

**CONTAMINANT TRANSPORT INVESTIGATION
FROM AN ONSITE WASTEWATER TREATMENT
SYSTEM (OWTS) IN FINE SAND**

Phase 3 Report

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1.0 INTRODUCTION

The Soap and Detergent Association (SDA) retained Ayres Associates (Ayres) to investigate the occurrence of various chemical constituents in wastewater and groundwater below and downgradient of an onsite wastewater treatment system (OWTS) in Florida. The purpose of the investigation was to characterize the septic tank effluent (STE) of the OWTS and to define the groundwater contaminant plume to determine if key constituents of certain household cleaning products are present in the STE and the plume. This report summarizes work completed during preliminary phases (Phase I and Phase II) of the investigation including determination of the preliminary contaminant plume and describes work conducted during the subsequent Phase III and IIIA portions of the project.

1.1 Background

Ayres Associates conducted a study of the impacts of OWTS on groundwater quality as part of the Florida Onsite Wastewater Treatment System Research Project from 1987 to 1990. An individual home in St. Johns County was chosen from this prior study by the SDA Treatability Subcommittee as a potential site for further investigation of groundwater quality impacts. The investigation specifically focused on determining the plume of impacted groundwater and subsequent evaluation of groundwater samples for key parameters of interest to the SDA.

The preliminary phase of this project (Phase I) was completed in March 1991. The objective of the first phase of the project was to attempt to delineate the effluent plume with conservative parameters such as chloride, conductivity, or nitrate-nitrogen. Once the effluent plume was delineated, a plan was to be developed for further investigation that incorporated additional parameters.

Household water use was metered during the Phase I investigation to estimate wastewater hydraulic loading to the OWTS and samples of STE were obtained to characterize the quality of the wastewater discharged to the OWTS infiltration system. Three groundwater piezometers were installed to determine groundwater flow direction. A stainless steel probe system, originally designed for soil gas monitoring in the unsaturated zone, was used to obtain groundwater samples without the time and expense of installing permanent groundwater monitoring wells. Forty-seven groundwater samples were collected and analyzed in the field for chloride, nitrate-nitrogen, and conductivity. Four groundwater monitoring wells were installed and groundwater samples for various water quality parameters were obtained to compare with the results of groundwater samples obtained with the stainless steel probe.

The results of the Phase I investigation indicated:

- 1) Groundwater flow direction was south-southwest.
- 2) Wastewater flow was estimated to be 168 gallons per day (gpd).
- 3) Surfactant concentrations in septic tank effluent, as measured by methylene blue active substance (MBAS) analyses, were two to three times higher than those measured previously and significantly higher than any household samples collected as part of the Florida OWTS Research Project. Additional sampling of STE was recommended to determine the accuracy of the MBAS sampling and analysis.
- 4) The field analyses of conservative groundwater quality parameters indicated two areas of potential impact. One area was upgradient (east) of the infiltration system and one area was downgradient (southwest). The cause of the impacted area east of the system was not determined. Effluent impact on groundwater in the area downgradient of the OWTS did not extend further than approximately 10 to 15 feet from the system. This finding indicated that there was either an extremely slow rate of horizontal groundwater movement, which was contradictory to those groundwater velocities calculated during the previous OWTS study, or that vertical movement of groundwater may have carried contaminants to a deeper level.

Based on these results, a second phase of work was recommended including: the collection of additional water use data and STE quality data; the installation of nested sets of shallow and deep groundwater monitoring wells; the installation of a more permanent downgradient miniature monitoring well network; collection and laboratory analysis of groundwater samples from the miniature wells; and the preparation of a data summary report. The SDA contracted Ayres Associates to conduct the Phase II investigation in May 1992. The work was completed in January 1993. Results of the Phase II investigation included:

- 1) Average concentrations of several STE parameters were increased over the concentrations found in the previous Florida OWTS Research study and the concentrations appeared to have increased over time, particularly between 1992 and 1993. The average concentration of MBAS was six times the average of the previous study and average values for total kjeldahl nitrogen (TKN) and chloride were approximately twice those of the previous study.
- 2) The total nitrogen average in STE for this study phase (75.5 mg/L) was higher than the normal range of values for total nitrogen in STE found in the literature.

Literature values for total nitrogen in STE range from 29.8 to 60.8 mg/L (Stolt and Reneau, 1991, and Ayres Associates, 1989).

- 3) The average daily wastewater flow was estimated to be 186 gpd and the estimated wastewater loading to the infiltration area was 0.89 gpd/ft². The drainfield trenches were ponded with wastewater indicating potential failure of the infiltration system.
- 4) The surficial groundwater flow direction was south-southwest at a gradient of 0.0027 feet/foot. Depth to groundwater at the site during this study phase ranged from approximately 1.5 to 5 feet below ground surface (bgs). Depth to groundwater in November 1990 ranged from five to six feet bgs.
- 5) At the time of the highest measured groundwater levels (January 12, 1993) the thickness of unsaturated soil below the OWTS infiltration system was only 0.34 feet.
- 6) With the exception of the southeast corner of the property, the groundwater flow appeared to have a very low vertical component. The vertical gradient at the nested set of monitoring wells in the southeast corner of the site was approximately the same as the horizontal groundwater gradient which indicated that groundwater in this area may move downward as it moves downgradient of the site.
- 7) Grainsize analyses of soil samples obtained from boreholes at the site indicated that the soils were primarily composed of fine sand to a depth of 50 feet bgs.
- 8) The contaminant plume appeared to have increased in horizontal extent since the last sampling event approximately two years previous and the total horizontal extent was not yet defined. Concentrations of parameters indicative of STE were elevated above background levels in groundwater obtained from the 6 foot depth approximately 25 feet downgradient of the OWTS.
- 9) With the exception of nitrate-nitrogen, no evidence was observed that parameters characteristic of effluent had migrated below 12 feet bgs.
- 10) The higher groundwater surface and the partial failure of the OWTS may have led to anoxic conditions beneath the infiltration area which, in turn, led to reduced nitrification at the site. As a result, ammonia nitrogen concentrations were elevated while nitrate-nitrogen concentrations were low. The concentrations of MBAS in groundwater downgradient of the system also suggested an anoxic environment. The higher groundwater table also appeared to reduce adsorption

of phosphorus. Phosphorus concentrations in groundwater closest to the infiltration area were similar to the total phosphorus concentration of the STE.

Based on the results of the Phase II investigation, further investigation was recommended including: continued monitoring of wastewater flow and composition; continued monitoring of water table elevations; the installation of additional wellpoints for collection and laboratory analysis of groundwater; and aquifer testing.

1.2 Objectives of Phase III

The objectives of the third phase of the SDA project were to continue monitoring of the contaminant plume at the OWTS of a single family home in St. Johns County, Florida, and continue to evaluate the fate and transport of key water quality parameters of interest to the SDA.

1.3 Scope of Work

In order to accomplish these objectives, Ayres Associates conducted the following scope of work:

- Performed additional monitoring of household wastewater quantity and quality to establish a history of estimated flows and loading to the infiltration system.
- Conducted a survey of household detergent usage during the study period.
- Continued to monitor groundwater elevations to develop a history of water levels and flow direction. Added an automated rainfall collection and water level equipment at the site to continuously record data.
- Conducted bromide tracer tests to more accurately determine groundwater flow direction and travel time. Results from the bromide tracer test were needed to obtain estimates of average groundwater velocity, particularly in the area of the infiltration system.
- Conducted aquifer slug tests on various wells around the OWTS for determination of saturated hydraulic conductivity and travel time in the shallow aquifer.
- Installed additional groundwater monitoring points downgradient of the OWTS to better define horizontal and vertical extent of various effluent parameters. Sampled groundwater under "worst case" (shallow groundwater table) and "best case" (deep groundwater table) conditions.

- Obtained soil cores from below the OWTS and performed analyses for bulk density, porosity, water content, and hydraulic conductivity.
- Prepared a data summary report describing results of the study.

2.0 SITE CHARACTERISTICS

2.1 Residence Characteristics

The residence utilized for this investigation is located in St. Johns County, Florida, south of the city of Jacksonville. The home is in a 200 unit subdivision located approximately one-half mile east of the St. Johns River. A general location map of the site is shown in Figure 2-1.

The residence has three bedrooms and two bathrooms and was constructed in 1976. It is served by an OWTS consisting of a 900 gallon septic tank and a 210 ft² infiltration system composed of three, 2-foot wide gravel-filled trenches. Further characteristics of the study residence are listed in Table 2-1. A plan view of the home's OWTS and backyard are shown in Figure 2-2.

Table 2-1 Characteristics of OWTS Study Site¹

Number of Residents	4
Adults	2
Children	2 (ages 7 and 11)
Lot Size	0.47 acres
Age of Home	17 years
Occupancy	11 years
Number of Bedrooms	3
Number of Bathrooms	2
Dishwasher	Yes
Clothes Washer	Yes
Garbage Disposal	No
Water Softener	No
Septic Tank	900 gallon
Date Last Pumped	August 1988
Infiltration System Area	210 ft ²
Infiltration System Type	2-foot wide, gravel-filled trenches
Effluent Distribution	Gravity flow, 4" perforated pipe

¹Based on information as of 1993

2.2 Physiography and Climate

The site is located in the physiographic province referred to as the Coastal Lowlands. The topography of the lowlands is controlled by a series of marine terraces which were formed during Pleistocene time. Elevations at the site range from 10 to 15 feet above mean sea level (MSL). Surface drainage in the area is primarily through the St. Johns River and its tributaries. The majority of surface runoff at the site is directed south-



Reference: Florida Atlas & Gazetteer,
DeLorme Mapping Co. (1989)

SCALE: 1:150,000

AYRES
ASSOCIATES

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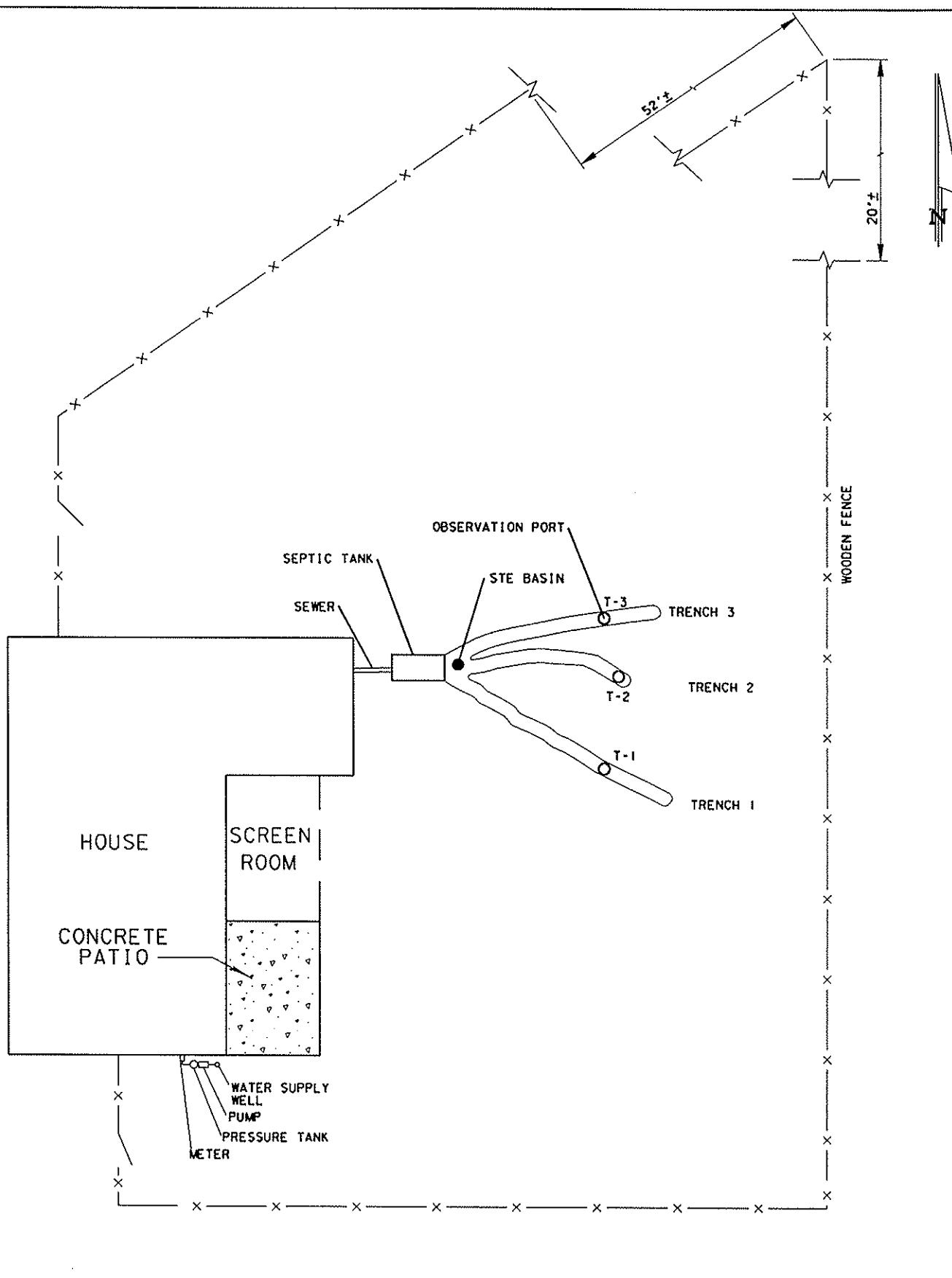
SDA ONSITE WASTEWATER
TREATMENT SYSTEM PROJECT

GENERAL LOCATION MAP

St. Johns County Subdivision
Fruit Cove, St. Johns County, Florida

FIGURE:
2.1

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DATE: 13-Apr-94 15:43



SCALE: 1"=20'

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SDA ONSITE WASTEWATER
TREATMENT SYSTEM PROJECT

SITE PLAN

FIGURE:

2-2

southeast towards a local topographic depression. Drainage ultimately enters the St. Johns River via a creek south of the site. The St. Johns River generally flows northward towards Jacksonville where it turns sharply eastward and empties into the Atlantic Ocean.

The climate of St. Johns County is subtropical and is characterized by warm, humid summers and mild, dry winters with occasional frost between November and February. Annual average rainfall is approximately 54 inches. Rainfall is seasonal with the majority falling during the months of June through September. During these months, the rain usually falls from localized heavy showers of short duration.

2.3 Regional Geology and Hydrogeology

St. Johns County is underlain by two major geologic units of differing lithologies. The uppermost unit consists of clastic sediments including poorly to moderately consolidated sand, clay, and shell material of Miocene to Holocene age. This overlies a thick sequence of limestone and dolomite, commonly referred to as the Floridan aquifer (Parker et. al, 1955). The top of the limestone of the Floridan aquifer is typically encountered at approximately 400 feet below MSL in this area.

The Floridan aquifer is the principal source of potable water in the area although potable water is also withdrawn from the surficial and the intermediate aquifers. The homes in the study area utilize private wells which are typically installed in the surficial aquifer at depths of 75 to 100 feet.

2.4 Soils

Soils throughout the subdivision were derived from sandy marine sediments. The morphology of the subdivision soils are, therefore, dominated by sandy profile descriptions.

According to the USDA Soil Conservation Service (SCS) publication "Soil Survey of St. Johns County", the site is located on Adamsville fine sand. The Adamsville series is a somewhat poorly drained soil with a rapid profile permeability. The water table is typically at 20 to 40 inches below grade for approximately two to six months of the year and below 40 inches for the rest of the year. The typical Adamsville profile has a fine sand texture throughout. Limitations for conventional septic system drainfields are classified as severe with the limitations due to wetness and poor filtration.

2.5 Site Specific Lithology

Subsurface characteristics of the site were determined from the installation of exploratory soil borings to a depth of 50 feet bgs during deep monitoring well construction and by taking representative soil samples for particle size analysis. The site's subsurface lithology consisted of approximately four units with observed differences in lithology based primarily on changes in color because the texture remained fine-grained throughout. The units and depths that were encountered during the well drilling operation were as follows: 1) very dark to dark gray fine-grained quartz sand with roots typical of topsoil, approximately 0 to 4 feet bgs; 2) a light gray to white

fine grained quartz sand with some thin gray streaks of clay, approximately 4 to 20 feet bgs; 3) light gray to light brownish gray fine-grained quartz sand, approximately 20 to 30 feet bgs; and 4) dark gray to gray fine-grained quartz sand approximately 30 to 50 feet bgs.

