Assessment of Groundwater Flow in the Floridan Aquifer and Contamination at Floridan Aquifer Monitoring Well L-2-4, Moltech Facility, Alachua, Florida

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Prepared for:

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EXECUTIVE SUMMARY

Hazlett-Kincaid, Inc. (HKI) was contracted by the Florida Department of Environmental Protection – Hazardous Waste Regulation Section (FLDEP-HW) to review existing documents and data related to groundwater flow and contamination at the Moltech Power Systems (MPS) facility in Alachua, Florida and (1) assess groundwater flow directions in the Floridan aquifer at MPS, (2) determine the feasibility of constructing a numerical model of groundwater flow in the Floridan aquifer at MPS, (3) define the most probable mechanism(s) for TCE contamination to the Floridan aquifer at MPS, (4) assess the probable risk of TCE contamination to neighboring water wells in the vicinity of MPS based on the document and data assessment, and (5) provide recommendations to FLDEP-HW for potential groundwater sampling at MPS and neighboring wells.

To perform these tasks, HKI (1) reviewed data and documents provided by FLDEP-HW on CDROM, the Alachua County Department of Environmental Protection (ACDEP) and Suwannee River Water Management District (SRWMD), and published sources; (2) performed a site investigation to assess site-scale hydrogeologic conditions potentially not described in the documentation; (3) compiled the data from those sources into an MS Excel spreadsheet; (4) performed graphical and spatial analysis on the data; and (5) developed this report on the results of the review and analyses.

Basic conclusions are as follows:

- The Floridan aquifer in the vicinity of MPS is highly karstified, wherein groundwater flow will be rapid and controlled by discrete dissolution features.
- Natural regional groundwater flow directions in the Floridan aquifer in the vicinity of MPS are to the west toward large springs in the Santa Fe River.
- The Gainesville well field creates a cone of depression that extends westward toward Hague and MPS to an unknown distance. The position of that cone of depression will define a local groundwater divide, to the east of which groundwater will flow east toward the Gainesville well field.
- Site-scale flow directions in the Floridan aquifer cannot be resolved with the current data.
- Groundwater in the surficial aquifer flows to shallow streams to the north, east and south of the MPS facility, which then flow to sinkhole-lakes, disappear, and recharge the Floridan aquifer.
- There is a significant downward vertical gradient (~ 100 feet) at MPS between the surficial and Floridan aquifers.
- Contamination in the surficial aquifer will either flow to the shallow streams and enter the Floridan aquifer at the sinkhole-lakes or flow downward through the confining layer to the Floridan aquifer.
- There has been a rising trend in TCE concentrations at MPS in the Floridan aquifer monitoring well L-2-4 since November 1993 and in confining unit monitoring well B-11-1 since November 1999.
- The large transmissivity and high flow rates through the Floridan aquifer will foster rapid dilution of TCE concentrations downgradient from the source of TCE to the Floridan aquifer, which is presumably the vicinity of well L-2-4 at MPS.
- Neighboring residential water wells completed with casings that terminate above the Hawthorne/Ocala Limestone contact and well depths that extend a minimal distance into the upper Floridan aquifer are more "at risk" to TCE contamination from the MPS plume, as it is currently defined, than wells open exclusively to the Floridan aquifer.
- If potable water wells in the region are to be sampled, wells to both the east and the west of MPS should be included so as to accommodate both potential flow directions.

HKI's recommendations are as follows:

- All Floridan aquifer and confining unit wells at MPS should continue to be regularly monitored for TCE and TCE related contamination, at least until a consistent downward trend in concentrations can be verified at all wells.
- Sampling events should be scheduled to coincide with typically wet and dry seasons such that the effect of water table elevation on contaminant concentrations in the aquifer can be evaluated.
- As a precautionary measure, at least one well in each of the east, south, and west potential Floridan aquifer flow directions, preferably ones that are cased above the Hawthorne/Ocala Limestone contact and have well depths that extend a minimal distance into the upper Floridan aquifer, should be periodically sampled for TCE and TCE related contamination.
- If TCE concentrations continue to climb at well L-2-4, a groundwater model should be constructed to evaluate probable flow directions and contaminant transport vectors in the Floridan aquifer in the vicinity of MPS.
- Based on the results of the modeling effort one or more additional Floridan aquifer pumping wells should be installed and pumped to intersect the contamination and remediate the upper part of the Floridan aquifer.

1. INTRODUCTION

The Florida Department of Environmental Protection Hazardous Waster Regulation Section (FLDEP-HW) contracted Hazlett-Kincaid, Inc. (HKI) to review documents related to the hydrogeology and environmental contamination at the Moltech Power Systems Facility in Alachua County Florida (MPS) and render (1) recommendations to the FLDEP-HW as to the necessity for groundwater sampling from water wells penetrating the Floridan aquifer in the vicinity of the facility and the location of potentially suitable wells for such sampling; and (2) an assessment of groundwater flow directions in the Floridan aquifer at MPS, mechanisms for contamination at Floridan aquifer monitoring well L-2-4, and an assessment of the feasibility of developing a groundwater model of flow in the Floridan aquifer at MPS. This report summarizes the worked performed for Task-2.

1.1. Scope of Work

The scope of work identified the following tasks to be performed within the budgetary constraints of the project.

1. Technical review of Floridan aquifer groundwater data that is available from wells located at MPS specifically:
   - assess the regional groundwater flow direction in the Floridan aquifer in the vicinity of MPS;
   - assess the potential for a groundwater divide in the Floridan aquifer to exist beneath MPS;
   - assess the feasibility of constructing an effective groundwater model of flow in the Floridan aquifer at MPS; and
   - assess the necessity for additional Floridan aquifer monitoring wells to confidently predict flow directions.
2. Technical review of historical groundwater well data provided by FLDEP-HW on a CD-ROM specifically;
   - assess probable mechanisms for increasing Trichloroethene (TCE) concentrations at Floridan aquifer monitoring well L-2-4;
   - assess the necessity of re-drilling or pumping Floridan aquifer monitoring well L-2-4; and
   - develop a diagram for the most probable mechanism for increasing TCE concentrations in Floridan aquifer monitoring well L-2-4.
3. Assess the risk to residential wells in the vicinity of MPS to TCE contamination including;
   - an assessment of the necessity for additional Floridan aquifer monitoring wells to determine the extent of TCE contamination in the Floridan aquifer at MPS and the vicinity; and
   - recommendations as to which neighboring residential wells, if any, should be sampled for TCE contamination.

1.2. Problem Overview

The purpose of this investigation stems from the persistent occurrence of Trichloroethene (TCE) in MPS monitoring well L-2-4 as indicated from groundwater samples collected between 11/96 and 2/03 (Appendix I). Monitoring well L-2-4 samples the Floridan aquifer and is located on the eastern side of the MPS property. The depth of the well is 144.5 ft with a screened interval between 135.5 and 145.5 feet (Appendix II). Based on the persistent presence of TCE at L-2-4, the U.S. Environmental Protection Agency (USEPA) and the FLDEP-HW are concerned that the TCE contamination in the Floridan aquifer could pose a threat to water quality in residential water supply wells in the vicinity of MPS. Consequently, they are re-evaluating, in more detail, probable groundwater flow directions in the Floridan aquifer and possible mechanisms for the observed increasing TCE concentrations at Floridan aquifer monitoring well L-2-4.

2. HYDROGEOLOGICAL OVERVIEW

As part of this investigation, HKI performed a cursory hydrogeological assessment of the region surrounding the MPS facility, which included:

- a review of the Alachua and High Springs USGS 7.5 minute topographic quadrangles, digital orthographic quadrangles, and digital elevation models;
- a review of borehole logs obtained from the Alachua County Department of Environmental Protection (ACDEP) and the Suwannee River Water Management District (SRWMD);
- a review of historical groundwater level data and potentiometric surface maps obtained from the ACDEP; and
- an field investigation of karstic features in the San Felasco Hammock State Preserve located immediately south of the MPS facility and across U.S. Highway 441 that receive water from an un-named stream flowing along the east and south side of the facility.

Graphs and maps referenced in this section are attached in individual appendices as copies of the originals provided on the CDROM and referenced to the file name on the CDROM and data index. Other data sources are cited where appropriate.

2.1. Karst

The MPS facility is located proximal to the Cody Scarp, which marks the transition zone between the Northern Highlands physiographic province and the numerous sub-provinces of the Gulf Coastal Lowlands. The Northern Highlands province is hydrogeologically characterized by the confinement or partial confinement of the Floridan aquifer and presence of intermediate and/or surficial aquifers. The Gulf Coastal Lowlands is hydrogeologically characterized by unconfined conditions in the Floridan aquifer and the absence of the surficial and intermediate aquifers. Figure 1 shows the location of the facility and nearby hydrologic features on part of the Alachua USGS 7.5 minute topographic quadrangle. Figure 2 and Animation 1 (moltech_topo.wmv attached with this report on CD-ROM) show the topographic relief surrounding the facility as measured by the Alachua USGS 3-meter digital elevation model. Elevations at the site range between approximately 150 feet and approximately 135 feet reflecting its position in the Northern Highlands. Within 1 mile of the site to the west, topographic elevations drop to 50 feet, which is demonstrative of the thinning surficial aquifer and confining bed within the transition zone.

The proximity of the facility to the Cody Scarp is significant because of the abundance of karst features within the transition zone and lowland provinces in north-central Florida and the influence those features exert on groundwater flow patterns in the Floridan aquifer. Karst in this region is manifest most prominently by sinkholes and disappearing streams, both of which are present in the immediate vicinity of MPS. Most notable of these features are two un-named creeks shown on the Alachua USGS 7.5 minute topographic quadrangle (Figure 1). One drains the region north and northeast of the MPS facility and flows into Burnetts Lake where it disappears. The second drains the region east and south of the MPS facility and flows to Lee Sink where it disappears and recharges the Floridan aquifer. These sinking streams are significant because they receive groundwater from the surficial aquifer and deliver it to sinkholes where it recharges the karstified Floridan aquifer. Numerous more karstic features including caves receiving surface runoff from streams were observed in the San Felasco Hammock State Preserve immediately south of the MPS facility during HKI's field investigation.

Karst features develop as a consequence of dissolution of limestone by acidic groundwater, which is generated by the addition of CO_2 to recharge from decaying organic matter at and/or near the land surface. Dissolution in the aquifer modifies groundwater flow paths by creating highly permeable pathways, which tend to align themselves with the hydraulic gradient (Huntoon, 1985; Kincaid, 1999) and thereby collect and deliver groundwater to down-gradient springs. It is highly probable, therefore that the sinkholes and dolines present near MPS collect and deliver water to the large magnitude springs on the upper part of the lower Santa Fe River, including Hornsby spring, High spring, and the rise of the Santa Fe River. Barring other evidence, it should therefore be expected that groundwater flow directions in the Floridan aquifer at MPS are to the west-northwest toward those springs. The permeability of the aquifer should be high, due to increasing karstification with proximity to the transition zone, which is supported by the very small draw-downs achieved when Floridan aquifer monitoring well L-2-4 was pump tested in 2002.

There are two probable mechanisms by which contaminants from MPS could penetrate the Floridan aquifer. 1) Contaminants introduced into the surficial aquifer will be carried by shallow groundwater flow to the nearby streams. The streams will then deliver the contaminants to the sinkholes where the streams disappear thereby introducing the contaminants to the Floridan aquifer. 2) Downward hydraulic gradients between the surficial and Floridan aquifers will cause the contaminants to move, first into the permeable limestone interbeds within the confining unit and then into the Floridan aquifer. The magnitude of this transport vector would be attenuated by the low permeability of the clay interbeds within the confining unit and most likely localized along heterogeneities and fractures within the confining unit and proximal to the source of contamination that provide higher permeable pathways. In either case once the contaminants enter the Floridan aquifer, highly permeable karstic features will facilitate rapid transport in the down-gradient direction.

2.2. Hydrostratigraphy, Permeability, & Flow

2.2.1. Surficial Aquifer

Three major hydrostratigraphic units exist beneath MPS: the surficial aquifer, a confining unit, and the Floridan aquifer, from top to bottom respectively. The surficial aquifer is a variably thick sequence of heterogeneous sandy sediments ranging in thickness from ~10 to ~30 feet as is indicated by borehole logs and cross-sections compiled by MPS consultants (Appendix III). The surficial aquifer at MPS is relatively permeable wherein horizontal hydraulic conductivity is approximately 0.65 ft/day (Moltech Power Systems, 2000). No data on the vertical hydraulic conductivity was found. In November 2002, the depth to water in the surficial aquifer ranged from 1.61 feet bls in monitoring well T-18 to 12.33 feet bls in monitoring well T-23.

Numerous water table contour maps have been compiled by MPS consultants that consistently show groundwater flow within the surficial aquifer to the east/southeast and north, following the topographic slope toward the streams that bound the site to the east and north. Examples of these maps from synoptic sampling periods in 1999 are provided in Appendix IV. Northward flow will contribute to the flow in the stream that flows west/northwest toward Burnetts Lake (Figures 1 and 2). Eastward/southeastward flow will contribute to the flow in the stream that flows southwest then northwest to Lee Sink (Figures 1 and 2).

2.2.2. Confining Unit

The confining unit consists of variably thick sequences of interbedded clayey sediments and limestones of the Hawthorne Formation and/or Alachua Formation. In the Santa Fe River Basin, which includes the MPS, the Hawthorne Formation is composed of interbedded layers of clay, sand, sandstone, and limestone (Hunn and Slack, 1983). Borehole logs in the region indicate that the thickness of the Hawthorne Formation in this region varies from ~60 to ~80 feet (Appendix III). The actual confining unit(s), however only comprises the clayey portion of the Formation, while the limestones, comprise a discontinuous and variably productive Intermediate aquifer system.

Water yielding zones within the Hawthorne Formation are recharged by infiltration from the overlying surficial aquifer and seepage from streams (Hunn and Slack, 1983). Discharge from the formation is predominantly leakage into the underlying Floridan aquifer (Hunn and Slack, 1983) though discharge to the land surface undoubtedly occurs where the formation is exposed in sinkholes. Fractures and heterogeneities within the formation and erosion that render the more permeable limestones closer to the land surface and/or the underlying limestones of the Floridan aquifer are the most probable pathways for the movement of water and contaminants horizontally and vertically through the confining unit.

Appendix V contains maps showing the structural tops of the Hawthorne Formation confining unit and the Floridan aquifer and the thickness of the confining unit as mapped by Hunn and Slack (1983). The maps show that both the top and bottom of the confining unit generally dip to the west / northwest from the site toward the Cody Scarp. The confining unit thickens to the east and is shown to be approximately 40 feet thick in the vicinity of the site. HKI did not find any site-specific data to constrain horizontal or vertical hydraulic conductivities within the confining unit. Hunn and Slack (1983) report yields from the water-bearing zones within the confining unit that range from 0.2 to 100 gal/min measured in wells and as much as 386 gal/min at Worthington spring, which discharges from the confining unit.

2.2.3. Floridan Aquifer

Within the Santa Fe River basin, the Floridan aquifer consists of several hundred feet of limestones and dolomites from the Ocala Limestone, Suwannee Limestone, and limestones at the base of the Hawthorne Formation. Permeability within the Floridan aquifer is generally very high, particularly in karstified sections such as those near the transition zone and in the unconfined sections. Permeabilities are typically so large that they are difficult to measure through standard aquifer testing because significant drawdowns are often not achievable. The pumping test performed at the site in 2002 was one such test that yielded problematic results. Careful evaluation of the drawdown data at three wells yielded transmissivity values that ranged between 1,170,000 and 1,870,000 gal/day per foot measured at wells PW-1 and PW-2 respectively (Hazlett-Kincaid, 2002). Assuming an aquifer thickness of 300 feet, those values equate to hydraulic conductivities of 530 and 840 feet per day respectively. These values, though very large, appear to be reasonable given that there are at least 10 springs along the Santa Fe River to the west/northwest of the site that each discharge between 30 and 60 cubic feet per second (Scott et al., 2002), which, even assuming a cross-sectional area of as much as 100 square feet correspond to velocities of 10^2 to 10^3 feet per day.

Flow directions in the Floridan aquifer can be estimated from potentiometric surface maps that have been compiled by Hunn and Slack (1983) and the ACDEP. Hunn and Slack (1983) present a map that was compiled from potentiometric surface elevations in wells in 1977 (Appendix VI) showing flow generally from east to west discharging along the western Santa Fe River in the unconfined region of the Floridan aquifer. Two potentiometric highs are mapped in the southwest and southeast sections of the Santa Fe River basin, which they attribute to lower transmissivity in the southwestern section and lower transmissivity and higher recharge rates in the southeastern section. This map could be considered indicative of natural flow through the aquifer because it does not account for withdraws from the large municipal well field in Gainesville.

More recent maps of the potentiometric surface in the Floridan aquifer are available from the ACDEP, which monitors Floridan aquifer heads at several monitoring wells located throughout Alachua County and compiles that data into biannual potentiometric surface maps. Maps produced for years 2000 and

2001 (Appendix VI) indicate that groundwater flow in the Floridan aquifer is west/northwest toward the major springs on the Santa Fe River (Hornsby, High, etc) though there is a divide somewhere close to the MPS facility across which groundwater in the Floridan aquifer flows to the Gainesville well field. Based on all the potentiometric surface mapping evaluated and the large discharges along the Santa Fe River, the only mechanism for significant eastward groundwater flow from the MPS facility toward Hague would be the groundwater divide created by pumping at the Gainesville well field if it is located at or west of the facility. Unfortunately, there is insufficient data to confidently map the location of the divide at a site-scale level of investigation.

At the site-scale, the head pattern in the Floridan aquifer is not well constrained. Five wells at MPS penetrate the Floridan aquifer: L-2-4, L-4-4, B-11-4, PW-1, and PW-2. Appendix VII contains maps showing the potentiometric surface at those wells as measured by MPS consultants on February 6 and February 18, 2003 and well construction details for those wells. The values indicate a general flow direction of NE-SW, which generally supports the flow directions indicated by the Hunn and Slack and ACDEP maps. Based on a review of available documents, HKI could not determine rather or not the potentiometric surface elevations for PW-1 and PW-2 were obtained while the pumps were operating or shut off.

Results of the 2002 aquifer pumping test showed that the maximum drawdown in the pumping well at PW-2 was 0.99 feet with a median value of 0.44 feet over 224 measurements collected over a period of more than 73 hours. The maximum drawdown at well L-2-4 during that test was 0.18 feet after 299 measurements collected over 28 hours. Based on those pump-test results, pumping at wells PW-1 and PW-2 could have influenced the flow directions in the Floridan aquifer to the extent reflected by the measurements presented on the maps in Appendix VII.

Assuming that no pumping was occurring at PW-1 and PW-2 during the measurement periods, the values indicate potential flow directions of north between PW-1 and PW-2 and radially away from L-2-4 from northwest to southeast. The complex pattern could reflect variability in well construction and possibly the aquifer hydraulic conductivity at those locations. Both PW-1 and PW-2 are more than 400 feet deep and cased to 170 feet or more below land surface. L-2-4, B-11-4, and L-4-4 are all less than 150 feet deep and, as such, open to less aquifer than the PW wells and open to a section of the aquifer to which the PW wells are not. It is also possible that L-2-4 intersects more chert or otherwise less permeable material than B-11-4 and L-4-4 resulting in slightly higher hydraulic head at that location. Well logs for all wells L-2-4, L-4-4, and B-11-4 as defined by MPS consultants are provided in Appendix VII.

Because of these inconsistencies and complexities, it is not currently possible to resolve groundwater flow directions in the Floridan aquifer at the site-scale. Based on the results of the 2002 aquifer pumping test, however, it is unlikely that pumping at the residential wells in Hague or the University of Florida Agricultural well are influencing flow directions in the Floridan aquifer at MPS. Pumping at PW-

1 and PW-2 likely exert a very small, localized influence on flow directions. The only probable regional influences on flow directions are the springs along the Santa Fe River and the Gainesville well field.

Additional Floridan aquifer monitoring wells at the MPS facility will likely yield data more or less reflective of the same complexities as indicated by the existing wells. In order to ascertain the possibility of a groundwater divide at the site, a better use of resources would be to obtain surveyed elevations at one or two residential wells to the east and west of the facility and then collect and evaluate Floridan aquifer heads from those wells. Well construction characteristics for residential wells in the vicinity of the MPS facility were compiled as part of Task-1 and provided with the Task-1 report. A copy of that data table is provided as Appendix VIII.

2.3. Vertical Gradients

Hydraulic head measurements collected from nested wells L-2-1 – 4, L-4-1 – 4, and B-11-1 – 4 indicate that there is a downward gradient from the surficial aquifer to the confining unit and then from the confining unit to the Floridan aquifer (Appendix VII). Head values range from approximately 130-135 feet amsl in the surficial aquifer, to 127-129 feet amsl in the confining unit, to approximately 36 feet amsl in the Floridan aquifer.

3. GROUNDWATER MODELING FEASIBILITY

The FDEP-HW's primary stated objective for groundwater modeling is to evaluate groundwater flow directions in the Floridan aquifer at the MPS facility. There is sufficient data to construct a steady-state groundwater model to address that objective. The model should be broad enough to encompass the springs along the Santa Fe River and pumping at Gainesville well field. Average discharge data for the major springs has been compiled by the Florida Geological Survey and is publicly available. Discharge data from the Gainesville well field should be available from either the city engineer or the ACDEP. If not, the ACDEP has compiled bi-annual potentiometric surface maps for the Floridan aquifer that could be used to calibrate model drawdowns from the well field.

The model should be three-dimensional, addressing recharge from the surficial aquifer through the confining layer as well as direct recharge through sinkholes receiving flow from disappearing streams near MPS. The structural surface of the Floridan aquifer can be defined regionally from maps compiled by the USGS and locally from deep borehole logs and residential well logs collected and maintained by the SRWMD. The thickness of the surficial aquifer and Hawthorne confining unit can be defined in the same manner.

The primary objectives of the model would be to:

- evaluate the lateral extent to which the Gainesville well field effects groundwater flow directions to the west in the Floridan aquifer;

- evaluate the potential for the existence of local groundwater divides in and around MPS that formed in response to differential recharge and pumping at MPS wells PW-1 and PW-2.

Once the model is developed, it would also be possible to evaluate dissolved-phase TCE and DCE transport in response to the steady-state groundwater flow field.

4. TCE CONTAMINATION AT MPS

HKI reviewed historical documents and data primarily produced by MPS consultants, FLDEP-HW, and the USEPA related to groundwater contamination at MPS. The documents were obtained from FLDEP-HW on a CDROM that contain an index to the individual documents referenced by the file names on the CDROM. All graphs, maps, and models presented in this section were independently developed by HKI based on data compiled from one or more files on the CDROM, which is presented in a re-tabulated format in Appendix I. Specific conclusions rendered by parties other than HKI are cited and referenced at the end of the document.

4.1. Surficial Aquifer

Figure 3 provides plots showing the trends in dissolved TCE concentrations in surficial aquifer monitoring wells at MPS between November 1996 and November 2002. The data from which the plots were rendered is provided in Appendix I. During that period, TCE concentrations in wells T-6, T-14, B-11-3, and T-19 have fluctuated significantly and repeatedly shown high concentrations of TCE. The plot of median synoptic values from all the sampled wells indicates that the overall size of the plume has decreased during the period of record, however the plot of mean values indicates that there is a persistent source of dissolved TCE at MPS, which is, most probably, sorbed TCE in the unsaturated zone that is slowly dissolving and releasing dissolved phase TCE to the surficial aquifer.

Figures 6-9 and Animation 2 (attached CDROM) provide contour maps of dissolved phase TCE concentrations in the surficial aquifer for each of the synoptic periods included in the graphical data presentations. The maps show three probable sources of contamination to the surficial aquifer, which are located adjacent to, northwest, and southwest of Floridan aquifer monitoring well L-2-4. The maps show continual decreasing concentrations in two of the three probable source areas over the period of record, the probable sources adjacent to and northwest of Floridan aquifer monitoring well L-2-4. Concentrations in wells southwest of L-2-4 show an overall decrease in concentration over the period of record though those concentrations have continually fluctuated above 50 and sometimes 100 ppb.

4.2. Confining Unit

Figure 4 provides plots showing the trends in dissolved TCE concentrations in confining unit monitoring wells at MPS between November 1996 and November 2002. The data from which the plots were rendered is provided in Appendix I. Concentration trends in all but well L-2-3 and the max, median, and mean values indicate that the plume in the confining unit has been persisting and growing during the period of record, particularly in the vicinity of well B-11-1.

Figures 10-13 and Animation 3 (attached CDROM) provide contour maps of dissolved phase TCE concentrations in the confining unit for each of the synoptic periods included in the graphical data presentations. The maps indicate that TCE contamination migrated east/northeast, east/southeast, and/or vertically through the surficial aquifer into the Hawthorne Formation from one or more of the probable sources sometime prior to November 1996. The contour maps further indicate that the size of the plume within the confining unit has decreased since November 1996 and that the confining unit plume has migrated toward the southeast. The highest recorded TCE concentrations are consistently localized around Floridan aquifer monitoring well L-2-4.

4.3. FLORIDAN AQUIFER

Figure 5 provides a plot showing the trend in dissolved TCE concentrations in Floridan aquifer monitoring well L-2-4 at MPS between February 1991 and February 2003. The trend indicates rising concentrations in the Floridan aquifer beginning in May 1994.

The data, as presented in Figures 3-13 indicate that the mechanism for TCE migration into the Floridan aquifer is vertical transport from the surficial aquifer through the confining unit. Figure 14 presents a 3-D contour of TCE data from the November 1999 synoptic period relative to a hypothesized structural model of the surficial aquifer, confining unit and Floridan aquifer at MPS. There is insufficient data to constrain the lateral or vertical extent of TCE contamination in the Floridan aquifer. Low TCE concentrations were measured from new wells installed into the Floridan aquifer (B-11-4 and L-4-4) and pumping wells PW-1 and PW-2 during the February 2003 synoptic sampling event, however the validity of that data remains in question (USEPA, 2003). The 3-D contour map indicates that the most probable pathway is from the vicinity of well T-6 to the vicinity of B-11-3 to L-2-4. The specific pathway is very likely localized along fractures or heterogeneities in the vicinity of those wells that provide a more permeable pathway for vertical groundwater flow from the surficial aquifer to the Floridan aquifer.

The persistent but fluctuating TCE concentrations in surficial aquifer wells T-6 and T-14 but declining median surficial aquifer TCE concentrations (Figure 3), and increasing concentrations in confining unit wells B-11-1, B-9, L-2-2, L-2-3 as well as increasing median confining unit TCE concentrations (Figure 4), indicate that the TCE plume is in the process of migrating vertically through the confining unit but that the source of the dissolved phase TCE in the surficial aquifer has been largely removed or otherwise rendered immobile. TCE concentrations in the Floridan aquifer will likely continue to rise or plateau until the TCE within the confining unit has either been removed by remedial action or completes the migration downward into the Floridan aquifer. The degree to which the concentrations will rise can only be surmised at this point, but is not likely to exceed the concentrations measured in the confining unit. Once in the Floridan aquifer, the TCE concentrations will quickly be diluted by large groundwater flow volumes through the Floridan aquifer, as evidenced by the high permeabilities that are reflected by the 2002 aquifer pumping test.

5. RISK TO RESIDENTIAL WELLS

Risk of TCE contamination to neighboring residential wells drawing from the Floridan aquifer from the MPS plume, as has been currently defined, is low. This is primarily because:

- measured TCE concentrations in the upper part of the Floridan aquifer are low;
- permeability and flow in the Floridan aquifer is high, both of which will foster rapid dilution downgradient from source of TCE in the Floridan aquifer, presumably the vicinity of well L-2-4; and
- neighboring residential wells are typically open to a large section of aquifer (Appendix 8), which will further foster dilution of any contaminants localized in the upper section proximal to the contact with the confining unit.

The most “at risk” wells will be those that have open or screened intervals that cross the contact between the confining unit and the Floridan aquifer and then extend minimally into the Floridan aquifer. Since site-scale groundwater flow patterns have not been identified, it is not as yet possible to classify risk based on direction from MPS. A prioritization of “at risk” residential wells was developed using the above criteria and distance from the MPS facility and presented with the Task-1 report (Hazlett-Kincaid, 2003). The ten most “at risk” wells based on that prioritization scheme are presented in Table 1.

6. CONCLUSIONS

- The presence of disappearing streams, sinkholes, and caves near the MPS facility and large magnitude springs down-gradient of the site indicate that the Floridan aquifer in this region is highly karstified, wherein groundwater flow will be rapid and controlled by discrete dissolution features.
- Natural regional groundwater flow directions in the Floridan aquifer in the vicinity of MPS are to the west toward the large springs in the Santa Fe River.
- The Gainesville well field creates a cone of depression that extends westward toward Hague and MPS to an unknown distance. The position of that cone of depression will define a local groundwater divide, to the east of which groundwater will flow east toward the Gainesville well field.
- Site-scale flow directions in the Floridan aquifer cannot be resolved with the current data.
- Groundwater in the surficial aquifer flows to shallow streams to the north, east and south of the MPS facility, which then flow to sinkhole-lakes, disappear, and recharge the Floridan aquifer.

- There is a significant downward vertical gradient at MPS between the surficial and Floridan aquifers.
- Contamination in the surficial aquifer will either flow to the shallow streams and enter the Floridan aquifer at the sinkhole-lakes or flow downward through the confining layer to the Floridan aquifer.
- There has been a rising trend in TCE concentrations at MPS in the Floridan aquifer monitoring well L-2-4 since November 1993 and in confining unit monitoring well B-11-1 since November 1999.
- The large transmissivity and high flow rates through the Floridan aquifer will foster rapid dilution of TCE concentrations downgradient from the source of TCE to the Floridan aquifer, which is presumably the vicinity of well L-2-4 at MPS.
- Neighboring residential water wells completed with casings that terminate above the Hawthorne/Ocala Limestone contact and well depths that extend a minimal distance into the upper Floridan aquifer are more “at risk” to TCE contamination from the MPS plume, as it is currently defined, than wells open exclusively to the Floridan aquifer.
- If potable water wells in the region are to be sampled, wells to both the east and the west should be included so as to accommodate both potential flow directions.

7. RECOMMENDATIONS

- All Floridan aquifer and confining unit wells should continue to be regularly monitored for TCE and TCE related contamination, at least until a consistent downward trend in concentrations can be verified at all wells.
- Sampling events should be scheduled to coincide with typically wet and dry seasons such that the effect of water table elevation on contaminant concentrations in the aquifer can be evaluated.
- As a precautionary measure, at least one well in each of the east, south, and west potential Floridan aquifer flow directions, preferably ones that are cased above the Hawthorne/Ocala Limestone contact and have well depths that extend a minimal distance into the upper Floridan aquifer, should be periodically sampled for TCE and TCE related contamination.
- If TCE concentrations continue to climb at well L-2-4, a groundwater model should be constructed to evaluate probable flow directions and contaminant transport vectors in the Floridan aquifer in the vicinity of MPS.

