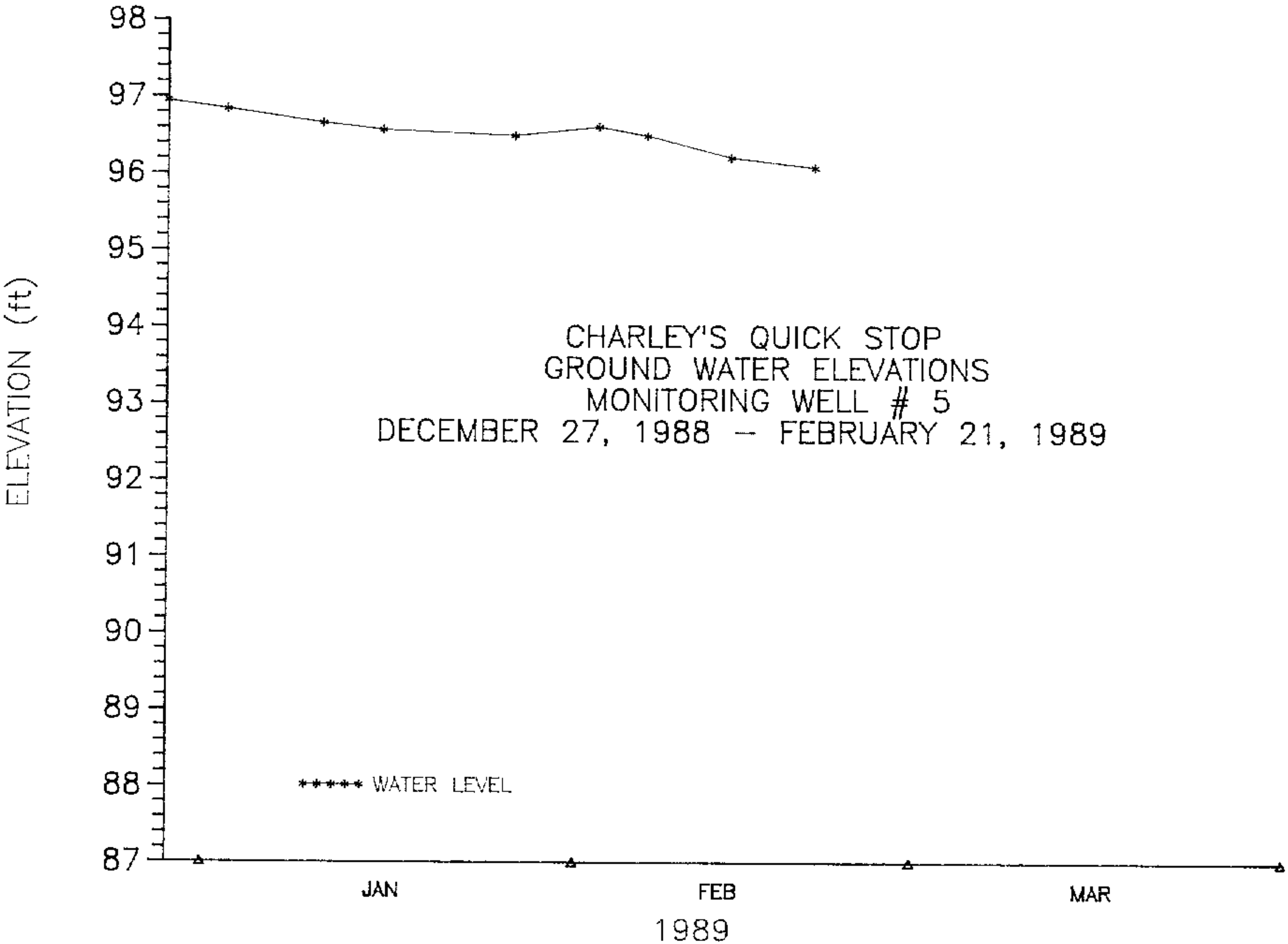

CHARLEY'S QUICK STOP
GROUND WATER ELEVATIONS
MONITORING WELL # 5
DECEMBER 27, 1988 - FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
***** WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-5