Particle size analyses indicated that approximately 85% to 97% by weight of the soil samples obtained were composed of fine sand. The percentage of fines (silts and clays) in the samples ranged from 0.9% to 6.0%. The samples obtained from the top few feet of sediment contained more fines than samples obtained at deeper intervals. Percentages of medium sand were generally less than 5% with the exception of soil samples obtained at approximately 27 to 32 feet bgs which contained approximately 10% medium sand. Detailed soils data obtained during drilling operations are included in Appendix B.

3.0 METHODS OF INVESTIGATION

3.1 Septic Tank Effluent (STE) Characterization

STE Quality: Effluent from the septic tank at the site was collected and analyzed for most typical STE parameters on four to five occasions prior to the initiation of this study as part of the Florida OWTS Research Project (Ayres Associates, 1989). Septic tank effluent was collected and analyzed on three occasions (November 15, 1990, November 5, 1991, and January 7, 1993) during the Phase II SDA research effort. For the Phase III investigation, septic tank effluent samples were obtained each day for seven days during the week of August 15, 1993. Additional STE samples were obtained routinely over the Phase III study period. All samples of STE were obtained from a septic tank effluent basin that was installed between the septic tank and the infiltration system. The more recent wastewater quality data were then compared with prior results and with literature values for STE quality.

STE Quantity: Wastewater flow at the home was estimated by reading water meters over several intervals during the study. The water meters were installed at several points on the household water system. A master meter was installed on the main supply line from the household well which monitored total water use. Individual meters were then installed on the exterior hose bibs to monitor outdoor water use. The home did not have an in-ground lawn sprinkler system. The home used a water to air heat pump system for household heating until August of 1993, so an additional meter was installed on the downstream side of the heat pump to monitor its water use prior to that date. By subtracting exterior water use from total water use, an estimate of interior water use could be obtained and used as an estimate of wastewater loading to the OWTS. Meter readings were also recorded immediately prior to and after the installation of monitoring wells and groundwater sampling because outside water was used during these periods. Water used during monitoring well installation and sampling was then subtracted from the total water usage.

3.2 Household Detergent Use Characterization

A homeowner's survey was conducted in June 1992 prior to the initiation of the Phase III study sampling period to determine types of cleaning products used in the home, thereby determining the types of surfactants that would potentially be found in the STE and groundwater monitoring. A second survey was conducted in February 1995 to determine if household products or habits had changed.

In addition, a homeowners detergent usage log was started in 1995 for dishwashing and laundry activities. The homeowners were asked to record the number of dishwashing events and laundry loads each day as well as the product used for each event. The homeowners also saved receipts from detergent purchases to track usage. The homeowners logs were returned to Ayres Associates where they were recorded and summarized in a database for subsequent analyses.

3.3 Temperature and Precipitation

Temperature and precipitation data for the OWTS project was collected beginning in 1994. Initially, this data was obtained from the Mandarin Middle School Science Department about 3 miles north of the study site. Temperature and precipitation monitoring were initiated directly at the study site in February 1995. A data-logging weather instrument was installed which recorded temperature and rainfall amounts every two hours and stored the data internally. This data was then routinely downloaded to a portable PC and input to a database for subsequent analyses.

3.4 Groundwater Monitoring Equipment

Three types of groundwater monitoring equipment including piezometers, groundwater monitoring wells, and a direct-push miniature wellpoint probe were used at the site.

Piezometers: Three groundwater piezometers were installed at locations around the OWTS. Piezometer locations are shown on Figure 3-1 as P1, P2, and P3. Piezometers were constructed by coupling a 2-inch diameter, 0.010 inch slotted, three foot long Schedule 40 PVC well screen to approximately 10 feet of blank 2-inch diameter, Schedule 40 PVC pipe. The piezometers were installed in native soil to a depth of approximately one to two feet below the water table surface using a stainless steel hand auger. The piezometers were used to determine groundwater elevations and to estimate the direction of groundwater flow.

Monitoring Wells: Four groundwater monitoring wells were installed near the subsurface infiltration system during the first phase of this study in January 1990. Monitoring well locations are shown on Figure 3-1 as W1, W2, W4, and W5. These monitoring wells were constructed of five feet of 2-inch diameter, 0.010 inch slotted Schedule 40 PVC well screen coupled to approximately seven feet of blank Schedule 40 PVC pipe. Monitoring wells were installed by hand augering with a stainless steel barrel auger to the water table, then augering through 4-inch diameter casing which was advanced with the auger to three to four feet below the water table. The 2-inch diameter PVC monitoring wells were then installed inside the 4-inch diameter casing. A clean, graded sand pack was placed around the monitoring well and the 4-inch casing was removed leaving the sand packed monitoring well in place. The monitoring wells were developed by pumping them at four to five gallons per minute for ten minutes after installation. Monitoring wells W1 and W2 were abandoned in January 1993.

Additional groundwater monitoring wells were installed on November 23 and 24, 1992. Nested sets of monitoring wells, (i.e., one shallow monitoring well and one deep monitoring well installed adjacent to each other) were installed at three locations onsite to determine the vertical hydraulic gradient. Monitoring well locations are shown on Figure 3-1 and are identified as DW-6, SW-7, DW-8, SW-9, DW-10, and SW-11. These monitoring wells were installed using an 8.25 inch outside diameter (OD) hollow stem auger. During the installation of monitoring well DW-6, soil samples were collected at two foot intervals using a split spoon sampler. Standard penetration resistance tests (a measure of soil density) were conducted and blowcounts were recorded at each two

PEW TABLE - 12/16/80/81

DATE OF PLOT - 07/15/96

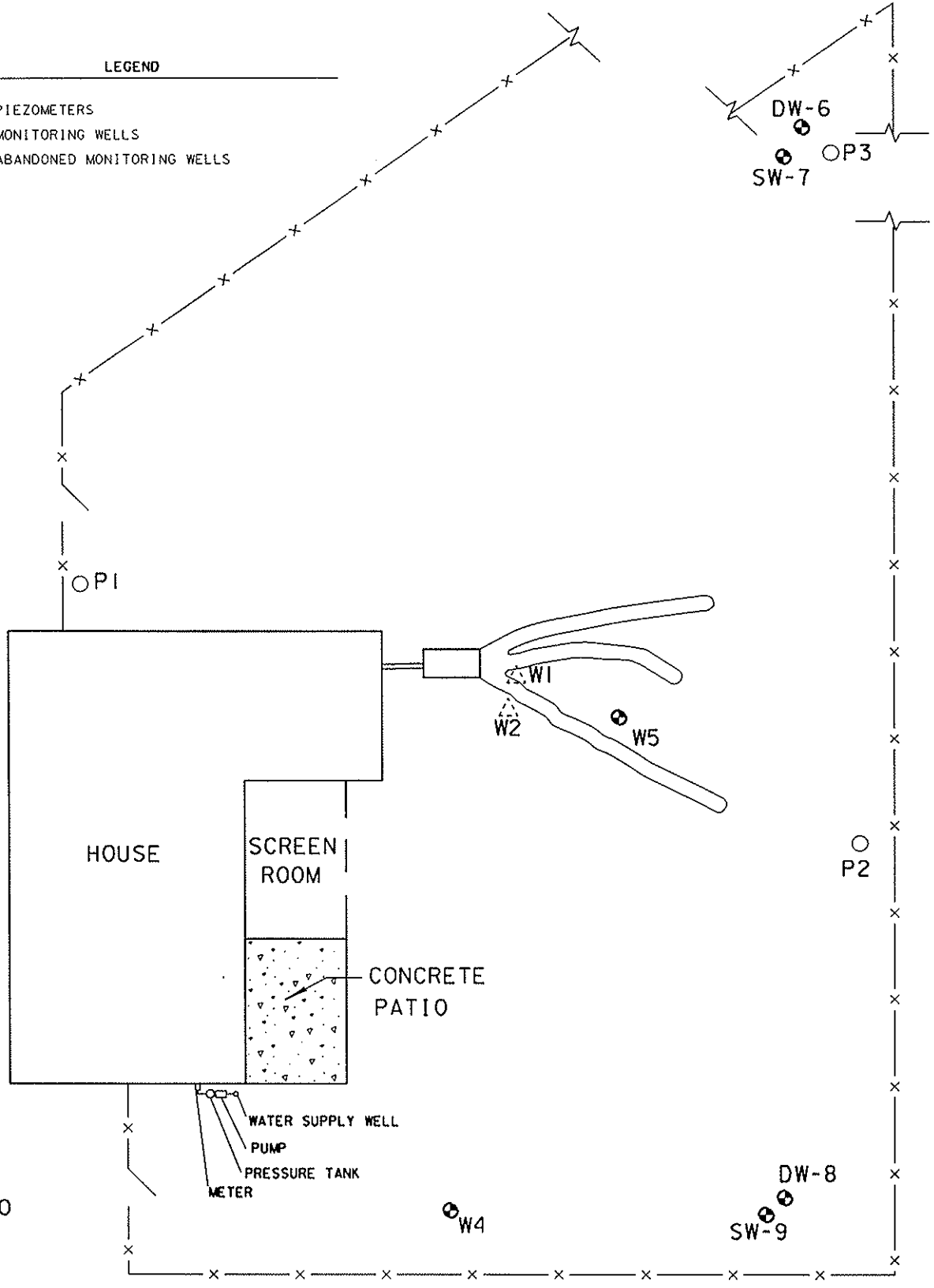
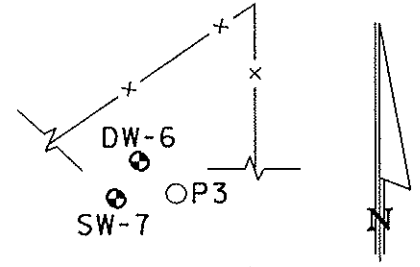
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LEGEND

- PIEZOMETERS
- ⊕ MONITORING WELLS
- △ ABANDONED MONITORING WELLS



SCALE 1" = 20'



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APPROVED BY:	DATE:

SDA ONSITE WASTEWATER
TREATMENT SYSTEM PROJECT
MONITORING WELL
AND PIEZOMETER
LOCATION MAP

FIGURE:
3-1

foot interval. Soil samples were collected at various intervals from the three deeper boreholes for grain size analysis. Lithologic descriptions were also recorded during the installation of the monitoring wells.

The shallow wells (SW-7, SW-9, and SW-11) were installed to a depth of approximately eight feet bgs and were constructed of five feet of 2-inch diameter, 0.010 inch slotted PVC well screen attached to 2.5 feet of 2-inch diameter blank PVC pipe. The deeper wells (DW-6, DW-8, and DW-10) were installed to a depth of approximately 50 feet bgs and were constructed of 2.5 feet of 2-inch diameter, 0.010 inch slotted well screen coupled to approximately 48 feet of 2-inch diameter solid PVC pipe. The annular space between the well was filled with clean 20/30 silica sand to the top of the well screen. A one foot thick bentonite seal was placed immediately above the sand pack during the construction of the shallow monitoring wells. A one foot thick layer of fine sand was used as a seal above the sand pack in the deeper wells. The remaining annulus was filled with Portland Type I cement to land surface. A protective flush-mounted manhole cover and pad was constructed around the top of the wells. The monitoring wells were developed by pumping with a centrifugal pump to remove fine sediment from the sand pack. These wells were not sampled but were used for additional groundwater measurements to determine the direction of groundwater flow and to determine if vertical flow of groundwater was significant at the site. Vertical groundwater flow would influence contaminant transport at the site by causing a downward movement of contaminants as they move away from the site.

Stainless Steel Probe: A stainless steel miniature wellpoint probe system, originally designed for soil gas vapor monitoring in the unsaturated zone, was used to obtain groundwater samples around the site. The probe unit utilized a "push-pull" wellpoint attached to 1/2 inch stainless steel tubing which was pushed or driven into the saturated zone. Groundwater samples were then obtained through a teflon sampling tube, inserted inside the stainless steel tube by applying suction with a peristaltic pump. The entire probe system could then be pulled from the ground and installed at a new sample location. This system allowed collection of groundwater samples from 10 to 15 different locations per day, and was especially useful for identifying the extent of the contaminant plume at the project site.

A more permanent monitoring network was established during the Phase II study. First, the area of impacted groundwater downgradient of the drainfield was further defined using the miniature wellpoint probe system. A row of eight sample locations were installed along the edge of the southernmost trench (Trench 1) using the push-pull probe and groundwater samples were obtained for field screening. Based on these results, 30 miniature stainless wellpoints with teflon tubing were permanently installed within the impacted area downgradient of the infiltration system. A total of three rows of wellpoint locations were established. The first row of wellpoints was placed five feet downgradient of Trench 1. Each additional row was placed approximately 10 feet further downgradient (i.e., at 15 feet and 25 feet downgradient of Trench 1, respectively). Each row contained four wellpoint locations. At wellpoint locations T-1 through T-6, sample points were installed at 3 depths (approximately 6, 12, and 20 feet bgs). At wellpoint locations T-7 through T-9, sample points were installed at two depths (approximately 6 and 20 feet bgs). Wellpoint locations T-10 through T-12 contained one

sample point each that was installed at approximately six feet bgs. A background wellpoint location was also installed upgradient of the drainfield with separate sample points at approximately 5, 10, and 15 feet bgs.

At the beginning of the Phase III investigation, 22 additional sample points (six at new wellpoint locations and four at previously designated wellpoint locations) were installed in August 1993. Three new wellpoint locations (TW-16, TW-17, and TW-18) were installed between Trenches 1 and 2 and three new wellpoint locations (TW-13, TW-14, and TW-15) were installed 40 feet downgradient of Trench 1. Sample points were installed to depths of 6, 12, and 20 feet bgs at each of these new wellpoint locations. One additional sample point was installed to a depth of 20 feet bgs at BW-1 and three additional sample points were installed to a depth of 12 feet bgs at wellpoint locations TW-7, TW-8, and TW-9.

Additional wellpoints were installed during the Phase III investigation in February 1995. Three wellpoint locations were installed immediately downgradient of infiltration Trench 1 (TW-19, TW-20, and TW-21) with sampling points at 6, 12, and 20 feet bgs at each location. Additional wellpoint locations were also installed along the house at the end of each existing monitoring row (TW-22, TW-23, TW-24, and TW-25) with sampling points at 6, 12, and 20 feet bgs at each location. Finally, a new row of wellpoints was established at the downgradient property line (TW-26, TW-27, and TW-28) with sampling points at 6, 12, 20, and 30 feet bgs.

The network of groundwater sampling locations is summarized on Figure 3-2. A total of 29 miniature well point locations have been installed at the site with 90 sampling points available at depths from 6 to 30 feet bgs.

3.5 Groundwater Elevations and Flow Direction

Groundwater Flow Direction: Groundwater movement in shallow aquifers is generally governed by forces of gravity and, therefore, moves from areas of higher water table elevations to areas of lower water table elevations. Water table elevations can be contoured to distinguish areas of higher or lower water table elevation. The groundwater flow direction is perpendicular, or normal to these water table elevation contour lines. Water table elevation contour lines are determined by obtaining the depth to groundwater at various locations and referencing that depth to a known elevation at the site.

An initial direction of groundwater flow was determined by the installation of three piezometers (P1 through P3) at the site. The elevations of the tops of the piezometer casings were initially surveyed by Ayres Associates on November 27, 1990, and referenced to a common datum. Depth to groundwater measurements were obtained by measuring from a mark on the top of the casing to the water table surface with a chalked steel tape. Subsequent depth to water measurements were obtained at periodic intervals over the study using a Keck KIR-89 electronic water level indicator. As monitoring wells were installed, the tops of casing were surveyed and depth to water measurements were referenced to the casing elevations. In February 1995, a data logging water elevation device was installed between Trench 1 and Trench 2 of the

OWTS. This device, known as a remote data sensing (RDS) unit, recorded groundwater levels in the well at routine intervals and stored them internally for subsequent downloading to a PC.

Thickness of Unsaturated Soil: Water table elevation data was also obtained to determine the thickness of the unsaturated soil at the site. The thickness of the unsaturated soil layer between the bottom of the infiltration system and the groundwater surface is an important component in a study of OWTS impact to groundwater quality.

Theoretically, the greater the thickness of unsaturated soil beneath the infiltration system the greater the degree of treatment of septic tank effluent before it reaches groundwater.