- Based on the results of the modeling effort one or more additional Floridan aquifer pumping wells should be installed and pumped to intersect the contamination and remediate the upper part of the Floridan aquifer.

8. REFERENCES

Hazlett-Kincaid, Inc., 2002, Evaluation of the Floridan aquifer pumping test at the Moltech Power Systems facility, Alachua Florida, Letter report to the Florida Department of Environmental Protection Hazardous Waste Management Division, Tallahassee, Florida.

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Moltech Power Systems, 2000, Semi-Annual Corrective Action Report July through December 1999, Moltech Power Systems, Inc., Alachua, Florida, report for the Florida Department of Environmental Protection Hazardous Waste Management Division, Tallahassee, Florida.

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USEPA, 2003, Technical Review Evaluation of Moltech Power Systems Inc., Status under the Corrective Action Environmental Indicator Event Codes (CA 725 and CA 750), prepared by Narindar M. Kumar, Chief, RCRA Programs Branch, Waste Management Division, USEPA.

9. TABLES

Table 1. Water wells most "at risk" to possible contamination from the MPS facility based on open interval of the well and proximity to MPS.

GIS Well-ID	Dist. (m)	Dir.	Drilling Permit	Date Issued	LL (DD.DDDD)	LN (DD.DDDD)	Well Owner Name & Address
49	820	E	68764	8/10/1999	29.773155	-82.425239	Edwin Cherna 8401 NW 13th St #73 Gainesville, FL 32653
33	1040	E	60560	3/10/1997	29.770579	-82.423708	Lamonta Douglas 6907 NW 126 Ave Gainesville, FL
53	1050	N	71340	4/20/2000	29.783051	-82.437473	Ina Summers 11426 Sage BLvd Alachua, FL 32615
46	1140	E	67704	5/5/1999	29.77325	-82.421817	Edith Riley 12814 NW CR 232 Alachua, FL
77	1500	SE	14334	7/7/1982	29.766527	-82.420783	Jerry Swearington 927 NW 40th Drive Gainesville, FL 32605
15	1510	E	35346	11/8/1989	29.7703	-82.4186	Nelson Citta Gainesville, FL 32601
23	1060	W	51785	9/27/1994	29.7775	-82.4439	Dwain Johnston 42161 143rd St. Gainesville, FL
84	1710	E	W5264	NA	29.767296	-82.419899	UF-Dairy Rt 3 Box 73 Gainesville, FL 32611
31	1230	E	59541	10/30/1996	29.774622	-82.420838	Lonnie Vann 12901 NW CV 237 Alachua
75	1940	NW	11434	4/22/1981	29.78363	-82.450476	J Busby Alachua, FL

10. FIGURES

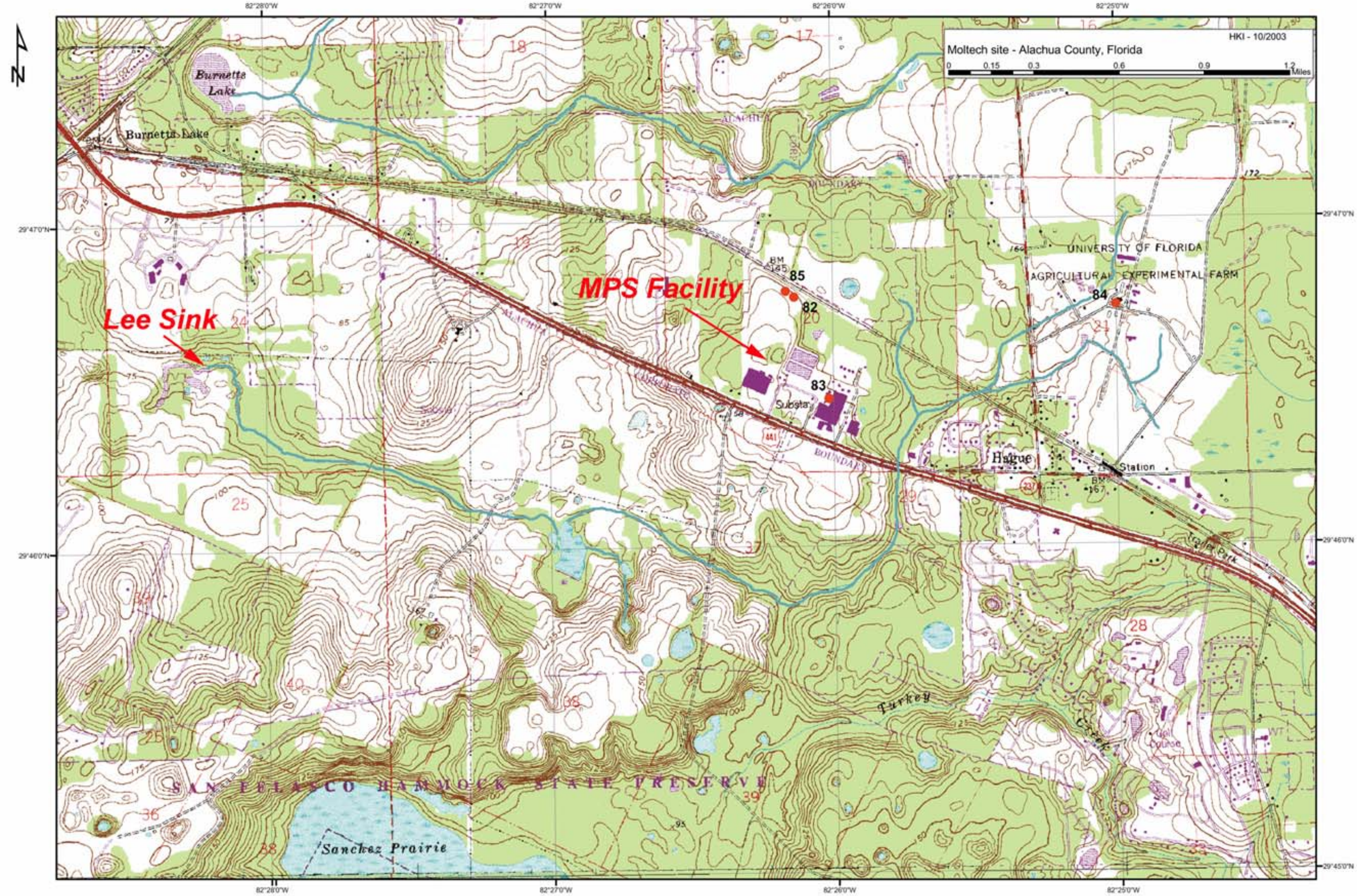


Figure 1. Part of the Alachua USGS 7.5 minute topographic quadrangle showing the location of the MPS facility relative to SRWMD deep boreholes (Appendix III) and surficial streams that drain to karst features (Lee Sink and Burnetts Lake). Note that the width of the streams has been exaggerated to facilitate viewing. Numbers marking the boreholes refer to designators in a GIS database of non-MPS wells in the area (Hazlett-Kincaid, 2003).

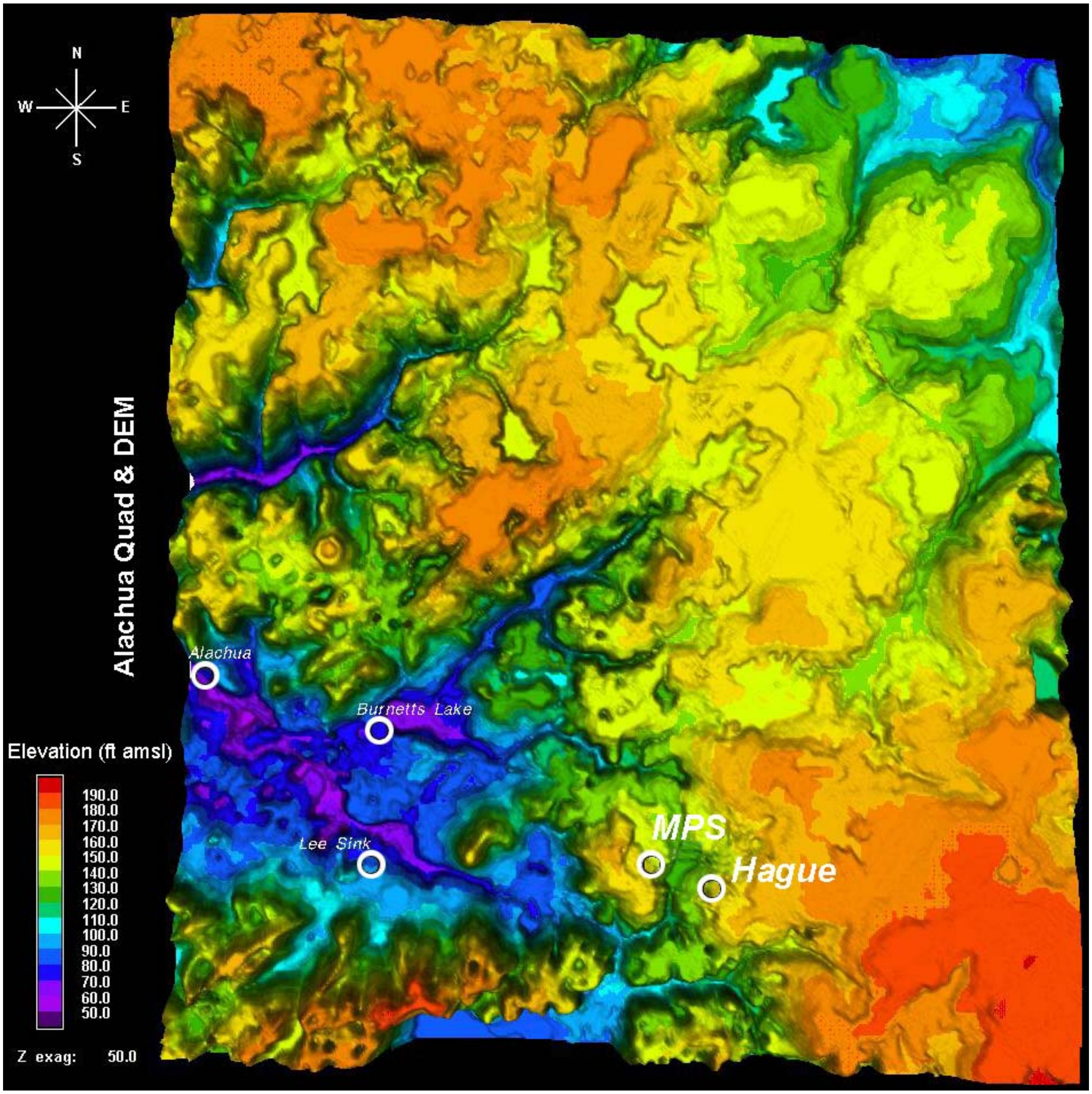


Figure 2. Flooded contour map of the topography surrounding the MPS facility, Alachua Florida as defined by the USGS 3m Digital Elevation Model (DEM). The topographic relief prominent west of MPS is indicative of the proximity of the facility to the Cody Scarp and transition zone between the Northern Highlands (SE), wherein the Floridan aquifer is confined by the extensive presence of the Hawthorne Formation, and the lowlands of the High Springs Gap, wherein the Floridan aquifer is unconfined because the Hawthorne Formation is absent. Karstification becomes more prominent with proximity to the scarp as is indicated by the pot-marked topographic surface.

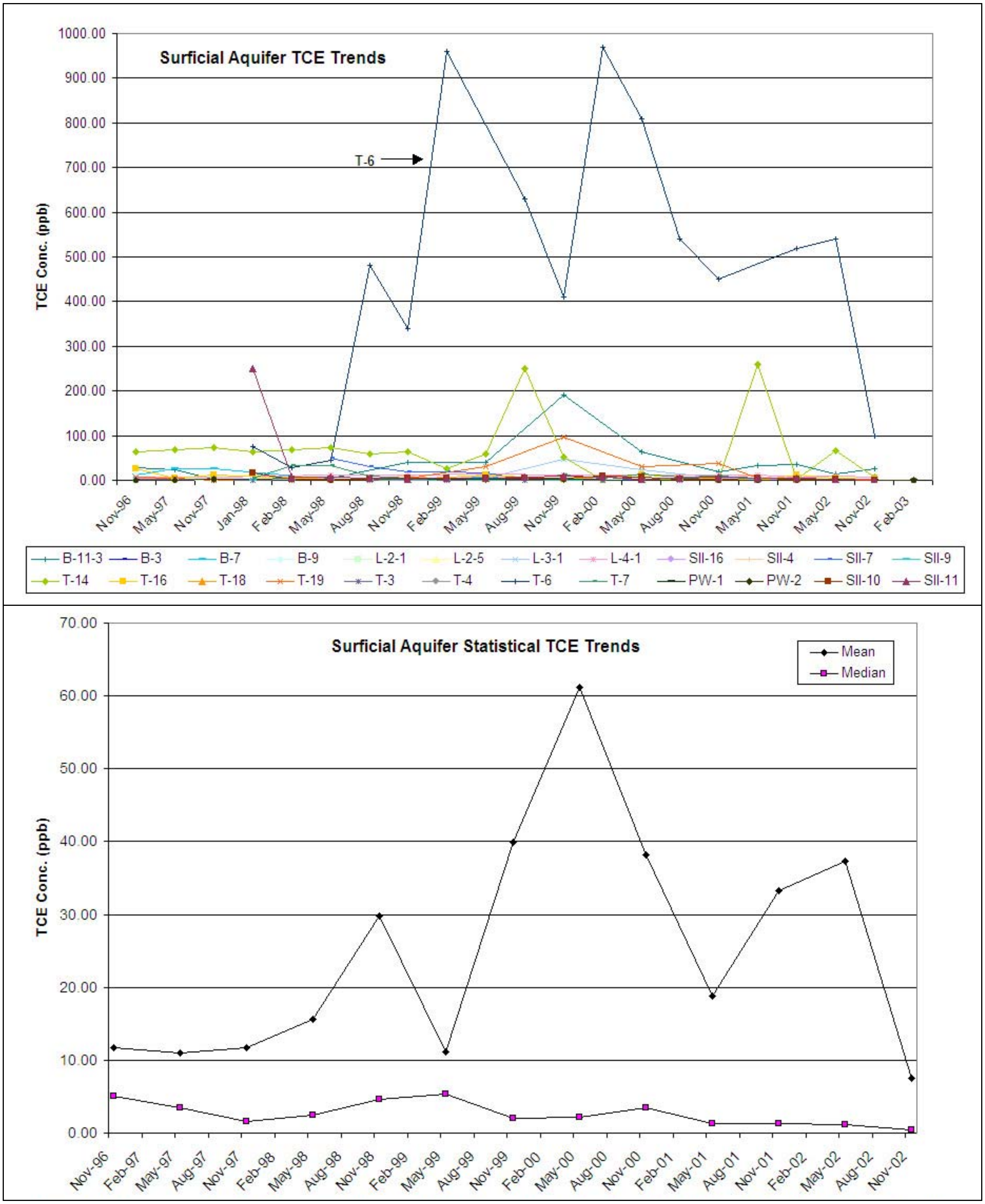


Figure 3. TCE concentration trends in surficial aquifer monitoring wells at the Moltech facility, Alachua Florida between Nov. 1996 and Nov. 2002. (A) Trends in measured concentrations at all surficial aquifer monitoring wells. (B) Trends in mean and median values for all measurements on each synoptic period. The trend in median values indicates that the overall size of the TCE plume in the surficial aquifer has been decreasing over the period of record, though high concentrations are persisting, though fluctuating, at wells T-6, T-14, and B-11-3.

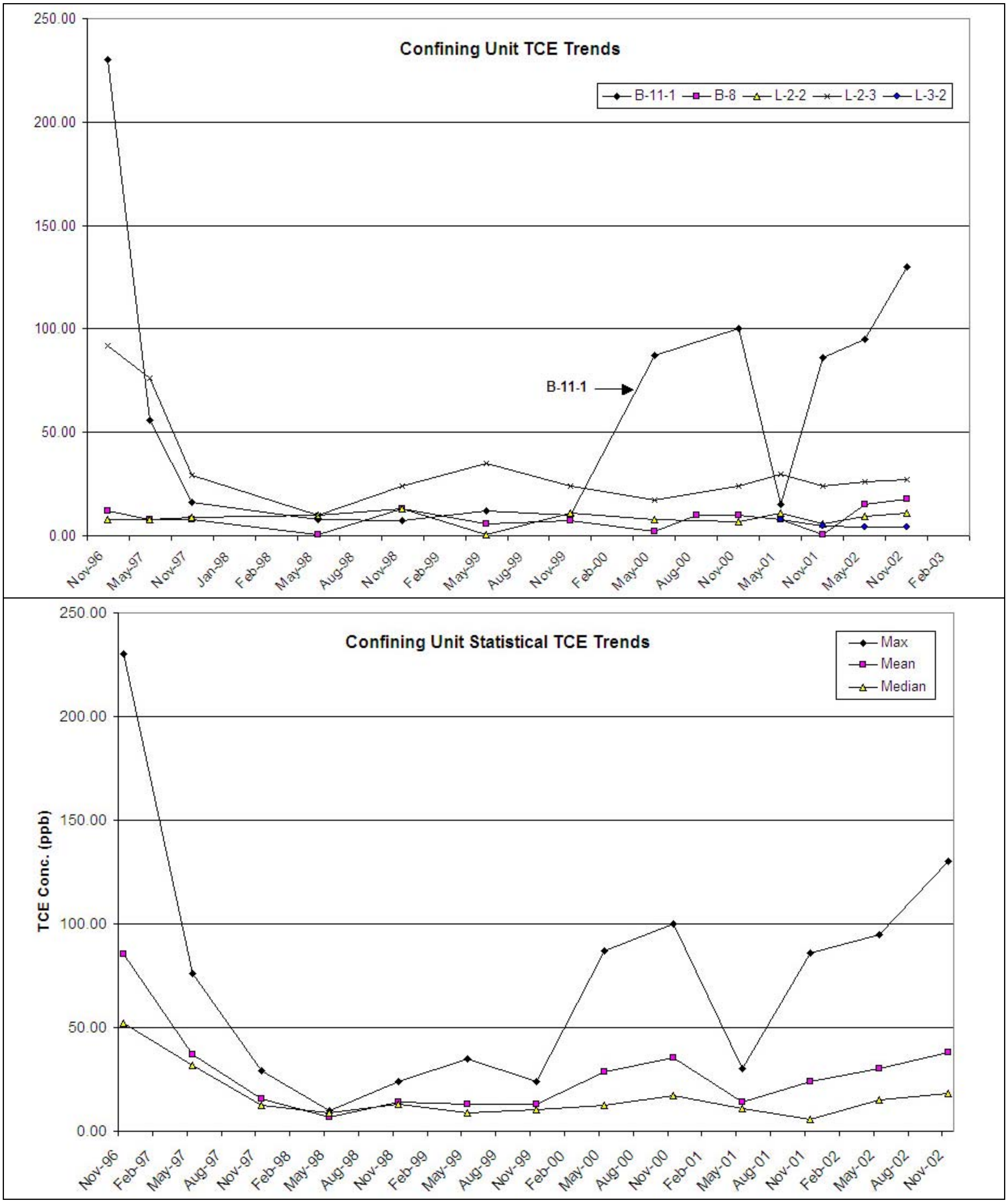


Figure 4. TCE concentration trends in confining unit monitoring wells at the Moltech facility, Alachua Florida between Nov. 1996 and Nov. 2002. (A) Trends in measured concentrations at all confining unit monitoring wells. (B) Trends max, mean and median values for all measurements on each synoptic period. Concentration trends in all but well L-2-3 and the max, median, and mean values indicate that the plume in the confining unit has been persisting and growing during the period of record, particularly in the vicinity of well B-11-1.

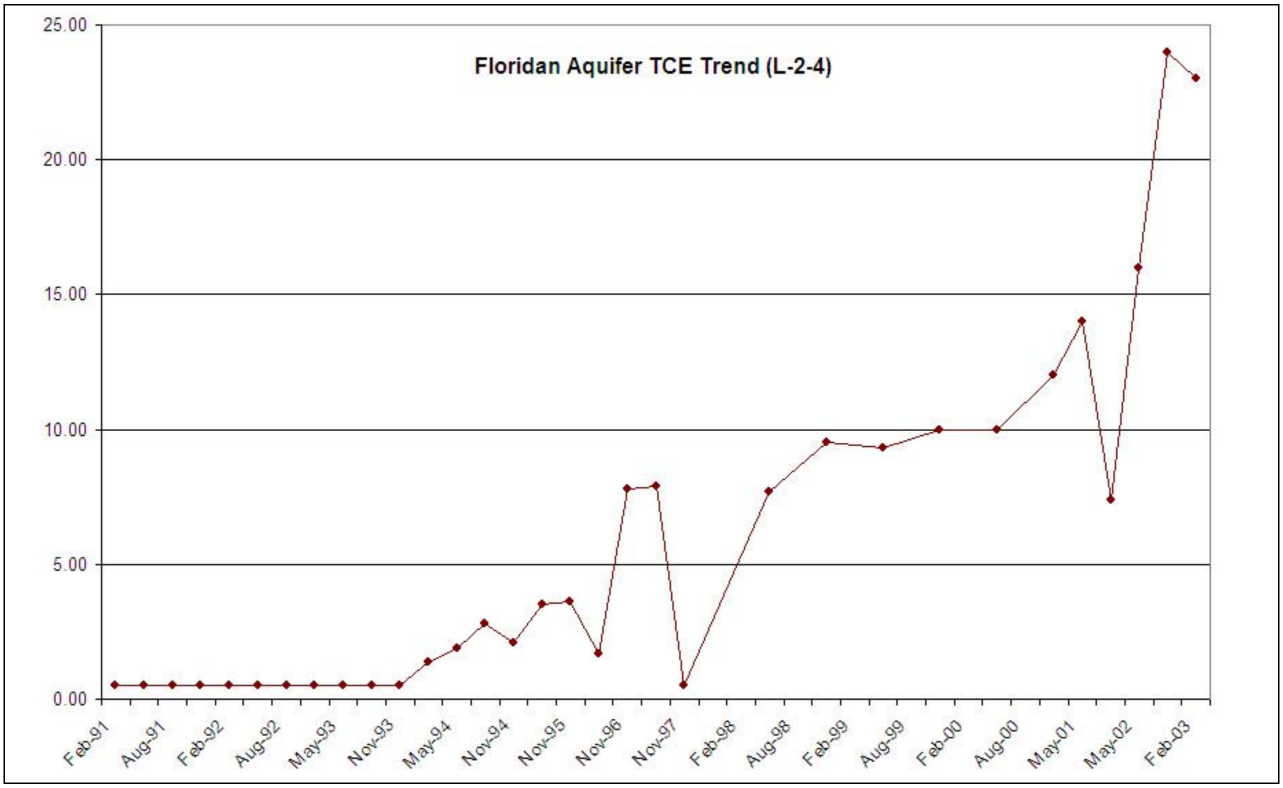


Figure 5. TCE concentration trends in Floridan aquifer monitoring well L-2-4 at the Moltech facility, Alachua Florida between February 1991 and February 2003. The trend indicates rising concentrations in the Floridan aquifer beginning in May 1994.

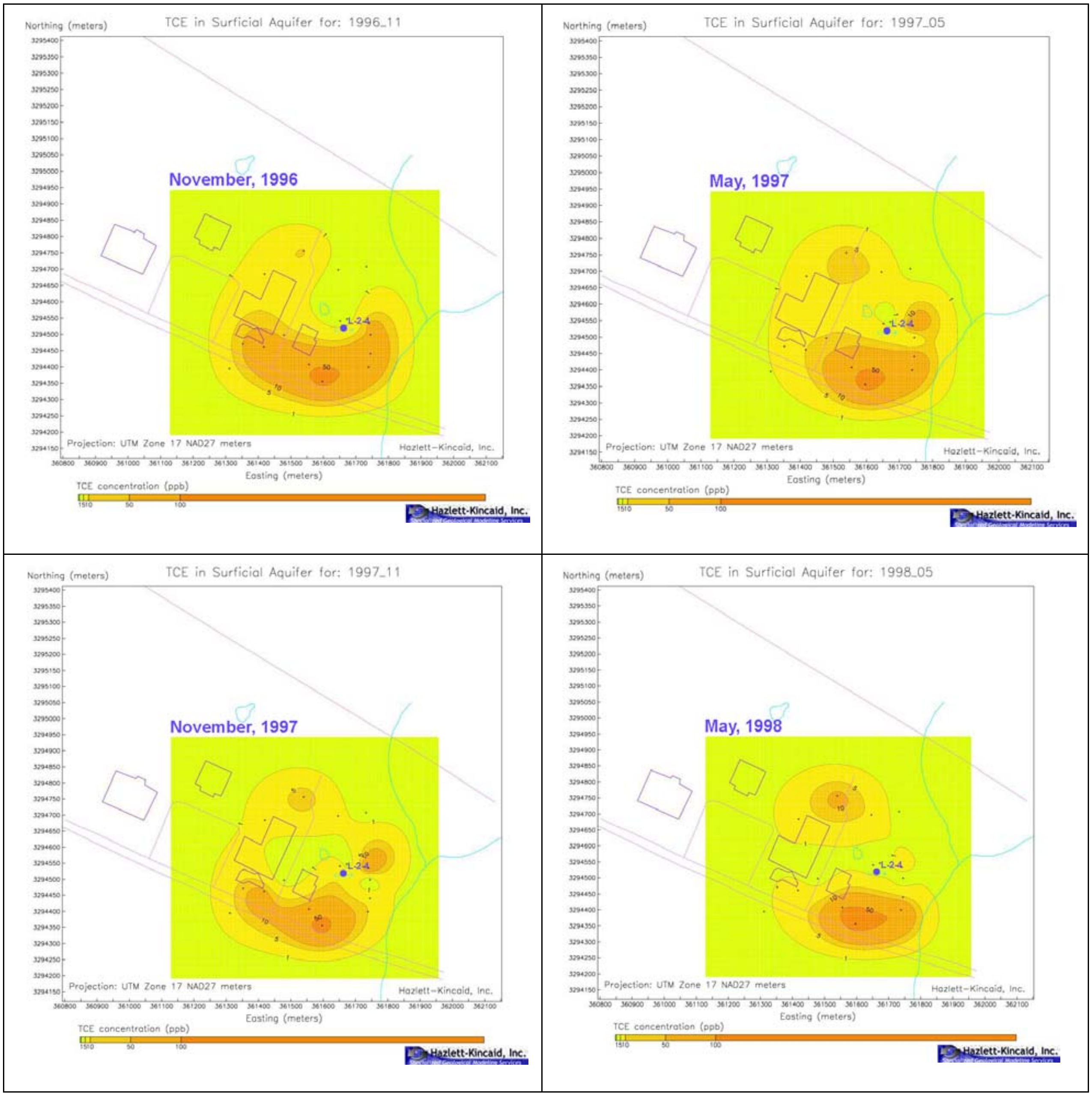


Figure 6. Isopleth maps of dissolved TCE concentrations in the Surficial aquifer at the Moltech Facility in Alachua, Florida for bi-yearly sampling periods from Nov. 1996 and May 1998 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps show three probable sources of contamination located adjacent to, northwest, and southwest of Floridan aquifer monitoring well L-2-4.

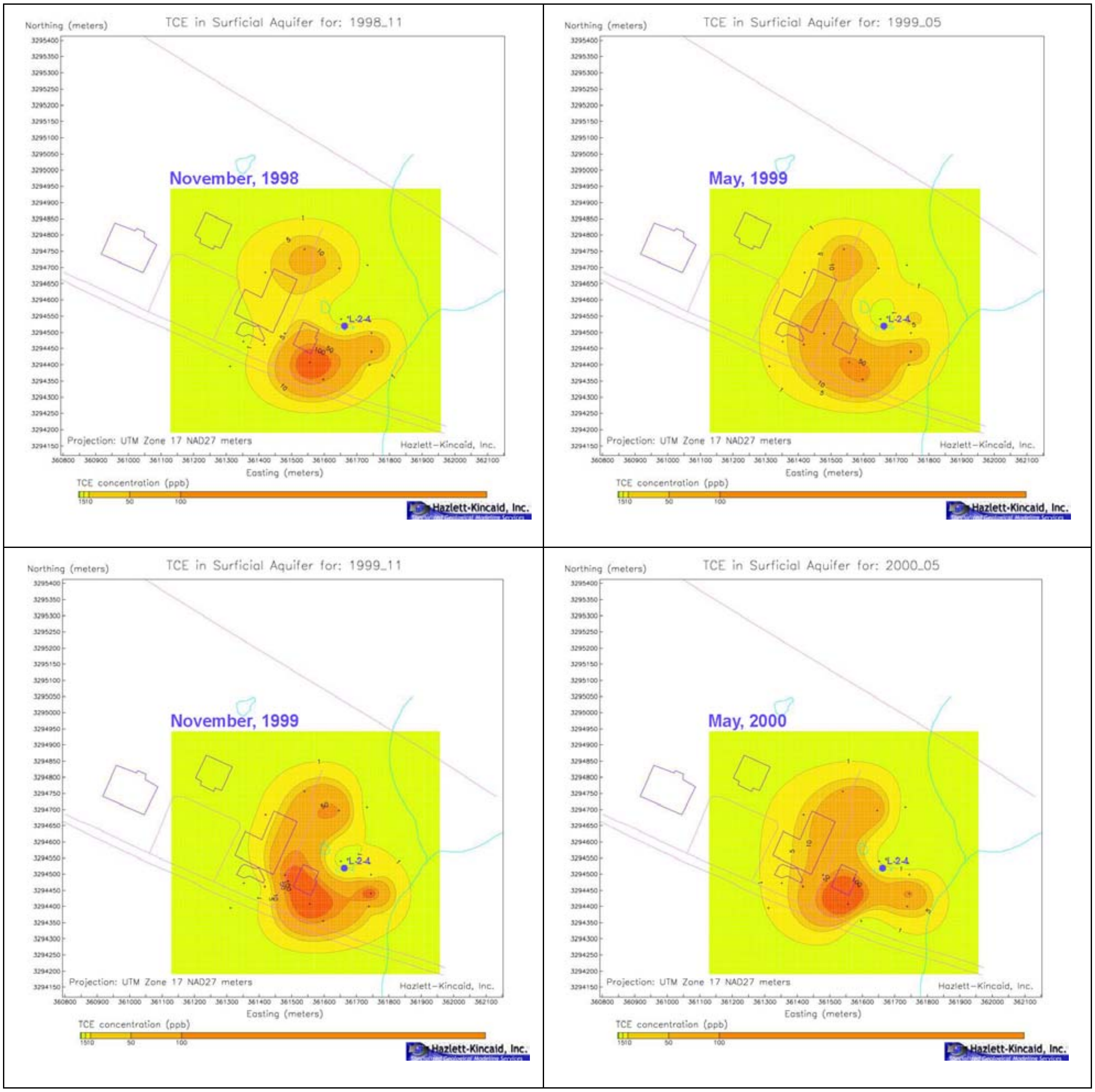


Figure 7. Isopleth maps of dissolved TCE concentrations in the Surficial aquifer at the Moltech Facility in Alachua, Florida for bi-yearly sampling periods from Nov. 1998 and May 2000 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps show decreasing concentrations in two of the three probable source areas depicted in Figure 5, adjacent to and northwest of Floridan aquifer monitoring well L-2-4 but persisting high concentrations southwest of the well.