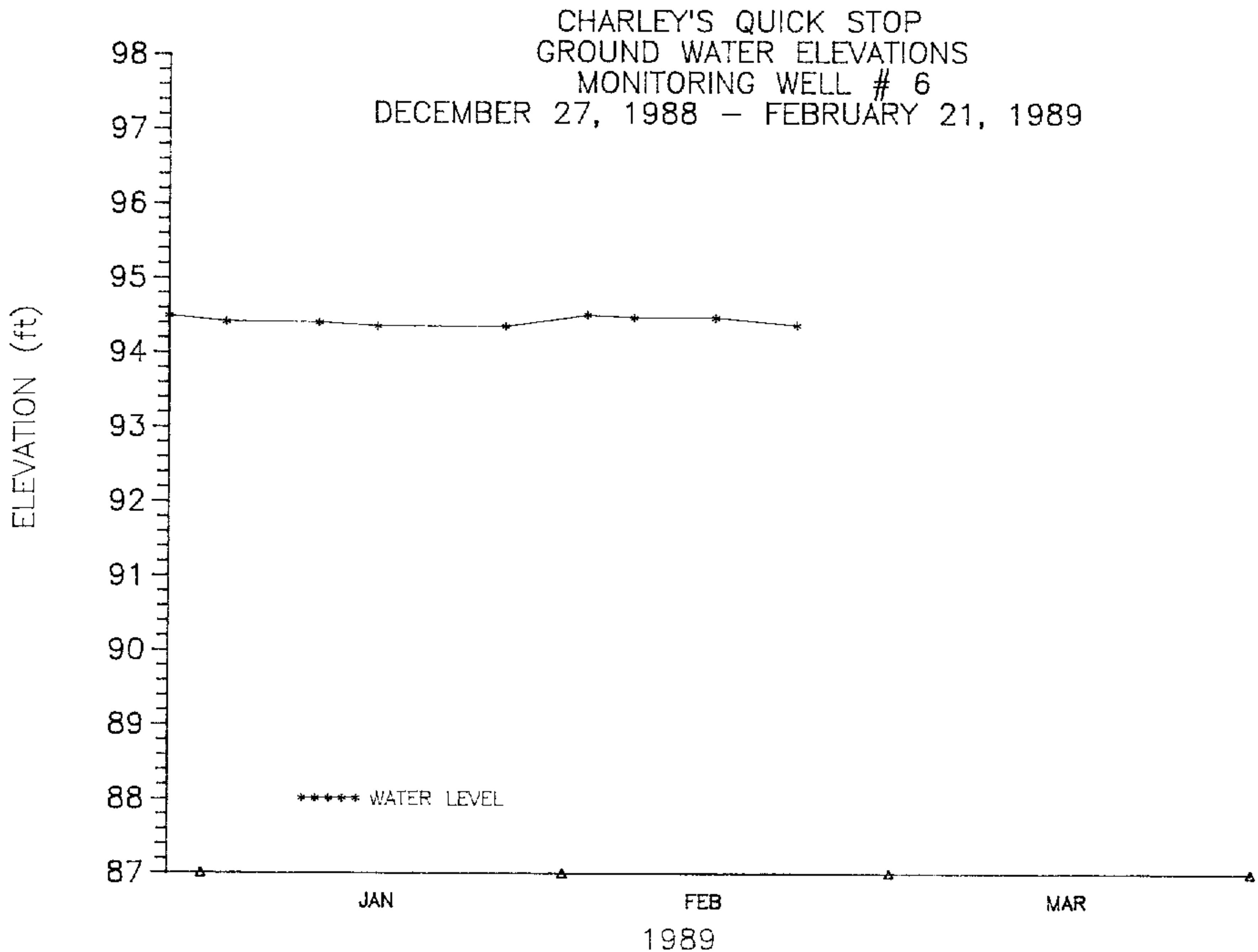

CHARLEY'S QUICK STOP
GROUND WATER ELEVATIONS
MONITORING WELL # 6
DECEMBER 27, 1988 – FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
***** WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-6