The depth to the bottom of the drainfield was measured through observation ports which had been installed in the drainfields. One observation port was located in each of the three trenches and was named accordingly (i.e., T-1 through T-3). The observation ports were installed to the infiltrative surface, which is the base of the drainfield, and depth to that surface was measured. Depth to groundwater measurements were obtained from wells located next to the drainfield (wells W5 and RDS) to determine the range in thickness of the unsaturated soil layer over time.

3.6 Aquifer Testing

Slug tests were performed for three of the shallow monitoring wells at the OWTS site in February 1993. The slug tests were performed by rapidly removing a large slug of water from the well and measuring the rate of rise of water back into the well. Data from the slug tests were then used to calculate the hydraulic conductivity of the shallow saturated zone using the method of Bouwer and Rice (1989). Slug tests were performed in wells W5, SW-7, and SW-9.

3.7 Soils Testing

Soil samples were collected in January 1996 to delineate various soil parameters which affect contaminant transport. Soil core samples were collected at three locations below and downgradient of the OWTS for analyses, using a stainless steel soil recovery auger with polycarbonate sample liners. Soil core 1 (SC-1) was a composite sample of the soil from locations along the infiltrative surface of Trench 1 directly below the trench from approximately 28-36 inches bgs. Soil core 2 (SC-2) was a composite sample from the same boreholes as SC-1, but the cores were taken below SC-1, from 48-56 inches bgs. SC-2 was in the saturated zone at the time of sampling. Soil core 3 (SC-3) was a composite sample of the soil downgradient of Trench 1 from four locations, between TW-4 and TW-5. The SC-3 sample was taken from the same relative elevation as SC-2 (48-56 inches bgs) and was also in the saturated zone at the time of sampling.

One set of soil core samples were sealed in their polycarbonate liners and placed on ice in coolers for shipping. These samples were shipped to Weston Analytics for determination of soil sorption and biodegradation parameters. A second set of soil core samples was analyzed by Florida Soil and Environmental Services for field moisture

content, soil moisture retention, saturated hydraulic conductivity, bulk density, and porosity. These tests were conducted according to "Methods of Soils Analysis: Part 1-Physical and Mineralogical Methods" (SSSA, 1986).

3.8 Bromide Tracer Testing

Two bromide tracer tests were conducted during the Phase III activities at the Florida OWTS site. These tests were used to aid in the determination of groundwater flow direction and velocity, and also to yield estimates of the groundwater dilution factor for conservative elements similar to bromide.

The first bromide tracer test was conducted in August 1993 by adding bromide tracer solution directly to the drainfield of the OWTS. The tracer solution was comprised of sodium bromide (NaBr) dissolved in distilled water to a final concentration of 410,000 mg/L as bromide ion (Br⁻). Bromide ion concentrations were measured on samples in the field with an ion selective electrode (ISE).

To discharge the tracer solution to the drainfield at a known location, a 4-inch diameter PVC casing was installed into the drainfield gravel of Trench 2 to act as a tracer input port. A miniature wellpoint was installed immediately below this port at a depth of 5.5 feet below the infiltrative surface of the drainfield. This wellpoint was used to intercept the "front" of bromide as the tracer entered the water table from the unsaturated zone and to estimate the unsaturated zone travel time.

Other downgradient wellpoints were utilized to monitor bromide movement from the source. Monitoring location TW-16 was established approximately 1.5 feet downgradient of the input port and had wellpoints placed at the 6, 12, and 20 foot depths. In addition, the wellpoints just downgradient of Trench 1 could be used to monitor bromide concentrations as the tracer migrated from below the drainfield. In addition, the push-pull sampling probe was utilized at various locations as needed to identify the location of the bromide plume.

The second bromide tracer test was conducted in May 1995. This test was conducted much the same way as the previous test except the bromide was added to the house plumbing system instead of being placed directly into the drainfield.

Approximately 8 kg of sodium bromide was added to the OWTS via the toilet on May 9, 1995. The bromide then traveled to the septic tank, through the septic tank and into the drainfield, and through the unsaturated soil below the drainfield to the shallow groundwater table. Bromide concentrations were monitored in the septic tank effluent and in the groundwater from the various sample points. The "push-pull" sampling probe was also used to locate the bromide plume in the groundwater.

The second test allowed formation of a larger bromide plume because the bromide spread throughout the drainfield in the same way wastewater was normally discharged.

3.9 Groundwater Sampling

Preliminary field screening of groundwater for chloride and conductivity was conducted at the OWTS site on December 14 through 15, 1992 using the push-pull stainless steel probe sampler. Results of the preliminary field screening indicated that impacted groundwater extended beyond the initial plume outlined in November 1990. Based on these data, a network of 12 sample points were installed in the area on December 15 through 17, 1992, and January 5 and 6, 1993. The chloride and conductivity values obtained during the preliminary screening also varied with depth. Background wellpoints were then installed approximately 15 feet upgradient of the infiltration system to determine if the values observed were due to the vertical movement of the contaminant plume or could be attributed to natural variations of chlorides in the native soil.

Groundwater samples from thirty wellpoints and two monitoring wells (SW-7 and W5) were obtained on January 7, 1993, as part of the Phase II investigation. Groundwater from these wellpoints and monitoring wells were subsequently sampled for the following water quality parameters:

- Chloride
- Foaming Agents (MBAS)
- Total Dissolved Solids
- Ammonia Nitrogen
- Nitrate-Nitrite Nitrogen
- Total Phosphorous
- Total Organic Carbon
- Fecal Coliform

Groundwater sampling during Phase III was conducted utilizing the same techniques as previous phases of the study. Briefly, a peristaltic pump with teflon tubing was utilized to pump groundwater samples from the miniature wellpoints directly into sample containers containing any necessary preservative. Each wellpoint had a dedicated teflon tube for sampling and the pump tubing was cleaned or replaced between sample points. Prior to filling the sample bottles, several liters of groundwater were pumped from the wellpoints to purge the system of stagnant water. Samples were placed on ice in coolers and shipped immediately to the laboratory for analysis.

4.0 RESULTS OF INVESTIGATION

4.1 Septic Tank Effluent (STE) Characterization

STE Quality: Septic tank effluent was routinely sampled at the site to assess the quality of wastewater discharged to the OWTS drainfield. Table 4-1 is a summary of the average septic tank effluent (STE) quality data during the SDA study. Appendix A includes the laboratory reports for the STE analyses.

A comparison of average STE values obtained over the course of this study shows variations in the STE parameters, but these variations are typically within the range of normal septic tank effluent quality. Average values for BOD₅ and total organic carbon (TOC) appeared to increase from Phase II to Phase III. Average STE values obtained during the Phase III investigation for MBAS and total phosphorous seemed to decrease when compared to the Phase II results.

STE Quantity: Water meter readings were collected at the site routinely from November 1992 to January 1996. These data were used to estimate the residence water use and average quantity of wastewater (STE) flowing from the home to the OWTS infiltration area. Water used by field personnel during the installation of monitoring wells and groundwater sampling was recorded and subtracted from the normal total water usage at the site. A summary of water use data collected at the study residence and the estimated wastewater loading to the OWTS infiltration area are presented in Table 4-2.

Total water use was significantly less during the Phase III period due to elimination of the water to air heat pump at the home. The exterior water use increased during the period from November 1993 to January 1996 but the interior use and estimated wastewater flows decreased significantly from previous periods. Estimated wastewater loading to the drainfield averaged 0.5 to 0.6 gpd/ft² over the November 1993 to January 1996 period, approximately half the loading rate previously. This reduction in wastewater loading would reduce the mass loading of contaminants to the soil assuming STE concentrations remained similar.

4.2 Household Detergent Use Characterization

Homeowner questionnaire surveys which were completed in June 1992 and February 1995 are included in Appendix C. Household characteristics remained relatively stable in terms of water using fixtures and appliances. Use of the automatic dishwasher increased between the two survey periods according to the homeowner, and hand dishwashing decreased. The number of laundry loads washed per week was also reported to be higher (5-7 loads per week) on the 1995 survey. The types of detergents and other cleaning products used by the homeowners are reported on the two surveys.

From April to December 1995, homeowners recorded laundry and dishwashing events on logs developed for the study. Table C-1 in Appendix C summarizes the events recorded on these logs. The completed logs are also included following the table.

Table 4-1 Summary of STE Quality Data

Parameter	SDA Phase II 11/90 - 1/93		SDA Phase III 8/93		SDA Phase IIIA 11/93 - 5/95	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
BOD ₅ (mg/L)	179	47.4	240	119	188	13.5
Foaming Agents (MBAS) mg/L	31	15.1	18.6	6.1	26.5	7.8
Total Suspended Solids (TSS) mg/L	59	18.9	36	6.3	46	10.9
Total Dissolved Solids (TDS) mg/L	387	109	--	--	--	--
Specific Conductance (μhos/cm)	1033	208	1029	47	--	--
Chloride (Cl) mg/L	53	11.4	55	8.4	53	10.0
Sulfate (SO ₄) mg/L	5	2.1	2.4	4.9	7.5	7.8
Total Hardness (CaCO ₃) mg/L	--	--	179	3.8	147	9.6
Total Phosphorus (TP) mg/L	17	0.6	8.2	1.2	8.8	0.9
Total Nitrogen (TN) mg/L	76	3.5	67	++	69.2	19.3
Total Kjeldahl Nitrogen (TKN) mg/L	66	16.1	67	9.1	69.2	19.3
Ammonia Nitrogen (NH ₄ -N) mg/L	75 ++	NA	61	4.1	63.2	17.9
Nitrate Nitrite-Nitrogen (NO _{2,3} -N) mg/L	0.02	0.02	0.01	0.01	0.04	0.03
Total Organic Carbon (TOC) mg/L	73	17.2	109	53.2	60	18.8
Oil and Grease (DG) mg/L	37	3.1	--	--	--	--
Fecal Coliforms (FC) colonies/100 ml	1.02 x 10 ⁷	NA	2.36 x 10 ⁶	--	--	--
Fecal Streptococci (FS) colonies/100 ml	350	NA	--	--	--	--
n (Number of samples)	3		7		4	

-- Not sampled
 ++ Only one sample

Table 4-2 Summary of Water Use and Estimated Wastewater Flows

Period of Meter Readings	Total Water Use (gpd)	Heat Pump (gpd)	Exterior Use (gpd)	Estimated Wastewater Flow (gpd)	Estimated Wastewater Loading (gpd/ft ²)
11/05/92 - 1/12/93	1166.5	973.5	7.0	186.3	0.9
8/15/93 - 11/01/93	583.1	301.7	32.0	253.3	1.2
11/01/93 - 12/23/94	173.2	0.0	67.7	105.6	0.5
12/23/94 - 1/16/96	219.4	0.0	102.1	117.3	0.6

* Based on an infiltration system area of 210 ft²

Table C-2 (Appendix C) summarizes detergent purchases by the homeowners and copies of the original receipts follow the table.

Based on the data in Table C-1, Table 4-3 was developed to summarize the number of washloads over the period from April through December 1995. The homeowners averaged 0.42 dishwashing loads per day, split evenly between hand and machine washing. An average of 0.62 loads of laundry were machine washed per day and approximately 0.38 hand clotheswashing events occurred each day based on the logs.

Table 4-3 Summary of Detergent Use Events

Date	Dishwashing (Loads/day)		Laundry (Loads/day)	
	Hand Wash	Machine Wash	Hand Wash	Machine Wash
April 1995	0.39	0.22	0.56	1.00
May 1995	0.13	0.19	0.81	1.00
June 1995	0.27	0.23	0.63	0.60
July 1995	0.16	0.13	0.58	0.68
August 1995	0.19	0.16	0.26	0.48
September 1995	0.27	0.23	0.27	0.93
October 1995	0.10	0.19	0.32	0.52
November 1995	0.23	0.23	0.00	0.17
December 1995	0.19	0.29	0.00	0.16
Average	0.21	0.21	0.38	0.62
Range	0.10 - 0.39	0.13 - 0.29	0.00 - 0.81	0.16 - 1.00

4.3 Temperature and Precipitation Monitoring

A data logging weather station was installed at the OWTS site in February 1995. Temperature and rainfall data was recorded every two hours and stored internally for downloading to a portable PC. This temperature and precipitation data is summarized by day in Table D-1, Appendix D. Unfortunately, the rainfall recorder tipping bucket was jammed by a pine needle from July 16 to October 4, 1995, and rainfall data was not obtained between those dates. Rainfall data was subsequently obtained for this period from the U.S. Navy Jacksonville Naval Air Station, about 9 miles north of the project site. This data is also included in Table D-1.

Temperature and precipitation data was collected in 1994 from the Mandarin Middle School Science Department Weather Station, about 3 miles north of the project site. This data is summarized in Table D-2.

The temperature and precipitation data shows the typical seasonal trends in North Florida, with relatively mild dry winters and warm, wet summers. The majority of rainfall occurred from June through September, and was characterized by numerous, relatively heavy showers of short duration.

The rainfall data will be utilized to evaluate the groundwater elevation data in the next section.

4.4 Groundwater Elevations and Flow Direction

Groundwater Flow Direction: Initial piezometer readings indicated the general direction of groundwater flow at the site was south-southwest toward the St. Johns River. Subsequent depth to groundwater measurements confirmed the groundwater

flow direction. The groundwater gradient was relatively constant across the site and was calculated at approximately 0.0029 feet/foot using the groundwater elevation data from November 5, 1993.

In November 1990, depth to groundwater measurements obtained from monitoring wells installed at the site ranged from 5 to 6 feet bgs. Depth to groundwater at the site during the remaining Phase II study period ranged from approximately 1.5 feet to 4 feet bgs.

Depths to groundwater during the Phase III study were similar, ranging from approximately 1.5 to 5 feet bgs. The lowest relative groundwater elevations were recorded at monitoring well SW-11 located in the southwest portion of the site. The highest relative groundwater elevations were calculated to be at piezometer P3 and monitoring well SW-7, which is located in the northeastern corner of the site. Table E-1 (Appendix E) lists the relative groundwater elevations calculated for depth to water measurements obtained from August 1993 through September 1995. Table 4-4 summarizes the range of relative groundwater elevations calculated during the OWTS study.

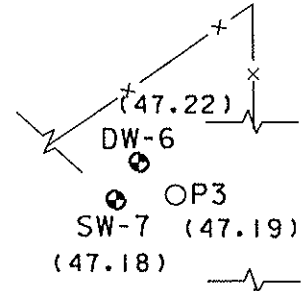
Figures 4-1 and 4-2 show relative groundwater elevation contours calculated from data collected on February 20, 1995 and June 29, 1995. The groundwater flow direction at the site would be perpendicular to and downgradient from these contours. As the figures show, groundwater flow direction and gradient varied between the two dates. A groundwater elevation gradient of approximately 0.0043 feet/foot existed February 20, 1995, while the gradient on June 29, 1995 was approximately 0.0016 feet/foot. Also, the flow direction from the February 20 data is more southerly than that of June 29. This variation in flow direction and gradient will have an effect on contaminant transport and explains some of the variability encountered in the water quality data.

Nested wells were installed at the site during Phase II to determine if a vertical component of flow was present at the site and, if so, whether that vertical component was great enough to cause the contaminant plume to "dip" into a deeper zone. Groundwater elevation data (Table E-1) indicated that a slight vertical gradient sometimes developed at the nested monitoring well sets at the site (DW-6, SW-7, DW-8, SW-9, DW-10, and SW-11). The groundwater elevation difference between nested pairs during the Phase III study ranged from 0.01 to 0.37 feet measured over a 46 foot distance between the top of the water table at the shallow well to the top of the screened interval at the deep well. This represented a vertical gradient which ranged from 0 to 0.008 feet/foot. The highest vertical gradient measured was in the vicinity of the paired wells DW-10 and SW-11 at the southwest corner of the site. These wells were within 20 feet of the drainage swale which ran along the road in front of the house and rainfall infiltration in this swale may have been primarily responsible for the vertical gradient at this location. However, vertical gradients approximately equal to the horizontal gradient were measured at well sets DW-6 and SW-7, and at DW-8 and SW-9 on occasion. Thus, there was some potential for downward groundwater flow at the site.