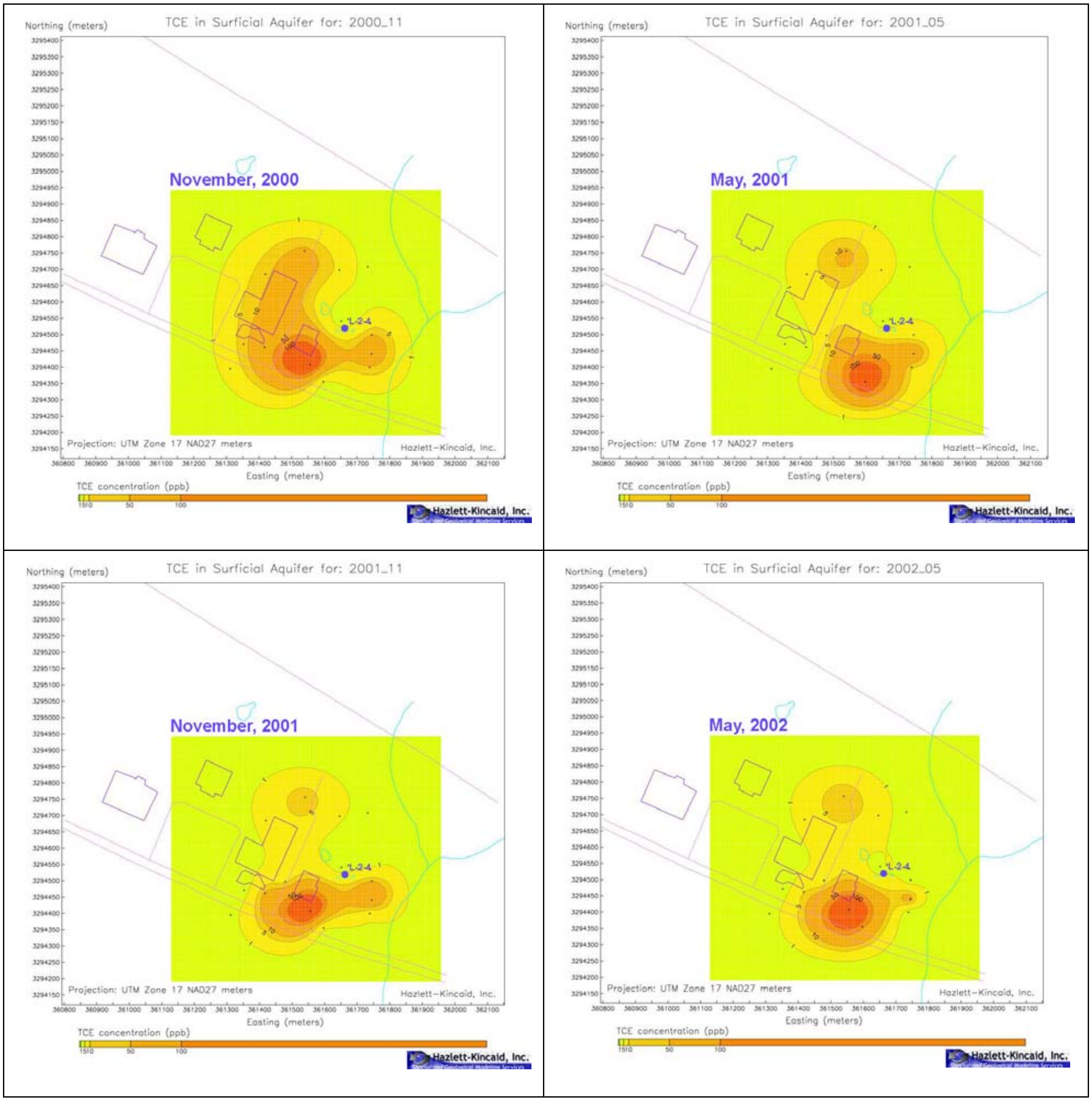


Figure 8. Isopleth maps of dissolved TCE concentrations in the Surficial aquifer at the Moltech Facility in Alachua, Florida for bi-yearly sampling periods from Nov. 2000 and May 2002 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps show further decrease in the overall size of the plume marked by significant decreases in concentrations at the two probable source areas, adjacent to and northwest of Floridan aquifer monitoring well L-2-4 and decreasing but fluctuating concentrations southwest of the well.

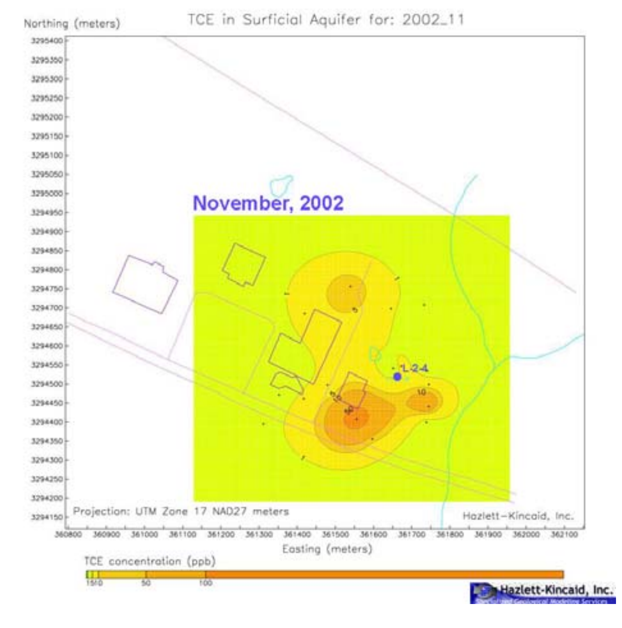


Figure 9. Isopleth maps of dissolved TCE concentrations in the Surficial aquifer at the Moltech Facility in Alachua, Florida for bi-yearly sampling period Nov. 2002 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour map was generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps show further decrease in the overall size of the plume marked by decreases in concentrations at the two probable source areas, adjacent to and northwest of Floridan aquifer monitoring well L-2-4 and a further decrease in concentrations southwest of the well.

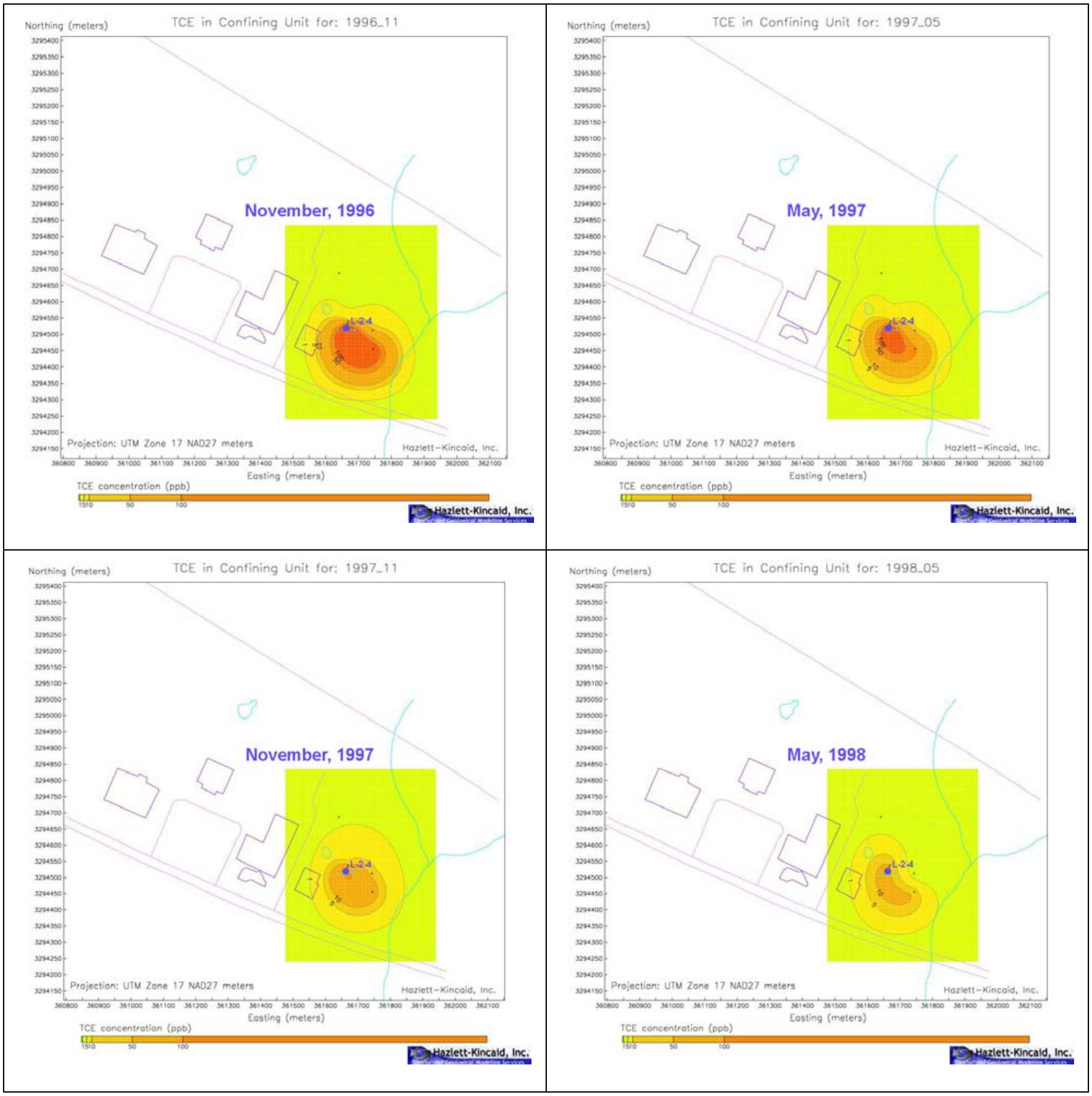


Figure 10. Isopleth maps of dissolved TCE concentrations in the Confining unit at the Moltech Facility in Alachua, Florida for bi-yearly sampling periods from Nov. 1996 and May 1998 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps indicate that TCE contamination likely migrated east/northeast, east/southeast through the surficial aquifer and then vertically into the Hawthorne Formation sometime prior to November 1996 but a decrease in the size of the plume within the confining unit since that time during the period of record. Note that the highest recorded TCE concentrations are consistently localized around Floridan aquifer monitoring well L-2-4.

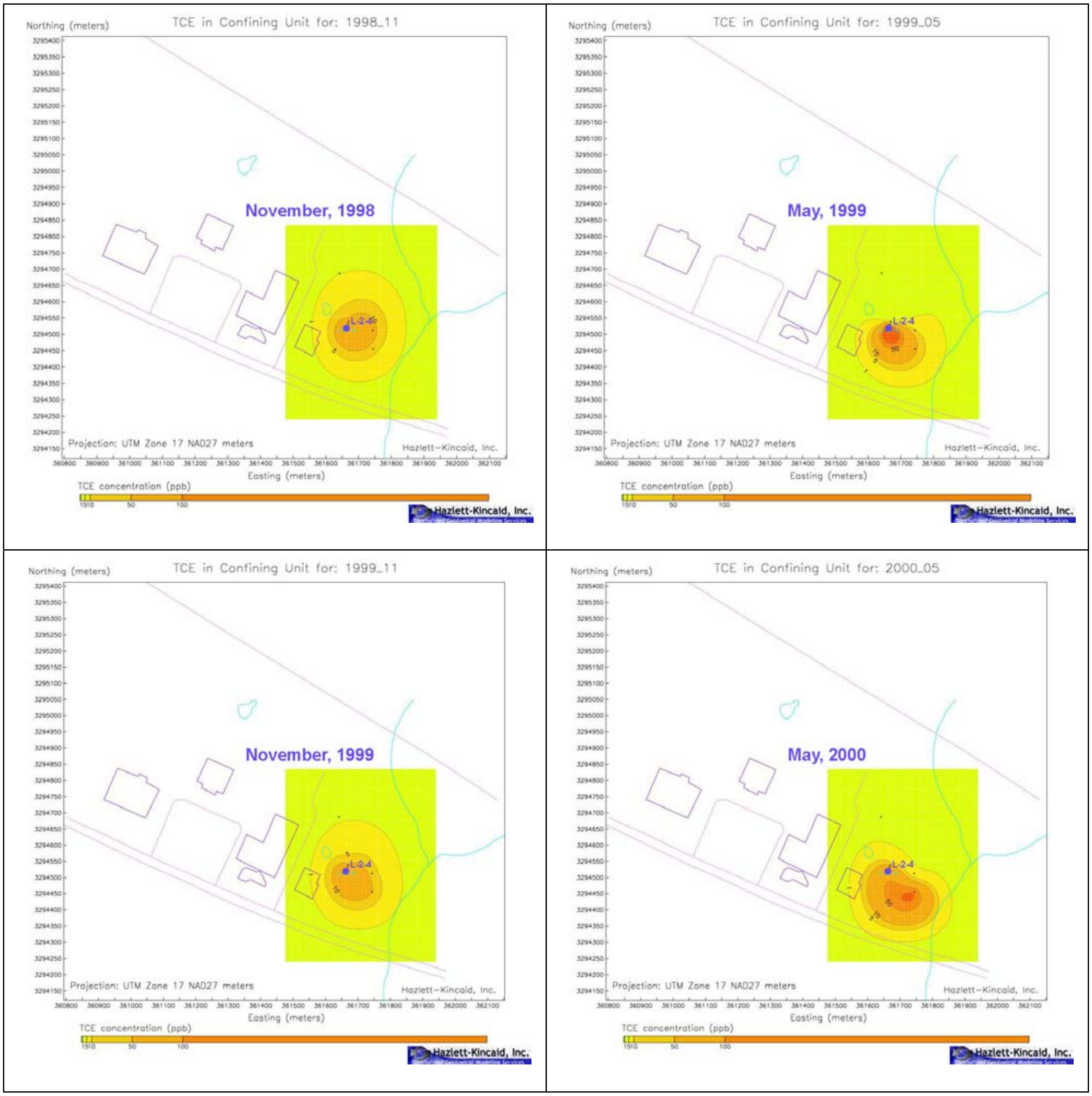


Figure 11. Isopleth maps of dissolved TCE concentrations in the Confining unit at the Moltech Facility in Alachua, Florida for bi-yearly sampling periods from Nov. 1998 and May 2000 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps indicate that TCE concentrations within the confining unit were fluctuating during the period of record and the plume was possibly moving toward the southeast within the confining unit away from Floridan aquifer monitoring well L-2-4.

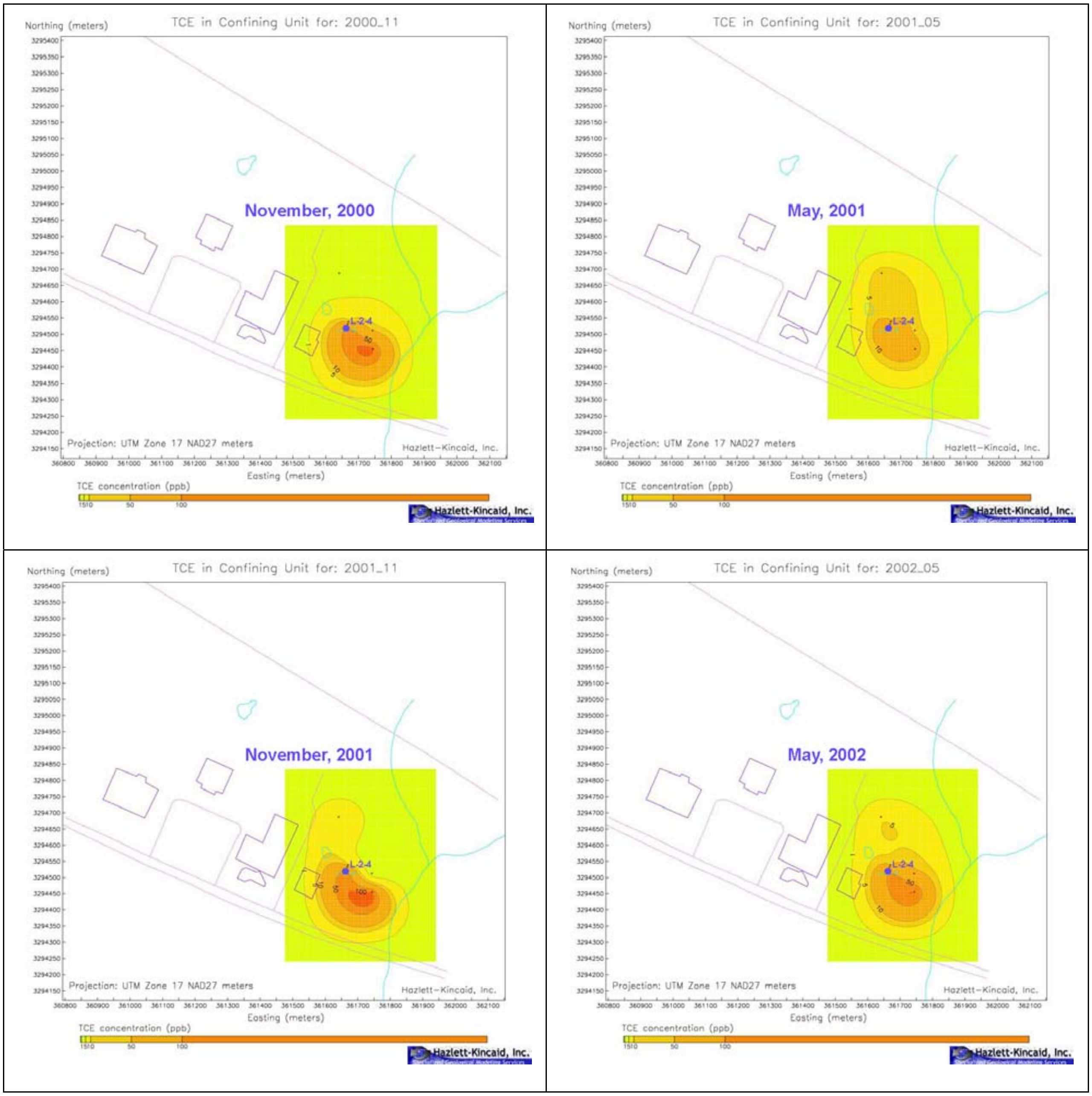


Figure 12. Isopleth maps of dissolved TCE concentrations in the Confining unit at the Moltech Facility in Alachua, Florida for bi-yearly sampling periods from Nov. 2000 and May 2002 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps indicate that TCE concentrations within the confining unit continued to fluctuate during the period of record again demonstrate that the plume was possibly moving toward the southeast within the confining unit away from Floridan aquifer monitoring well L-2-4.

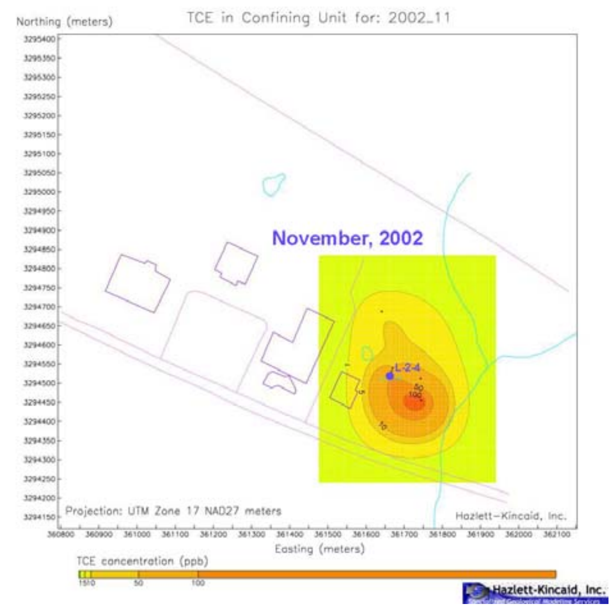


Figure 13. Isopleth maps of dissolved TCE concentrations in the Confining unit at the Moltech Facility in Alachua, Florida for bi-yearly sampling period May 2002 as defined by contaminant concentration data provided FLDEP document 13d90.xls and replicated in Appendix I. The contour maps were generated using the EarthVision™ 2-D minimum tension gridding algorithm and assuming non-detect levels at the boundaries of the grid marked by the outer edged of the green square. The maps indicate that TCE concentrations within the confining unit continued to fluctuate during with apparent increased TCE concentrations southeast of Floridan aquifer monitoring well L-2-4.

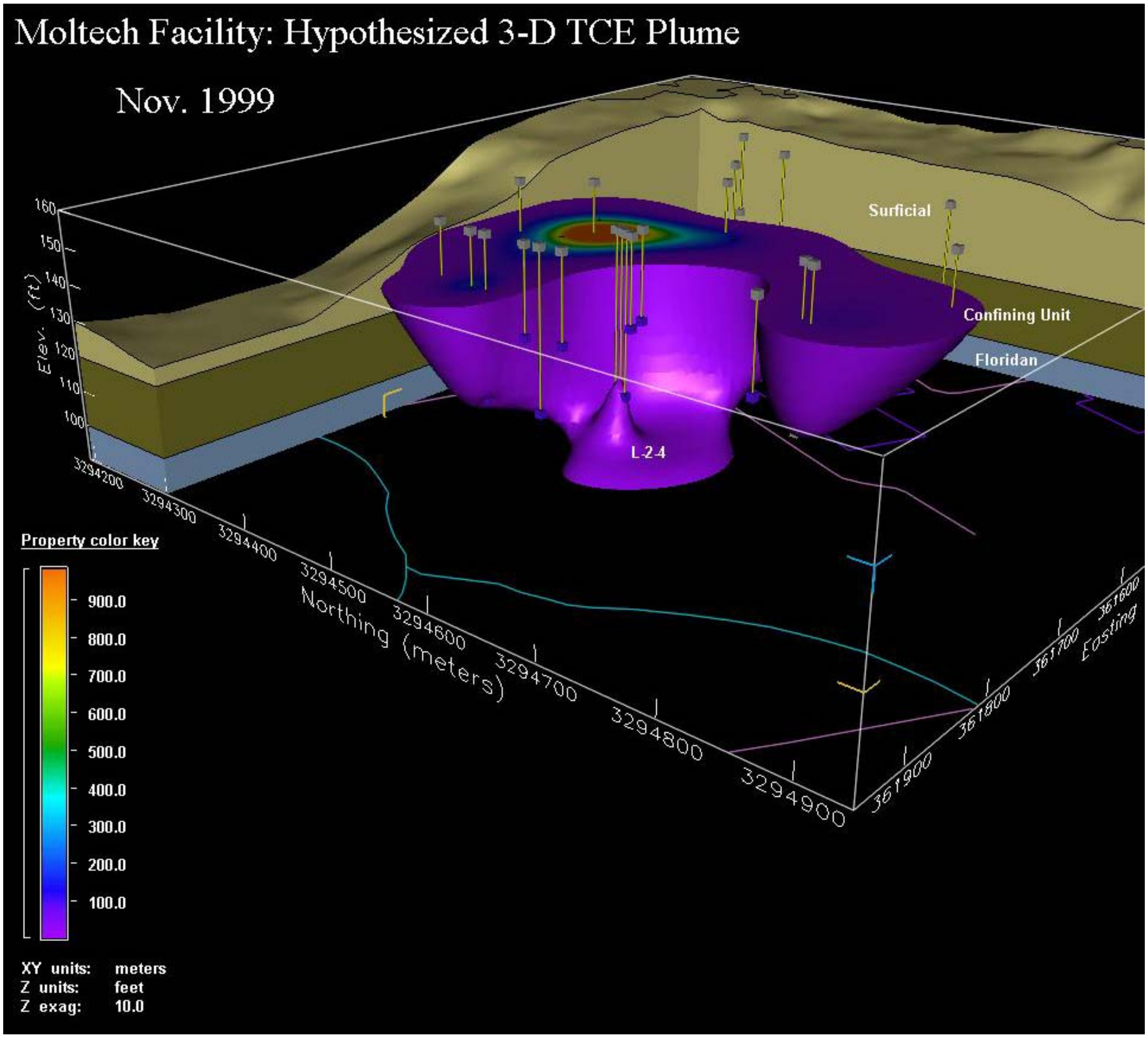


Figure 14. 3-D contour of the November 1999 dissolved phase TCE data for the surficial aquifer, confining unit, and Floridan aquifer at the Moltech Facility, Alachua, Florida relative to a hypothesized structural model of the three units. Top of the confining unit is assumed to be a planar surface at 120 feet amsl. Top of the Floridan aquifer is assumed to be a planar surface at 100 feet amsl. The top of the surficial aquifer is the topographic surface as defined by the USGS digital elevation model for the Alachua, Florida quadrangle. The outer edge of the plume marks the 10 ppb isoshell. Note that the highest concentrations are in the surficial aquifer near well T-6 and the plume shrinks in the downward direction toward well L-2-4.

APPENDIX I

COMPILATION OF GROUNDWATER LEVEL AND ANALYTICAL DATA FOR THE MOLTECH POWER SYSTEMS FACILITY, ALACHUA FLORIDA

FLDEP: Moltech Facility Review: Task-2 Data Compilation Table

Color Key & Notes

Well-ID	Lat	Lon	AQ	TOC	TD	Casing Depth	*Rep. TCE Concentration in Water Samples*				
							Feb-91	May-91	Aug-91	Nov-91	Feb-92
B-1	29.777148	-82.430247	SUR	135.38	19.82	NR	NR	NR	NR	NR	NR
B-10	29.774433	-82.430169	SUR	141.48	18.44	NR	NR	NR	NR	NR	NR
B-11-1	29.77431	-82.430151	CU	141.15	37	NR	NR	NR	NR	NR	NR
B-11-2	29.77424	-82.430152	CU	140.89	69.1	NR	NR	NR	NR	NR	NR
B-11-3	29.774174	-82.430142	SUR	140.5	18.91	NR	NR	NR	NR	NR	NR
B-11-4	NR	NR	FL	141.12	145	135	NR	NR	NR	NR	NR
B-2	29.776889	-82.430236	SUR	138.61	19.75	NR	NR	NR	NR	NR	NR
B-3	29.776587	-82.430298	SUR	138.84	18.84	NR	NR	NR	NR	NR	NR
B-4	29.776307	-82.430241	SUR	138.28	19.81	NR	NR	NR	NR	NR	NR
B-5-1	29.776024	-82.430218	CU	137.97	61.8	NR	NR	NR	NR	NR	NR
B-5-2	29.77609	-82.430202	SUR	138.06	18.95	NR	NR	NR	NR	NR	NR
B-6	29.775302	-82.430531	SUR	138.28	17.84	NR	NR	NR	NR	NR	NR
B-7	29.775019	-82.430191	SUR	139.2	17.75	NR	NR	NR	NR	NR	NR
B-8	29.774826	-82.430167	CU	141.24	57.25	NR	NR	NR	NR	NR	NR
B-9	29.774699	-82.430146	SUR	140.88	18.85	NR	NR	NR	NR	NR	NR
L-1-1	29.774884	-82.432457	SUR	146.34	19.93	NR	NR	NR	NR	NR	NR
L-2-1	29.775126	-82.430897	SUR	144.5	24.44	NR	NR	NR	NR	NR	NR
L-2-2	29.775054	-82.430932	CU	144.32	37.75	NR	NR	NR	NR	NR	NR
L-2-3	29.774994	-82.430952	CU	144.11	62.5	NR	NR	NR	NR	NR	NR
L-2-4	29.774928	-82.43098	FL	144.51	147.75	135.5	<1	<1	<1	<1	<1
L-2-5	29.775069	-82.431115	SUR	142.51	23.52	NR	NR	NR	NR	NR	NR
L-3-1	29.776487	-82.431194	SUR	143.44	23.11	NR	NR	NR	NR	NR	NR
L-3-2	29.776391	-82.431241	CU	143.63	37.4	NR	NR	NR	NR	NR	NR
L-4-1	29.777005	-82.432303	SUR	145.94	22.95	NR	NR	NR	NR	NR	NR
L-4-2	29.777029	-82.43236	CU	146.12	36.9	NR	NR	NR	NR	NR	NR
L-4-3	29.777046	-82.432436	CU	146.66	92.7	NR	NR	NR	NR	NR	NR
L-4-4	NR	NR	FL	146.06	146	136	NR	NR	NR	NR	NR
L-5-1	29.775591	-82.434423	SUR	147.34	11.04	NR	NR	NR	NR	NR	NR
L-5-2	29.775535	-82.434436	CU	147.28	36.78	NR	NR	NR	NR	NR	NR
L-6	29.776349	-82.434041	SUR	143.5	8.28	NR	NR	NR	NR	NR	NR
L-7	29.776678	-82.434943	SUR	149.4	8.68	NR	NR	NR	NR	NR	NR
PW-1	NR	NR	FL	155.18	430	180	NR	NR	NR	NR	NR
PW-2	NR	NR	FL	153.8	472	171	NR	NR	NR	NR	NR
S-1	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
S-2	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
S-3	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
SII-10	NR	NR	SUR	145.01	14.95	NR	NR	NR	NR	NR	NR
SII-11	NR	NR	SUR	145.25	25.58	NR	NR	NR	NR	NR	NR
SII-16	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
SII-4	NR	NR	SUR	148.17	15.6	NR	NR	NR	NR	NR	NR
SII-7	NR	NR	SUR	145.07	9.92	NR	NR	NR	NR	NR	NR
SII-9	NR	NR	SUR	142.77	15.88	NR	NR	NR	NR	NR	NR
SW-1	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
SW-2	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
SW-3	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
SW-4	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
SW-5	NR	NR	SUR	NR	NR	NR	NR	NR	NR	NR	NR
T-1	29.775599	-82.434213	SUR	146.72	NR	NR	NR	NR	NR	NR	NR
T-10A	29.774122	-82.429397	SUR	132.27	NR	NR	NR	NR	NR	NR	NR
T-10B	NR	NR	SUR	130.88	NR	NR	NR	NR	NR	NR	NR
T-11	29.77405	-82.428927	SUR	130.32	8.12	NR	NR	NR	NR	NR	NR
T-12	29.774109	-82.427336	SUR	132.07	7.98	NR	NR	NR	NR	NR	NR
T-13	NR	NR	SUR	133.71	NR	NR	NR	NR	NR	NR	NR