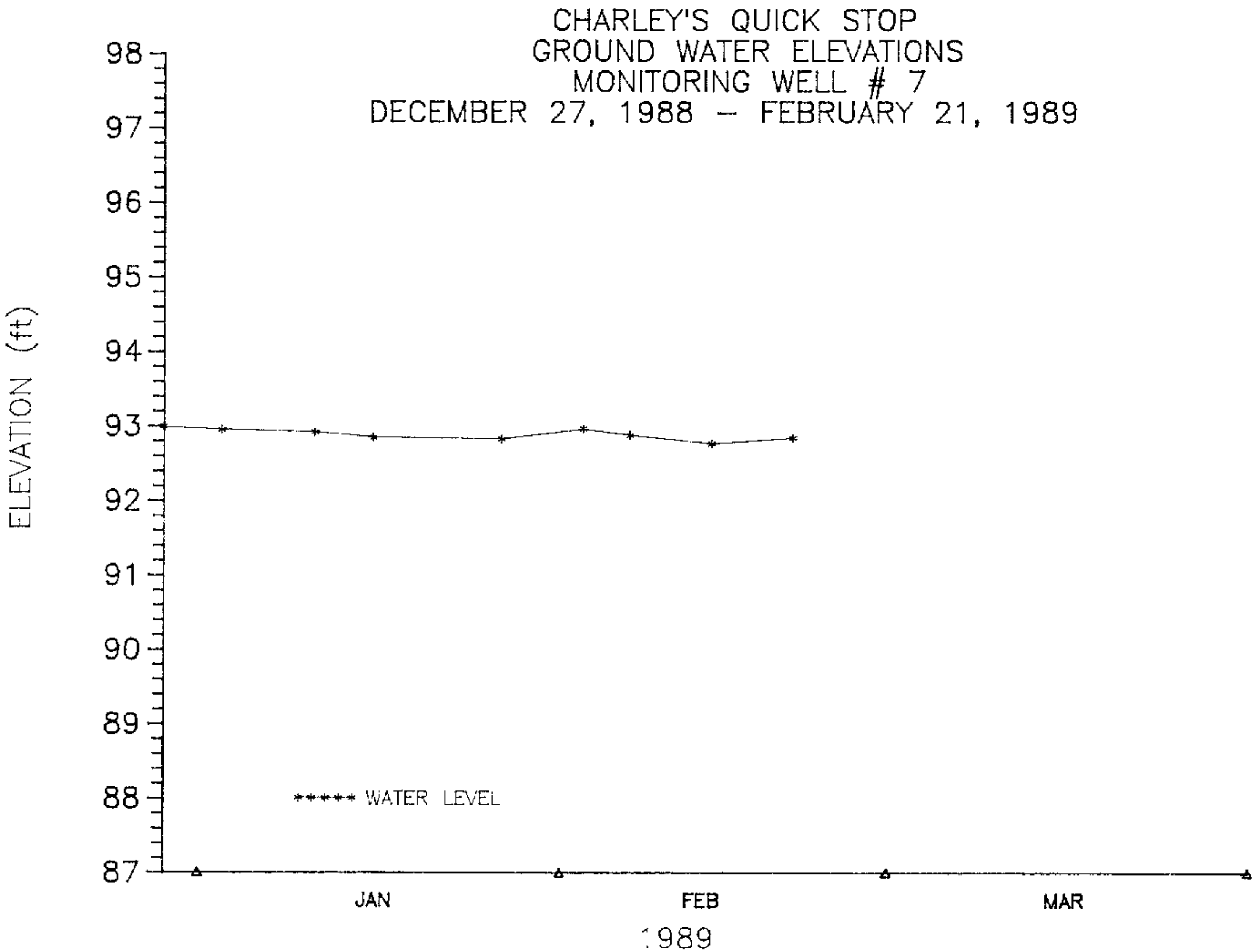
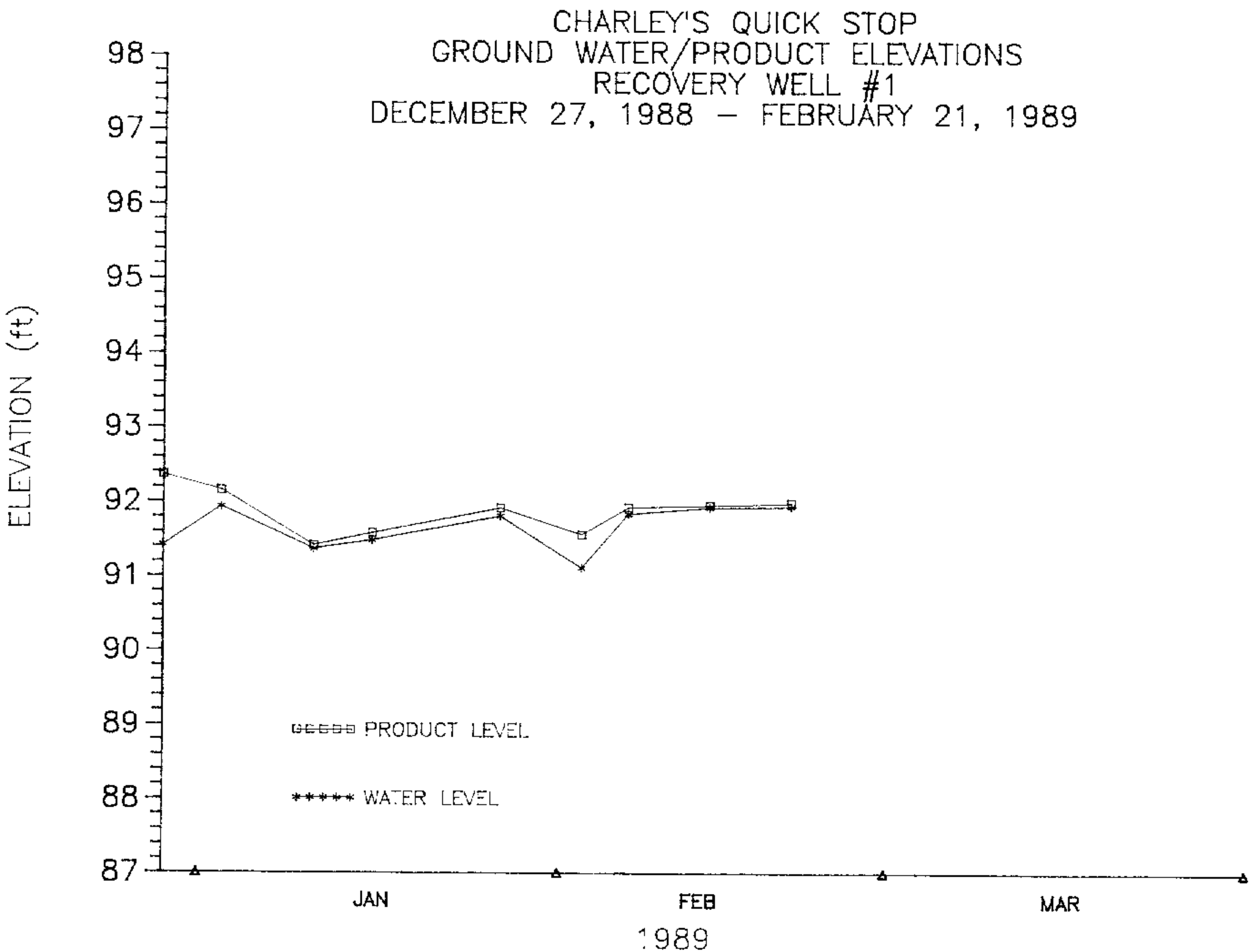