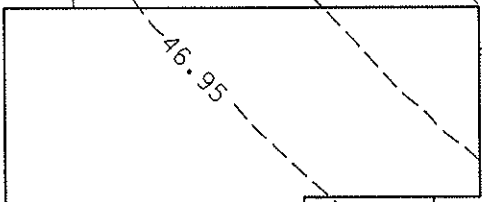
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 DATE OF PLOT • 07/15/96
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LEGEND

- PIEZOMETERS
- ⊕ MONITORING WELLS



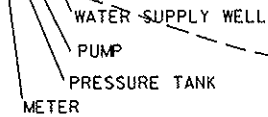
PI (46.95)



HOUSE

SCREEN ROOM

CONCRETE PATIO



WATER SUPPLY WELL

PUMP

PRESSURE TANK

METER

(46.83)

SW-11

DW-10

(46.82)

W5 (47.11)

P2

W4

SW-9 (46.91)

DW-8

SCALE SCALE: 1"=20'

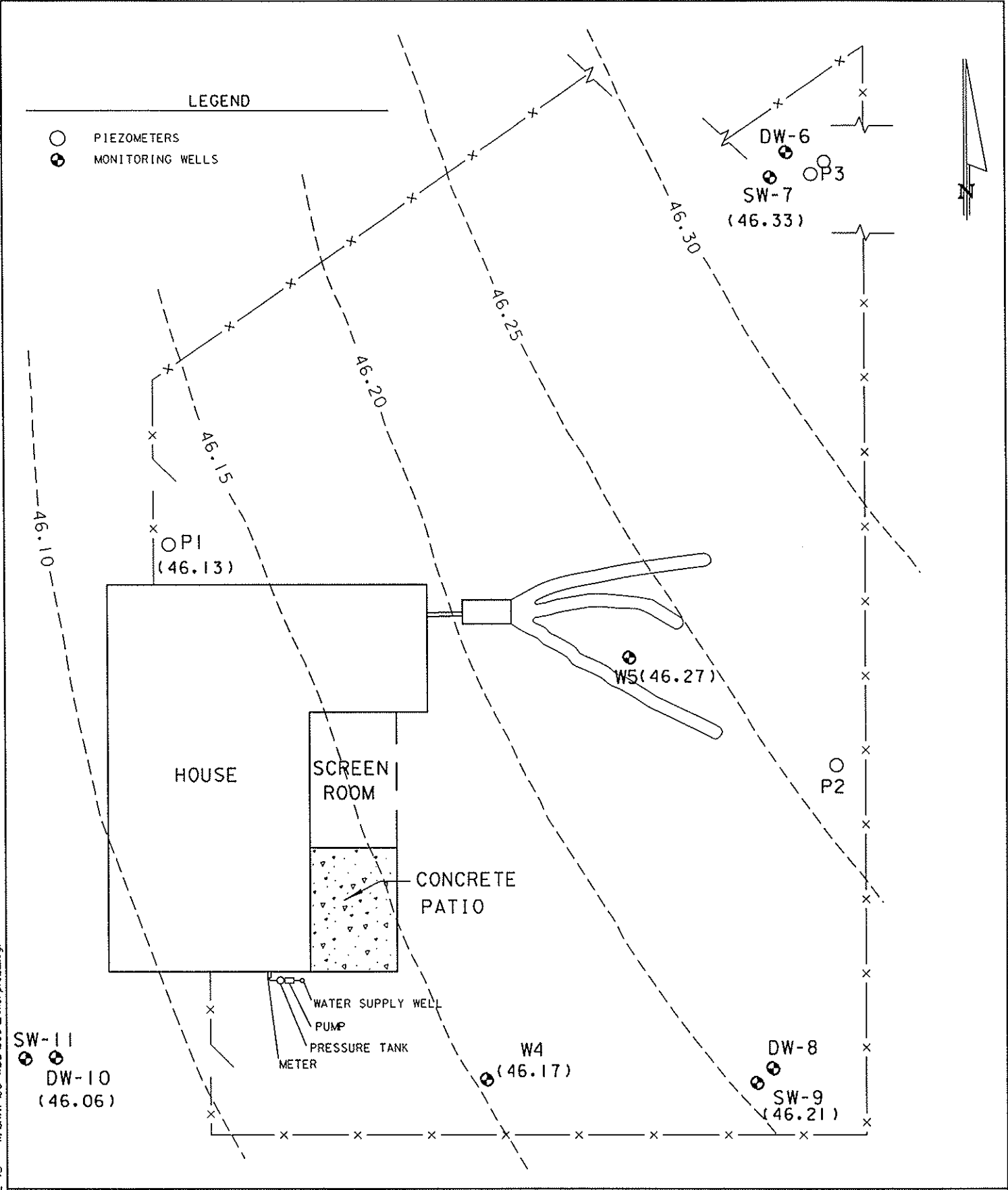
AYRES
ASSOCIATES

REVISED:	
DRAWN BY:	DATE:
MAN	5-96
CHECKED BY:	DATE:
APPROVED BY:	DATE:

SDA ONSITE WASTEWATER
TREATMENT SYSTEM PROJECT
**RELATIVE GROUNDWATER
ELEVATION CONTOUR MAP**
FEBRUARY 20, 1995

FIGURE:
4-1

PEN TABLE - 10/19/87N
 DATE OF PLOT - 07/15/96
 PRF NAME IS R:\PROJ\00-4155\sdwr\moplez2.dgn
 DESIGN FILE IS



SCALE SCALE: 1"=20'	REVISED:	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT	FIGURE: 4-2
	DRAWN BY: MAN DATE: 5-96		
AYRES ASSOCIATES	CHECKED BY: DATE:	RELATIVE GROUNDWATER ELEVATION CONTOUR MAP	JUNE 29, 1995
	APPROVED BY: DATE:		

Unsaturated Zone Thickness: The range of water table elevations measured over the study are summarized in Table 4-4. Table 4-4 also shows the range of unsaturated soil thickness between the infiltrative surface and the water table for well W5 near the infiltration area. Table E-2 (Appendix E) lists the water elevation and calculated unsaturated thickness at the remote data sensing (RDS) unit, also near the drainfield.

Table 4-4 Range of Relative Water Table Elevation and Unsaturated Soil Thickness

Well ID #	Water Table Elevation Range (ft.)	Unsaturated Zone Range* (ft. below infiltrative surface)
W4	44.51 - 47.52	N/A
W5	43.61 - 48.21	4.13 - (-0.5)
P1	44.52 - 48.17	N/A
P3	44.72 - 48.56	N/A
DW-6	44.87 - 48.72	N/A
SW-7	44.87 - 48.58	N/A
DW-8	44.55 - 47.79	N/A
SW-9	44.69 - 47.88	N/A
DW-10	44.57 - 47.98	N/A
SW-11	44.59 - 47.98	N/A

* Based on elevation of 47.74 ft. for infiltrative surface of drainfield at observation port T-1

N/A - Wells not in area of drainfield

(-0.5) Water table elevation higher than drainfield infiltrative surface

Based on measurements made at well W5 during site visits, the unsaturated soil thickness ranged from 0 to 4.13 feet. At the time of the highest measured groundwater levels (October 17, 1994) at W5, the water table was actually 0.5 ft higher than the infiltrative surface of the drainfield. Based on the continuous water level data logged at the RDS, the water table was routinely within 1 foot of the infiltrative surface and was above the infiltrative surface on numerous occasions. The highest water table elevation logged by the RDS was 48.4 ft, or approximately 0.7 feet above the infiltrative surface of the drainfield. Table 4-5 lists the approximate unsaturated soil thickness at the time of each groundwater sampling event.

Table 4-5 Unsaturated Soil Thickness at Groundwater Sampling Events

Groundwater Sampling Event	Unsaturated Soil Thickness (ft)
Phase II, January 6-7, 1993	1.4
Phase III, November 1-3, 1993	0.03
Phase III, May 9-11, 1995	1.3

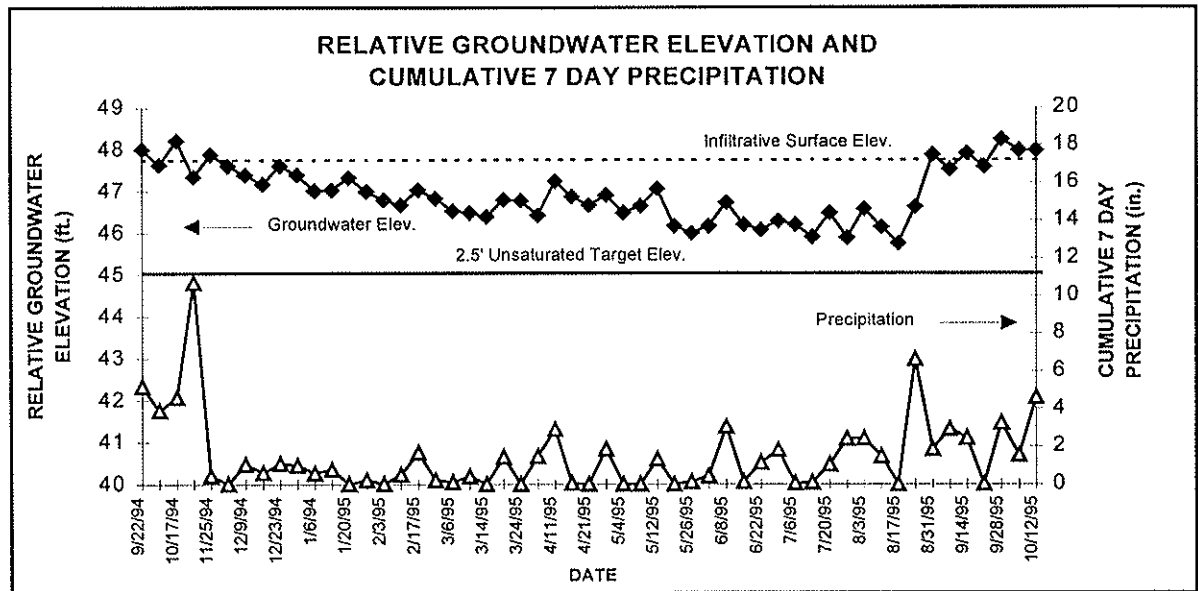


Figure 4-3 Groundwater Elevations and 7 Day Cumulative Precipitation

Figure 4-3 above shows the effect of rainfall on groundwater elevations at the site. The figure is based on the precipitation data in Table D-1 and the groundwater elevation at either well W5 or the RDS (after 3/14/95). The precipitation shown on the figure is the amount of rainfall recorded for 7 days: the date of record and the previous 6 days. The figure includes an entire year and shows the falling water table through the winter and spring dry season and the rising water table at the end of summer and early autumn due to the rainy season.

The figure also shows the rapid response of the water table at the site to rainfall. The sandy soil and shallow water table result in rapid rises in water table elevation after the heavy thunderstorms typical of Florida. Of particular note is the period from 8/17/95 to 8/31/95 where approximately 8 inches of rainfall resulted in a 2 foot rise in water table elevation.

4.5 Aquifer Testing

Appendix F contains the data from slug tests performed on wells W5, SW-7, and SW-9 on February 23, 1995. Slug testing was performed on these monitoring wells to obtain estimates of saturated hydraulic conductivity in the shallow water table zone. Results of these tests are summarized in Table 4-6. Saturated hydraulic conductivity ranged from 0.45 ft/day at well SW-7 to 9.26 ft/day at well W5. However, the slug test data at well SW-7 appears questionable and fouling of the well screen is suspected to have influenced the test.

Table 4-6 Summary of Slug Test Results

Well ID	Saturated Hydraulic Conductivity	
	cm/day	ft/day
W5	282	9.26
SW-7*	13.6	0.45
SW-9	212	6.96

*Fouling of the screen at well SW-7 is suspected based on observations during test

4.6 Soils Testing

Soil core samples were taken at 3 locations in the vicinity of the OWTS drainfield. One set of soil cores were shipped to Weston Analytics for determination of soil sorption and biodegradation parameters. A second set of cores were analyzed locally for various physical parameters. A summary of the soils results are provided Table 4-7.

The deeper soil core samples (SC-2, SC-3) showed a slightly higher bulk density and slightly lower porosity as would be expected. They were also at saturation whereas the shallow soil core (SC-1) was slightly below saturation. Hydraulic conductivity values from the lab tests on the undisturbed soil cores at SC-2 and SC-3 yielded values approximately twice as high as the values obtained during the slug tests at wells W5 and SW-9.

4.7 Bromide Tracer Movement

Results of the first bromide tracer test (August 1993) are included in Appendix G, Figures G-1 and G-2. The test indicated a travel time of approximately 36 hours through the unsaturated zone, a distance of approximately 3 feet at that time. The average groundwater velocity estimated from this test was 0.03 to 0.05 ft/day, however the data on which this estimate was based were limited. The input of bromide at a single point in the drainfield resulted in a very narrow plume which was difficult to track. Therefore, a second tracer test was conducted in May 1995, by adding bromide to the house plumbing system and allowing it to flow through the septic tank and into the drainfield with the normal flow of wastewater.

Approximately 8 kg of sodium bromide was added to the OWTS via the toilet on May 9, 1995. Detailed results of the second bromide tracer test are listed in Tables G-2 and G-3 (Appendix G).

Figure 4-4 shows the bromide ion concentration in STE samples over the days immediately following bromide input. Bromide began exiting the septic tank very shortly after input, the first STE sample at 30 minutes after input contained over 600 ppm bromide. Peak bromide concentrations in the STE occurred at approximately 54 hours after input.

Table 4-7 Summary of Drainfield Soil Core Data

Soil Parameter*	Sample Identification**					
	SC-1		SC-2		SC-3	
Bulk Density (gm/cc)	1.43		1.54		1.53	
Porosity (%)	46.10		41.90		42.30	
Field Water Content (% wt.)	23.60		26.00		30.10	
Saturated Hydraulic Conductivity (cm/d)	324.00		410.00		514.00	
Soil Moisture Retention @ Pressure (cm)	% vol.	% wt.	% vol.	% wt.	% vol.	% wt.
	3.5	37.98	26.59	38.96	25.29	39.17
20.0	36.95	25.87	37.98	24.66	38.74	25.05
30.0	35.32	24.73	37.73	24.50	38.50	25.15
45.0	24.37	17.07	35.75	23.21	34.16	22.31
60.0	16.67	11.67	17.27	11.21	15.60	10.19
80.0	12.67	8.87	9.19	5.97	8.34	5.45
100.0	11.12	7.78	7.49	4.87	6.73	4.4
150.0	9.43	6.60	5.81	3.77	5.24	3.42
200.0	8.96	6.27	5.53	3.59	4.84	3.16
345.0	7.23	5.06	4.32	2.80	3.61	2.36
15000.0	4.00	2.80	1.10	0.71	0.69	0.45

* Soils analyses performed according to Soil Science Society of America (SSSA), 1986, *Methods of Soil Analysis, Part 1*

** SC-1 composite taken directly below Trench 1, 28-36" bgs

SC-2 composite taken directly below SC-1, 48-56" bgs

SC-3 composite taken downgradient from Trench 1, between TW-4 and TW-5, at 48-56" bgs