FLDEP: Moltech Facility Review: Task-2 Data Compilation Table

Color Key & Notes

Well-ID	Lat	Lon	AQ	TOC	TD	Casing Depth	Rep. TCE Concentration in Water Samples Feb-91	May-91	Aug-91	Nov-91	Feb-92
T-14	29.773392	-82.431664	SUR	146.66	16.98	NR	NR	NR	NR	NR	NR
T-15	29.775405	-82.433256	SUR	147.15	9.93	NR	NR	NR	NR	NR	NR
T-16	29.774331	-82.433528	SUR	153.24	12.47	NR	NR	NR	NR	NR	NR
T-18	29.773714	-82.434615	SUR	149.15	6.56	NR	NR	NR	NR	NR	NR
T-19	29.774657	-82.432897	SUR	151.71	17.08	NR	NR	NR	NR	NR	NR
T-2	29.775389	-82.43448	SUR	148.06	NR	NR	NR	NR	NR	NR	NR
T-20	29.774574	-82.43271	SUR	151.92	20.45	NR	NR	NR	NR	NR	NR
T-21	29.774351	-82.43238	SUR	151.63	18.91	NR	NR	NR	NR	NR	NR
T-22	29.774592	-82.433409	SUR	152.42	NR	NR	NR	NR	NR	NR	NR
T-23	29.774422	-82.433347	SUR	155.87	15.47	NR	NR	NR	NR	NR	NR
T-24	29.774167	-82.433496	SUR	155.86	15.55	NR	NR	NR	NR	NR	NR
T-3	29.77634	-82.433537	SUR	146.28	NR	NR	NR	NR	NR	NR	NR
T-4	29.774411	-82.434204	SUR	151.23	NR	NR	NR	NR	NR	NR	NR
T-5	29.773905	-82.432349	SUR	150.89	NR	NR	NR	NR	NR	NR	NR
T-6	29.773859	-82.432089	SUR	147.76	12.55	NR	NR	NR	NR	NR	NR
T-7	29.773808	-82.430201	SUR	139.45	17.76	NR	NR	NR	NR	NR	NR
T-8	29.773674	-82.429759	SUR	132	13.55	NR	NR	NR	NR	NR	NR
T-9	29.774107	-82.429806	SUR	137.82	NR	NR	NR	NR	NR	NR	NR

Color Key & Notes

1	*ff2a.tif (1982-1987 VARIOUS DOCUMENTS, STRATAGRAPHIC INFO, FIGURES, - 1982.11.30)*
2	*RCRA Facility GW Well Information Report - 9/28/87 (fdc0.tif)*
3	*Table 1. Constr details of monitor wells… 1987 (12995.tif (p.2)*
4	*4TH QUARTER GW MONITORING RESULTS - 1991 (f7d8.tif)*
5	*1996 Off-site assessment plan (f6a2.tif)*
6	*Progress Report 6/21/96 (f8b8.tif)*
7	*March 2000 - Semi-annual corrective action report - graphical results - Appendix C (00011994.tif)*
8	*digitized location coordinates from Pink*
9	*TES - Corrective Action Effectiveness Report… July-December 2002 (1314e.tif)*
10	*TES - Technical Memorandum Floridan Aquifer Assesment 4/3/03 (13275.tif)*
11	*MOLTECH TABLES/ANALYTICAL DATA (13d90.xls)*
NR	*not reported or not found during records search*
ns	*reported as "not sampled" in raw data*

Note: All non-detect values set to detection limit / 2 for graphing and gridding purposes

Well-ID	Rep. TCE Concentration in Water Samples											
	May-92	Aug-92	Nov-92	May-93	Aug-93	Nov-93	Feb-94	May-94	Aug-94	Nov-94	May-95	Nov-95
B-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-10	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-5-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-5-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-8	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	5.3
B-9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	2.2
L-1-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-2-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-2-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-2-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-2-4	<1	<1	<1	<1	<1	<1	1.4	1.9	2.8	2.1	3.5	3.6
L-2-5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-3-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	<1
L-3-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-5-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-5-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
PW-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
PW-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-10	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-11	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-16	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-10A	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-10B	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-11	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-12	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-13	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

	Rep. TCE Concentration in Water Samples											
Well-ID	**May-92**	**Aug-92**	**Nov-92**	**May-93**	**Aug-93**	**Nov-93**	**Feb-94**	**May-94**	**Aug-94**	**Nov-94**	**May-95**	**Nov-95**
T-14	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	250
T-15	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-16	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-18	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-19	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	6.4
T-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-20	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-21	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-22	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-23	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-24	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	3.1
T-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-8	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

	Rep. TCE Concentration in Water Samples											
Well-ID	May-96	Nov-96	May-97	Nov-97	Jan-98	Feb-98	May-98	Aug-98	Nov-98	Feb-99	May-99	Aug-99
B-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-10	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-1	NR	230	56	16	NR	NR	7.7	NR	7.1	NR	12	NR
B-11-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-3	NR	29	23	3.2	NR	NR	5.7	NR	39	NR	39	NR
B-11-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-3	NR	<1	<1	<1	NR	NR	<1	NR	<1	NR	<1	NR
B-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-5-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-5-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-7	NR	11	25	27	NR	NR	1.6	NR	1.2	NR	7.4	NR
B-8	2.3	12	7.7	7.9	NR	NR	<1	NR	13	NR	5.5	NR
B-9	4.3	12	1.9	<1	NR	NR	<1	NR	6.7	NR	1.8	NR
L-1-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-2-1	NR	<1	<1	<1	NR	NR	<1	NR	<1	NR	<1	NR
L-2-2	NR	7.9	7.6	8.7	NR	NR	9.7	NR	13	NR	<1	NR
L-2-3	NR	92	76	29	NR	NR	9.7	NR	24	NR	35	NR
L-2-4	1.7	7.8	7.9	<1	NR	NR	7.7	NR	9.5	NR	9.3	NR
L-2-5	NR	<1	1.1	2.6	NR	NR	<1	NR	<1	NR	<1	NR
L-3-1	2.2	<1	3.4	1.5	NR	NR	3.5	NR	5.7	NR	4.6	NR
L-3-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-1	NR	5.1	6.8	7.6	NR	NR	12	NR	12	NR	13	NR
L-4-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-5-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-5-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
PW-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
PW-2	NR	<1	<1	1.4	NR	NR	<1	NR	1.5	NR	1.5	NR
S-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-10	<1	NR	NR	NR	16	3.5	2.2	2	3.6	5.6	4.4	4.6
SII-11	5.9	NR	NR	NR	250	7.7	7.4	4.2	3.3	5.5	5.7	6.1
SII-16	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-4	NR	NR	NR	NR	<1	<1	7.7	4.5	10	2.7	12	<1.0
SII-7	NR	NR	NR	NR	NR	NR	50	31	20	20	17	1.2
SII-9	40	NR	NR	NR	<1.0	<1.0	<1.0	<1	<1	<1	<1	<1
SW-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-10A	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-10B	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-11	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-12	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-13	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Well-ID	May-96	Nov-96	May-97	Nov-97	Jan-98	Feb-98	May-98	Aug-98	Nov-98	Feb-99	May-99	Aug-99
	Rep. TCE Concentration in Water Samples											
T-14	330	64	69	74	64	69	74	60	64	25	59	250
T-15	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-16	NR	<50	<10	<25	NR	NR	2	NR	2	NR	<25	NR
T-18	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-19	3.9	8	5.4	<1	NR	NR	<1	NR	4.7	NR	31	NR
T-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-20	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-21	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-22	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-23	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-24	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-3	3.8	2.2	2.4	1.6	NR	NR	2.5	NR	3.9	NR	2.3	NR
T-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-6	NR	NR	NR	NR	75	28	45	480	340	960	ns	630
T-7	42	NR	NR	NR	5.8	34	33	10	4.6	3.4	5.3	4.4
T-8	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Well-ID	Rep. TCE Concentration in Water Samples									
	Nov-99	Feb-00	May-00	Aug-00	Nov-00	May-01	Nov-01	May-02	Nov-02	Feb-03
B-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-10	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-1	9.9	NR	87	NR	100	15	86	95	130	NR
B-11-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-11-3	190	NR	63	NR	20	33	35	13	25	NR
B-11-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	<4.3
B-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-3	<1	NR	<1	NR	<1	<1.0	<1.0	<1.0	<1.0	NR
B-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-5-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-5-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
B-7	2.7	NR	<1	NR	3.1	1.3	1.3	<1.0	<1.0	NR
B-8	7.5	NR	2.3	10	10	7.9	<1.0	15	18	NR
B-9	2.1	NR	2.1	NR	10	2.5	10	<1.0	3	NR
L-1-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-2-1	<1	NR	<1	NR	<1	<1.0	<1.0	1.1	1.4	NR
L-2-2	11	NR	7.9	NR	7	11	5.9	9.5	11	NR
L-2-3	24	NR	17	NR	24	30	24	26	27	NR
L-2-4	10	NR	10	NR	12	14	7.4	16	24	23
L-2-5	<1	NR	1	NR	<1	<1.0	<1.0	<1.0	<1.0	NR
L-3-1	47	NR	23	NR	3.7	2.2	1.3	2	1.2	NR
L-3-2	NR	NR	NR	NR	NR	7.6	4.6	4.3	4	NR
L-4-1	11	NR	12	NR	12	11	7.7	9.7	8.1	NR
L-4-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-4-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	<4.3
L-5-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-5-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L-7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
PW-1	NR	NR	NR	NR	NR	NR	NR	<1	<1.0	<.43
PW-2	2.5	NR	<1	NR	<1	<1.0	<1.0	<1.0	<1.0	0.77
S-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
S-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SII-10	4	9.1	6	3.3	3.5	3.6	3.2	2.5	<1.0	NR
SII-11	9.5	7.7	3.4	5	7.2	5.4	4.8	1.3	<1.0	NR
SII-16	NR	NR	NR	NR	NR	1.2	<1.0	2.5	<1.0	NR
SII-4	1.7	7.1	7.8	3.5	6	9.6	<1.0	1.5	<1.0	NR
SII-7	1.8	<1.0	2.1	<1	<1	<1.0	<1.0	ns	ns	NR
SII-9	<1	<1	<1	<1	<1	ns	ns	<1.0	<1.0	NR
SW-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
SW-5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-10A	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-10B	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-11	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-12	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
T-13	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Well-ID	Nov-99	Feb-00	May-00	Aug-00	Nov-00	May-01	Nov-01	May-02	Nov-02	Feb-03
	Rep. TCE Concentration in Water Samples									
T-14	51	1	<1	1.6	1.2	260	1.5	65	7.2	*NR*
T-15	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-16	1.6	*NR*	<25	*NR*	ns	<1.0	<25	<10	1.4	*NR*
T-18	*NR*	*NR*	*NR*	*NR*	*NR*	<1.0	<1.0	<1.0	<1.0	*NR*
T-19	96	*NR*	30	*NR*	37	4	4.3	2.9	2	*NR*
T-2	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-20	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-21	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-22	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-23	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-24	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-3	1.9	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-4	*NR*	*NR*	*NR*	*NR*	*NR*	<1.0	<1.0	<1.0	<1.0	*NR*
T-5	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-6	410	970	810	540	450	ns	520	540	100	*NR*
T-7	11	4	14	7.1	9.1	5.8	2.4	<1.0	<1.0	*NR*
T-8	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*
T-9	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*	*NR*

Well-ID	Comments
B-1	
B-10	
B-11-1	
B-11-2	
B-11-3	
B-11-4	
B-2	
B-3	
B-4	
B-5-1	
B-5-2	
B-6	
B-7	
B-8	
B-9	
L-1-1	
L-2-1	
L-2-2	
L-2-3	*major discrepancy btw excel sheet & pink*
L-2-4	
L-2-5	
L-3-1	
L-3-2	
L-4-1	
L-4-2	
L-4-3	
L-4-4	
L-5-1	
L-5-2	
L-6	
L-7	
PW-1	
PW-2	
S-1	
S-2	
S-3	
SII-10	
SII-11	
SII-16	
SII-4	
SII-7	
SII-9	
SW-1	
SW-2	
SW-3	
SW-4	
SW-5	
T-1	
T-10A	
T-10B	
T-11	
T-12	
T-13	

Well-ID	Comments
T-14	*major discrepancy btw excel sheet & pink*
T-15	
T-16	
T-18	
T-19	*major discrepancy btw excel sheet & pink*
T-2	
T-20	
T-21	
T-22	
T-23	
T-24	
T-3	
T-4	
T-5	
T-6	
T-7	
T-8	
T-9	

APPENDIX II

WELL CONSTRUCTION DETAILS FOR FLORIDAN AQUIFER MONITORING WELL L-2-4 AT THE MOLTECH POWER SYSTEMS FACILITY, ALACHUA FLORIDA

MOLTECH

REPORT
COMPREHENSIVE GROUND WATER MONITORING EVALUATION
GATES ENERGY PRODUCTS
GAINESVILLE, FLORIDA
EPA I.D. NO.: FLD 043 860 451

PREPARED BY:
The Florida Department of Environmental Regulation
September 1987

RCRA FACILITY GROUNDWATER WELL INFORMATION REPORT
Last update: 09/28/87

09/28/87

Facility Name: GATES ENERGY PRODUCT

Well ID	Casing	Dia.	Elev.	Depth	Cas. L	Seal. Int.	Seal.	Scr. Int.	Scr. L	Instld.	Meth.	Purp.	Unit	Pump	Contaminants
L- 2-4	PVC	4		144.5	144.5		NP	135.5-145.5	10			POC	F	N	
Comments:															
L- 2-5	PVC	4		22.0	22.0		FS	17.0-22.0	5				A1	N	
Comments:															
L- 3-1	PVC	4	141.5	35.0	21.0		FS	16.0-21.0	5			POC	A1	N	
Comments:															
L- 3-2	PVC	4	141.7	35.0	35.0		FS	30.0-35.0	5			POC	C1-U	N	
Comments:															
L- 4-1	PVC	4	144.0	90.0	21.0		FS	16.0-21.0	5			POC	A1	N	
Comments:															
L- 4-2	PVC	4	142.8	90.0	35.0		FS	30.0-35.0	5			A	C1-U	N	
Comments:															
L- 4-3	PVC	4	143.8	90.0	90.0		FS	85.0-90.0	5			A	C1-L	N	
Comments:															
L- 5-1	PVC	4		10.0	9.5		B*	4.5-9.5	5			POC	A1	N	
Comments:															
L- 5-2	PVC	4		37.0	36.0		FS	26.0-36.0	10					N	
Comments:															
L- 6	PVC	4		19.0	16.0		B	11.0-16.0	5					N	
Comments:															
L- 7	PVC	4		18.0	12.0		B	7.0-12.0	5			POC	A1	N	
Comments:															
L- 8	PVC			10.0									A1	N	
Comments:															
L-1-1	PVC	4	144.6	20	18	10-11	FS	13-18	5			A	A1	N	
Comments:															
L-2-1	PVC	4	142.6	60*	22		FS	17-22	5		MR	POC	A1		VOC'S
Comments: * Lith. log (19. May, 87) for wells L-2-1 through 1-2-3															
SP- 1	GS	1*		13,5	11.0	NP	NP	8.5-11.0	2.5		D		A1	N	
Comments:															
SP- 2	GS	1*		17.0	14.5	NP	NP	12.0-14.5	2.5		D		A1	N	
Comments:															

Key: See last page.

APPENDIX III

BOREHOLE LOGS AND CROSS SECTIONS SHOWING THE SURFICIAL AQUIFER AND CONFINING UNIT AT THE MOLTECH POWER SYSTEMS FACILITY, ALACHUA FLORIDA

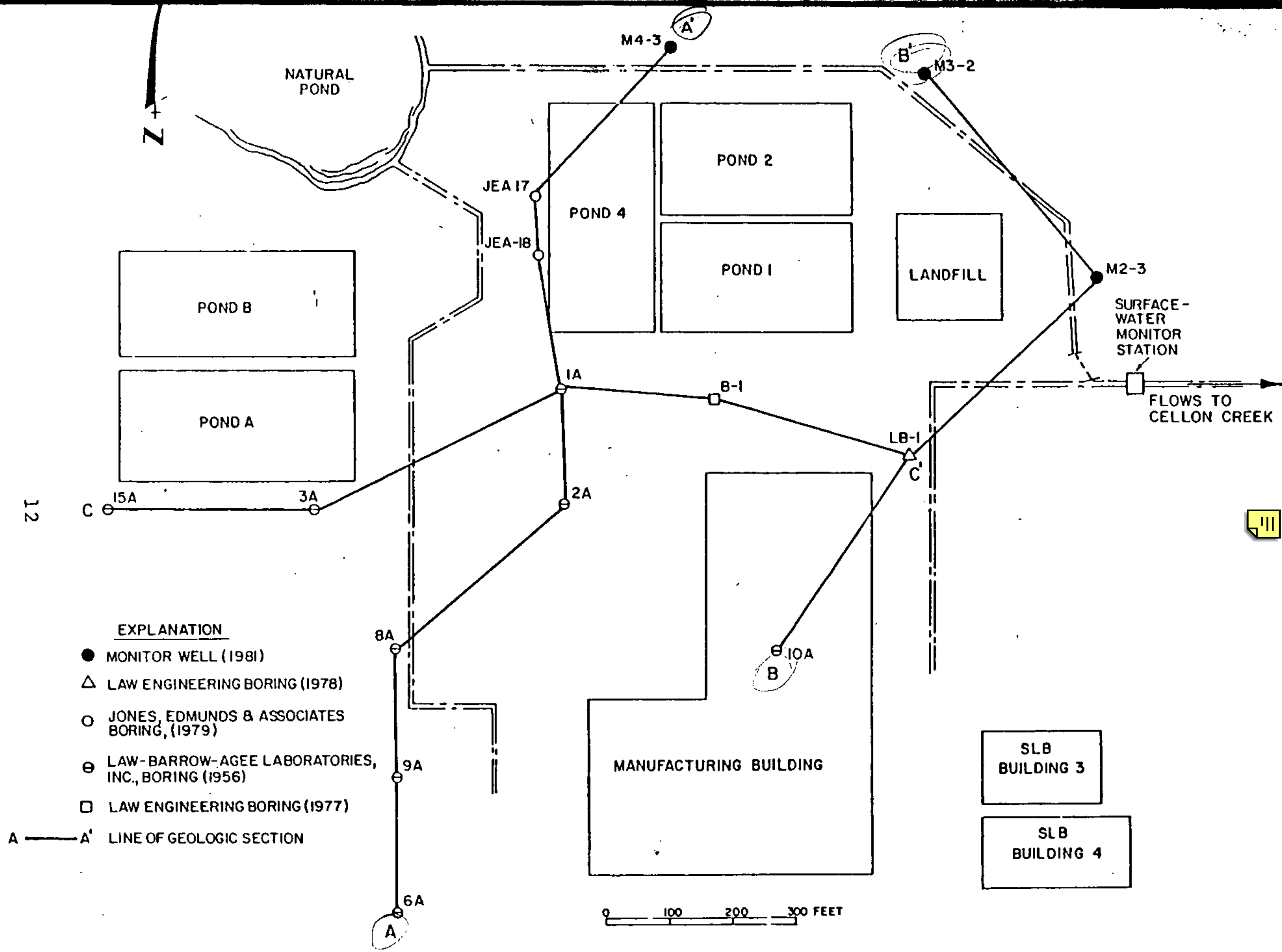


Figure 5. Map Showing the Locations of Geologic Cross Sections A-A', B-B', and C-C'.

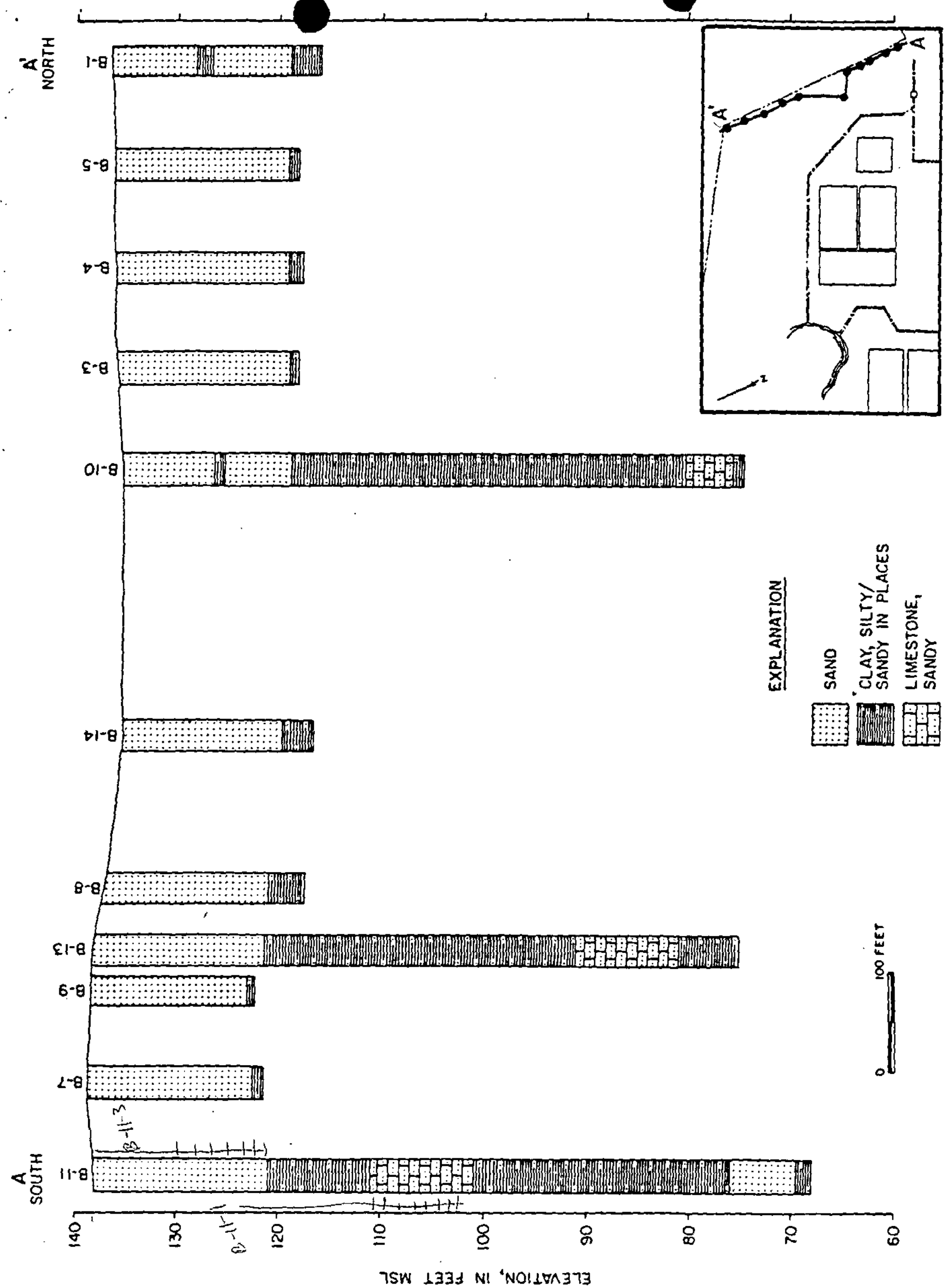


Figure 9. North-South Geologic Cross Section.

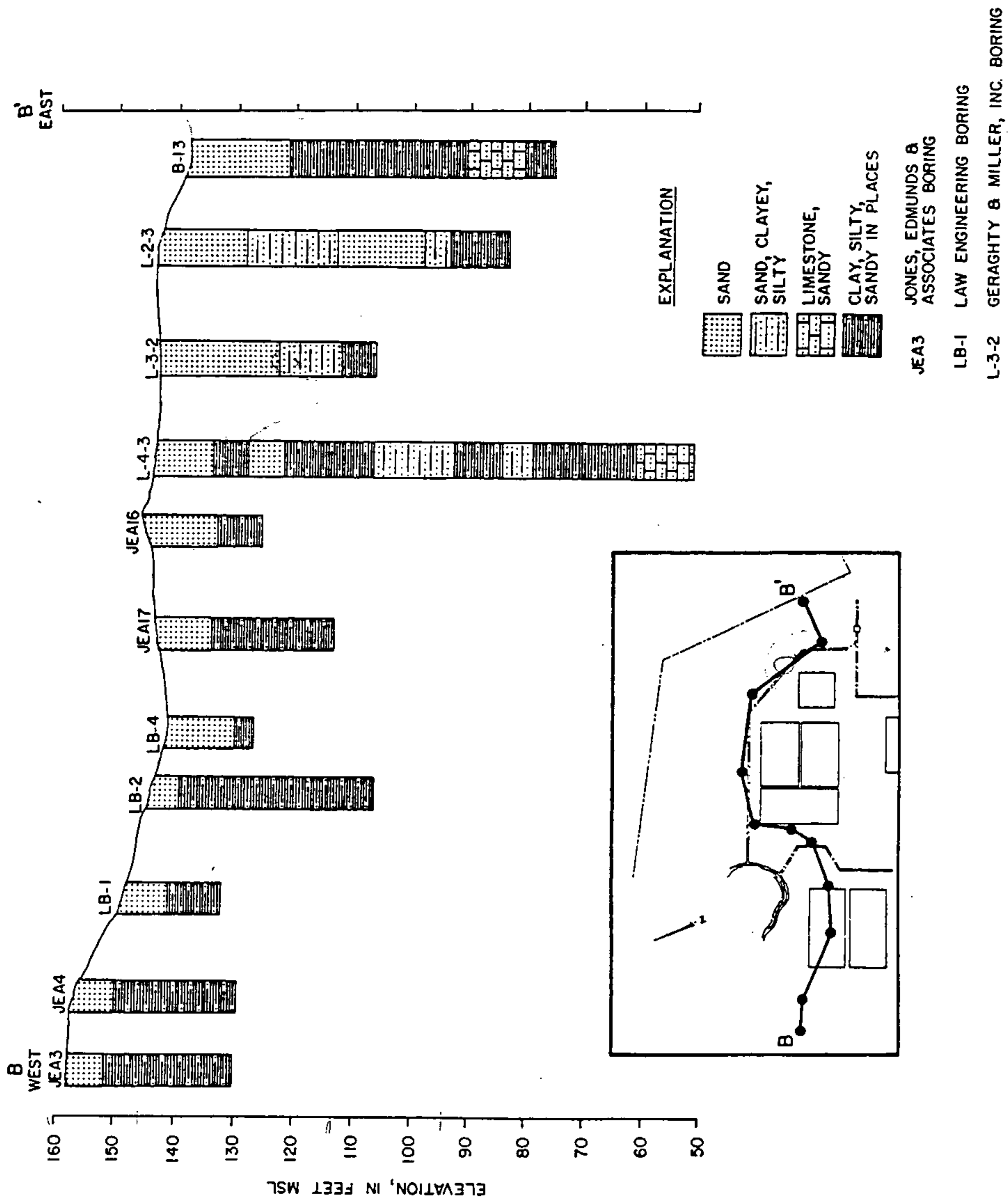


Figure 10. East-West Geologic Cross Section.

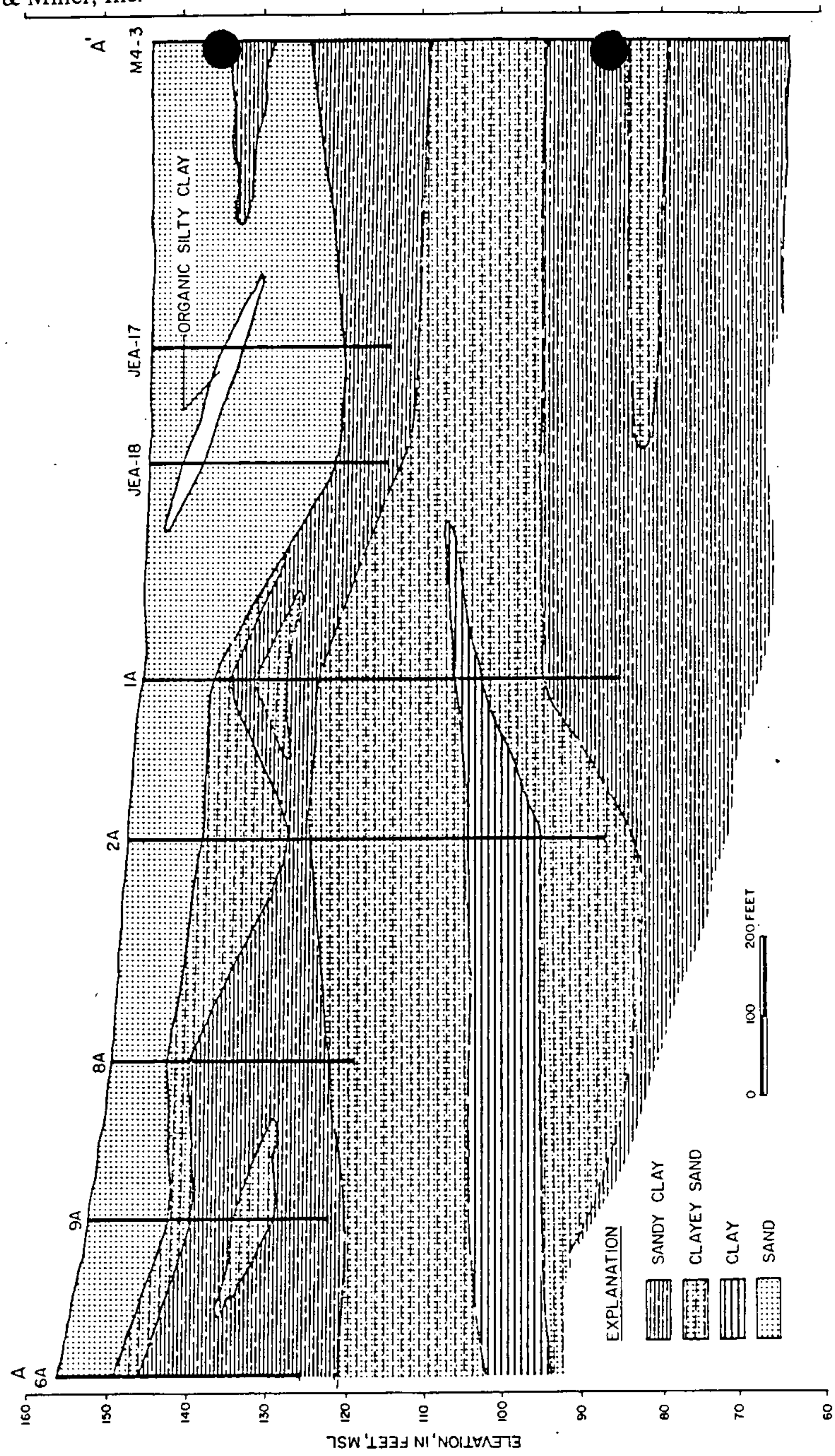


Figure 6. Geologic Cross Section A-A'.