CHARLEY'S QUICK STOP
GROUND WATER ELEVATIONS
MONITORING WELL # 7
DECEMBER 27, 1988 - FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
***** WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A



CHARLEY'S QUICK STOP
GROUND WATER/PRODUCT ELEVATIONS
RECOVERY WELL #1
DECEMBER 27, 1988 - FEBRUARY 21, 1989
ELEVATION (ft)
98
97
96
95
94
93
92
91
90
89
88
87
PRODUCT LEVEL
WATER LEVEL
JAN
FEB
MAR
1989

FIGURE A-8

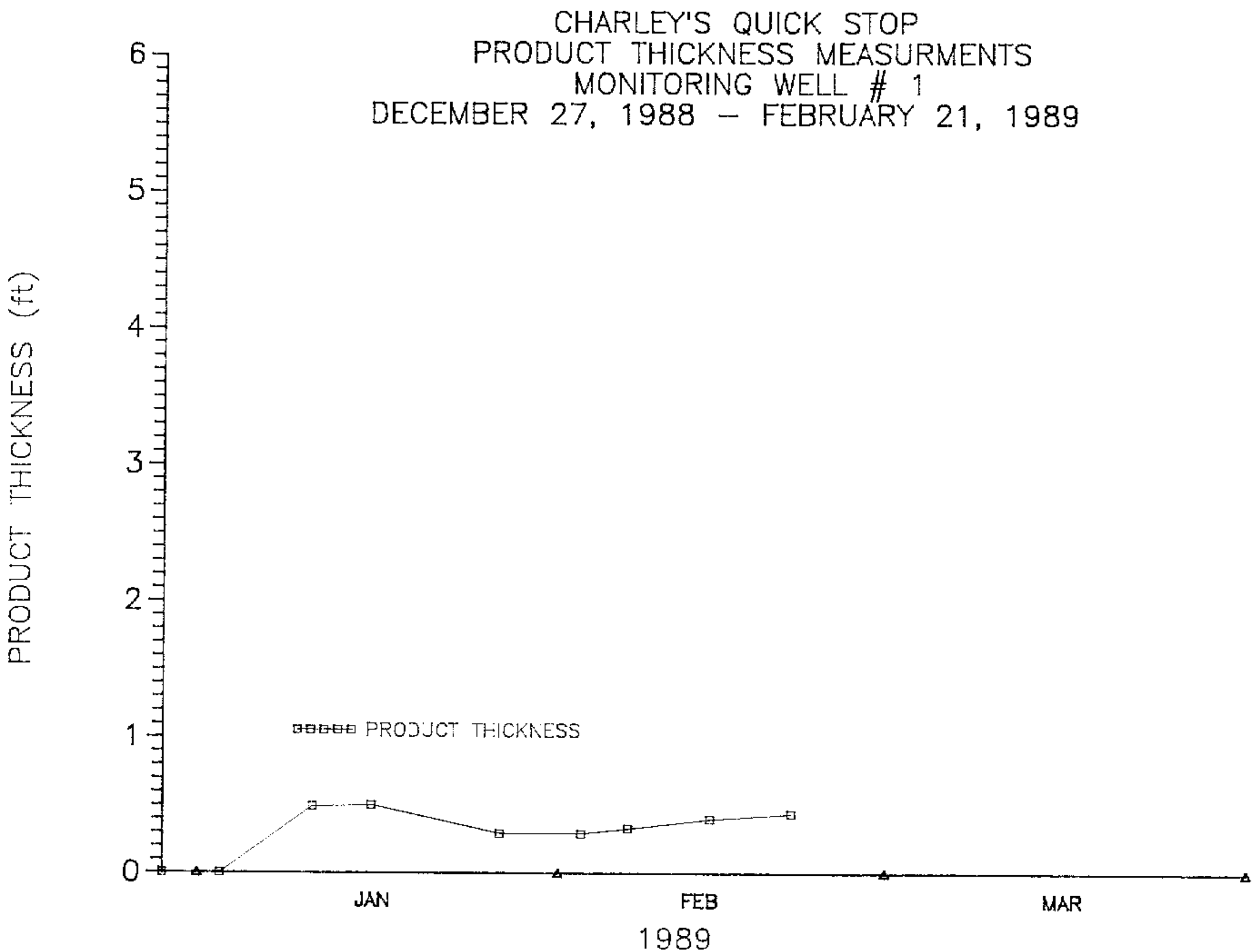

CHARLEY'S QUICK STOP
PRODUCT THICKNESS MEASURMENTS
MONITORING WELL # 1
DECEMBER 27, 1988 - FEBRUARY 21, 1989
PRODUCT THICKNESS (ft)
0
1
2
3
4
5
6
PRODUCT THICKNESS
JAN
FEB
MAR
1989

FIGURE A-

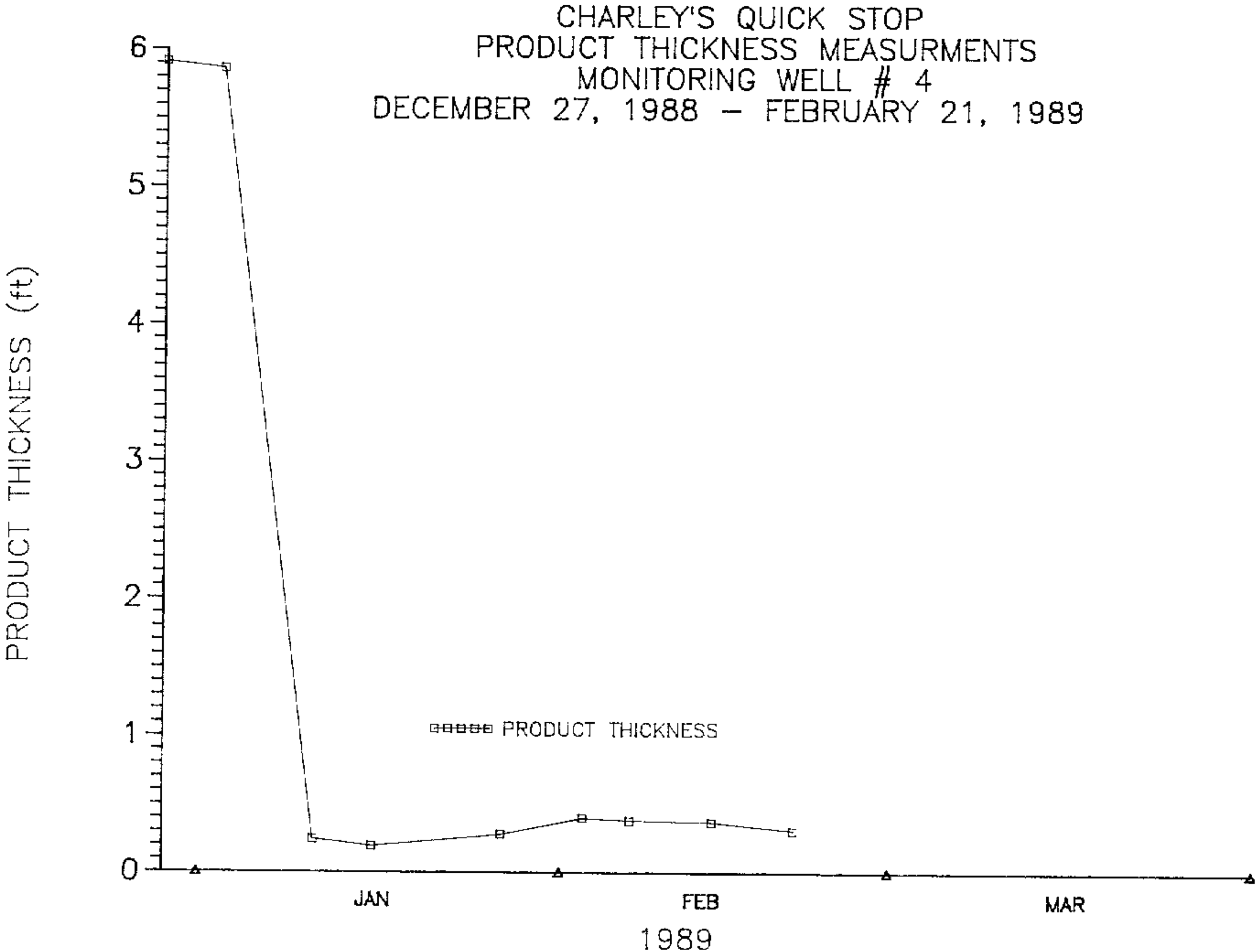

CHARLEY'S QUICK STOP
PRODUCT THICKNESS MEASURMENTS
MONITORING WELL # 4
DECEMBER 27, 1988 - FEBRUARY 21, 1989
PRODUCT THICKNESS (ft)
6
5
4
3
2
1
0
PRODUCT THICKNESS
JAN
FEB
MAR
1989