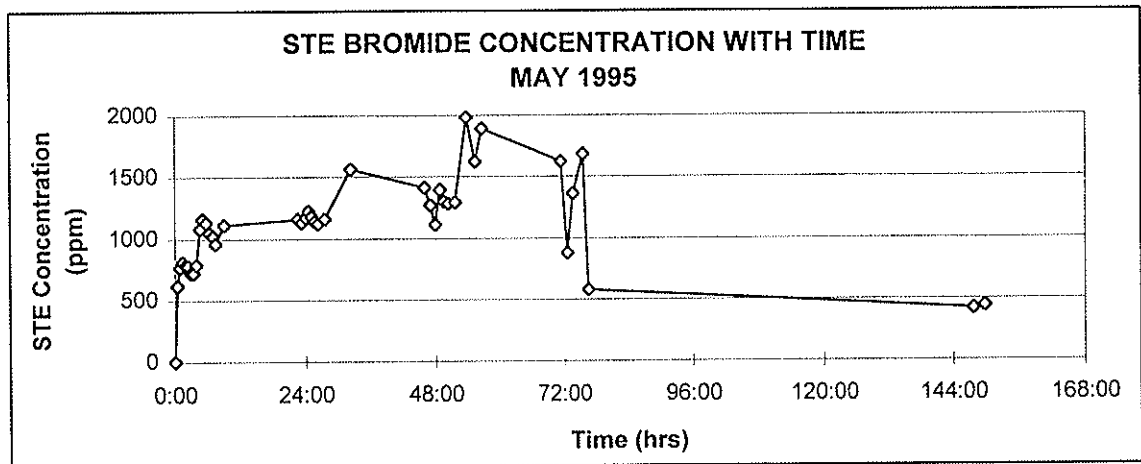


Figure 4-4 Bromide Ion Concentration with Time in STE

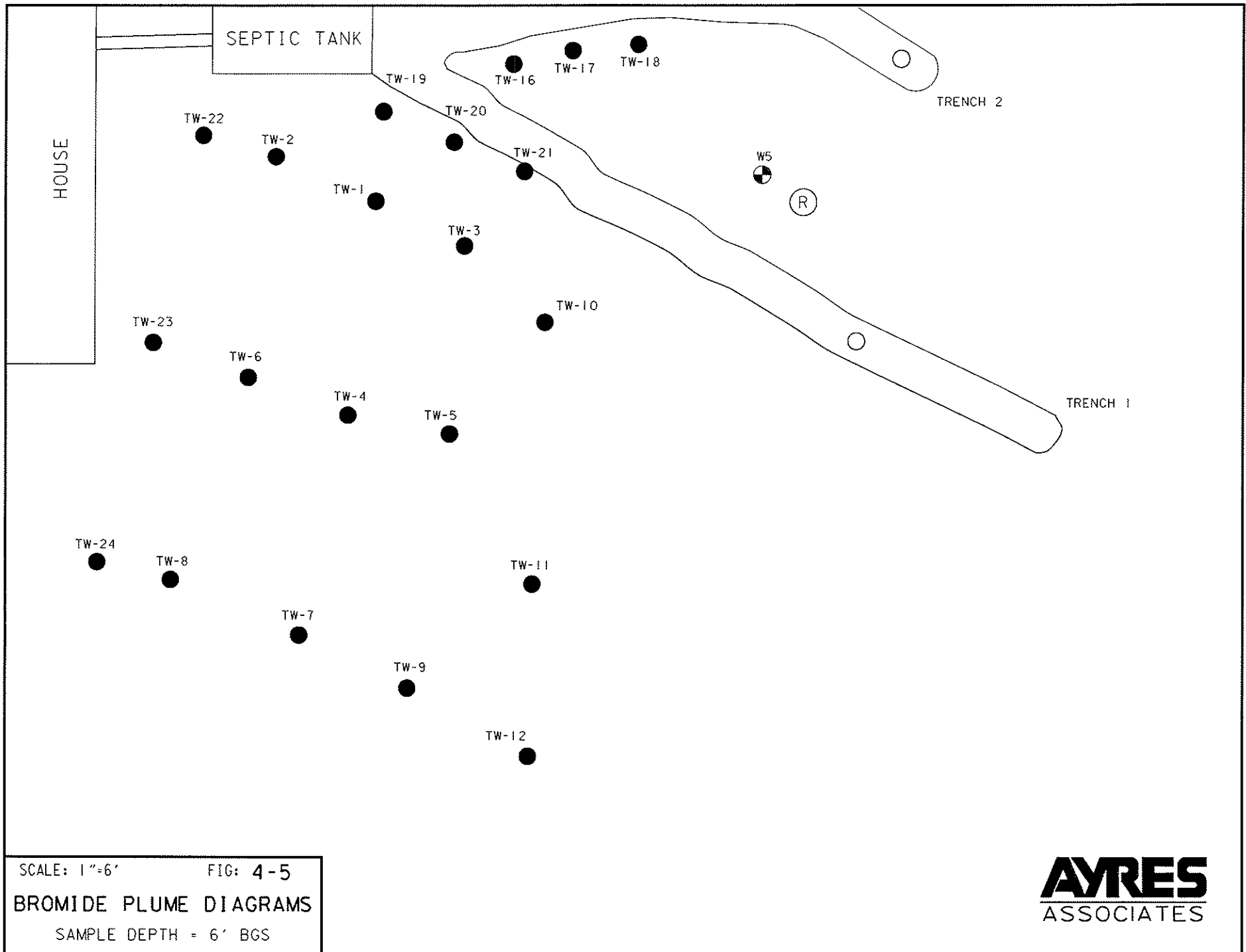
The presence of significant concentrations of bromide in the STE at the 30 minute sampling suggests a degree of hydraulic short circuiting may be occurring in the septic tank. The time of peak bromide concentration (2.2 days), which represents the average hydraulic detection time in the septic tank, is about right for a typical single home system. However, the hydraulic detection time of 2.2 days indicated by the bromide test is less than the 5 days which would be predicted by the average daily flow at the house (~120 gpd) and an assumed tank clearspace volume of approximately 600 gallons in the 900 gallon septic tank.

Appendix G3 and G4 contain the results of groundwater bromide testing. Elevated bromide concentrations in the groundwater were first detected on June 16, 1995 (t = 38 days) in well points TW-10, 20, and 21 at the 6' bgs levels. The highest bromide concentrations were found in TW-21 (427 ppm) and TW-10 (633 ppm). These results are somewhat surprising because bromide was expected to appear first in wellpoints TW-19 and TW-20 due to their location nearest the trench and the septic tank outlet. It appeared that the bromide laced wastewater traveled further out Trench 1 than anticipated before soaking into the drainfield soils. Two reasons could account for this. First, a hydraulic surge of flow could have occurred which forced effluent further out the trench after bromide input. It was noted that residents were home during the day bromide was input as well as the next day, which could have caused such a surge. The second reason could be that the head end of Trench 1 (closest to the septic tank) was developing a clogging biomat which was causing effluent to move further out the trench with time.

Subsequent samplings were conducted with the "push-pull" sampler to determine where the bromide plume was located. Figure 4-5 (with overlays) shows the result of these samplings. The June 28-30 sampling (t = 52 days) revealed bromide at elevated levels in TW-19, 20, and 21 next to Trench 1 and in TW-1, 3, and 10 in the row 5' downgradient (see also Figure G-4). The highest bromide concentration was again found in TW-10, but had dropped to 329 ppm. Using the push-pull probe, a peak concentration was identified approximately 1 foot downgradient from TW-10 (563 ppm). Concentrations appeared to taper off further out along Trench 1.

The July 25-27 sampling (t = 79 days) showed many more points impacted with bromide (Figure 4-5 and G-5). Peak concentrations were found approximately 4 feet downgradient of TW-10. Other peaks were located further to the southeast, downgradient from the T-1 observation port, and also downgradient of TW-1. Figure 4-5 seems to indicate that bromide infiltrated almost the entire length of Trench 1, but it may have infiltrated more quickly in the area further from the septic tank. This would likely be the case if a biomat was developed in the near-tank area, as the biomat would slow effluent infiltration into the unsaturated zone.

A final bromide sampling event was conducted October 3-6, 1995 (t = 150 days). By this time, the bromide plume had moved beyond TW-4, TW-5, and TW-6 and extended downgradient approximately 23 feet from Trench 1. Peak concentrations were located at TW-4 in the area near the head of Trench 1 and about 20 feet downgradient from the end of Trench 1. The bromide plume was fully developed along the entire trench at this time.



Based on the bromide groundwater data and Figure 4-5, average groundwater velocities were calculated. These velocities were based on the distance of the peak groundwater concentrations downgradient from Trench 1 and the time of travel. Results are presented in Table 4-8. The velocity calculations are very consistent and indicate a relatively uniform average velocity of approximately 0.13 ft/day downgradient.

Table 4-8 Average Groundwater Velocities Calculated from Bromide Test

Sample Date	Time (t) since Br- Input (days)	Distance of Br- Peak (ft)	Average Velocity (ft/day)
6/16/95	38	5	0.13
6/30/95	52	6	0.12
7/27/95	79	10	0.13
10/6/95	150	20	0.13

The bromide data discussed thus far are based on groundwater samples taken 6 feet bgs, or 2 to 3 feet below the top of the water table. To test the hypothesis that the bromide may have been moving either above or below this sample depth profile, samples were taken with depth using the push-pull sampler. The results of these samples are shown in the tables on Figures G-4 and G-6 (Appendix G4). Also shown are the 12' and 20' points in the permanent monitoring network. The profile samples indicate that the peak bromide concentrations are at 6-8 feet bgs, and that the sample points are near the peak bromide concentrations vertically.

4.8 Groundwater Quality and Contaminant Transport

Tables 4-9 and 4-10 summarize the results of water quality monitoring at the OWTS site during Phase III. Each of the two groundwater sampling events are included as well as the average results for STE and tap water samples.

Table 4-9 lists the values for MBAS, Hardness, BOD₅, TOC, Cl, and SO₄. Table 4-10 lists the values for the nutrients, N and P.

As the tables show, significant differences in groundwater quality data for some contaminants were measured in the May 1995 sampling as compared to the November 1993 sampling. The obvious difference between the two events was their relationship to the rainy season. The November 1993 sampling occurred just after the summer rainy season when the water table was relatively high. The May 1995 sampling event occurred before the rainy season when the water table was relatively low. However, during this study period the water table elevation difference between these two events was only about 1.3 feet.

Figures 4-6 to 4-25 show concentrations of various STE contaminants in groundwater obtained during the May 1995 sampling. A discussion of several key contaminants follows.

MBAS: Data from the November 1993 sampling event indicated that groundwater from all wellpoints existing at that time contained MBAS concentrations above background (<0.05 mg/L) at the 6 and 12 foot depths. MBAS concentrations had decreased overall when compared to the Phase II groundwater results. The highest concentrations of MBAS at the 6 foot depth were encountered in groundwater obtained from the wellpoints TW-2, TW-6, TW-8, and TW-9 which contained 1.8 mg/L, 1.5 mg/L, 1.3 mg/L, and 1.2 mg/L, respectively. MBAS concentrations increased at the 12 foot depth significantly since the Phase II sampling. The highest concentrations of MBAS during the 1993 sampling were found in groundwater obtained from the 12 foot depth. Groundwater obtained from TW-4, TW-5, and TW-13 at 12' bgs contained MBAS concentrations of 1.9 mg/L, 2.6 mg/L, and 1.2 mg/L, respectively. MBAS was not detected in groundwater obtained from the 20 foot depth.

Data from the May 1995 sampling (Figures 4-6 to 4-8) showed decreased concentrations of MBAS at both the 6' bgs and 12' bgs levels. Only one sample location (TW-19) exceeded 1 mg/L MBAS, and this location was a new wellpoint immediately adjacent to Trench 1 and the septic tank outlet.

Figure 4-7 shows MBAS concentration contours at 6' bgs. A plume of groundwater with MBAS concentrations >0.5 mg/L extended approximately 20 feet downgradient of Trench 1 at the time of the sampling.

Total Phosphorus: Total phosphorus concentrations in groundwater obtained from 6 feet bgs during the November 1993 sampling were elevated above background (<0.01 mg/L) at all the existing downgradient wellpoints. The highest concentrations were found in groundwater obtained closest to the infiltration system. Total phosphorus concentrations gradually reduced further downgradient. Total phosphorus concentrations at the 12 foot depth were also elevated above background (<0.01 mg/L) in seven of the wellpoints. Wellpoints located adjacent to the infiltration area had the highest total phosphorus concentrations. Total phosphorus concentrations at 12 feet bgs in wellpoint TW-16, TW-3, TW-4, and TW-5 were 0.29 mg/L, 0.22 mg/L, 0.10 mg/L, and 0.18 mg/L, respectively. Groundwater collected from wellpoints TW-18, TW-6, and TW-13 contained total phosphorus concentrations at less than 0.10 mg/L. Total phosphorus concentrations at 20 feet bgs were generally near or at background.

Phosphorus concentrations from the May 1995 sampling event were generally higher than those of the 1993 sampling at the 6' bgs depth (Figure 4-10). Figure 4-11 shows phosphorus concentration contours during May 1995. The plume of groundwater at 2 mg/L P or above is very similar in extent to that measured in November 1993. Phosphorus concentrations at the 12' bgs depth and below continue to be relatively low (Figure 4-12).

Nitrogen: The total kjeldahl nitrogen and nitrate-nitrogen concentrations at six feet bgs during the November 1993 sampling were generally comparable to those encountered in the Phase II investigation. TKN concentrations greater than 20 mg/L were found in groundwater obtained from sample points TW-2, TW-4, TW-5, TW-6, TW-7, TW-9, and TW-10 at 6 feet bgs. Background concentrations of TKN at the 5 foot depth were 0.03 mg/L.

Nitrate-Nitrogen concentrations during the November 1993 sampling increased at the 6' bgs depth compared to the Phase II sampling. The highest concentrations of NO₃-N were encountered in groundwater obtained from beneath the infiltration system. Groundwater obtained from sample points TW-16, TW-17, and TW-18 at the 6 foot depth were 59 mg/L, 52 mg/L, and 50 mg/L, respectively. A plume of NO₃-N concentrations greater than 10 mg/L extended 25 feet downgradient of the infiltration system. Background concentrations of NO₃-N at the 5 foot depth were 0.17 mg/L.

TKN concentrations were low (< 0.12 mg/L) at all 12' bgs locations during the 1993 monitoring, except TW-13, 14, and 15. TKN concentrations at these monitoring locations were 16 mg/L, 6.7 mg/L, and 0.70 mg/L, respectively. Since these points were furthest from the OWTS, this suggested that the groundwater table was very high at the time this water was under the drainfield.

NO₃-N concentrations were elevated above background (<0.01 mg/L) in seven wellpoints located at 12 feet bgs in November 1993. Sample points TW-1, TW-2, TW-3, TW-6, TW-16, TW-17, and TW-18 had NO₃-N concentrations of 14.2 mg/L, 19.4 mg/L, 19.5 mg/L, 1.4 mg/L, 9.8 mg/L, 11.0 mg/L, and 9.3 mg/L, respectively. With the exception of TW-6, these sample points are located adjacent to (within 5 feet) of the infiltration system. Concentrations of both TKN and nitrate nitrogen were low at the 20' bgs depth except at TW-1, where NO₃-N was measured at 3.1 mg/L.

Nitrogen data from the May 1995 sampling showed a decrease in overall nitrogen concentrations (Figures 4-17 to 4-20). At the 6' bgs level, NO₃-N concentrations were less at every comparable wellpoint. TKN concentrations were also generally less than the 1993 sampling, except at wellpoints TW-1, TW-4, and TW-11 where they exceeded the 1993 values. The highest TKN concentrations were found in the 6' bgs wellpoints TW-19, TW-1, TW-20, TW-4, and TW-11 where TKN values were 62 mg/L, 47 mg/L, 35 mg/L, 48 mg/L, and 30 mg/L, respectively. At the 12' bgs depth the May 1995 sampling showed relatively low concentrations except in the wellpoints immediately adjacent to Trench 1.

The major difference in nitrogen concentrations between the November 1993 sampling and the May 1995 sampling was in the relationship of nitrogen species. In the 1993 data, both TKN and NO₃-N concentrations were significantly elevated, but NO₃-N made up the major portion of total nitrogen, especially in the contaminated zone near the drainfield. In the May 1995 data, generally just the TKN concentrations were elevated and NO₃-N concentrations were relatively low in comparison. The 1995 sampling occurred during a period of greater unsaturated soil thickness compared to the 1993 sampling, so this result appears contradictory. A thicker unsaturated zone should increase nitrification of TKN in the soil, thus increasing NO₃-N concentrations in groundwater. What must be considered, however, is that the groundwater downgradient of the OWTS was under the drainfield at a different point in time. Using the bromide velocity of 0.13 ft/day, groundwater sampled at a point 10 feet downgradient from the edge of Trench 1 would have been under the center of the drainfield area (15' away) some 115 days earlier. As the water level data recorded by the RDS unit indicated, groundwater levels and thus unsaturated thickness could have been completely different when the sampled water was below the drainfield.

Chloride: Chloride concentrations in groundwater obtained during the November 1993 sampling were above background (12 mg/L) at all wellpoints except TW-13, TW-14, and TW-15, which were furthest from the infiltration system at that time. Chloride concentrations in groundwater obtained from all wellpoints at the 12 foot depth were above background (3 mg/L). The chloride plume at 6' bgs during the November 1993 sampling extended approximately 25-30 feet downgradient.

Chloride concentrations at 6' bgs during the May 1995 sampling (Figure 4-21) were generally lower than the 1993 sampling levels; however, the chloride plume remained similar and continued to extend downgradient approximately 30 feet (Figure 4-22).

Summary: In summary, groundwater analytical results indicated that the extent of significantly impacted groundwater continued to extend approximately 25 to 30 feet downgradient of the onsite wastewater treatment system. Several STE substances, most notably nitrogen, have been found in quantities above background in groundwater located 35 to 40 feet from the infiltration area. STE parameters have also been detected at the 12 foot bgs depths indicating that groundwater carrying STE substances has moved vertically as well as horizontally. However, it appears that the vertical extent of the contaminant plume does not extend much below the 12' bgs level, as data at the 20' level indicates generally low concentrations of all parameters.