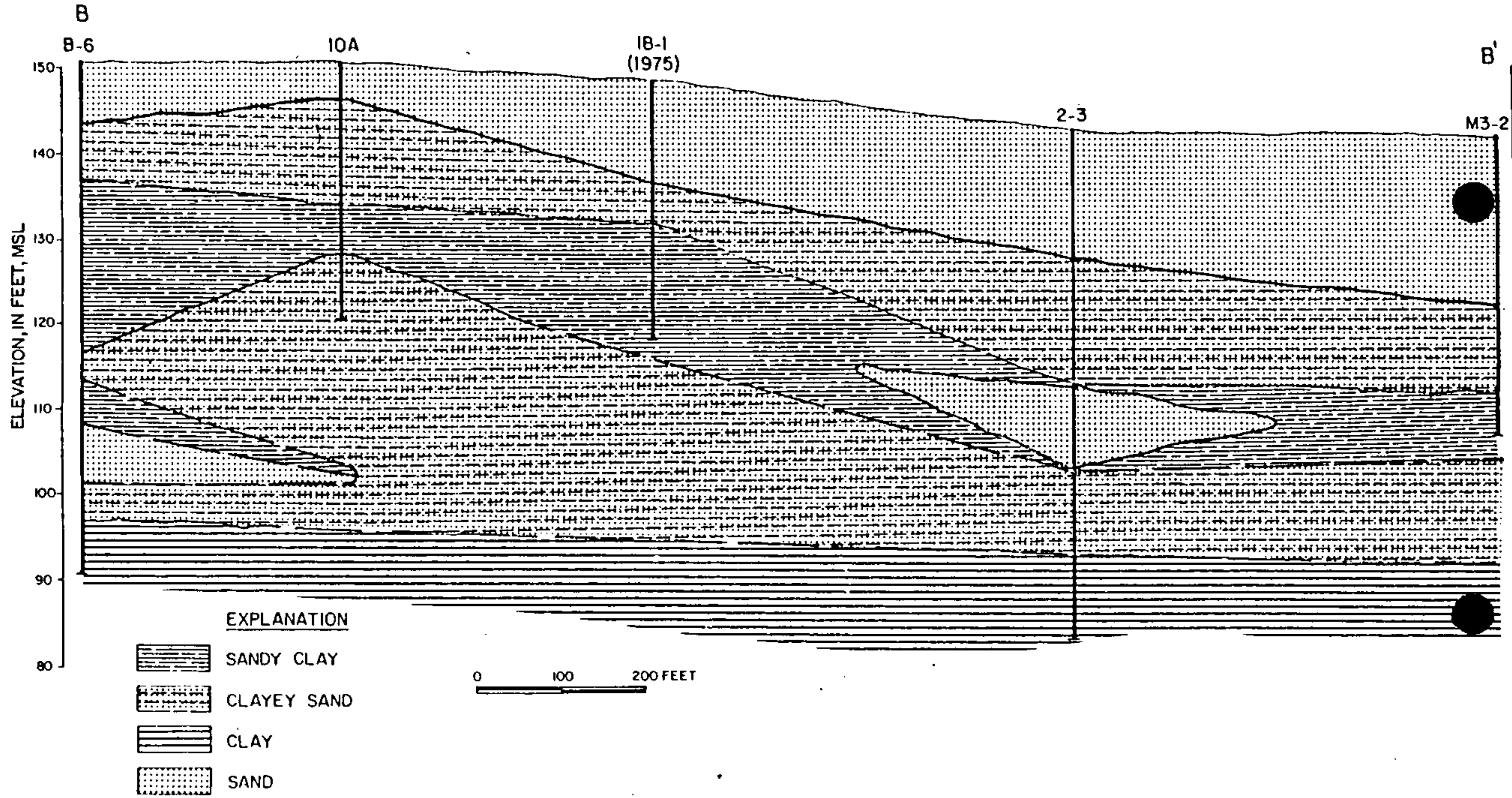


Figure 7. Geologic Cross Section B-B'.

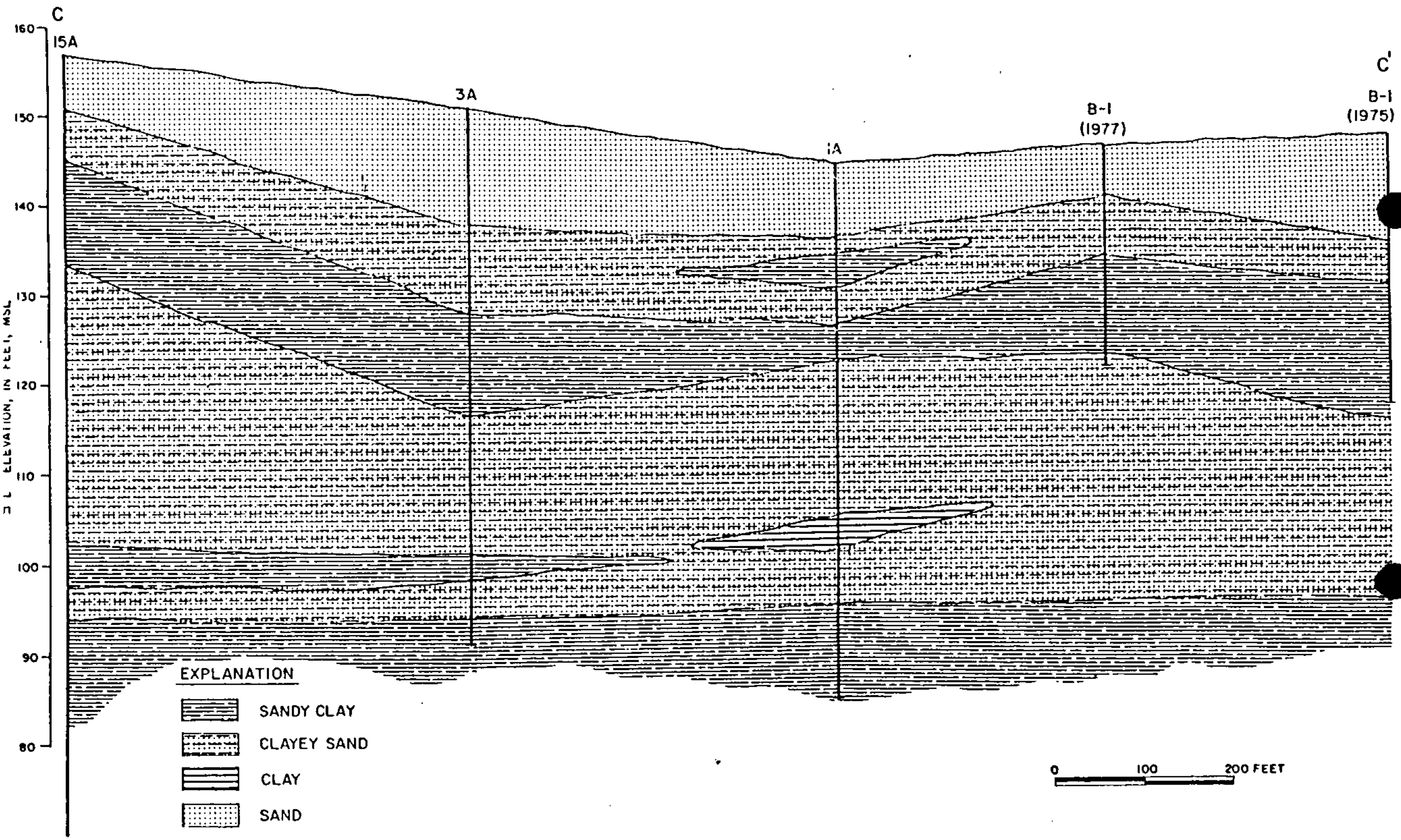


Figure 8. Geologic Cross Section C-C'.

TABLE A-1. CONSTRUCTION DETAILS OF THE MONITOR WELLS AND SAND POINT WELLS

Well Number	Total Depth Below Land Surface (feet)	Screened Setting Below Land Surface (feet)	Gravel-Pack Interval Below Land Surface (feet)
L-1-1	18	13 - 18	11 - 18
L-2-1	22	17 - 22	15 - 22
L-2-2	36	31 - 36	27 - 36
L-2-3	63	58 - 63	51 - 63
L-3-1	21	16 - 21	13 - 21
L-3-2	35	30 - 35	26 - 35
L-4-1	21	16 - 21	10 - 21
L-4-2	35	30 - 35	27 - 35
L-4-3	90	85 - 90	78 - 90
B-1	17	14 - 17	11 - 17
B-2	16	13 - 16	10 - 16
B-3	17	14 - 17	11 - 17
B-4	16	13 - 16	10 - 16
B-5	17	14 - 17	10 - 17
B-6	16	13 - 16	9 - 16
B-7	16	13 - 16	9 - 16
B-8	16	13 - 16	10 - 16
B-9	16	13 - 16	9 - 16
B-10	59	56 - 59	53 - 59
B-11	66	63 - 66	55 - 66
B-12	34	31 - 34	28 - 34
B-13	54	51 - 54	45 - 54
B-14	15	12 - 15	10 - 15
SP-1	11	8.5 - 11	-
SP-2	14.5	12 - 14.5	-
SP-3	13.5	11 - 13.5	-
SP-4	13.5	11 - 13.5	-
SP-5	13.5	11 - 13.5	-
SP-6	13.5	11 - 13.5	-
SP-7	13.5	11 - 13.5	-
SP-8	10	7.5 - 10	-
SP-9	14.5	12 - 14.5	-
SP-10	14	11.5 - 14	-

9/9/81 GW Hydrology Invests.

Part IV Attch 5

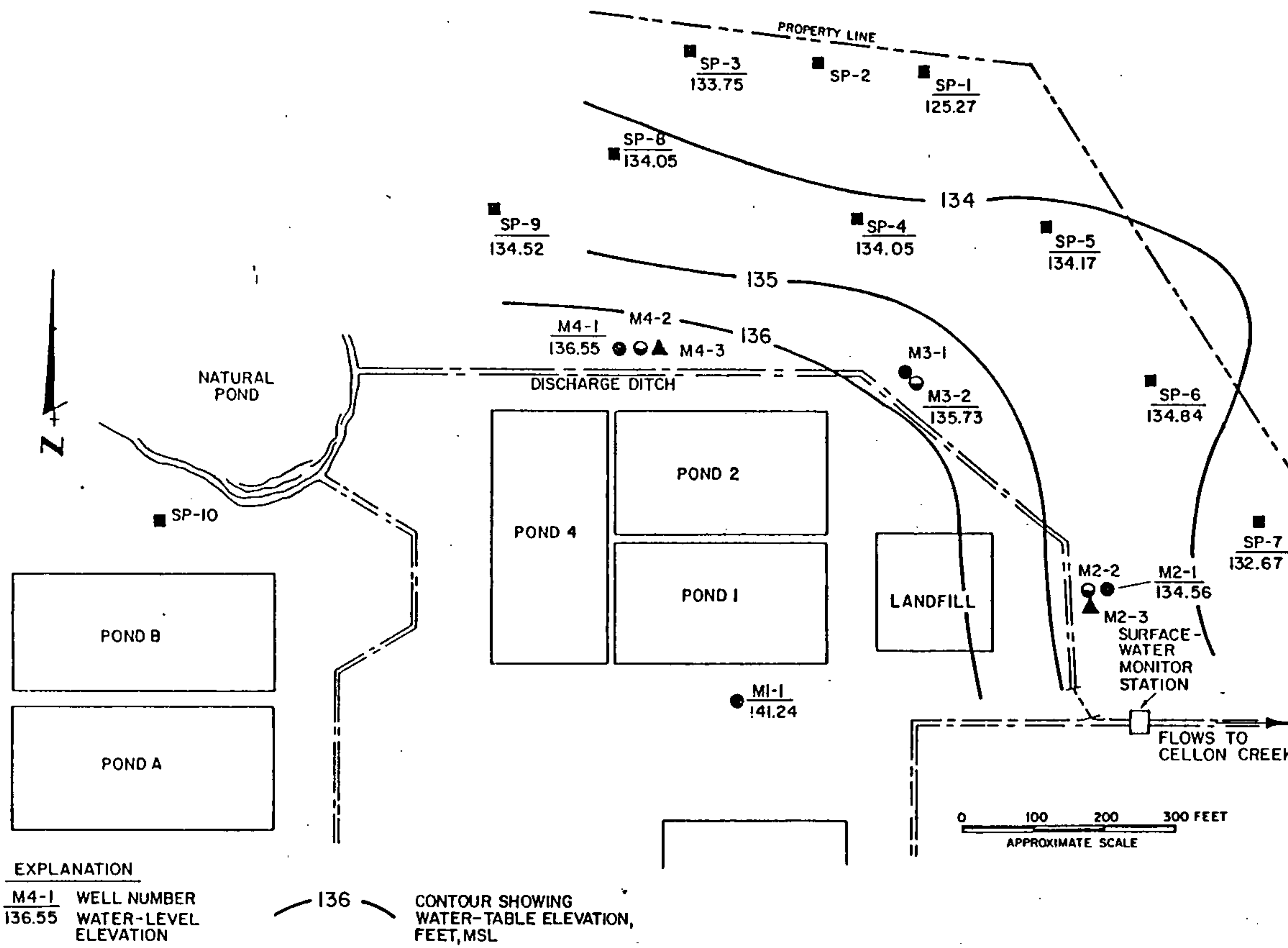


Figure 9. Water-Table Elevation at the Industrial Wastewater-Treatment Facility, June 19, 1981.

Table B-1. Lithologic Log of Monitor Well 1-1.

Description	Depth (ft)	Thickness (ft)
Sand, quartz, very fine to fine-grained, white....................................	0 - 5	5
Sand, quartz, very fine to fine-grained, white, trace of clay......................	5 - 10	5
Clay, very sandy, soft, white.............	10 - 15	5
Clay, sandy, soft, white to orange........	15 - 20	5

Table B-2. Lithologic Log of Monitor Well 2-3.

Description	Depth (ft)	Thickness (ft)
Sand, quartz, very fine to fine-grained, white to gray..............................	0 - 5	5
Sand, quartz, very fine to fine-grained, white....................................	5 - 10	5
Sand, quartz, very fine to fine-grained, slightly silty, gray.......................	10 - 15	5
Sand, quartz, very fine to fine-grained, white; slightly clayey....................	15 - 20	5
Sand, quartz, clayey, very fine to fine-grained, white............................	20 - 25	5
Sand, quartz, very fine-grained, clayey, white....................................	25 - 30	5
Sand, quartz, very fine-grained, white....	30 - 35	5
Sand, quartz, very fine-grained, white; trace of fine-grained calcareous sand.....	35 - 40	5
Sand, quartz, clayey, very fine to fine-grained, cream, trace of fine-grained calcareous sand; trace of very fine-grained phosphorite......................	40 - 45	5
Sand, quartz, clayey, very fine to fine-grained, cream; fine-grained calcareous sand; trace of fine-grained phosphorite and skeletal fragments..................	45 - 50	5
Clay, sandy, cream; poorly indurated limestone; trace of fine-grained phosphorite................................	50 - 55	5
Clay, sandy, cream; poorly indurated limestone; fine-grained quartzitic sand...	55 - 60	5

Table B-3. Lithologic Log of Monitor Well 3-2.

Description	Depth (ft)	Thickness (ft)
Sand, quartz, very fine to fine-grained, white to tan; slightly silty..............	0 - 5	5
Sand, quartz, very fine to fine-grained, white....................................	5 - 10	5
Sand, quartz, very fine to fine-grained, white....................................	10 - 15	5
Sand, quartz, very fine to fine-grained, white; trace of clay.....................	15 - 20	5
Sand, quartz, very fine to fine-grained, white to tan; slightly clayey; trace of fine-grained calcareous sand..............	20 - 25	5
Sand, quartz and calcareous, very fine to fine-grained, clayey, cream to brown, trace of fine-grained phosphorite; shell fragments.................................	25 - 30	5
Clay, calcareous, sandy, cream to brown; slightly amount of fine-grained quartzitic sand and phosphorite; fragments of shell and indurated limestone..................	30 - 35	5

Table B-4. Lithologic Log of Monitor Well 4-3.

Description	Depth (ft)	Thickness (ft)
Sand, quartz, very fine to fine-grained, white..................................	0 - 5	5
Sand, quartz, very fine to fine-grained, white; trace of clay......................	5 - 10	5
Clay, slightly sandy, soft, white.........	10 - 15	5
Sand, quartz, very fine to fine-grained; slightly clayey, white; trace of fine-grained calcareous sand..................	15 - 20	5
Clay, sandy, soft, white and orange; calcareous skeletal and shell fragments......	20 - 25	5
Clay, sandy, soft, white and orange, calcareous skeletal and shell fragments......	25 - 30	5
Clay, sandy, stiff, green, some orange and white; lost circulation at 35 ft..........	30 - 35	5
Sand, quartz, very fine-grained, clayey, white to green, trace of calcareous sand..	35 - 40	5
Sand, quartz, very fine-grained, clayey, white to green; trace of calcareous sand..	40 - 45	5
Sand, quartz, very fine to fine-grained, white; trace of green clay; trace of limestone fragments......................	45 - 50	5
Clay, sandy, green; trace of limestone fragments.................................	50 - 55	5
Clay, very sandy, green; poorly indurated limestone; shell fragments...............	55 - 60	5
Sand, quartz, very fine to fine-grained, slightly clayey; white and brown; trace of fine-grained, calcareous sand..........	60 - 65	5
Clay, very sandy, gray to green...........	65 - 70	5
Clay, slightly sandy, cream, chert; poorly indurated, sandy limestone...............	70 - 75	5
Clay, very sandy, cream; iron stains; traces of well indurated limestone; chert.	75 - 80	5

Table B-4. Lithologic Log of Monitor Well 4-3 (Continued).

Description	Depth (ft)	Thickness (ft)
Limestone, clayey, sandy, pasty, white; traces of well indurated limestone; chert.	80 - 85	5
Limestone, slightly clayey, poorly indurated, white; chert....................	85 - 90	5

8/27/82 GWHR Part II M
Attch 1a.

LITHOLOGIC LOG OF MONITOR WELL B-1

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray..................	0 - 6.5	6.5
Sand, very fine to fine-grained, silty, gray....................................	6.5 - 8.5	2
Clay, sandy, gray; several small lenses of clayey sand.............................	8.5 - 10	1.5
Sand, very fine to fine-grained, silty, light gray to white......................	10 - 16	6
Sand, fine-grained, slightly clayey, gray.	16 - 17.5	1.5
Clay, sandy, stiff, gray..................	17.5 - 20.5	3

LITHOLOGIC LOG OF MONITOR WELL B-2

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray..................	0 - 7	7
Clay, sandy, dark gray....................	7 - 8.5	1.5
Sand, fine-grained, silty, white..........	8.5 - 15	6.5
Sand, fine-grained, silty, slightly clayey, white............................	15 - 16.5	1.5
Clay, slightly sandy, light green; limestone fragments..........................	16.5 - 18.5	2

LITHOLOGIC LOG OF MONITOR WELL B-3

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray..................	0 - 10	10
Sand, very fine to fine-grained, silty, slightly clayey, white to gray...........	10 - 17	7
Clay, sandy, stiff, green; fine-grained phosphorite; limestone fragments..........	17 - 17.5	0.5

LITHOLOGIC LOG OF MONITOR WELL B-4

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray..................	0 - 10	10
Sand, very fine to fine-grained, silty, slightly clayey, white to gray...........	10 - 17	7
Clay, slightly sandy, green...............	17 - 18.5	1.5

LITHOLOGIC LOG OF MONITOR WELL B-5

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray..................	0 - 10	10
Sand, fine-grained, silty, white..........	10 - 17	7
Clay, sandy, stiff, gray..................	17 - 17.5	0.5

LITHOLOGIC LOG OF MONITOR WELL B-6

Description	Depth (ft)	Thickness (ft)
Sand, very fine to fine-grained, gray.....	0 - 1.5	1.5
Sand, very fine to fine-grained, white....	1.5 - 6	4.5
Sand, very fine to fine-grained, slightly silty, white to gray.....................	6 - 9	3
Sand, very fine-grained, gray............	9 - 13.5	4.5
Sand, very fine-grained, silty, dark gray to black................................	13.5 - 15	1.5
Clay, sandy, white.........................	15 - 18.5	3.5
Clay, sandy, blue-green..................	18.5 - 20	1.5

LITHOLOGIC LOG OF MONITOR WELL B-7

Description	Depth (ft)	Thickness (ft)
Sand, very fine to fine-grained, gray to white....................................	0 - 16	16
Clay, sandy, blue-green..................	16 - 17	1

LITHOLOGIC LOG OF MONITOR WELL B-8

Description	Depth (ft)	Thickness (ft)
Sand, very fine to fine-grained, gray to white....................................	0 - 16	16
Clay, sandy, green.........................	16 - 17	1
Clay, sandy, blue-green; fine-grained phosphorite..............................	17 - 19.5	2.5

LITHOLOGIC LOG OF MONITOR WELL B-9

Description	Depth (ft)	Thickness (ft)
Sandy, very fine to fine-grained, gray....	0 - 15	15
Sand, very fine-grained, clayey...........	15 - 16	1
Clay, sandy, blue-green...................	16 - 16.5	0.5

LITHOLOGIC LOG OF MONITOR WELL B-10

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, brown and gray........	0 - 9	9
Clay, sandy, gray.........................	9 - 10	1
Sand, silty, slightly clayey, white.......	10 - 17.5	7.5
Clay, sandy, green........................	17.5 - 27.5	10
Clay, sandy, friable, stiff, olive green to blue-green; very fine to fine-grained phosphorite; limestone fragments..........	27.5 - 55	27.5
Limestone, hard, cream; fine-grained sand; very fine to fine-grained phosphorite.....	55 - 59.5	4.5
Clay, silty, green........................	59.5 - 60	0.5

LITHOLOGIC LOG OF MONITOR WELLS B-11 AND B-12

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray to white.........	0 - 17	17
Clay, sandy, green........................	17 - 28	11
Limestone, sandy, friable, cream; light and dark brown chert......................	28 - 28.5	0.5
Limestone, sandy, friable, cream; interbedded soft, clayey sand..................	28.5 - 37	8.5
Clay, sandy, friable, dry, yellow; limestone fragments..........................	37 - 57	20
Clay, very sandy, dry, green..............	57 - 62	5
Sand, slightly clayey, moist, gray; small limestone and shell fragments............	62 - 68.5	6.5
Silt, friable, dry, blue-green............	68.5 - 70	1.5

LITHOLOGIC LOG OF MONITOR WELL B-13

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray..................	0 - 17	17
Clay, sandy, soft; some small sand lenses.	17 - 29	12
Clay, silty, friable, blue-green; fine to medium-grained phosphorite; trace of quartz sand............................	29 - 36	7
Limestone, hard, light brown; interbedded silt and sand...........................	36 - 36.5	0.5
Silt, sandy, clayey, moist, green; very fine to fine-grained phosphorite..........	36.5 - 38.5	2
Clay, silty, blue-green; fine-grained to pebble-size phosphorite; limestone fragments................................	38.5 - 47	8.5

Limestone, sandy, slightly clayey, cream; chert fragments..........................	47 - 57	10
Clay, very sandy, stiff, hard, blue-green.	57 - 63	6

LITHOLOGIC LOG OF MONITOR WELL B-14

Description	Depth (ft)	Thickness (ft)
Sand, fine-grained, gray and brown........	0 - 13	13
Sand, fine-grained, silty, white..........	13 - 18.5	5.5

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - N

WELL NUMBER: W-7054
TOTAL DEPTH: 472 FT.
18 SAMPLES FROM 0 TO 291 FT.

COUNTY - ALACHUA
LOCATION: T.07S R.19E S.20 AD
LAT = 29D 46M 36S
LON = 82D 26M 00S

COMPLETION DATE: 08/12/64
OTHER TYPES OF LOGS AVAILABLE - GEOLOGIST

ELEVATION: 160 FT

OWNER/DRILLER:OWNER: GENERAL ELECTRIC CO. DRILLER: W. EARL FLOYD AND SON

WORKED BY:GREEN (3-29-87)
LITHOLOG TERMINATED AT TOP OF AVON PARK.;0-110FT. MAY CONTAIN HAWTHORN,
BUT IT IS DIFFICULT TO SAY; LITTLE PHOSPHATE WAS FOUND.

0.	-	110.	090UDSC	UNDIFFERENTIATED SAND AND CLAY
110.	-	231.	124CLRV	CRYSTAL RIVER FM.
231.	-	291.	124WLSN	WILLISTON FM.

\+ 0 - 5 SAND; TRANSPARENT TO DARK YELLOWISH BROWN
POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: COARSE TO FINE
MEDIUM SPHERICITY; UNCONSOLIDATED
ACCESSORY MINERALS: CLAY-10%, ORGANICS-05%

\+ 5 - 15 SAND; WHITE TO TRANSPARENT
POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN SIZE: MEDIUM; RANGE: COARSE TO FINE
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT
ACCESSORY MINERALS: CLAY-15%, DOLOMITE-10%
PHOSPHATIC SAND-05%, IRON STAIN-02%
OTHER FEATURES: CHALKY

\+ 15 - 25 AS ABOVE

\+ 25 - 44 SAND; WHITE TO TRANSPARENT
POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT
ACCESSORY MINERALS: IRON STAIN-05%, CLAY-20%
OTHER FEATURES: CHALKY

\+ 44 - 60 SAND; WHITE TO TRANSPARENT
POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN SIZE: MEDIUM; RANGE: COARSE TO FINE
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-40%, HEAVY MINERALS-02%
IRON STAIN-02%
OTHER FEATURES: CALCAREOUS

LITHOLOGIC WELL LOG PRINTOUT   SOURCE - N

WELL NUMBER: W-5624
TOTAL DEPTH: 154 FT.
16 SAMPLES FROM 0 TO 154 FT.

COUNTY - ALACHUA
LOCATION: T.08S R.21E S.21 CA
LAT = 29D 46M 39S
LON = 82D 25M 04S

COMPLETION DATE: 20/07/59
OTHER TYPES OF LOGS AVAILABLE - GEOLOGIST

ELEVATION: 156 FT

OWNER/DRILLER:OWNER: UNIV. OF FLORIDA (DAIRY RESEARCH UNIT) DRILLER: J.J. HA

WORKED BY:CALDWELL

0. - 90. 122HTRN HAWTHORN GROUP
90. - 154. 124CLRV CRYSTAL RIVER FM.

+ 0 - 10 SAND; TRANSPARENT
POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: VERY COARSE TO FINE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
UNCONSOLIDATED

+ 10 - 10 DOLOSTONE; WHITE
POROSITY: LOW PERMEABILITY; 90-100% ALTERED; ANHEDRAL
GRAIN SIZE: CRYPTOCRYSTALLINE
RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE
MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
ACCESSORY MINERALS: IRON STAIN- %, QUARTZ SAND-10%
DOLOMITE AS A MATRIX CEMENTING SAND;SOME HEAVY
IRON-STAINING ON SOME FRAGMENTS, SHOWING LEACHING OF
CARBONATE.

+ 10 - 20 SAND; TRANSPARENT
POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: COARSE TO FINE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
ACCESSORY MINERALS: DOLOMITE-30%, PHOSPHATIC GRAVEL-05%
HEAVY MINERALS-01%
ACCESS. DOLOMITE AS ABOVE;SOME FRAGS ARE WATER WORN
ROUNDED;POORLY CONSOLIDATED FRAGS OF SAND ARE RARE
DOLOMITE FRAGS ARE MODERATLEY CONSOLIDATED; Fe STAINING ON
SOME SAND(5%); SAND IS PROBAB. CAVINGS.

+ 20 - 70 AS ABOVE

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W-6144
TOTAL DEPTH: 430 FT.
86 SAMPLES FROM 0 TO 430 FT.

COUNTY - ALACHUA
LOCATION: T.08S R.19E S.20 DC
LAT = 29D 46M 19S
LON = 82D 26M 15S

COMPLETION DATE: 12/12/62
OTHER TYPES OF LOGS AVAILABLE - NONE

ELEVATION: 151 FT

OWNER/DRILLER:OWNER: GENERAL ELECTRIC CO. DRILLER: W. EARL FLOYD AND SON

WORKED BY:NEIL COOK (FEB. 12, 1975)

0.	-	30.	090UDSC	UNDIFFERENTIATED SAND AND CLAY
30.	-	110.	122HTRN	HAWTHORN GROUP
110.	-	180.	124CLRV	CRYSTAL RIVER FM.
180.	-	305.	124WLSN	WILLISTON FM.
305.	-	430.	124AVPK	AVON PARK FM.

0 - 5 SAND; LIGHT OLIVE GRAY
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE
MEDIUM SPHERICITY; UNCONSOLIDATED
ACCESSORY MINERALS: CLAY-12%
FOSSILS: NO FOSSILS

5 - 10 AS ABOVE

10 - 15 SAND; YELLOWISH GRAY TO WHITE
08% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
ACCESSORY MINERALS: CLAY-35%
FOSSILS: NO FOSSILS

15 - 20 SAND; YELLOWISH GRAY TO WHITE
08% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
ACCESSORY MINERALS: CLAY-35%, PHOSPHATIC SAND-01%
FOSSILS: NO FOSSILS

20 - 25 SAND; YELLOWISH GRAY TO WHITE
08% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
ACCESSORY MINERALS: CLAY-35%
FOSSILS: NO FOSSILS

25 - 30 AS ABOVE

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W-3904
TOTAL DEPTH: 430 FT.
43 SAMPLES FROM 0 TO 430 FT.

COUNTY - ALACHUA
LOCATION: T. 8S R.19E S.20 BC
LAT = 29D 46M 34S
LON = 82D 26M 17S

COMPLETION DATE: 18/ 6/56
OTHER TYPES OF LOGS AVAILABLE - NONE

ELEVATION: 151 FT

OWNER/DRILLER:OWNER: GENERAL ELECTRIC CORP. DRILLER: MERRELL GRAY (JACKSONVI

WORKED BY:J.W. YON, JR. (7-17-56)

0. - 90.	122ALCH	ALACHUA FM.
90. - 210.	124CLRV	CRYSTAL RIVER FM.
210. - 300.	124WLSN	WILLISTON FM.
300. - 430.	124AVPK	AVON PARK FM.

0 - 90 SANDY, PHOSPHATIC CLAYS; TAN TO WHITE
LIMESTONE NEAR BASE (FINELY CRYSTALLINE AND WELL
INDURATED).

90 - 210 LIMESTONE; WHITE
POROSITY: INTERGRANULAR, INTRAGRANULAR
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE
GRAIN SIZE: FINE; MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: CHERT- %
OTHER FEATURES: MEDIUM RECRYSTALLIZATION
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS
RARE CHERT; LEPIDOCYCLINA, HETEROSTEGINA, AND GYPSINA
NOTED.