FIGURE A-1

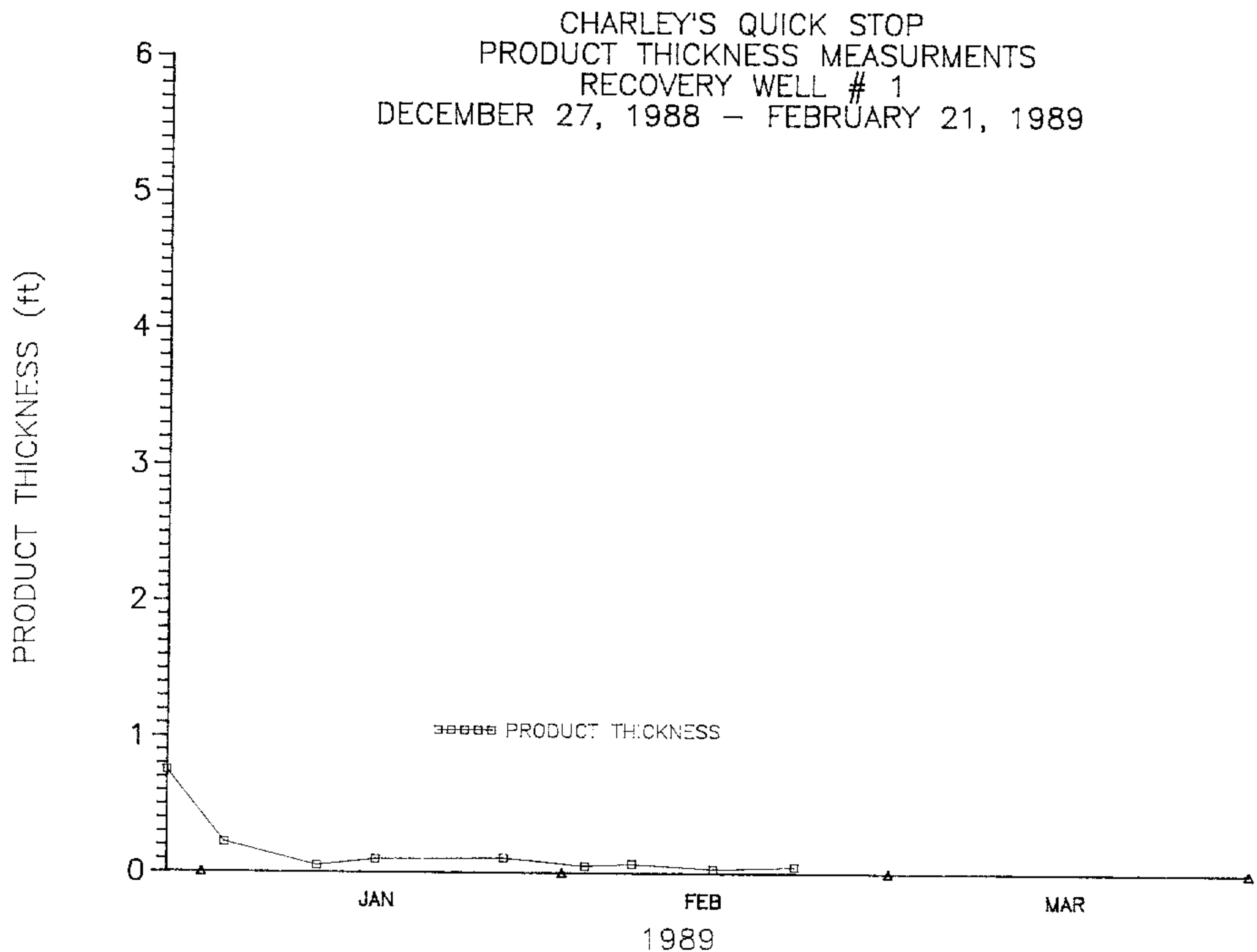

CHARLEY'S QUICK STOP
PRODUCT THICKNESS MEASURMENTS
RECOVERY WELL # 1
DECEMBER 27, 1988 - FEBRUARY 21, 1989
PRODUCT THICKNESS (ft)
6
5
4
3
2
1
0
PRODUCT THICKNESS
JAN
FEB
MAR
1989