**Table 4-9 Summary of Water Quality Results: Organic and Ionic Species (mg/L)
November 1993 and May 1995**

Sample Point	Sample Depth (ft. bgs)	MBAS		Hardness (as CaCO ₃)		BOD ₅		TOC		Cl ⁻		SO ₄	
		1993	1995	1993	1995	1993	1995	1993	1995	1993	1995	1993	1995
STE (Ave)	N/A	26.5		147		188		60		53		7.5	
Tap H ₂ O (Ave)	N/A	<0.05		155		--		<1		10.2		<2	
BW-1	5	<0.05	<0.05	22	8.9	--	--	3.1	3.4	12	6.2	12	5
	10	<0.05	<0.05	35	130	--	--	5.9	4.9	3	10	16	35
	15	<0.05	NS	65	NS	--	NS	1.6	NS	29	NS	56	NS
	20	<0.05	NS	110	NS	--	NS	1.4	NS	32	NS	120	NS
TW-1	6	0.44	0.54	210	130	<1	--	5.7	7.7	51	42	54	11
	12	0.54 (0.46)	NS	260 (260)	NS	--	NS	6.1 (7.0)	NS	250 (250)	NS	36 (38)	NS
	20	<0.05	NS	130	NS	--	NS	2.1	NS	230	NS	91	NS
TW-2	6	1.8	0.10	220	130	6.2	--	11.0	12	52	18	110	9
	12	0.32 (0.27)	NS	210 (210)	NS	--	NS	4.7 (4.6)	NS	40 (40)	NS	36 (35)	NS
	20	<0.05	NS	85	NS	--	NS	2.3	NS	21	NS	100	NS
TW-3	6	0.14	NS	180	NS	<1	NS	4.6	NS	46	NS	38	NS
	12	0.75	NS	130	NS	--	NS	8.0	NS	44	NS	52	NS
	20	<0.05	NS	83	NS	--	NS	2.5	NS	24	NS	100	NS
TW-4	6	0.65 (0.52)	0.67	160 (160)	130	--	--	6.0 (5.9)	9.4	49 (50)	46	95 (90)	24
	12	1.9	<0.05	180	150	--	--	13.0	4.9	46	20	15	15
	20	<0.05	NS	43	NS	--	NS	1.6	NS	23	NS	66	NS
TW-5	6	0.26	0.27	140	180	--	--	4.8	4.3	41	48	56	23
	12	2.6	<0.05	170	160	--	--	14.0	5.0	46	22	25	13
	20	<0.05	NS	22	NS	--	NS	1.9	NS	11	NS	2	NS
TW-6	6	1.5	0.25	120	220	--	--	12.0	9.6	52	39	84	17
	12	0.20	<0.05	130	160	--	--	5.8	3.8	36	35	<2	33
	20	<0.05	NS	75	NS	--	NS	1.2	NS	26	NS	60	NS
TW-7	6	0.66	0.07 (0.12)	80	130 (130)	--	-- (-)	9.8	7.0 (7.1)	62	20 (20)	83	9 (9)
	12	0.09	<0.05	100	140	--	--	5.1	3.6	20	29	<2	22
	20	<0.05	NS	59	NS	--	NS	<1	NS	16	NS	57	NS
TW-8	6	1.3	<0.05	110	67	--	--	12.0	4.1	49	3.6	50	14
	12	<0.05	NS	75	NS	--	NS	2.9	NS	9.8	NS	<2	NS
	20	<0.05	NS	83	NS	--	NS	1.2	NS	24	NS	66	NS
TW-9	6	1.2 (1.3)	0.08	120 (93)	130	--	--	11.0 (9.9)	8.4	45 (49)	31	19 (20)	11
	12	0.21	<0.05	100	140	--	--	5.2	4.5	16	20	<2	11
	20	<0.05	NS	47	NS	--	NS	1.3	NS	18	NS	22	NS

Table 4-9 Summary of Water Quality Results: Organic and Ionic Species (mg/L) □ continued
November 1993 and May 1995

Sample Point	Sample Depth (ft. bgs)	MBAS		Hardness (as CaCO ₃)		BOD ₅		TOC		Cl ⁻		SO ₄	
		1993	1995	1993	1995	1993	1995	1993	1995	1993	1995	1993	1995
TW-10	6	0.25	0.07	120	180	--	--	4.7	5.1	48	48	45	45
	12	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS
	20	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS
TW-11	6	0.93	0.28	310	140	--	--	7.9	9.0	100	42	140	44
	12	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS
	20	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS
TW-12	6	0.54	<0.05	240	190	--	--	9.9	10	52	45	<2	13
	12	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS
	20	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS	NW	NS
TW-13	6	<0.05	<0.05	45	24	--	--	4.6	1.8	2.1	4.7	4	4
	12	1.2	<0.05	100	28	--	--	11	4.3	37	36	10	36
	20	<0.05	<0.05	99	52	--	--	1.5	<1	10	37	38	33
TW-14	6	0.12	<0.05	35	24	--	--	6.1	4.3	12	3.1	4	3
	12	0.44	<0.05	89	140	--	--	6.2	4.1	16	32	<2	14
	20	<0.05	<0.05	93	98	--	--	1.6	<1	11	57	29	20
TW-15	6	0.10	<0.05	69	42	--	--	11	7.8	13	4.5	25	<2
	12	0.99	0.05	200	120	--	--	10	4.2	43	28	17	10
	20	<0.05	<0.05	99	110	--	--	1.3	<1	13	67	23	31
TW-16	6	0.15	<0.05	120	110	<1	--	8.9	9.3	300	23	47	32
	12	0.54	NS	100	NS	--	NS	6.8	NS	41	NS	44	NS
	20	<0.05	NS	110	NS	--	NS	1.6	NS	28	NS	120	NS
TW-17	6	0.10	NS	180	NS	<1	NS	4.4	NS	46	NS	49	NS
	12	0.63 (0.57)	NS	67 (73)	NS	--	NS	6.4 (6.3)	NS	38 (38)	NS	39 (38)	NS
	20	<0.05	NS	110	NS	--	NS	1.4	NS	29	NS	130	NS
TW-18	6	0.15	NS	190	NS	<1	NS	4.0	NS	50	NS	36	NS
	12	0.81	NS	91	NS	--	NS	7.1	NS	40	NS	44	NS
	20	<0.05	NS	110	NS	--	NS	1.5	NS	28	NS	130	NS
TW-19	6	NW	1.7	NW	140	NW	--	NW	12	NW	46	NW	<2
	12	NW	1.4	NW	150	NW	--	NW	13	NW	46	NW	2
	20	NW	<0.05	NW	31	NW	--	NW	<1	NW	23	NW	20
TW-20	6	NW	0.52	NW	150	NW	--	NW	7.6	NW	46	NW	40
	12	NW	0.11	NW	160	NW	--	NW	4.6	NW	19	NW	15
	20	NW	0.08	NW	33	NW	--	NW	1.1	NW	12	NW	42

Table 4-9 Summary of Water Quality Results: Organic and Ionic Species (mg/L) □ continued
November 1993 and May 1995

Sample Point	Sample Depth (ft. bgs)	MBAS		Hardness (as CaCO ₃)		BOD ₅		TOC		Cl ⁻		SO ₄	
		1993	1995	1993	1995	1993	1995	1993	1995	1993	1995	1993	1995
TW-21	6	NW	0.06	NW	94	NW	--	NW	7.5	NW	28	NW	36
	12	NW	<0.05	NW	140	NW	--	NW	5.4	NW	13	NW	14
	20	NW	<0.05	NW	51	NW	--	NW	<1	NW	9.8	NW	48
TW-22	6	NW	0.05	NW	110	NW	--	NW	15	NW	12	NW	<2
	12	NW	<0.05	NW	130	NW	--	NW	2.9	NW	16	NW	59
	20	NW	<0.05	NW	26	NW	--	NW	<1	NW	20	NW	18
TW-23	6	NW	0.07	NW	73	NW	--	NW	10	NW	5.9	NW	4
	12	NW	<0.05	NW	150	NW	--	NW	2.5	NW	14	NW	72
	20	NW	<0.05 (<0.05)	NW	27 (28)	NW	-- (--)	NW	<1 (<1)	NW	23 (23)	NW	21 (29)
TW-24	6	NW	<0.05	NW	9.9	NW	--	NW	4.4	NW	0.70	NW	3
	12	NW	<0.05	NW	150	NW	--	NW	3.7	NW	14	NW	71
	20	NW	<0.05	NW	30	NW	--	NW	<1	NW	25	NW	24
TW-25	6	NW	<0.05	NW	7.9	NW	--	NW	2.4	NW	1.4	NW	3
	12	NW	<0.05	NW	120	NW	--	NW	5.3	NW	30	NW	21
	20	NW	<0.05	NW	36	NW	--	NW	<1	NW	30	NW	24
TW-26	6	NW	<0.05	NW	40	NW	--	NW	2.6	NW	3.9	NW	6
	12	NW	<0.05	NW	120	NW	--	NW	3.9	NW	25	NW	45
	20	NW	<0.05	NW	55	NW	--	NW	<1	NW	19	NW	22
	30	NW	<0.05	NW	110	NW	--	NW	<1	NW	30	NW	140
TW-27	6	NW	<0.05	NW	20	NW	--	NW	1.7	NW	1.8	NW	16
	12	NW	<0.05 (<0.05)	NW	100 (100)	NW	-- (--)	NW	3.9 (3.5)	NW	22 (22)	NW	29 (25)
	20	NW	<0.05	NW	71	NW	--	NW	<1	NW	28	NW	47
	30	NW	<0.05	NW	110	NW	--	NW	<1	NW	28	NW	160
TW-28	6	NW	<0.05	NW	40	NW	--	NW	4.5	NW	2.8	NW	5
	12	NW	<0.05	NW	110	NW	--	NW	2.7	NW	30	NW	10
	20	NW	<0.05	NW	82	NW	--	NW	1.3	NW	30	NW	61
	30	NW	<0.05	NW	110	NW	--	NW	<1	NW	28	NW	30

-- Not analyzed
 NS Not sampled
 NW No wellpoint
 () Duplicate sample

**Table 4-10 Summary of Water Quality Results: Nutrients (mg/L)
November 1993 and May 1995**

Sample Point	Sample Depth (ft. bgs)	TKN		NH ₃ -N		NO ₃ -N		TP	
		1993	1995	1993	1995	1993	1995	1993	1995
STE (Ave)	N/A	69.2		63.2		0.04		8.8	
Tap H ₂ O (Ave)	N/A	0.08		0.08		<0.01		0.06	
BW-1	5	0.16	0.13	0.03	<0.01	0.17	<0.01	<0.01	0.03
	10	0.29	0.21	0.10	0.06	<0.01	<0.01	<0.01	0.02
	15	0.18	NS	0.04	NS	<0.01	NS	<0.01	NS
	20	0.10	NS	0.06	NS	0.33	NS	<0.01	NS
TW-1	6	2.6	47.0	3.2	46.0	43.01	1.2	6.8	8.8
	12	0.36 (0.37)	NS	0.12 (0.12)	NS	14.29(15.03)	NS	<0.01 (<0.01)	NS
	20	0.32	NS	0.22	NS	3.1	NS	<0.01	NS
TW-2	6	36	1.7	36	1.2	37.0	<0.01	4.6	6.7
	12	0.61 (0.49)	NS	<0.01 (0.03)	NS	19.4 (20.4)	NS	<0.01(<0.01)	NS
	20	0.21	NS	0.14	NS	<0.01	NS	0.02	NS
TW-3	6	0.59	NS	0.07	NS	43.13	NS	7.9	NS
	12	0.76	NS	0.03	NS	19.49	NS	0.22	NS
	20	0.25	NS	0.13	NS	<0.01	NS	<0.01	NS
TW-4	6	29 (28)	48.0	30.00 (30.00)	47.0	39.0 (37.0)	<0.01	6.9 (6.3)	13.0
	12	0.35	0.16	0.07	0.03	<0.01	<0.01	0.10	0.07
	20	0.21	NS	0.11	NS	<0.01	NS	<0.01	NS
TW-5	6	24	4.7	24.00	4.1	46.0	15.0	6.1	5.1
	12	0.35	0.31	0.04	0.18	<0.01	<0.01	0.18	0.28
	20	0.11	NS	0.04	NS	<0.01	NS	0.05	NS
TW-6	6	45.00	9.0	44.00	8.5	19.0	<0.01	4.7	5.2
	12	0.39	0.17	0.07	0.05	1.41	<0.01	0.06	0.01
	20	0.19	NS	0.11	NS	<0.01	NS	<0.01	NS
TW-7	6	27.00	2.4 (2.5)	27.00	2.1 (2.1)	1.8	<0.01 (<0.01)	4.1	4.8 (4.6)
	12	0.24	0.20	0.12	0.07	<0.01	<0.01	<0.01	0.02
	20	0.14	NS	0.07	NS	<0.01	NS	0.03	NS
TW-8	6	11.00	0.62	11.00	0.37	1.3	0.02	2.50	1.1
	12	0.14	NS	0.05	NS	<0.01	NS	0.01	NS
	20	0.30	NS	0.10	NS	<0.01	NS	0.01	NS
TW-9	6	29.00 (31.00)	2.9	29.0 (30.0)	2.5	<0.01 (<0.01)	<0.01	2.5 (2.3)	6.6
	12	0.16	0.36	<0.01	0.25	<0.01	<0.01	<0.01	<0.01
	20	0.16	NS	0.07	NS	<0.01	NS	<0.01	NS

Table 4-10 Summary of Water Quality Results: Nutrients (mg/L) □ continued
November 1993 and May 1995

Sample Point	Sample Depth (ft. bgs)	TKN		NH ₃ -N		NO ₃ -N		TP	
		1993	1995	1993	1995	1993	1995	1993	1995
TW-10	6	22.00	10.0	21.00	9.9	33.00	14.0	4.60	4.8
	12	NW	NS	NW	NS	NW	NS	NW	NS
	20	NW	NS	NW	NS	NW	NS	NW	NS
TW-11	6	17.00	30.0	15.00	29.0	13.01	<0.01	0.32	2.0
	12	NW	NS	NW	NS	NW	NS	NW	NS
	20	NW	NS	NW	NS	NW	NS	NW	NS
TW-12	6	2.5	3.5	2.50	3.1	<0.01	0.01	0.39	0.44
	12	NW	NS	NW	NS	NW	NS	NW	NS
	20	NW	NS	NW	NS	NW	NS	NW	NS
TW-13	6	0.86	0.16	0.03	0.02	0.25	<0.01	0.85	0.16
	12	15.00	0.12	16.00	0.01	<0.01	<0.01	0.09	<0.01
	20	0.16	<0.05	0.12	<0.01	<0.01	<0.01	<0.01	<0.01
TW-14	6	1.10	0.41	0.67	0.15	<0.01	<0.01	0.43	0.18
	12	7.40	0.36	6.7	0.24	<0.01	<0.01	0.01	<0.01
	20	0.13	<0.05	0.08	<0.01	<0.01	0.01	0.01	0.01
TW-15	6	3.60	0.40	3.00	0.09	<0.01	<0.01	0.32	0.31
	12	0.83	2.0	0.70	1.9	<0.01	0.01	<0.01	<0.01
	20	0.12	<0.05	0.08	<0.01	<0.01	<0.01	<0.01	0.01
TW-16	6	1.00	2.4	0.08	1.5	59.15	2.7	16.00	6.3
	12	0.52	NS	0.03	NS	9.8	NS	0.29	NS
	20	0.14	NS	0.04	NS	<0.01	NS	<0.01	NS
TW-17	6	7.10	NS	8.40	NS	52.00	NS	5.3	NS
	12	0.56 (0.59)	NS	0.02 (0.02)	NS	11.00 (11.0)	NS	<0.01 (0.17)	NS
	20	0.11	NS	0.02	NS	0.02	NS	<0.01	NS
TW-18	6	7.30	NS	9.10	NS	50.00	NS	2.2	NS
	12	0.54	NS	0.03	NS	9.34	NS	0.02	NS
	20	0.11	NS	0.04	NS	<0.01	NS	<0.01	NS
TW-19	6	NW	62.0	NW	61.0	NW	<0.01	NW	11.0
	12	NW	61.0	NW	60.0	NW	<0.01	NW	11.0
	20	NW	0.06	NW	0.06	NW	<0.01	NW	0.04
TW-20	6	NW	35.0	NW	34.0	NW	0.03	NW	12.0
	12	NW	0.19	NW	0.04	NW	<0.01	NW	0.08
	20	NW	<0.05	NW	0.02	NW	<0.01	NW	0.15