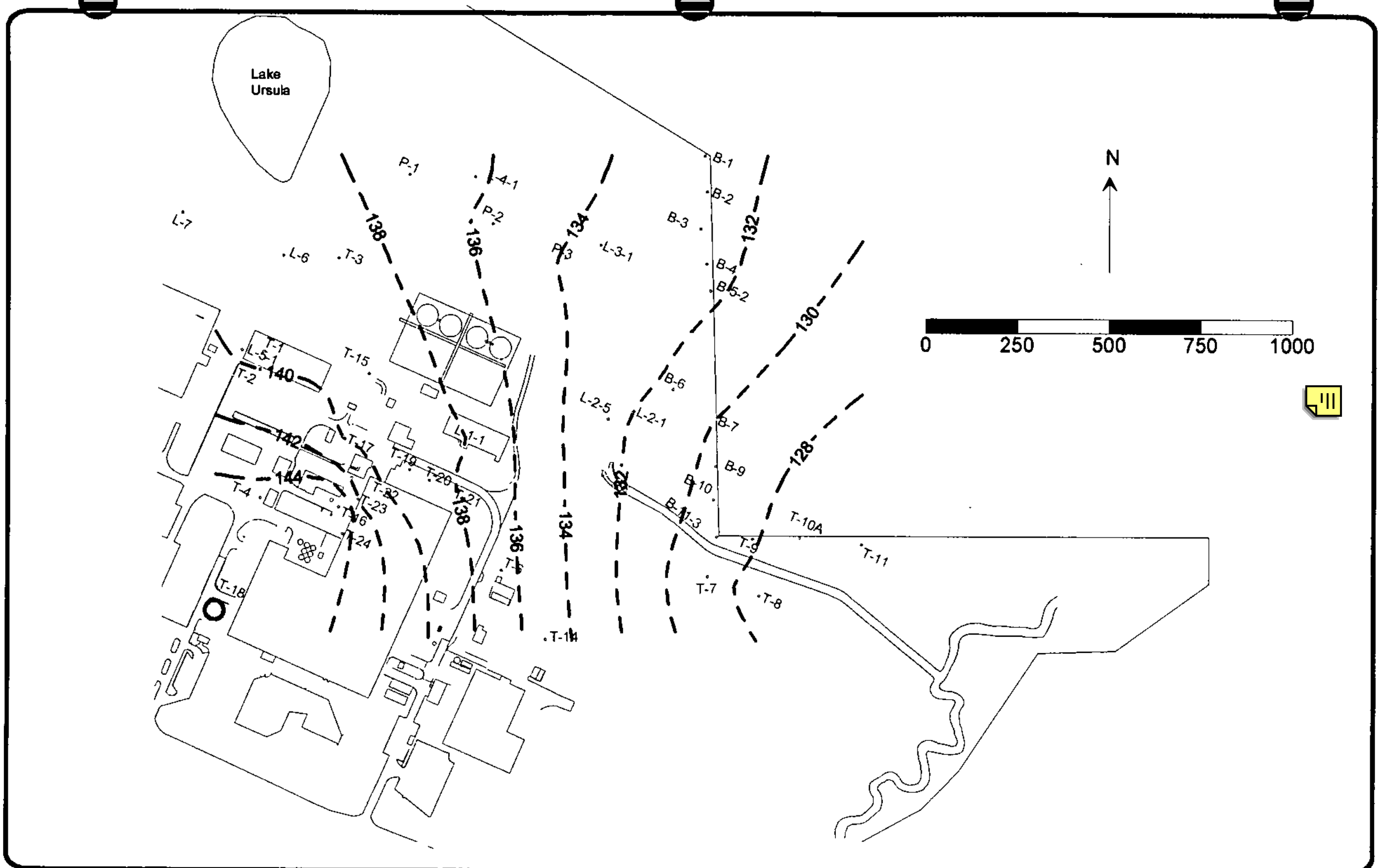
210 - 300 LIMESTONE; WHITE
POROSITY: INTERGRANULAR, INTRAGRANULAR
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE
GRAIN SIZE: FINE; MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
OTHER FEATURES: MEDIUM RECRYSTALLIZATION
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS
VERY RARE ACCESSORY CHERT; CAMERINA MOODYBRANHENSIS NOTED.

300 - 430 DOLOSTONE; LIGHT BROWN TO LIGHT GRAY
POROSITY: INTERCRYSTALLINE; 90-100% ALTERED
RANGE: FINE TO MEDIUM; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
ACCESSORY MINERALS: CHERT- %, PYRITE- %
OTHER FEATURES: HIGH RECRYSTALLIZATION
FOSSILS: CONES
RARE CONES, PYRITE; SOME MOLDIC POROSITY FROM 360-370.

430 TOTAL DEPTH

APPENDIX IV

WATER TABLE ELEVATION MAPS FOR THE SURFICIAL AQUIFER AT THE MOLTECH POWER SYSTEMS FACILITY, ALACHUA FLORIDA



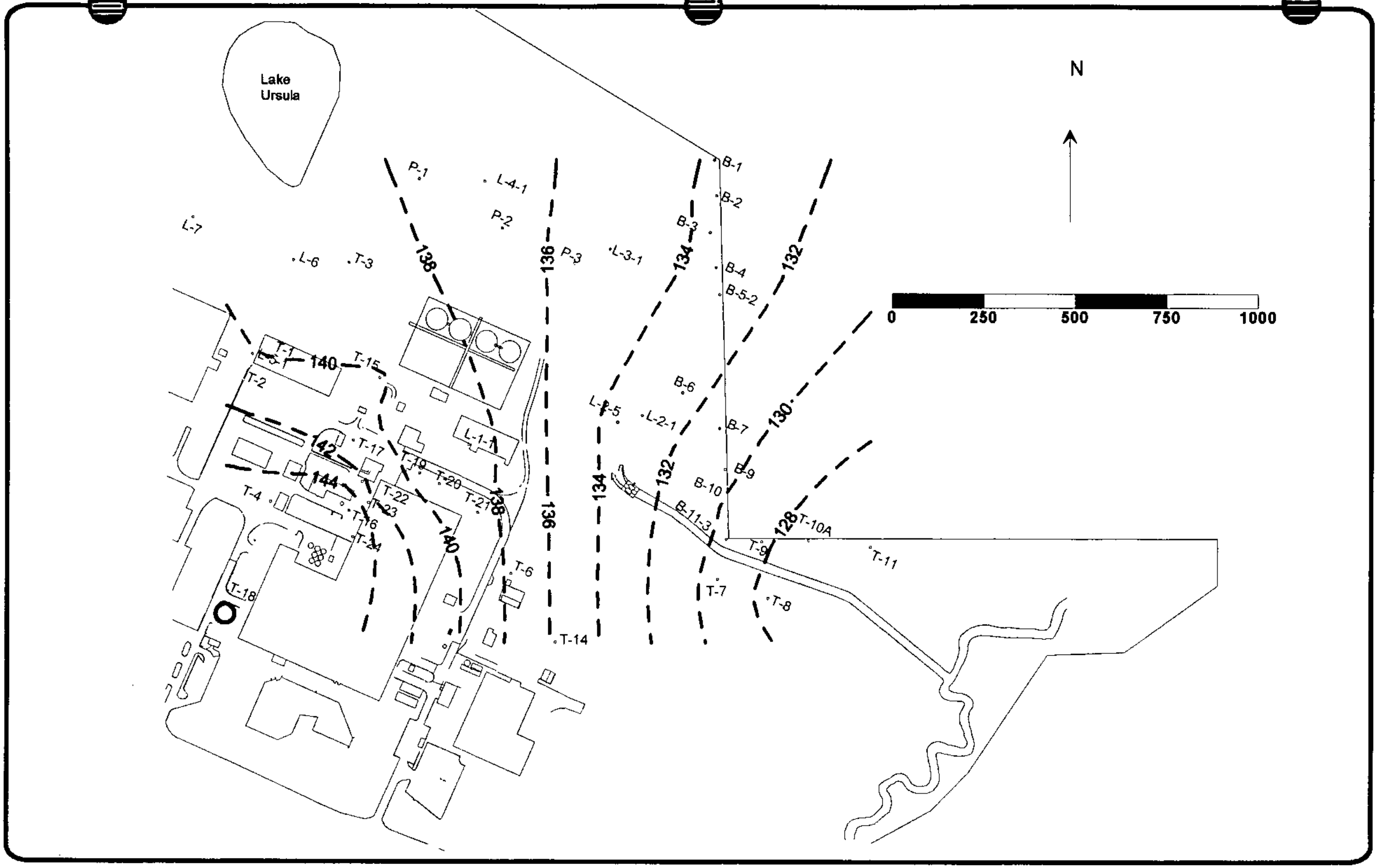
MOLTECH POWER SYSTEMS

Figure 3
Surficial Aquifer Water Level Elevations
July 1999

EXPLANATION

B-1 ∘ SURFICIAL AQUIFER MONITOR WELL

- - 130 - - LINE OF EQUAL WATER LEVEL ELEVATION IN FEET MEAN SEA LEVEL



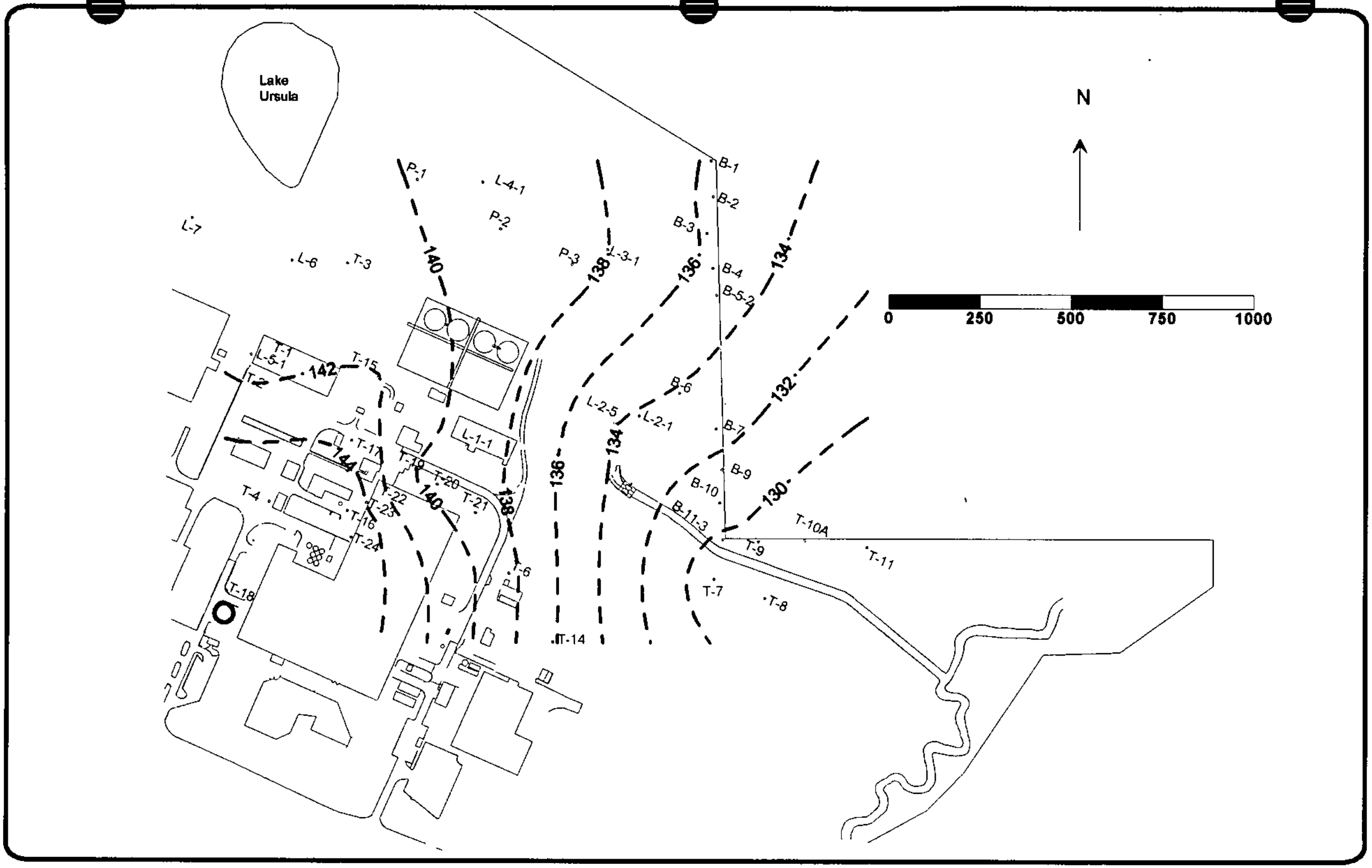
MOLTECH POWER SYSTEMS

Figure 4
Surficial Aquifer Water Level Elevations
August 1999

EXPLANATION

B-1 ∘ SURFICIAL AQUIFER MONITOR WELL

–130– LINE OF EQUAL WATER LEVEL ELEVATION IN FEET MEAN SEA LEVEL



MOLTECH POWER SYSTEMS

Figure 5
Surficial Aquifer Water Level Elevations
September 1999

EXPLANATION

B-1 ° SURFICIAL AQUIFER MONITOR WELL

- - 130 - - LINE OF EQUAL WATER LEVEL ELEVATION IN FEET MEAN SEA LEVEL

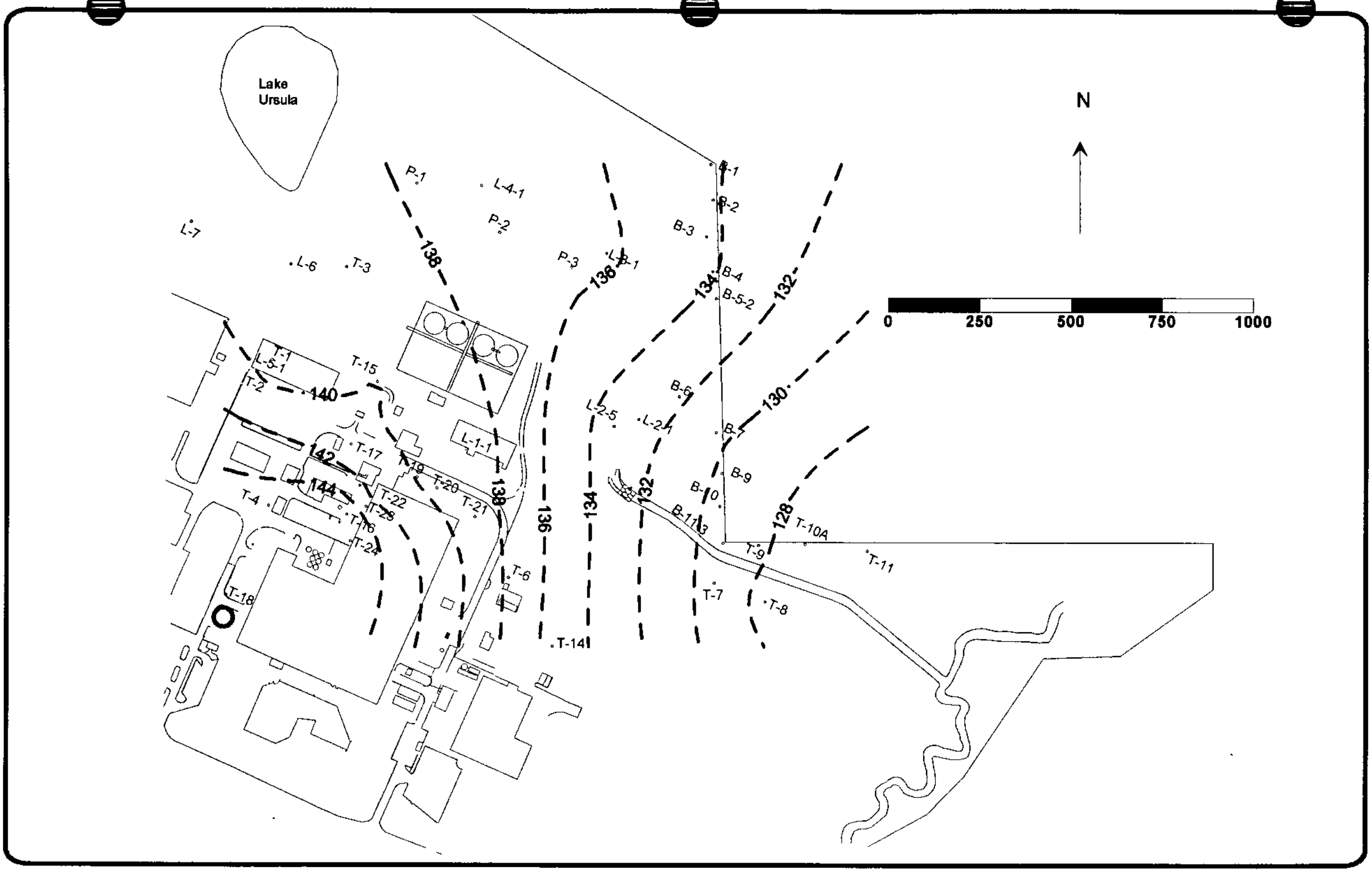


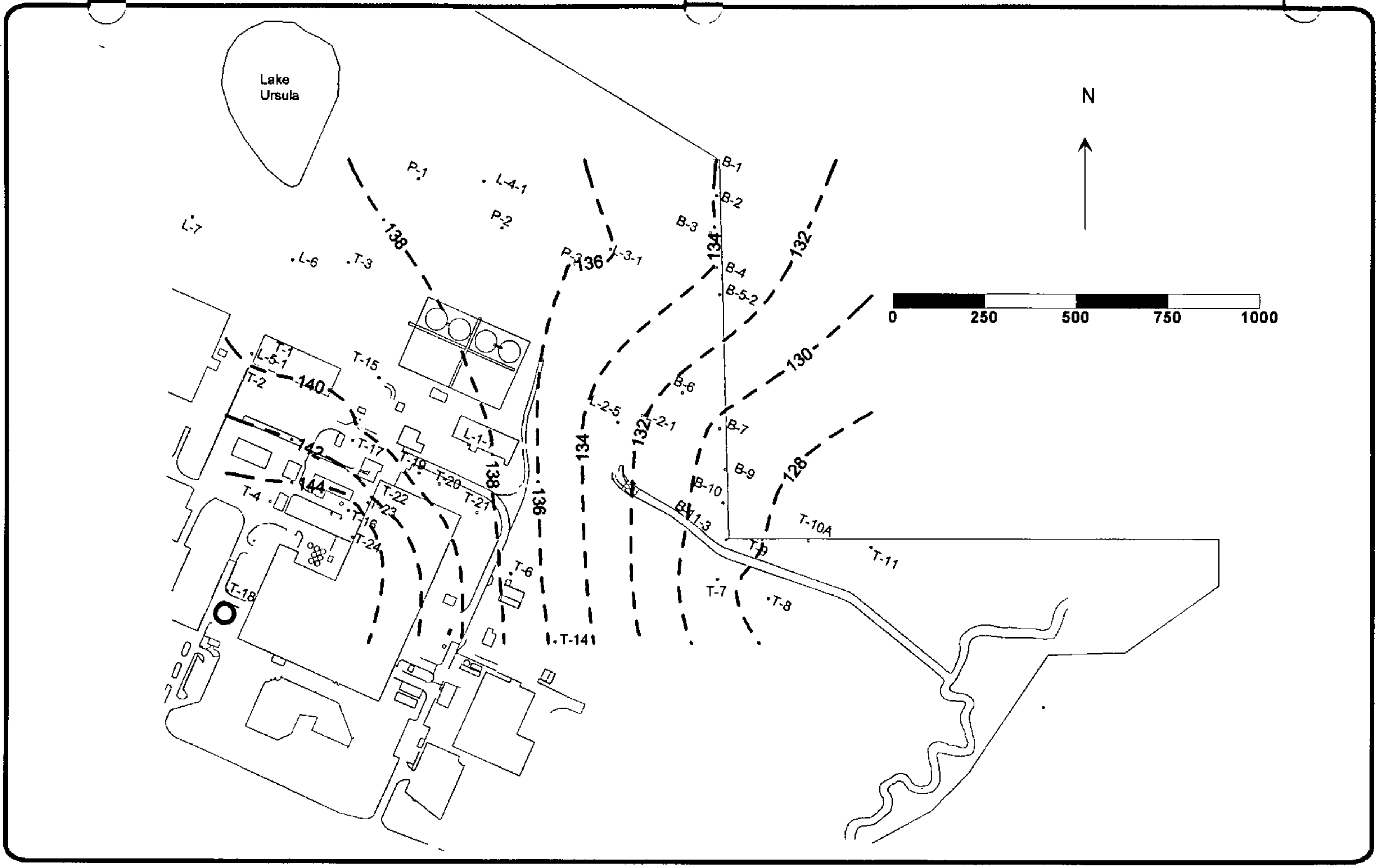
Figure 6
Surficial Aquifer Water Level Elevations
October 1999

EXPLANATION

B-1 ° SURFICIAL AQUIFER MONITOR WELL

- - 130 - - LINE OF EQUAL WATER LEVEL ELEVATION IN FEET MEAN SEA LEVEL

MOLTECH POWER SYSTEMS



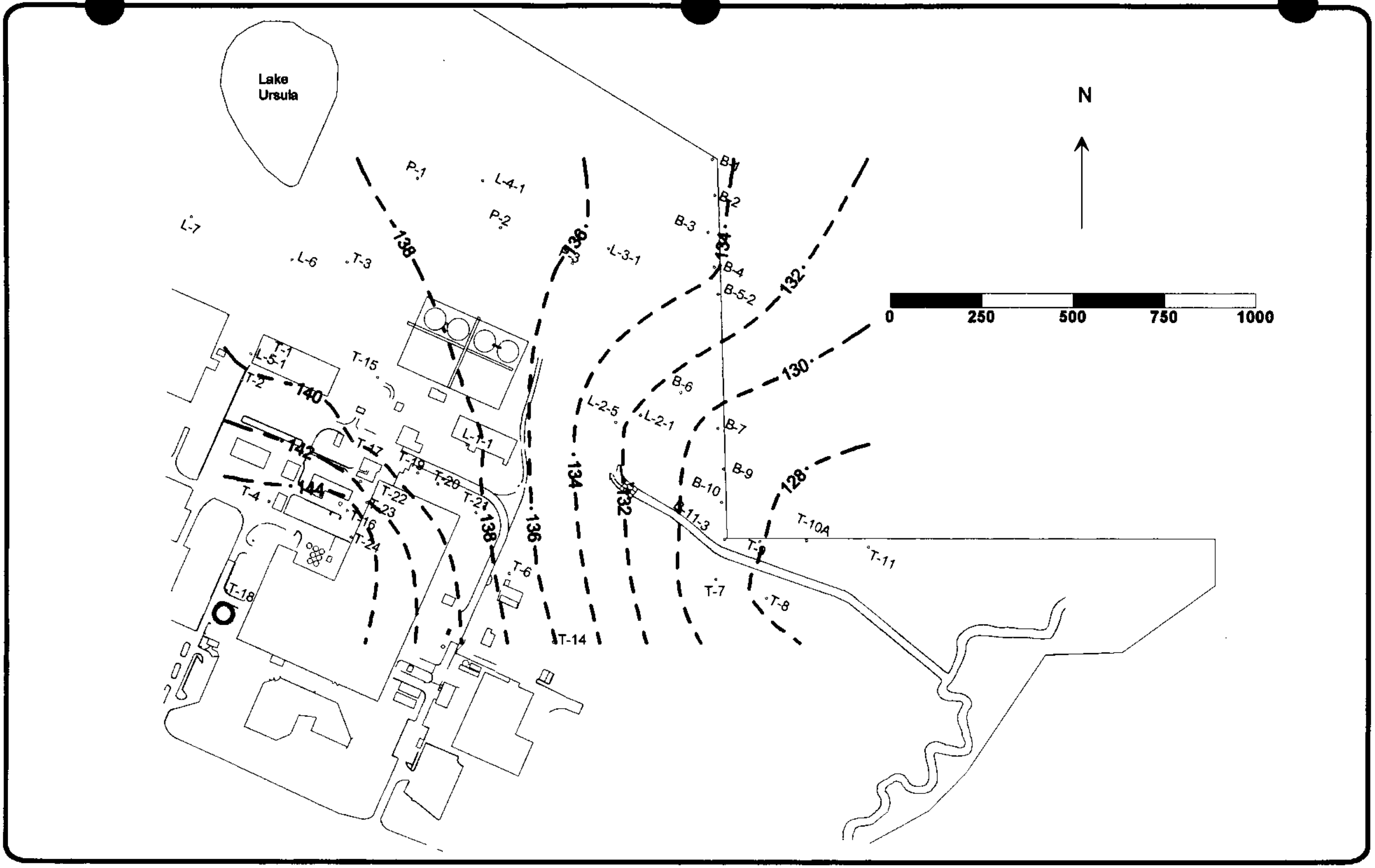
MOLTECH POWER SYSTEMS

Figure 7
Surficial Aquifer Water Level Elevations
November 1999

EXPLANATION

B-1 ° SURFICIAL AQUIFER MONITOR WELL

- - 130 - - LINE OF EQUAL WATER LEVEL ELEVATION IN FEET MEAN SEA LEVEL



MOLTECH POWER SYSTEMS

Figure 8
Surficial Aquifer Water Level Elevations
December 1999

EXPLANATION

B-1 SURFICIAL AQUIFER MONITOR WELL

- - 130 - - LINE OF EQUAL WATER LEVEL ELEVATION IN FEET MEAN SEA LEVEL

APPENDIX V

STRUCTURAL MAPS FOR THE CONFINING UNIT AND THE FLORIDAN AQUIFER IN THE SANTA FE RIVER BASIN, FLORIDA

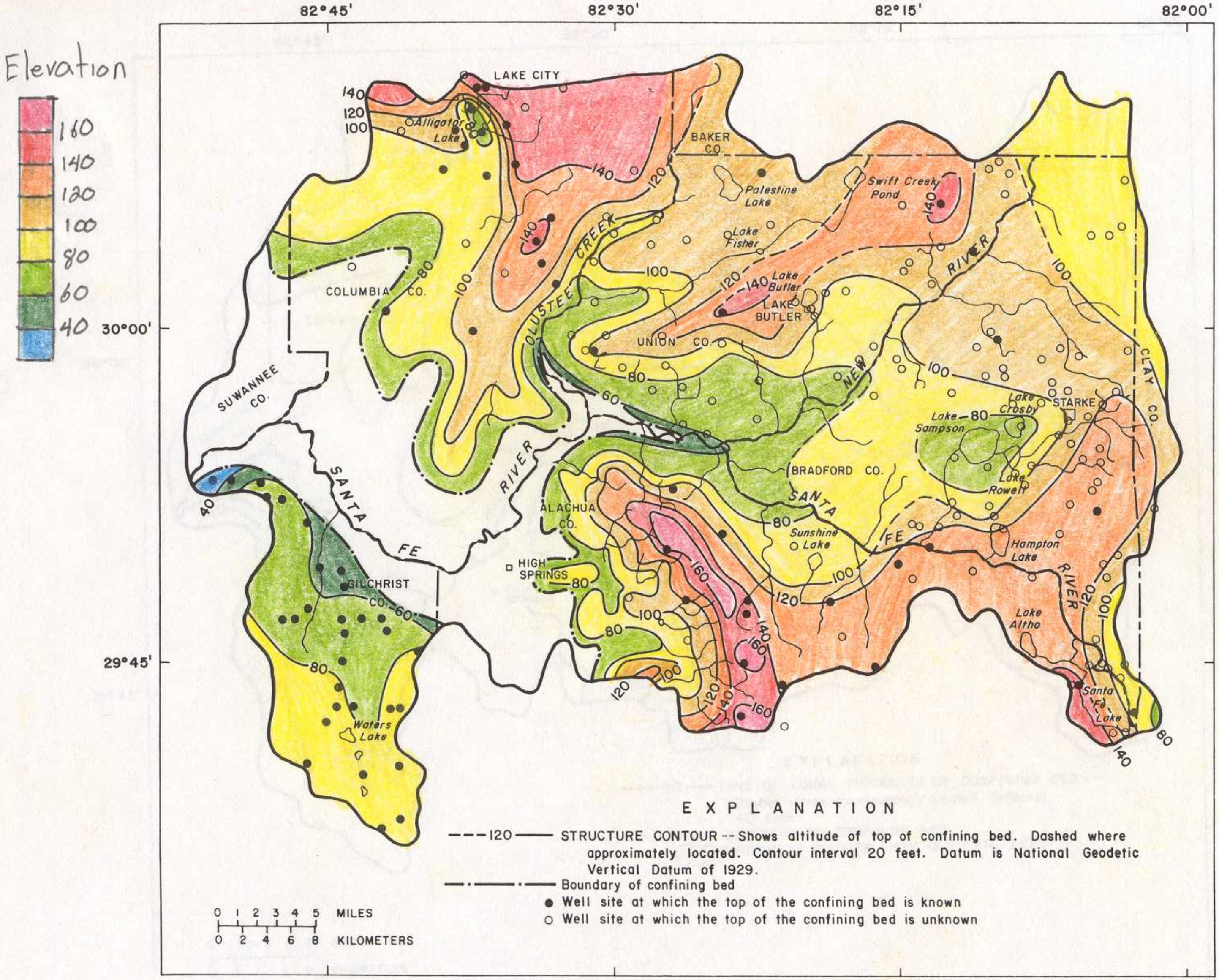


Figure 9.--Altitude of the top of the confining bed.

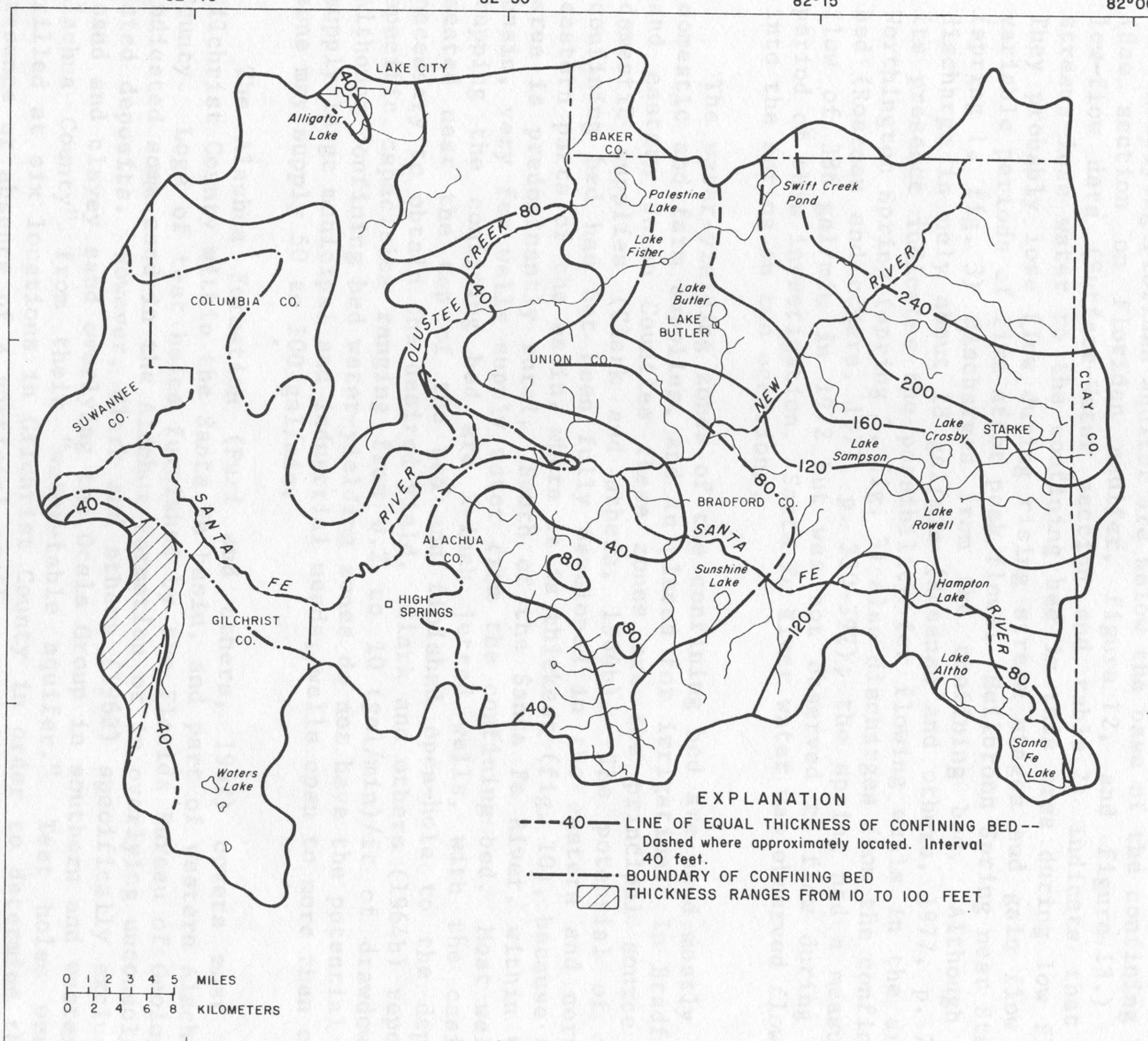


Figure 10.--Thickness of the confining bed.