FIGURE A-1

Appendix B

Water Quality Data

PROJECT Charley's Quik Stop

JOB NO. LAG 88

LOCATION Enosburg Falls

SHEET 1 OF 1

LINCOLN APPLIED GEOLOGY

Sample Point	TOTAL HYDROCARBONS (ppb)							
Date	1/6/89	1/16/89						
MW-1		FP						
MW-2		35.5						
MW-3		ND						
MW-4		FP						
MW-5		ND						
MW-6		ND						
MW-7		ND						
RW -1		FP (30,876)						
CC-1	46.7	29.10						
CC-2	ND	ND						

Note: ND = Not Detected
FP = Free Product

TABLE B-1

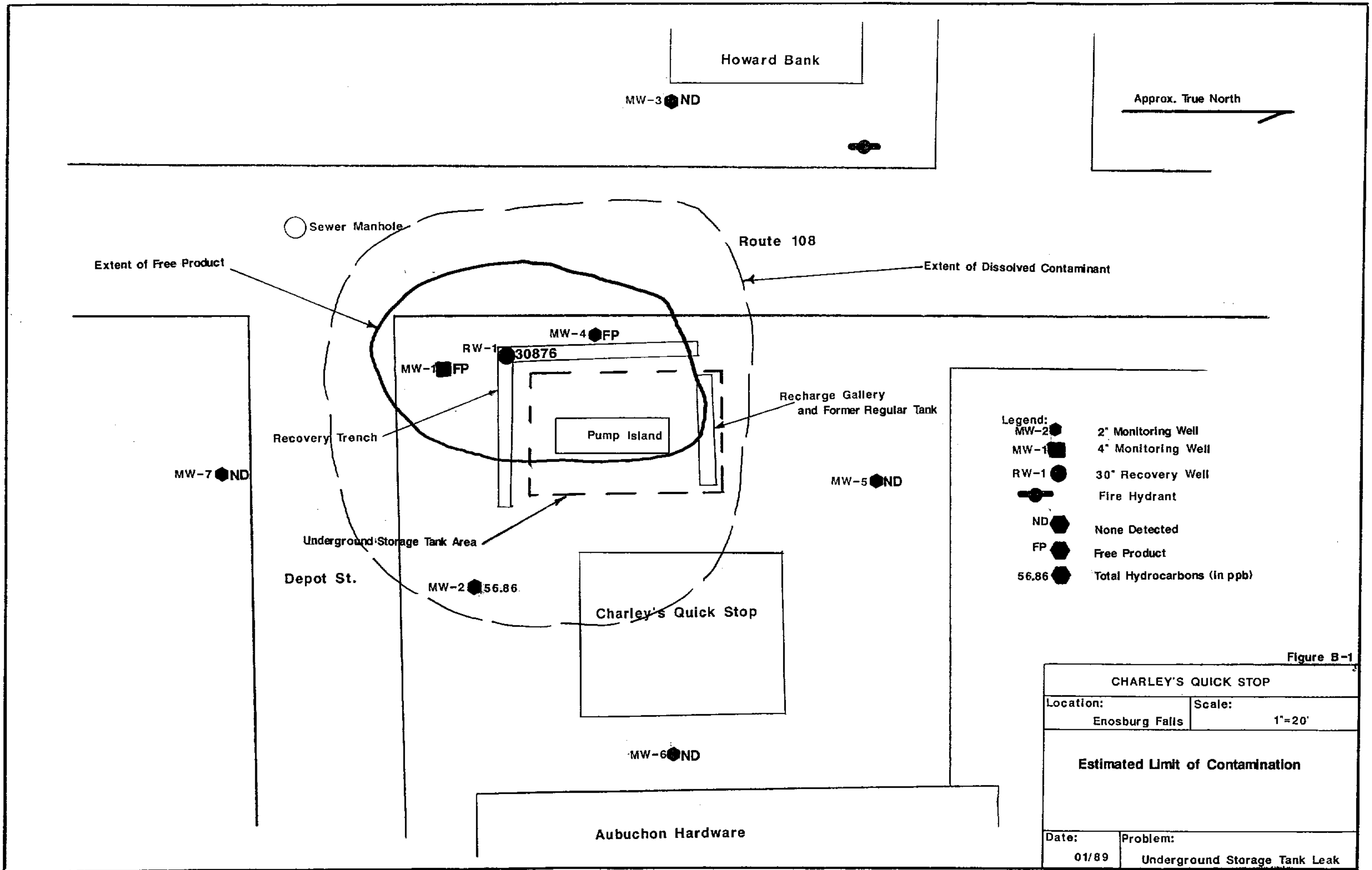

Howard Bank
MW-3 ND
Approx. True North
Sewer Manhole
Route 108
Extent of Free Product
Extent of Dissolved Contaminant
MW-4 FP
RW-1 30876
MW-1 FP
Recharge Gallery
and Former Regular Tank
Pump Island
Recovery Trench
MW-7 ND
MW-5 ND
Underground Storage Tank Area
Depot St.
MW-2 56.86
Charley's Quick Stop
MW-6 ND
Aubuchon Hardware
Legend:
MW-2 2" Monitoring Well
MW-1 4" Monitoring Well
RW-1 30" Recovery Well
Fire Hydrant
ND None Detected
FP Free Product
56.86 Total Hydrocarbons (in ppb)
CHARLEY'S QUICK STOP
Location: Enosburg Falls
Scale: 1"=20'
Estimated Limit of Contamination
Date: 01/89
Problem: Underground Storage Tank Leak

Figure B-1

ENDYNE, INC.

Laboratory Services

1 Wentworth Drive
Williston, Vermont 05495
(802) 879-4333

LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 26, 1989 REF. #: 4282
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: MW-2
DATE SAMPLED: January 16, 1989
DATE RECEIVED: January 16, 1989

Parameter	Concentration (ug/L)
Benzene	4.44
Toluene	5.16
Ethylbenzene	4.10
Xylenes	21.8
Aliphatics (Total by EPA 601)	5.86
Aromatics (Total by EPA 602)	35.5

Analyst: J. Morris

Reviewed by [signature] 1/29/89

ENDYNE, INC.

Laboratory Services

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LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 26, 1989 REF. #: 4283
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: MW-3
DATE SAMPLED: January 16, 1989
DATE RECEIVED: January 16, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	TBQ [2]
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis
2 Trace but below quantitation limit

Analyst: J. Morris

Reviewed by Ronald Weddell 1/29/89

ENDYNE, INC.

Laboratory Services
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(802) 879-4333

LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 25, 1989 REF. #: 4273
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: MW-5
DATE SAMPLED: January 11, 1989
DATE RECEIVED: January 11, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	ND
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis

Analyst: J. Morris

Reviewed by [signature] 1/27/89

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(802) 879-4333

LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 25, 1989 REF. #: 4274
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: MW-6A
DATE SAMPLED: January 11, 1989
DATE RECEIVED: January 11, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	ND
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis

Analyst: J. Morris

Reviewed by Ronald Waldrill 1/27/89

ENDYNE, INC.

Laboratory Services