Table 4-10 Summary of Water Quality Results: Nutrients (mg/L) □ continued
November 1993 and May 1995

Sample Point	Sample Depth (ft. bgs)	TKN		NH ₃ -N		NO ₃ -N		TP	
		1993	1995	1993	1995	1993	1995	1993	1995
TW-21	6	NW	1.1	NW	0.33	NW	9.4	NW	3.3
	12	NW	0.16	NW	0.01	NW	<0.01	NW	0.16
	20	NW	<0.05	NW	<0.01	NW	<0.01	NW	0.03
TW-22	6	NW	0.47	NW	<0.01	NW	<0.01	NW	1.2
	12	NW	0.05	NW	0.05	NW	<0.01	NW	<0.01
	20	NW	<0.05	NW	<0.01	NW	<0.01	NW	0.02
TW-23	6	NW	0.46	NW	0.15	NW	<0.01	NW	1.4
	12	NW	0.18	NW	0.10	NW	<0.01	NW	0.02
	20	NW	<0.05 (<0.05)	NW	<0.01 (<0.01)	NW	<0.01 (<0.01)	NW	0.03 (0.02)
TW-24	6	NW	1.2	NW	<0.01	NW	<0.01	NW	2.0
	12	NW	0.17	NW	0.07	NW	<0.01	NW	0.03
	20	NW	<0.05	NW	<0.01	NW	<0.01	NW	0.05
TW-25	6	NW	0.23	NW	<0.01	NW	0.05	NW	0.22
	12	NW	0.19	NW	0.05	NW	<0.01	NW	0.05
	20	NW	<0.05	NW	0.02	NW	<0.01	NW	0.03
TW-26	6	NW	0.19	NW	0.03	NW	<0.01	NW	0.19
	12	NW	0.49	NW	0.38	NW	<0.01	NW	0.02
	20	NW	0.06	NW	<0.01	NW	1.5	NW	0.03
	30	NW	0.05	NW	0.05	NW	<0.01	NW	<0.01
TW-27	6	NW	0.12	NW	0.01	NW	<0.01	NW	0.13
	12	NW	0.48 (0.49)	NW	0.36 (0.36)	NW	<0.01 (0.01)	NW	0.02 (0.03)
	20	NW	0.05	NW	0.05	NW	0.01	NW	0.02
	30	NW	0.07	NW	0.07	NW	<0.01	NW	0.02
TW-28	6	NW	0.25	NW	0.08	NW	<0.01	NW	0.07
	12	NW	3.0	NW	2.9	NW	<0.01	NW	0.03
	20	NW	0.05	NW	0.05	NW	0.01	NW	0.03
	30	NW	<0.05	NW	0.04	NW	0.01	NW	0.02

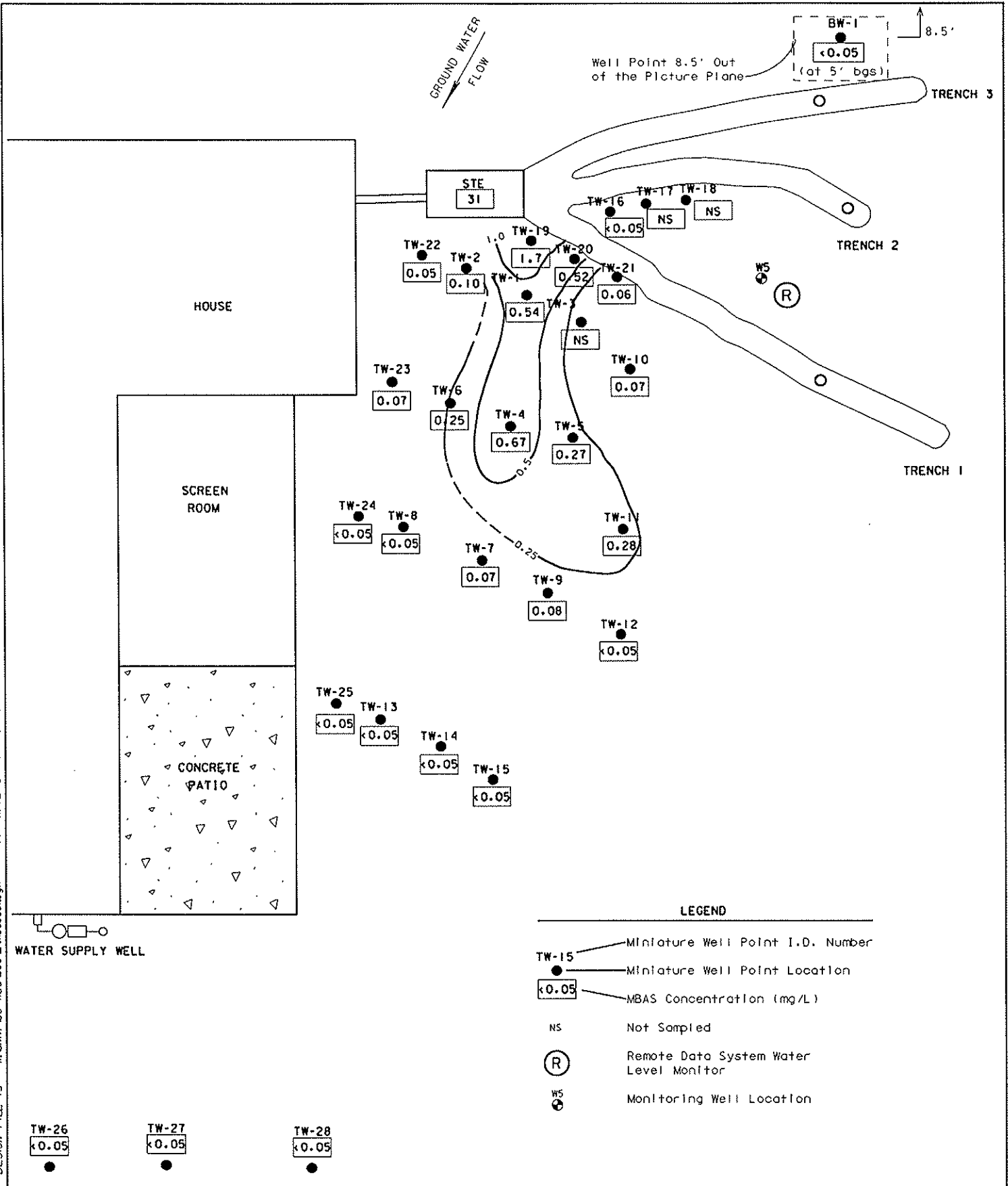
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 NS Not sampled
 NW No wellpoint
 () Duplicate sample

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DATE OF PLOT - 07/15/96

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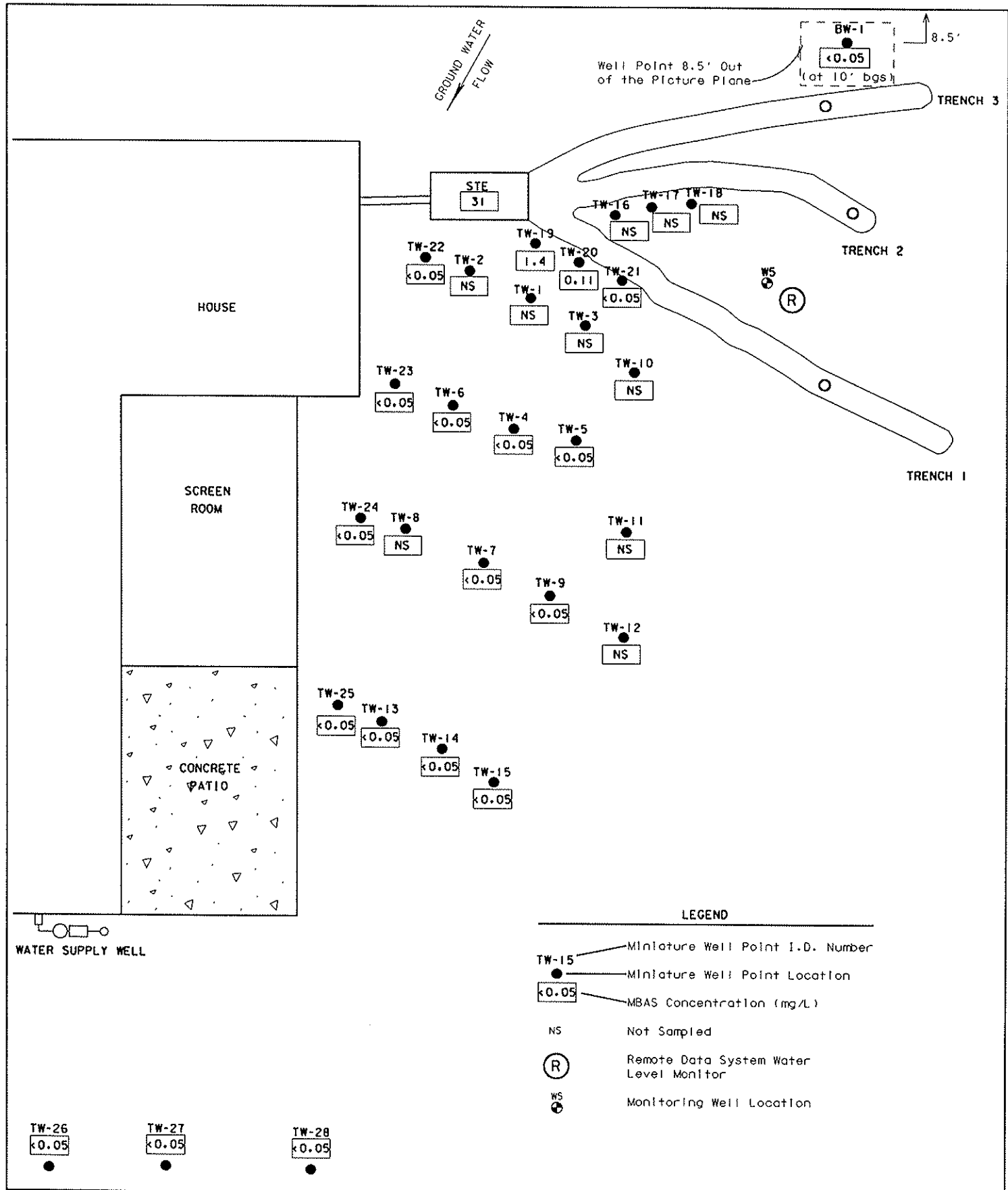


LEGEND	
TW-15	Miniature Well Point I.D. Number
●	Miniature Well Point Location
<math><0.05</math>	MBAS Concentration (mg/L)
NS	Not Sampled
(R)	Remote Data System Water Level Monitor
W	Monitoring Well Location

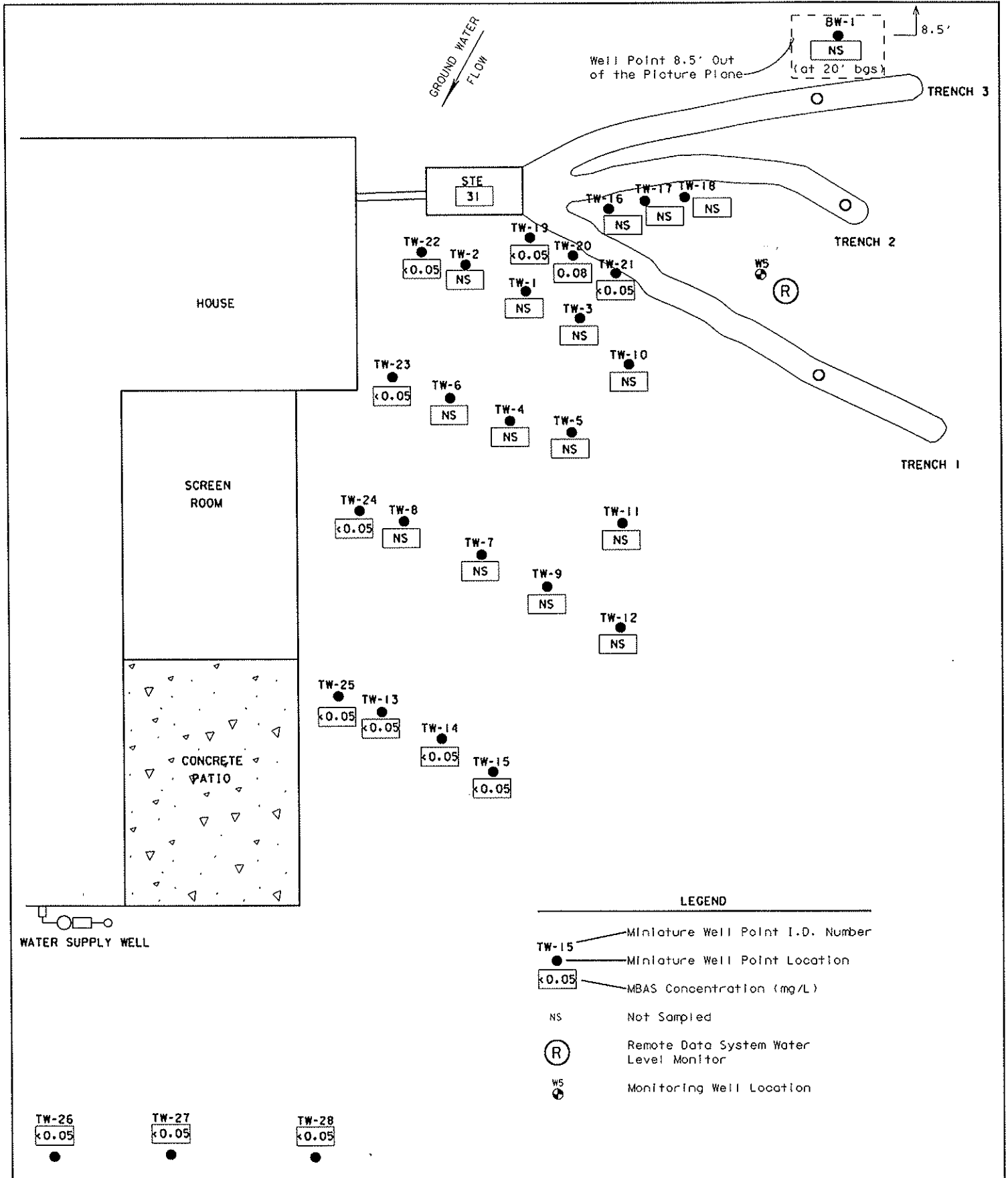
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SCALE 1" = 10'	PROJECT NO. 1 30-4155.10	SOA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT	FIGURE: 4-7
	DRAWN BY: MAN DATE: 5-96		
AYRES ASSOCIATES	CHECKED BY: DLA DATE: 5-96	MBAS CONCENTRATION CONTOURS (6' bgs) - 5/8-12/95	UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM
	APPROVED BY: DATE:		