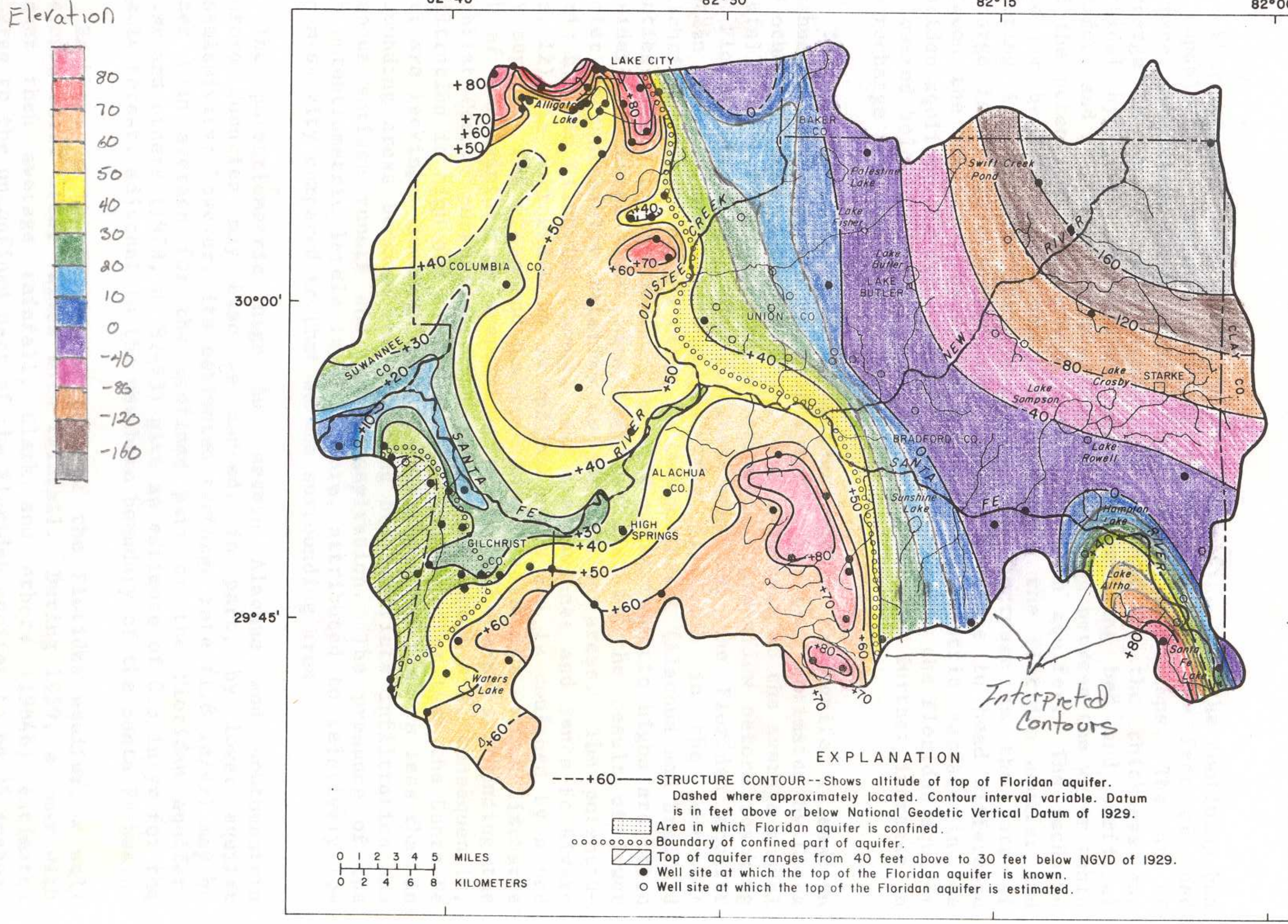


Figure 11.--Altitude of the top of the Floridan aquifer.

APPENDIX VI

POTENTIOMETRIC SURFACE MAPS FOR THE FLORIDAN AQUIFER IN THE SANTA FE RIVER BASIN AND ALACHUA COUNTY, FLORIDA

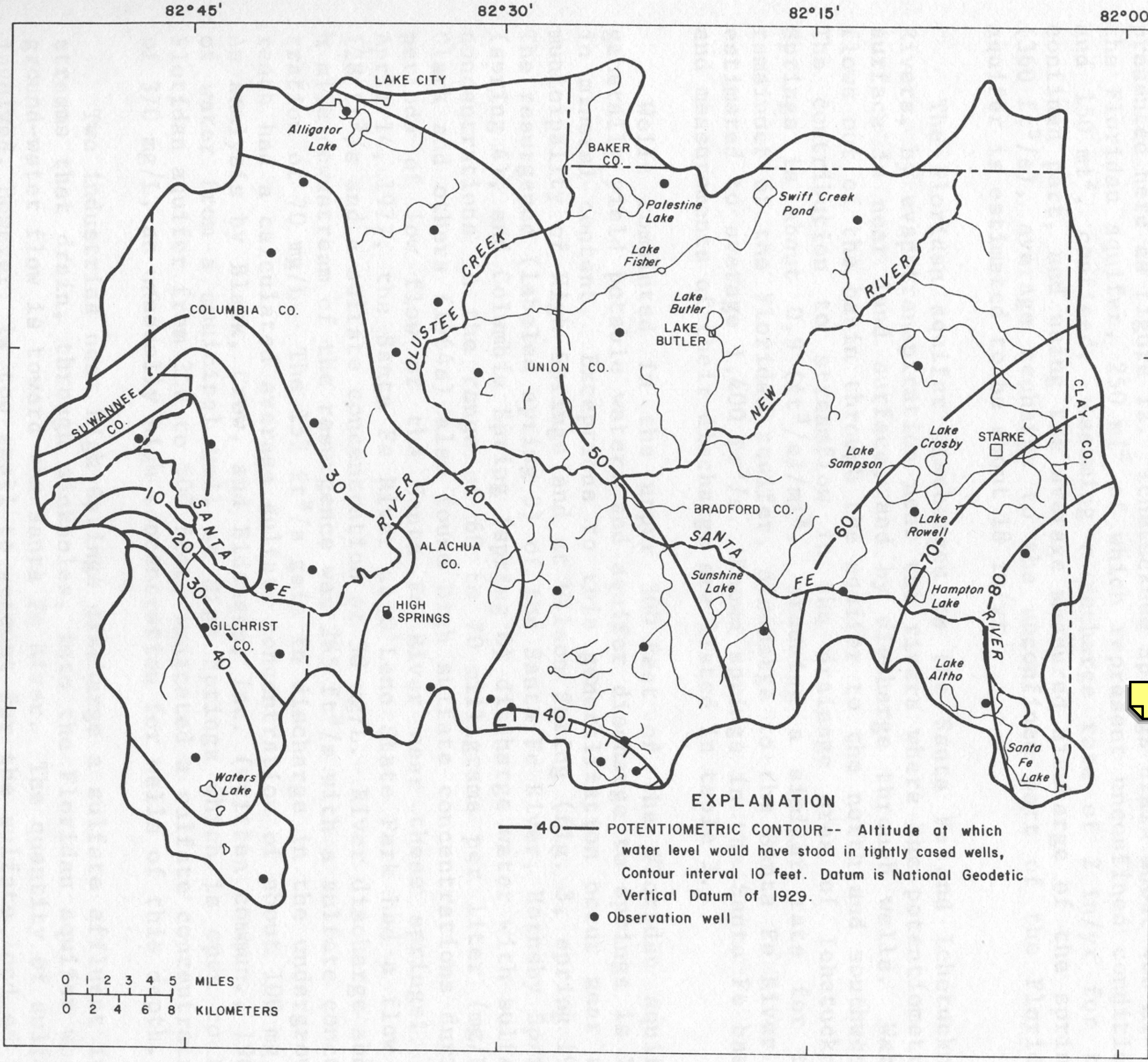
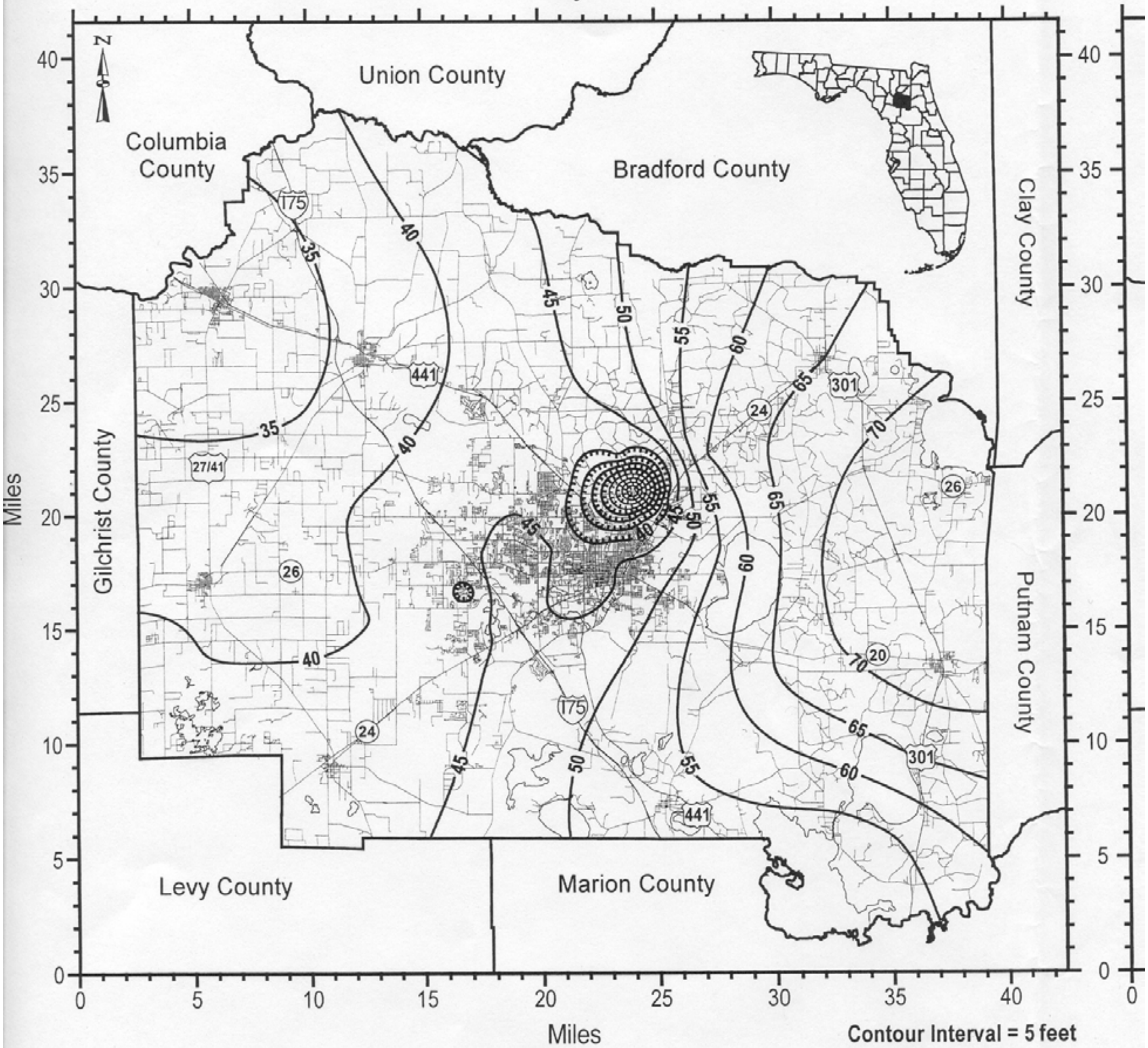


Figure 12.--Altitude of the potentiometric surface of the Floridan aquifer, May 1976 (from Fisk and Rosenau, 1977).

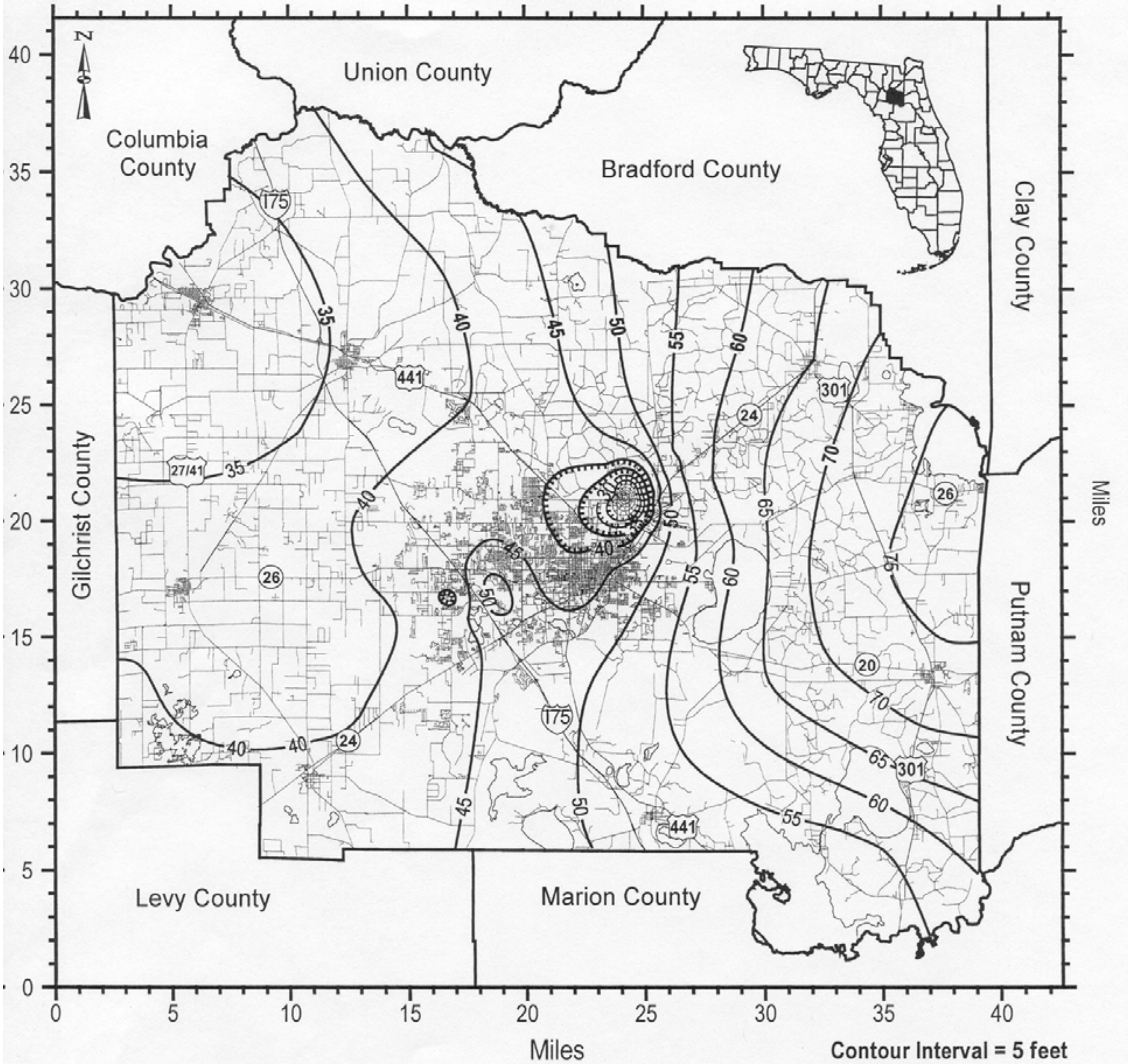
POTENTIOMETRIC SURFACE MAP OF THE FLORIDAN

May



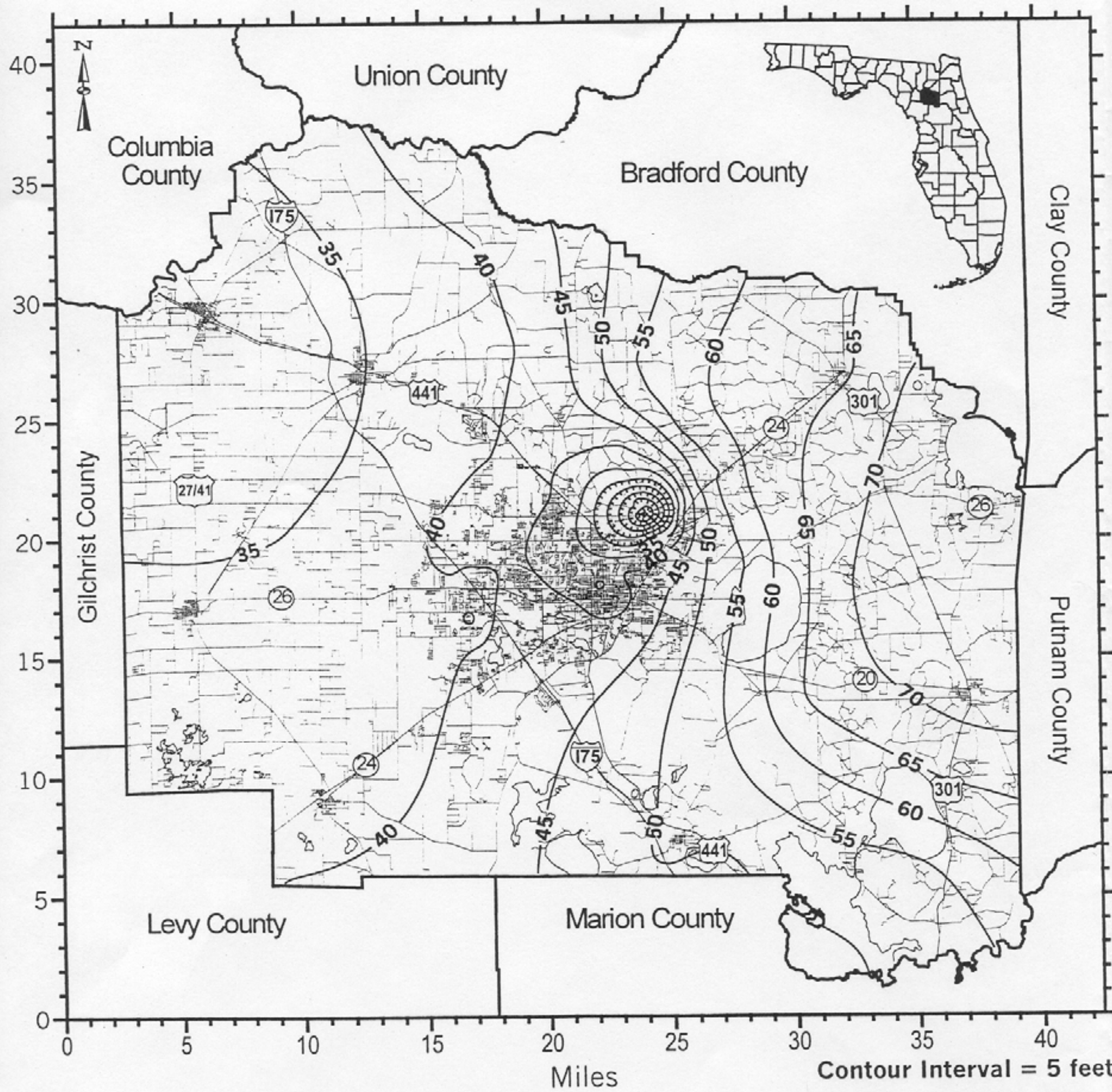
IDAN AQUIFER IN ALACHUA COUNTY FOR 2000

September



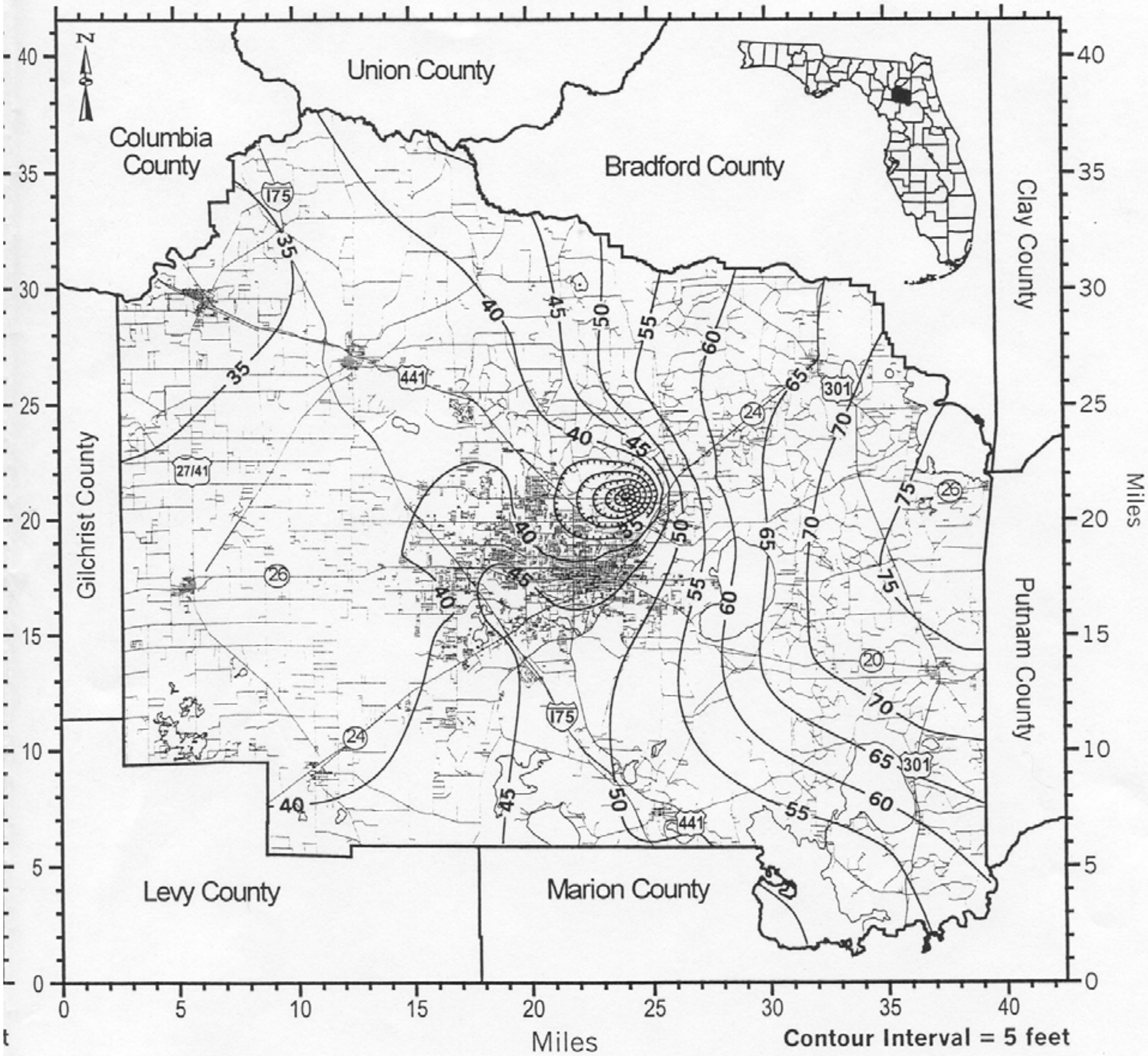
2001 Floridan Aquifer Potentiom

May



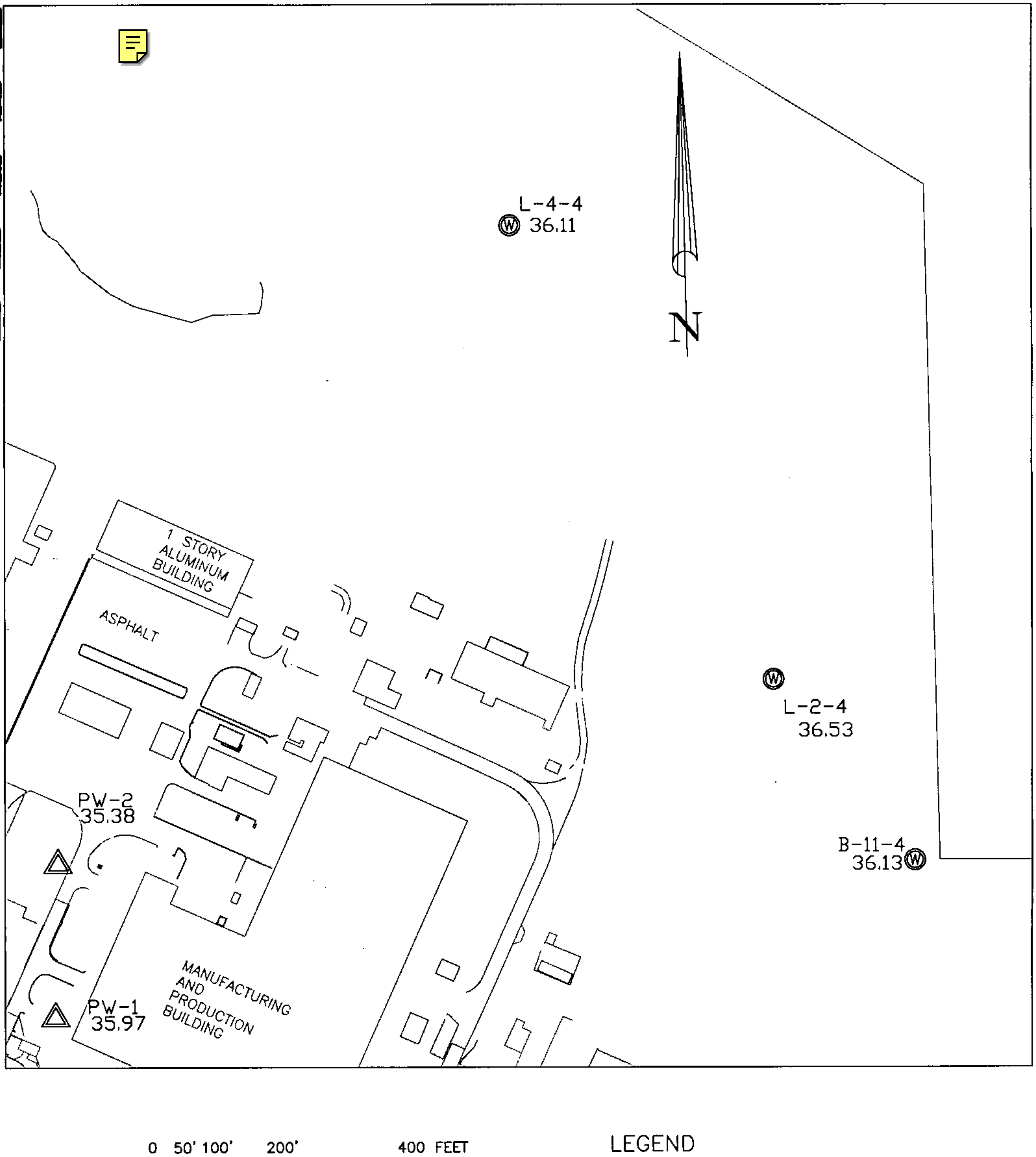
›metric Surface Map in Alachua County

September



APPENDIX VII

POTENTIOMETRIC SURFACE ELEVATIONS AT FLORIDAN AQUIFER MONITORING WELLS AT THE MOLTECH POWER SYSTEMS FACILITY, ALACHUA FLORIDA



LEGEND

PW-2 Well Designation

35.38 Water-Level Elevation Feet Mean Sea Level

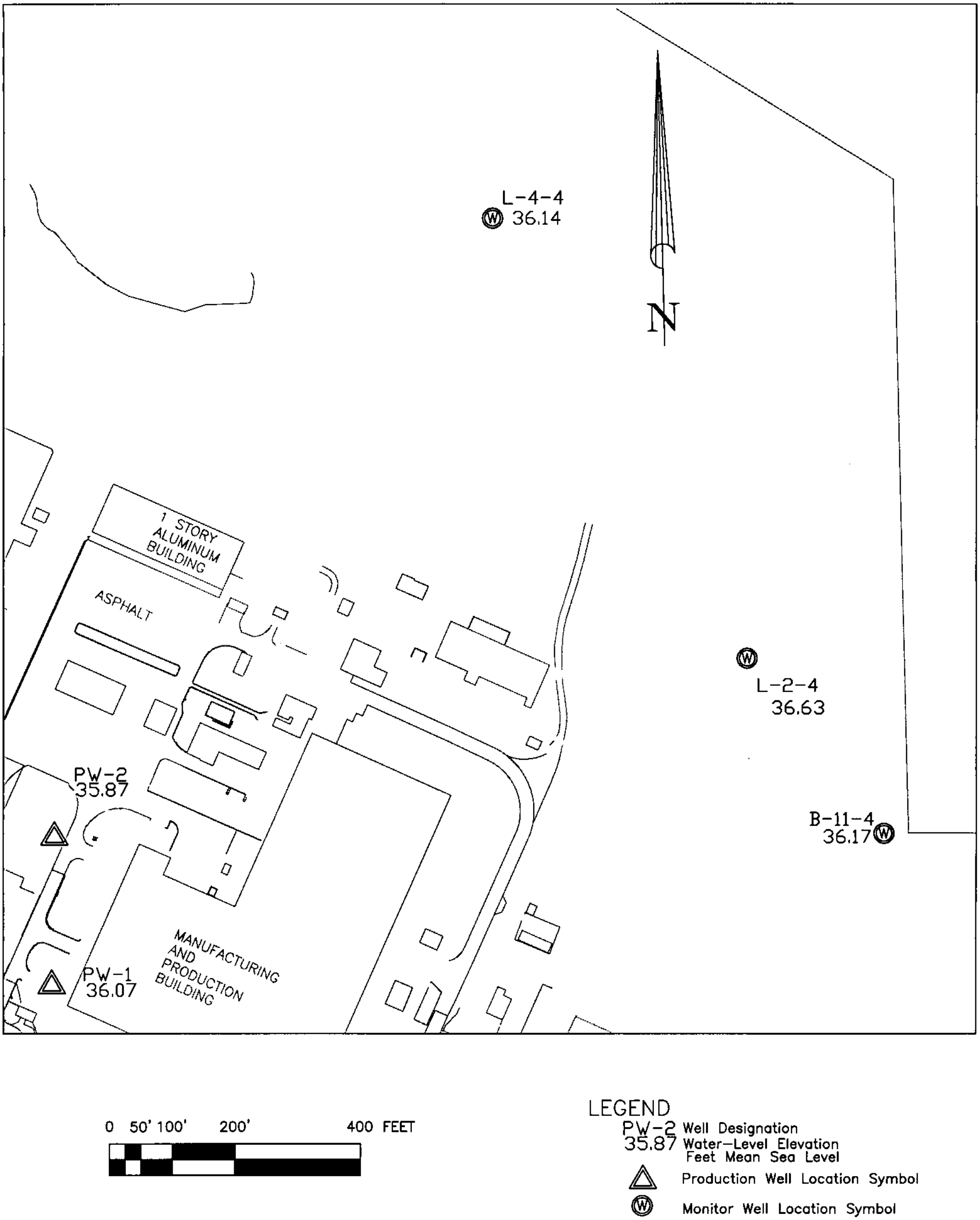
△ Production Well Location Symbol

Ⓦ Monitor Well Location Symbol

MOLTECH POWER SYSTEMS

FIGURE 4. FLORIDAN AQUIFER WATER-LEVEL ELEVATIONS ON FEBRUARY 6, 2003

TERRA Environmental Services, Inc.