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(802) 879-4333

LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 25, 1989 REF. #: 4275
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: MW-6B
DATE SAMPLED: January 11, 1989
DATE RECEIVED: January 11, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	ND
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis

Analyst: J. Morris

Reviewed by Ronald Waddell 1/27/89

ENDYNE, INC.

Laboratory Services

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(802) 879-4333

LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 26, 1989 REF. #: 4284
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: MW-7
DATE SAMPLED: January 16, 1989
DATE RECEIVED: January 16, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	1.67
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis

Analyst: J. Morris

Reviewed by K Waddell 1/29/89

ENDYNE, INC.

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(802) 879-4333

LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 26, 1989 REF. #: 4285
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: Recovery Well
DATE SAMPLED: January 16, 1989
DATE RECEIVED: January 16, 1989

Parameter	Concentration (ug/L)
Benzene	1,280.
Toluene	17,200
Ethylbenzene	396.
Xylenes	12,000
Aliphatics (Total by EPA 601)	124.
Aromatics (Total by EPA 602)	32,100

Analyst: J. Morris

Reviewed by Ronald Waddell 1/29/89

ENDYNE, INC.

Laboratory Services

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LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 25, 1989 REF. #: 4271
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: Canister 1
DATE SAMPLED: January 11, 1989
DATE RECEIVED: January 11, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	29.1
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	12.8
Aromatics (Total by EPA 602)	29.1

NOTES:

1 Compound not detected in analysis

Analyst: J. Morris

Reviewed by Ronald Waddell 1/27/89

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Laboratory Services

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LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 25, 1989 REF. #: 4272
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: Canister 2
DATE SAMPLED: January 11, 1989
DATE RECEIVED: January 11, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	ND
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis

Analyst: J. Morris

Reviewed by Ronald Waddell 1/27/89

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LABORATORY REPORT

GC METHOD -- BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES)

DATE: January 26, 1989 REF. #: 4286
CLIENT: Lincoln Applied Geology, Inc.
PROJECT NAME: Charlie's Quick Stop
STATION: TRIP BLANK
DATE SAMPLED: January 16, 1989
DATE RECEIVED: January 16, 1989

Parameter	Concentration (ug/L)
Benzene	ND [1]
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Aliphatics (Total by EPA 601)	TBQ [2]
Aromatics (Total by EPA 602)	ND

NOTES:

1 Compound not detected in analysis
2 Trace but below quantitation limit

Analyst: J. Morris

Reviewed by Ronald Waddell 1/29/89