MOLTECH POWER SYSTEMS

FIGURE 5. FLORIDAN AQUIFER WATER-LEVEL ELEVATIONS ON FEBRUARY 18, 2003

TERRA Environmental Services, Inc.

Table 1

Construction Details for Monitor and Production Wells Completed in the Floridan Aquifer

Moltech Power Systems, Inc.
Gainesville, Florida

Well Identification	Casing Material	Casing Diameter (inches)	Depth (feet below land surface)	
			Total	Cased
B-11-4	PVC	2	145	135
L-2-4	PVC	4	147	NA[\1]
L-4-4	PVC	2	146	136
PW-1	Steel	12	430	180
PW-2	Steel	12	472	171

[\1] NA = Not Available

TERRA
Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: L-4-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **146 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depth Shown**		Start Date: **1/14/03** End Date: **1/16/03**

WELL CONSTRUCTION LOG

Portland cement grout from 0 to 129 feet below grade.

2" Sch. 80 PVC Well Casing from 0 to 136 feet below grade

Recovery %	Drilling Method	Type	Depth	Lithologic Description
100	HAND AUGER	GRAB		SAND, fine grained, dry, trace silt, stems and leaves
			1	Same as above (SAA), black 10YR2/1, dry, very loose
				SAA, moist, no organics, very dark gray 10YR3/1
			5	
	ROTARY SONIC	CONTINUOUS CORE		SAND, fine grained, loose, trace silt, saturated, dark gray 10YR4/1,
				SAA, grades to gray 10YR6/1
100			10	
				SAA, grades to light gray 10YR7/2, slight increase in silt content
				SAA w/indurated sand nodules-25%
			15	SAND, silty, saturated, white 10YR8/1, indurated sand nodules 1"-2" diameter, trace clay
				SAND, clayey, trace marl, color is SAA
100			20	
				SAND, fine grained, clayey (< 50%), trace silt, medium plasticity, soft, light greenish gray 10Y8/1
				CLAY, sandy, moist, stiff, low plasticity, 10GY7/1, trace reddish yellow-increasing w/ depth
			25	CLAY, sandy, stiff, low plasticity, reddish yellow 7.5YR5/8
			30	CLAY, sandy, SAA but 20% light greenish gray 10GY7/1

TERRA Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: L-4-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **146 fe**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inche**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depth Shown**	SAMPLE	Start Date : **1/14/03** End Date: **1/16/03**

WELL CONSTRUCTION LOG	RECOVERY %	DRILLING METHOD	Graphic Log	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
	100	ROTARY SONIC		CONTINUOUS CORE		SAA, 5GY6/1
					35	SAA, trace indurated sand nodules, sand increasing w/depth
	100				40	
					45	SAA, 20% fine sand, greenish gray 10GY6/1
						SAND, clayey, loose, moist, color is SAA
						CLAY, sandy, medium stiff, slightly moist, interbedded seams of loose clayey sand, light greenish gray 5G7/1
	100				50	
					55	
					60	

TERRA Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: L-4-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **146 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 Inches**	Well Diameter: **2 Inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depth Shown**	SAMPLE	Start Date : **1/14/03** End Date: **1/16/03**

WELL CONSTRUCTION LOG	RECOVERY %	DRILLING METHOD	Graphic Log	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
	100	ROTARY SONIC		CONTINUOUS CORE		SAND, clayey, loose, light greenish grey 5GY8/1
						CLAY, sandy, medium stiff, low plasticity, moist
						CLAY, trace silt/very fine sand, moist, very stiff, 10GY5/1
					65	
	NO RETURN					No Return
					70	
					75	
	100					CLAY, sandy, moist, stiff, light greenish gray 10Y8/1
						LIMESTONE, poorly indurated, wet, cherty, with little silt, sand and clay, pale greenish yellow 10Y8/2
					80	
						CLAY, sandy, medium stiff, low plasticity, moist, white 5Y8/1
						SAND, clayey-30% clay, trace moisture, medium dense, color is SAA
					85	
	70				90	

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Lithologic Log and Well Construction Diagram

Well Identification: L-4-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **146 fe**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inch**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depth Shown**	SAMPLE	Start Date : **1/14/03** End Date: **1/16/03**

WELL CONSTRUCTION LOG	RECOVERY %	DRILLING METHOD	Graphic Log	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
		ROTARY SONIC		CONTINUOUS CORE	95	
						SAND, clayey, trace LS pebbles, wet, pale yellow 5Y7/3
						SILT, clayey, loose/soft, trace very fine sand, moist, white 5Y8/1
						LIMESTONE, well indurated, dry, very light gray N8
	100				100	
						LIMESTONE, poorly indurated, trace clay, dry, very pale orange 10YR8/2
						CLAY, calcareous, dry, brittle, white N9
						Same as 101', but 10% clay, pinkish gray 5YR 8/1
					105	
						LIMESTONE, poorly indurated, moist, trace shell fragments, trace cherty
						LIMESTONE, occasional well indurated LS pebble up to 3 inch diameter, white 5Y8/1
	100				110	
					115	
						SAA, wet
						SAA, shell fragments increased to 20%, 10% cherty pebbles
					120	

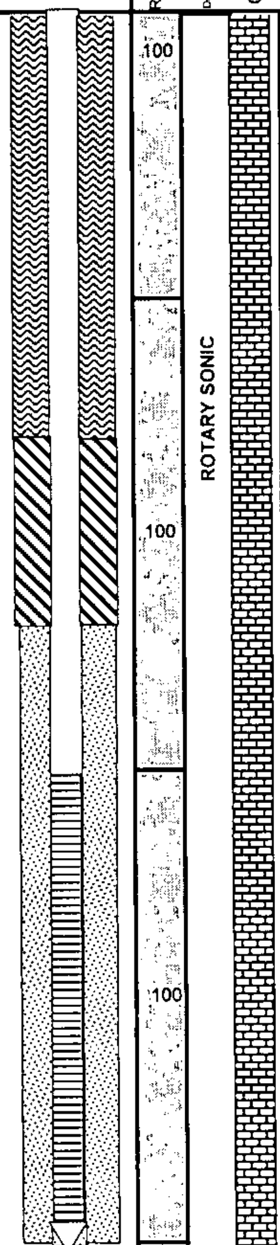
TERRA Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: L-4-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **146 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depth Shown**	SAMPLE	Start Date : **1/14/03** End Date: **1/16/03**

WELL CONSTRUCTION LOG



Bentonite Pellet Seal from 129 to 133 feet

20-30 Graded Silica Sand from 129 to 133 feet

2" Screen from 136 to 145.5 feet below land surface

Slot size = 0.010 inches

PVC Cap, pointed

RECOVERY %	DRILLING METHOD	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
100	ROTARY SONIC	CONTINUOUS CORE	125	
100			130	SAA, light pinkish gray 5YR8/1
			135	
100			140	LIMESTONE, well indurated, 5YR8/1
				LIMESTONE, poorly indurated, 20% shell fragments, trace clay, color is SAA
			145	Same as 142'
			146	Total Depth

TERRA Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: B-11-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **145 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depths Shown**	SAMPLE	Start Date : **1/16/03** End Date: **1/18/03**

WELL CONSTRUCTION LOG

Portland cement grout from 0 to 130 feet below grade.

2" Sch. 80 PVC Well Casing from 0 to 135 feet below grade

RECOVERY %	DRILLING METHOD	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
100	HAND AUGER	GRAB		SAND, fine grained, damp, loose, well sorted, dark reddish brown 5YR3/2
			1	Same as above (SAA), trace silt, light brownish gray 10YR6/2
			5	SAA, very pale brown 10YR8/2
	ROTARY SONIC	CONTINUOUS CORE		SAA, dry, very pale brown 10YR7/2
				SAA, moist, brown 10YR 4/2
			10	
100				SAA, wet, dark grayish brown 10YR4/2
				SAA, saturated
			15	
				SAA, pale brown 10YR6/3 grading to light gray 5Y7/1
				SAND (40%), CLAY (40%), trace marl and black sand (phosphatic), moist
				CLAY, medium stiff, medium plasticity, trace to little fine sand damp, light greenish gray 5GY7/1
			20	SAND, loose, fine, wet, trace clay, trace black sand, light greenish gray 10Y7/1
100				SAA, 20% Clay
				Same as 16 feet depth description
				Same as 19.5 feet depth description
				CLAY, sandy-40%, fine grained, wet
			25	CLAY, sandy-20%, saturated, fine grained, trace limestone pebbles, light greenish gray 10Y8/1
				CLAY, trace fine sand, medium stiff, plastic, light greenish gray 5GY8/1
				CLAY, brittle, moist, soft, olive yellow 2.5Y6/8 CLAY, sandy, saturated 15% black pebbles (phosphatic)
				LIMESTONE, well indurated
			30	LIMESTONE, saturated, 10% clay, 2.5Y8/1

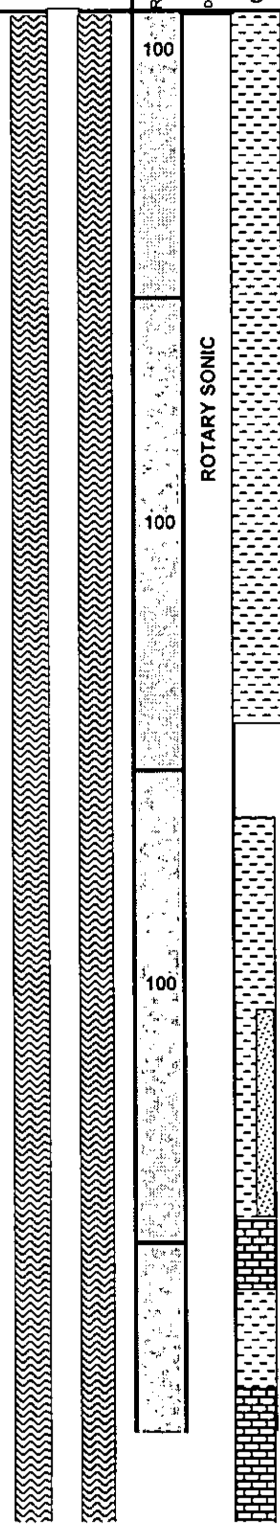
TERRA Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: B-11-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **145 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depths Shown**	SAMPLE	Start Date : **1/16/03** End Date: **1/18/03**

WELL CONSTRUCTION LOG



RECOVERY %	DRILLING METHOD	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
100	ROTARY SONIC	CONTINUOUS CORE		
			35	LIMESTONE, clayey, poorly indurated, saturated, light greenish gray 5GY8/1
				CLAY, stiff, low plasticity, trace fine sand, wet, greenish gray 10Y7/1
				CLAY, very stiff to hard, damp, trace fine sand, grayish green 5G5/2
			40	
100				
			45	
				SAA, trace fine sand, brownish yellow 10YR6/8
				CLAY, wet, pale yellow 5Y8/410% very fine sand, 15% LIMESTONE pebbles, 10% iron stains that are yellowish red 5YR5/8
				CLAY, sandy, medium stiff, slightly moist, intermittent seams of loose clayey sand, light greenish gray 5G7/1
			50	
100				SAND (40%), very fine grained, 40% clay, 15% silt, trace LS pebbles, fossil plant/coral present at 51-51.5 feet, pale yellow 5Y7/3
			55	
				SANDSTONE/LIMESTONE, calcareous/granular, moderate to well indurated, little clay, light gray 5Y7/2
				CLAY, sandy, very stiff, 30% very fine grained sand, trace iron stains, slight plasticity, dry, pale yellow 5Y8/2
				Same as 55.5 feet description, but white 5Y8/2
			60	

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Lithologic Log and Well Construction Diagram

Well Identification: B-11-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **145 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depths Shown**	SAMPLE	Start Date : **1/16/03** End Date: **1/18/03**

WELL CONSTRUCTION LOG	RECOVERY %	DRILLING METHOD	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
	100	ROTARY SONIC	CONTINUOUS CORE	65	LIMESTONE, well indurated, 20% very fine to fine sand, moist
					SAND, silty, 10% LIMESTONE pebbles, wet
	100			70	CLAY, trace silt , very low plasticity, dry, greenish gray 5G5/1
					CLAY/SAND
					Same as 69.5 foot description, but 5G6/1
					Same as 70. foot description, damp, silty, light greenish gray 5G7/1
				75	
					SAND, clayey, moist, light greenish gray 10GY7/1
	100			80	
					SAND, very fine to fine grained, trace silt, moist, color is 5GY8/1
					SAA, trace clay nodules
				85	CLAY, medium stiff, damp, high plasticity, greenish gray 10GY6/1
	100			90	

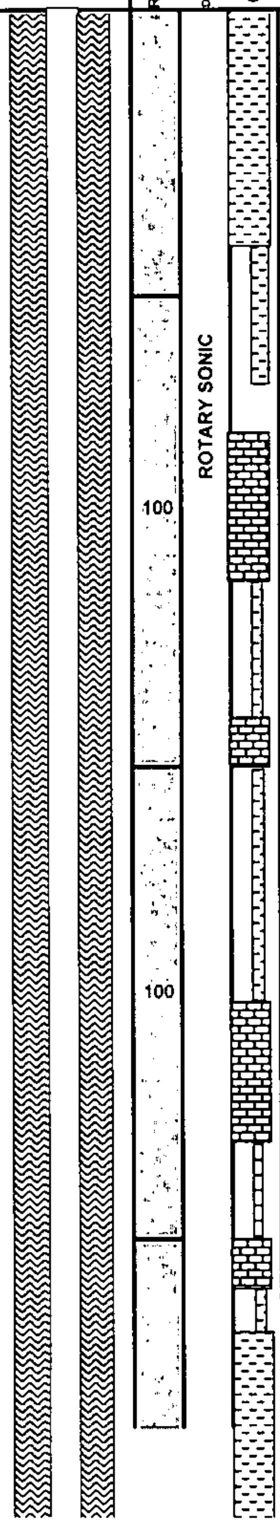
TERRA
Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: B-11-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **145 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depths Shown**		Start Date : **1/16/03** End Date: **1/18/03**

WELL CONSTRUCTION LOG



SAMPLE: RECOVERY % — 100, 100; DRILLING METHOD — ROTARY SONIC; TYPE — CONTINUOUS CORE

DEPTH	LITHOLOGIC DESCRIPTION
	SAA, grades to stiff and 10GY5/1
	SAA, trace silt/very fine sand
	SAA, low to medium plasticity
95	CLAY/SILT, silty/clayey, dry, brittle, trace LIMESTONE pebble, light greenish gray 10Y8/1, seams w/higher clay content are greenish gray 5G6/1
	SILT, loose, 10% clay, trace LIMESTONE pebbles, dry, white 5Y8/1
	LIMESTONE, well indurated, dry, white N8/1
100	LIMESTONE, dry, broken/loose, color is SAA
	LIMESTONE, silty, damp, loose, light greenish gray 5GY8/1
	SILT, clayey, loose, damp, light greenish gray 10Y7/1
105	MUDSTONE, well indurated, dry, light greenish gray 10GY8/1
	Same as 102 foot description, but saturated due to drilling fluid, light greenish grey 5GY7/1
	SAA, moist.
110	
	LIMESTONE/SILTSTONE, grainular/15% very fine sand, moderately indurated, dry, light greenish gray 10Y7/1
	SAA, well indurated
115	SILT, w/ brittle clay, semiconsolidated, 15% LIMESTONE pebbles, 10% coarse to very coarse calcareous sand
	SILT, clayey, 10% very fine sand, damp, loose to medium dense.
	LIMESTONE, well indurated
	SILT, clayey, 10% LIMESTONE pebbles, trace very fine sand, loose, light greenish gray 5GY8/1
	CLAY, silty, trace very fine sand, stiff, damp, greenish gray 5GY6/1
120	

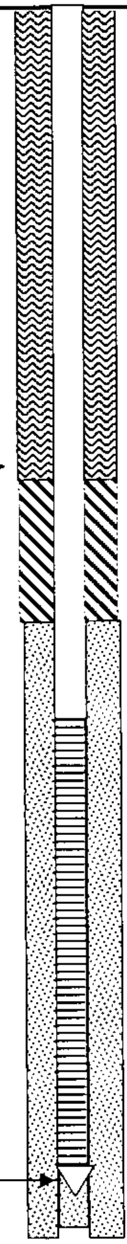
TERRA
Environmental Services, Inc.

Lithologic Log and Well Construction Diagram

Well Identification: B-11-4

Client: **Moltech Power Systems**	Total Depth[1]: **146 feet**	Location: **U.S. Highway 441 North, Alachua County, Florida**
Site: **Alachua, FL**	Total Depth of Well: **145 feet**	Drilling Method: **Sonic** Contractor: **Prosonic** Driller: **Chuck Wilson**
Scientist: G. O'Neal	Borehole Diameter: **6 inches**	Well Diameter: **2 inches** Well Material: **PVC, Schedule 80**
Vertical Scale: **Depths Shown**	SAMPLE	Start Date : **1/16/03** End Date: **1/18/03**

WELL CONSTRUCTION LOG	RECOVERY %	DRILLING METHOD	Graphic Log	TYPE	DEPTH	LITHOLOGIC DESCRIPTION
	100	ROTARY SONIC		CONTINUOUS CORE		
						LIMESTONE, well indurated, light greenish gray 10Y8/1
					125	
						CLAY, silty, moist, medium stiff, low plasticity, grayish brown 10YR8/1
						LIMESTONE, 50% shell fragments, 50% LS pebbles and cobbles that are well indurated, saturated, white 10YR8/1
Bentonite Pellet Seal from 130 to133 feet					130	
	100					SAA, trace clay
						Same as 127 foot description
20-30 Graded Silica Sand from 133 to bottom of hole						
					135	
2" Screen from 135 to 144.5 feet below land surface						
Slot size = 0.010 inches						
						SAA, trace clay
					140	Same as 127 foot description, trace of entact bivalve halves (scallops)
	100					
						SAA, trace clay
PVC Cap, pointed					145	
					146	Total Depth



APPENDIX VIII

COMPILATION OF REPORTED WATER WELL DATA IN ALACHUA COUNTY FLORIDA AND PROXIMITY TO THE MOLTECH POWER SYSTEMS FACILITY

Table-1: Moltech Area Potable Well Information
Alachua County, Florida

	X	Y
Moltech Location (GIS #83):	551239.98	641774.82

First six entries are ranked in order of perceived worth as a sampling point based on location and open-hole interval
Remaining entries are ordered by direction and distance to Moltech facility

GIS Well-ID	Loc. Rating	Dist. (m)	Dir.	Drilling Permit	Date Issued	Well Owner	Well Use Code	Casing Depth (Feet)	Bore Depth (Feet)	Static Water Level (Feet)	TRS	LL (DD.DDDD)	LN (DD.DDDD)	Well Owner Address
49	2	820	E	68764	8/10/1999	EDWIN CHERENA	R	96	139	100	-81921	29.7731549	-82.425239	8401 NW 13th St #73 Gainesville, FL 32653
33	3	1040	E	60560	3/10/1997	LAMONTA DOUGLAS	R	95	120	124	-81928	29.7705792	-82.423708	6907 NW 126 Ave Gainesville, FL
53	3	1050	N	71340	4/20/2000	INA SUMMERS	R	70	105	45	-81920	29.7830511	-82.437473	11426 Sage BLvd Alachua, FL 32615
46	3	1140	E	67704	5/5/1999	EDITH RILEY	R	78	140	19	-81921	29.7732495	-82.421817	12814 NW CR 232 Alachua, FL
77	4	1500	SE	14334	7/7/1982	JERRY SWEARINGTON	R	62	131	92	-81928	29.7665266	-82.420783	927 NW 40th Drive Gainesville, FL 32605
15	1	1510	E	35346	11/8/1989	NELSON CITTA	R	74	175	132	-81921	29.7703	-82.4186	Gainesville, FL 32601
23	1	1060	W	51785	9/27/1994	DWAIN JOHNSTON	P	11	185	86	-81919	29.7775	-82.4439	42161 143rd St. Gainesville, FL
84	1	1710	E	W5264	NA	UF-DAIRY	NA	0	154	45	-81921	29.7672959	-82.419899	Rt 3 Box 73 Gainesville, FL 32611
31	3	1230	E	59541	10/30/1996	LONNIE VANN	R	0	215	12	-81921	29.7746222	-82.420838	12901 NW CV 237 Alachua
75	4	1940	NW	11434	4/22/1981	J BUSBY	R	0	83	0	-81919	29.7836297	-82.450476	Alachua, FL
01	3	2310	SE	11863	6/15/1981	HARRY DAUGHERTY	R	0	140	80	-81928	29.763855	-82.412791	3502 Creek Drive West, Alachua FL 32615
02	1	2510	SE	2032	1/26/1977	TURKEY CREEK INC	I	97	184	92	-81928	29.7575	-82.4161	6600-1 NW 22nd Gainesville, FL 32601
03	4	2510	SE	22304	12/3/1985	JOHN V SMITH	I	84	125	80	-81928	29.7564101	-82.417598	3534 Creek Drive W, Alachua FL 32615
05	3	1200	E	28661	9/21/1987	DONALD KING	R	193	240	103	-81921	29.7736786	-82.4212	Rt. 3 Box 146 Alachua, FL 32615
06	3	1300	E	28881	10/20/1987	RICK R BUMPUS	R	105	150	37	-81921	29.7737991	-82.420109	Rt. 3 Box 152 Alachua, FL 32615
07	1	2010	W	29353	12/14/1987	CITY OF ALACHUA	P	162	200	74	-81919	29.7739	-82.4544	P.O. Drawer 9, Alachua FL 32615
08	3	1600	SE	30064	3/4/1988	JOHN VAN MILLS	R	105	125	79	-81928	29.7655376	-82.420296	n/a
09	3	710	SE	30125	3/10/1988	SMYDER MOTORS	P	119	180	104	-81929	29.7696171	-82.428441	P.O. Box 842 Alachua, FL 32615
11	1	900	SE	32136	11/9/1988	JERRY AUSTIN	R	117	142	93	-81920	29.77	-82.4256	Rt. 3 Box 107-A Gainesville, FL 32606
14	1	1360	E	35075	10/19/1989	HAGUE METHODIST CHURCH	P	143	200	124	-81928	29.7694	-82.4206	Rt. 3 Box 84G Gainesville, FL 32606
16	2	1150	E	36208	2/9/1990	U OF F/DEPT OF ENT	O	104	188	122	-81921	29.7771199	-82.422174	3085 McCarty Hall Gainesville, FL 32611
18	4	1290	E	41018	7/15/1991	BETTY SEAL	R	126	170	120	-81928	29.7704345	-82.420921	12606 NW 69 Terr. Gainesville, FL 32606
19	3	1050	E	43930	7/27/1992	RAY CARTER	R	120	170	97	-81921	29.7710501	-82.423349	Rt. 3 Box 192 Alachua, FL 32034
21	4	910	SW	47454	8/11/1993	ALACHUA CO OFC OF ENV	M	25	54	26	-81937	29.7672964	-82.438697	One SW 2nd Place Gainesville, FL 32601

GIS Well-ID	Loc. Rating	Dist. (m)	Dir.	Drilling Permit	Date Issued	Well Owner	Well Use Code	Casing Depth (Feet)	Bore Depth (Feet)	Static Water Level (Feet)	TRS	LL (DD.DDDD)	LN (DD.DDDD)	Well Owner Address
22	3	2310	E	49667	3/4/1994	B & C CRANE SERVICE	P	72	230	133	-81928	29.7674613	-82.410963	Gainesville, FL
24	3	1390	E	53379	2/23/1995	S L ROGERS JR	R	137	175	125	-81921	29.7737512	-82.419216	Rt. 9 Box 1424 Gainesville, FL 32609
25	4	2210	E	53936	4/11/1995	CLIFFORD & SANDRA MARTIN	M	12	12	0	-81928	29.7665122	-82.412524	605 SE Depot Ave. Gainesville, FL 32606
26	4	2100	E	54080	4/25/1995	U OF F DAIRY POULTRY	I	255	335	125	-81921	29.7756973	-82.411887	13200 NW 59th Drive Gainesville, FL 32606
27	4	2350	NW	56026	10/30/1995	JACK OLIVER	I	180	220	95	-81919	29.7826358	-82.455873	P.O. Box 40 Alachua, FL 32615
29	3	2320	SE	58916	8/16/1996	CITY OF ALACHUA	M	40	50	20	-81928	29.7607627	-82.415267	P.O. Box 9 Alachua, FL
32	3	170	E	60340	2/18/1997	ENERGIZER	M	20	35	10	-81920	29.7742132	-82.431805	n/a
34	3	1010	E	61546	6/13/1997	JOSE E VERTIG	R	106	170	105	-81921	29.7718895	-82.423434	7206 NW 127 Place Alachua FL
35	1	2380	E	62067	8/19/1997	RICHARD MCGINLY	P	160	217	142	-81928	29.7689	-82.4097	6602 NW 169th Alachua, FL 32615
36	3	2310	E	62068	8/18/1997	RICHARD MCGINLY	P	175	197	142	-81928	29.7678844	-82.410839	6602 NW 169th Alachua, FL 32615
37	3	1100	E	64318	5/21/1998	Q N RILEY JR	R	183	200	142	-81921	29.7726492	-82.42237	12818 NW CTY R8 237 Alachua, FL 32615
38	3	1600	W	64759	6/26/1998	BARNEY CRUCE	R	100	120	50	-81919	29.7790295	-82.449235	907 NW 25th Ave Gainesville, FL 32609
39	3	1130	SE	65264	8/13/1998	JOHN FREELAND	R	165	175	127	-81928	29.7685525	-82.423825	7114 NW 126 Ave Alachua, FL 32615
41	3	970	SE	66553	1/19/1999	GLENN HARELL	R	168	180	115	-81920	29.770682	-82.424426	7515 NW 126 Ave Alachua, FL 32614
43	3	1450	E	66675	1/28/1999	DARRELL DOUGLAS	R	180	220	160	-81928	29.7694909	-82.419584	16913 NW 126 Ave Gainesville, FL 32653
47	3	950	E	67746	5/7/1999	RONALD CLARK CONSTRUCTION	R	128	160	113	-81921	29.7713824	-82.42435	Alachua, FL
48	2	1520	E	68205	6/16/1999	HOUSE CRAFT HOMES	R	189	200	150	-81928	29.7694448	-82.418869	12523 Martin Luther King Hwy Alachua, FL 32615
50	1	1400	SE	68880	8/20/1999	HAGUE CEMETARY ASSOCIATION	H	189	200	125	-81928	NM	NM	P.O. Box 946 Alachua, FL 32616
52	1	2010	W	71167	4/3/2000	HICKS IND.	H	180	220	75	-81937	29.7753	-82.4544	P.O. Box 14016 Gainesville, FL 32614
54	4	1270	E	71655	5/12/2000	WILLIAM SEATON	R	153	170	121	-81928	29.7715705	-82.420817	12628 NW 69th Terr. Alachua, FL 32615
55	3	1210	SE	73621	11/15/2000	LAND O' SUN MANAGEMENT	A				-81928	29.7691257	-82.422531	3715 NW 97th BLVD Suite A Gainesville, FL 32606
56	3	2000	W	77264	10/30/2001	J. F. MCCALL	A				-81919	29.778321	-82.453778	13932 NW US HY 441 Alachua, FL
57	3	240	SE	74882	3/28/2001	MOLTECH	A				-81920	29.7730913	-82.431473	Hwy 441 Hague Alachua, FL 32615
59	3	1170	NW	77914	1/15/2002	SOUTHERN PRECAST	C	240	160	120	-81920	29.7809308	-82.442865	13365 S. Procast Dr. Alachua, FL 32615
61	4	1190	E	78818	4/9/2002	MIKE KELLY	R	149	170	127	-81928	29.7705229	-82.422053	P.O. Box 1743 Alachua, FL 32616

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62	2	2360	SE	79871	7/10/2002	TURKEY CREEK , INC	H	168	210	127	-81928	29.7648159	-82.411677	158 Turkey Creek Alachua, FL
63	3	1120	E	80317	8/23/2002	SARA WRIGHT	R	174	210	124	-81921	29.7705124	-82.422816	7124 NW 126th Ave Alachua FL
64	3	1190	E	81044	11/13/2002	DONALD KING	R	106	120	30	-81921	29.7744186	-82.421276	12917 NW CR 237 Alachua, FL 32615
66	3	220	NE	81551	1/10/2003	MPS HOLDINGS, INC.	M	136	146		-81920	29.7758487	-82.432304	US Hwy 441 N Gainesville, FL 32615
71	3	2170	W	18038	4/13/1984	JOHN SHOLTENS SR	R	125	150	100	-81919	29.7776745	-82.455692	P.O. Box 448 Gainesville, FL 32602
74	3	2430	SE	11980	6/29/1981	ARTHUR REED	R	0	125	79	-81928	29.7586275	-82.415887	3510 Creek Drive Alachua, FL 32615
78	4	2060	W	9507	5/22/1980	MR RUSSEL	R	105	134	0	-81919	29.7794988	-82.454022	Alachua FL 32615