PEN 10/1/88
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 AF MA...
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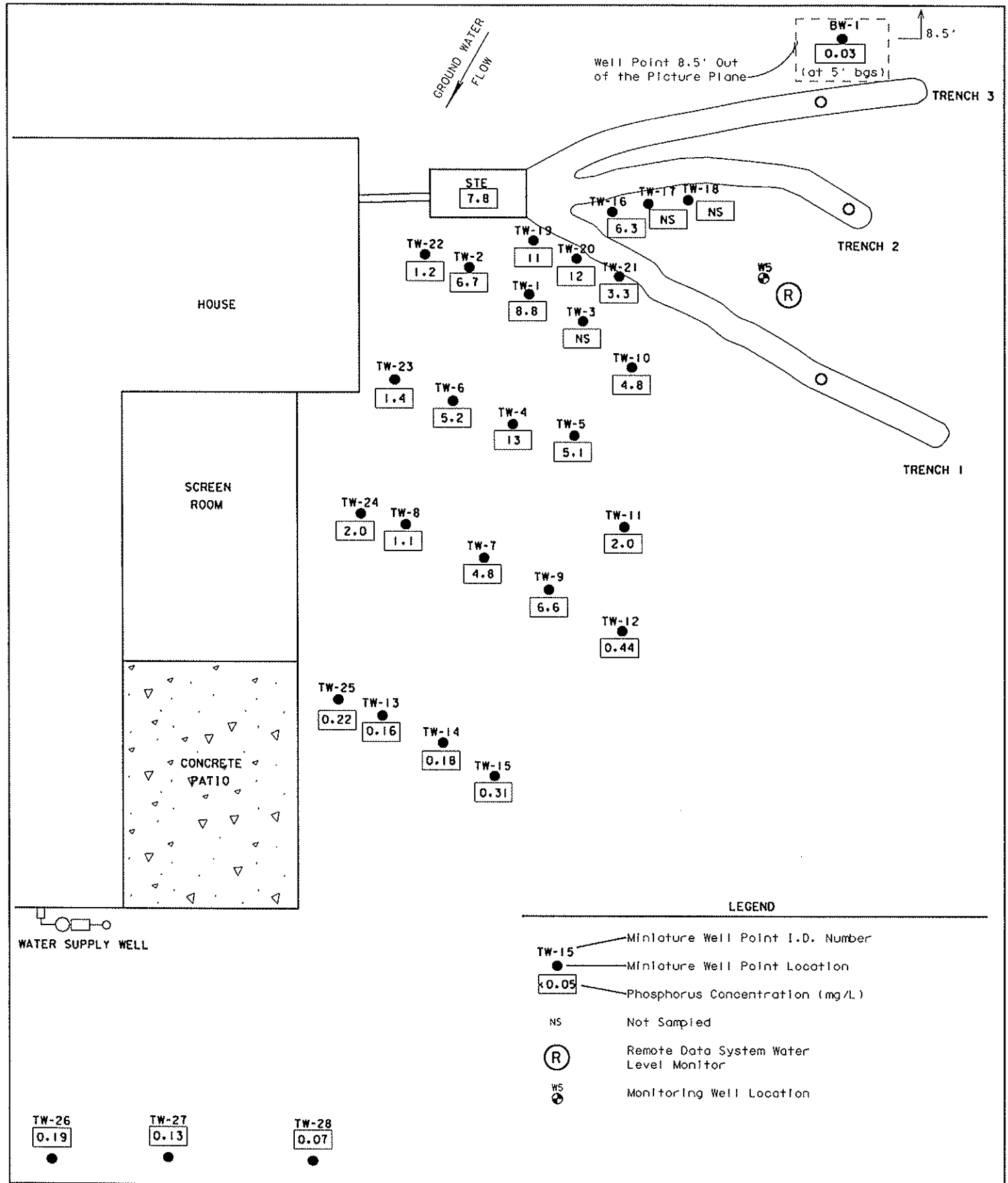


SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT	FIGURE: 4-8
	DRAWN BY: MAN 6/95		
	CHECKED BY: CGH 6/95	MBAS CONCENTRATIONS (12 bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	
	APPROVED BY: DATE:		



SCALE 1" = 10' AYRES ASSOCIATES	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT MBAS CONCENTRATIONS (20' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-9
	DRAWN BY: MAN DATE: 6/95		
	CHECKED BY: CGH DATE: 6/95		
APPROVED BY: _____ DATE: _____			

PEN 10000 - 10/16/95
 DATE OF PLOT - 01/12/96
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SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT TOTAL PHOSPHORUS CONCENTRATIONS (6' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-10
	DRAWN BY: MAN		
CHECKED BY: CGH	DATE: 6/95		
APPROVED BY:	DATE:		
AYRES ASSOCIATES			

PEN TABLE - 10/17/2014

DATE OF PLOT - 07/15/96

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GROUND WATER FLOW

Well Point 8.5' Out of the Picture Plane

BW-1
0.03
(at 5' bgs)

TRENCH 3

TRENCH 2

TRENCH 1

HOUSE

SCREEN ROOM

CONCRETE PATIO

STE
7.8

TW-22
1.2

TW-2
6.7

TW-19
1

TW-1
8.8

TW-3
NS

TW-20
17

TW-21
3.3

TW-10
4.8

TW-23
1.4

TW-6
6.2

TW-4
13

TW-5
5.1

TW-24
2.0

TW-8
1.1

TW-7
4.8

TW-9
6.6

TW-12
0.44

TW-25
0.22

TW-13
0.16

TW-14
0.18

TW-15
0.31

LEGEND

- TW-15 — Miniature Well Point I.D. Number
- — Miniature Well Point Location
- 0.05 — Phosphorus Concentration (mg/L)
- NS — Not Sampled
- (R) — Remote Data System Water Level Monitor
- WS — Monitoring Well Location

TW-26
0.19

TW-27
0.13

TW-28
0.07

SCALE 1" = 10'



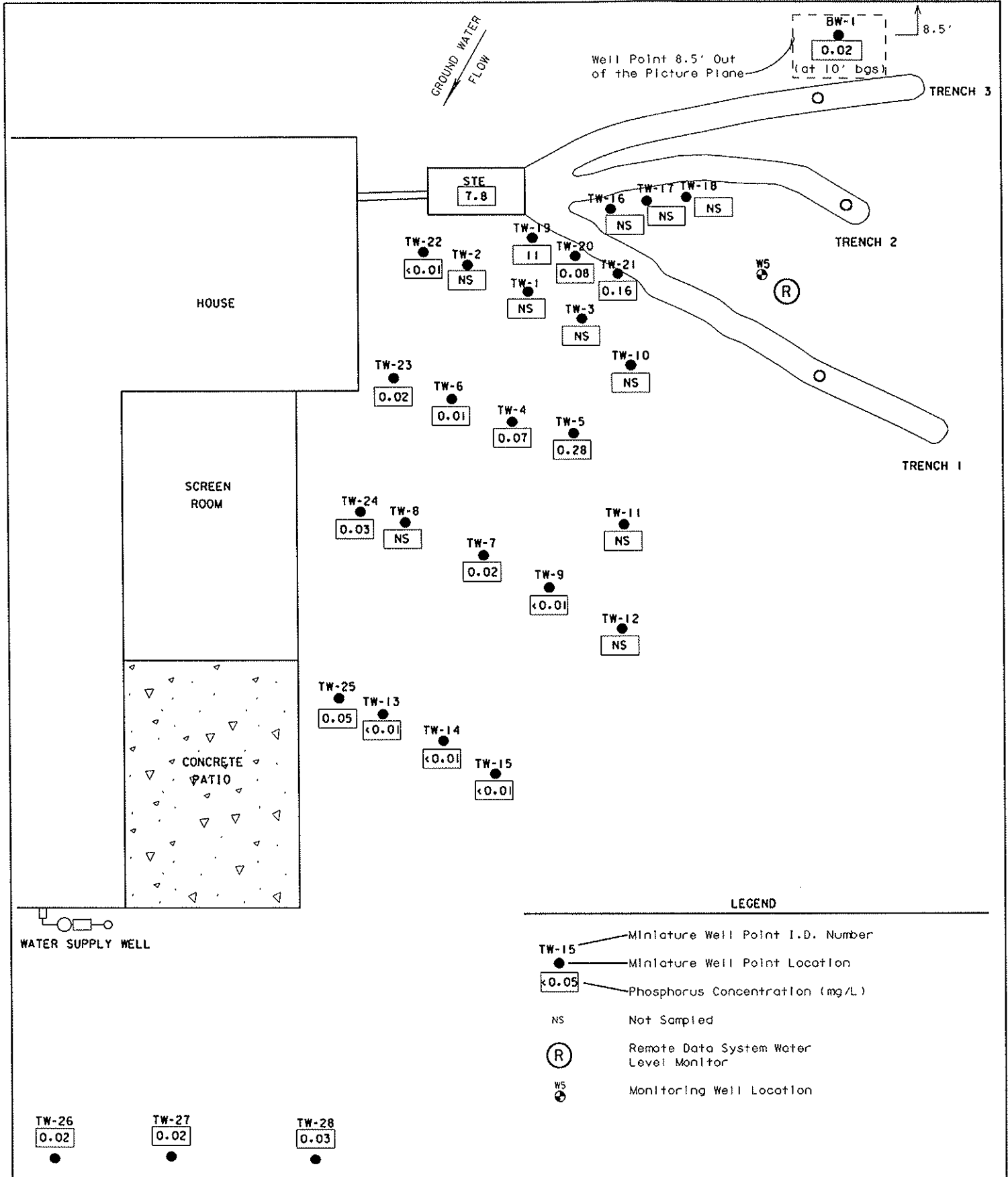
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DRAWN BY: MAN	DATE: 5-96
CHECKED BY: DLA	DATE: 5-96
APPROVED BY:	DATE:

SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT

TOTAL PHOSPHORUS CONCENTRATION CONTOURS
(6' bgs) - 5/8-12/95
UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM

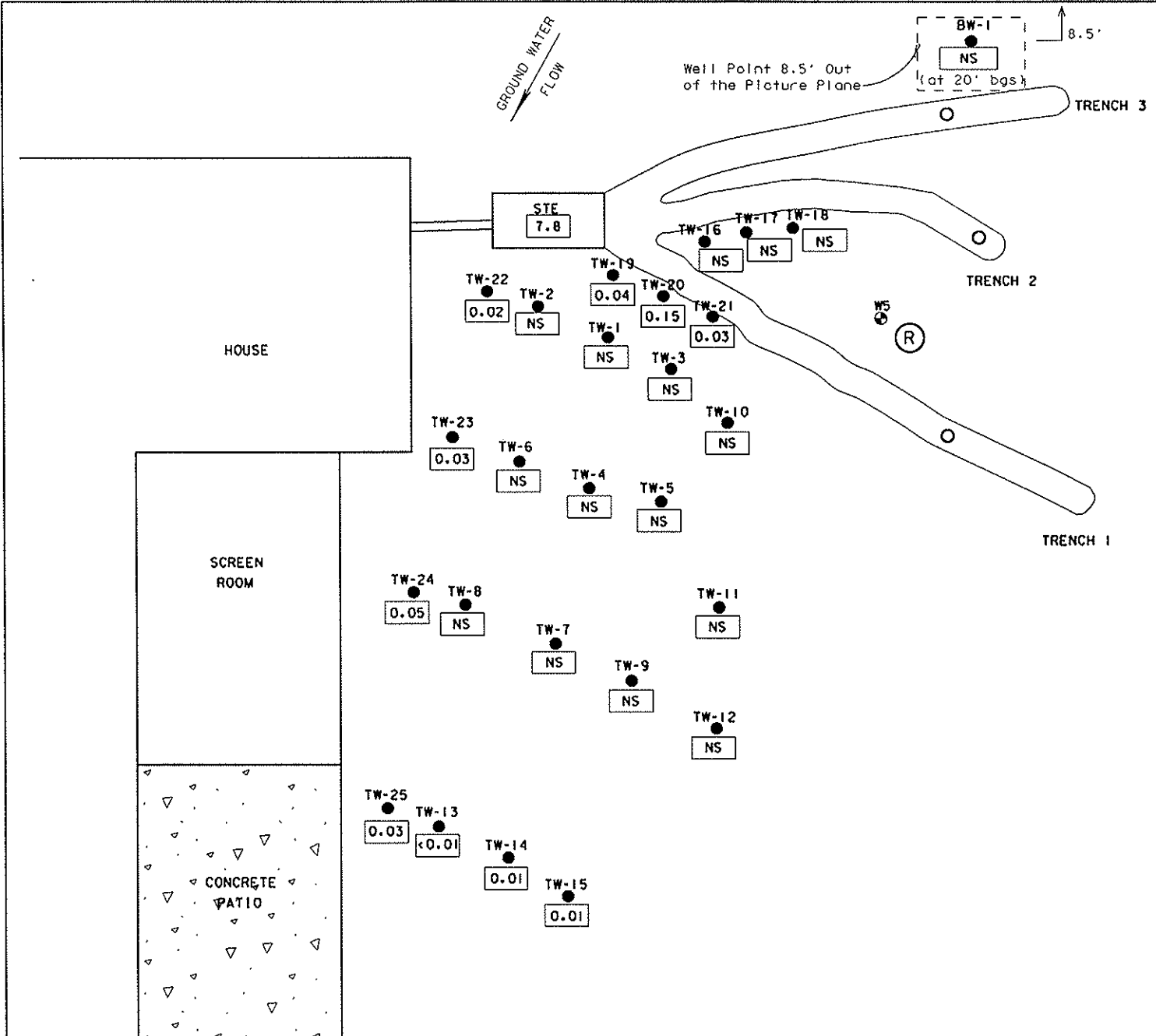
FIGURE:
4-11

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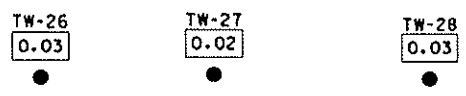


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	DRAWN BY: MAN 6/95 CHECKED BY: CGH 6/95 APPROVED BY: DATE:		

DRAWING FILE IN ... \Sdr2... \dgn
 .IF NAM
 \PRFO
 \DAPRF
 D.
 PLOT *
 *6
 PEN I
 REV 8

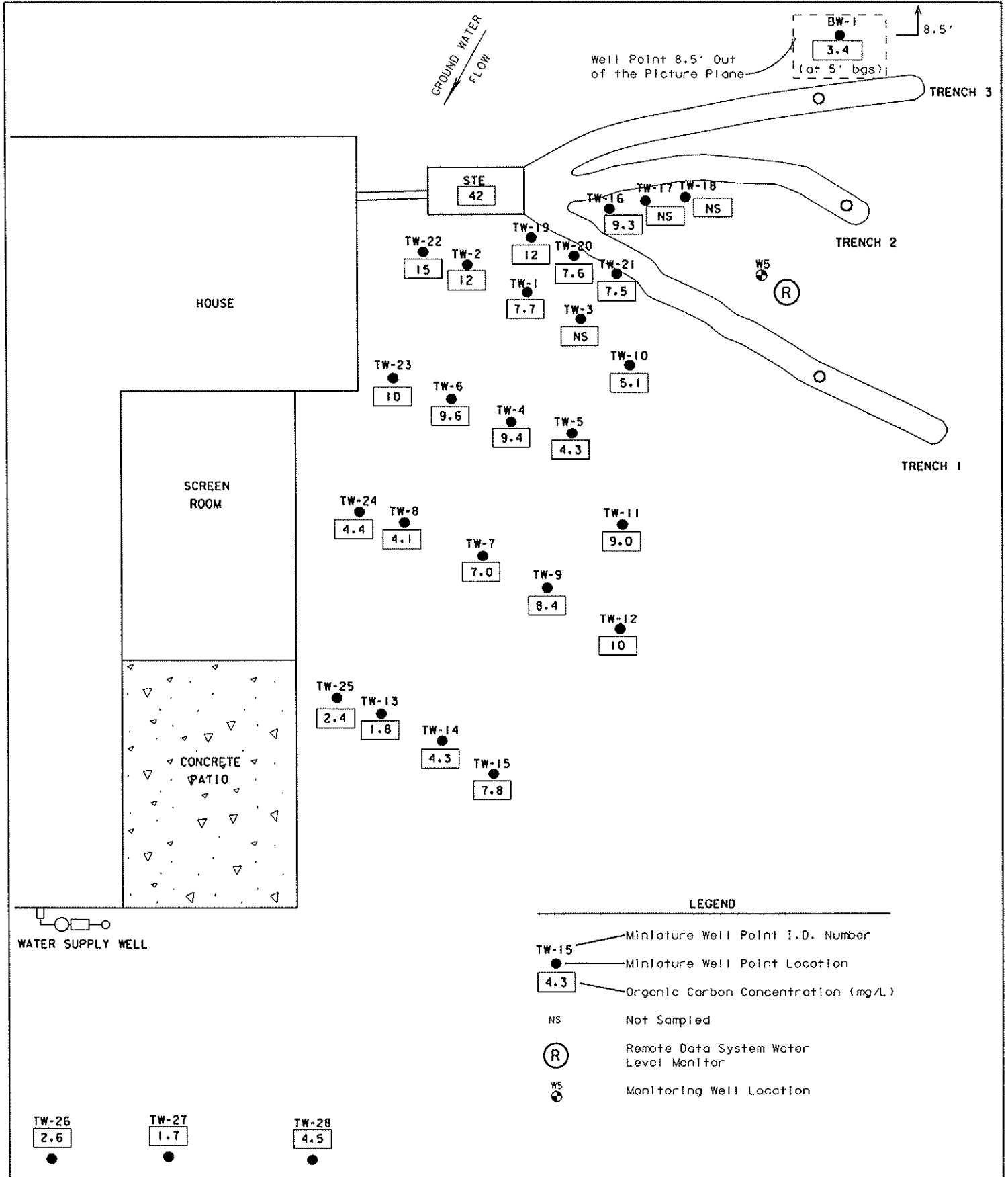


WATER SUPPLY WELL



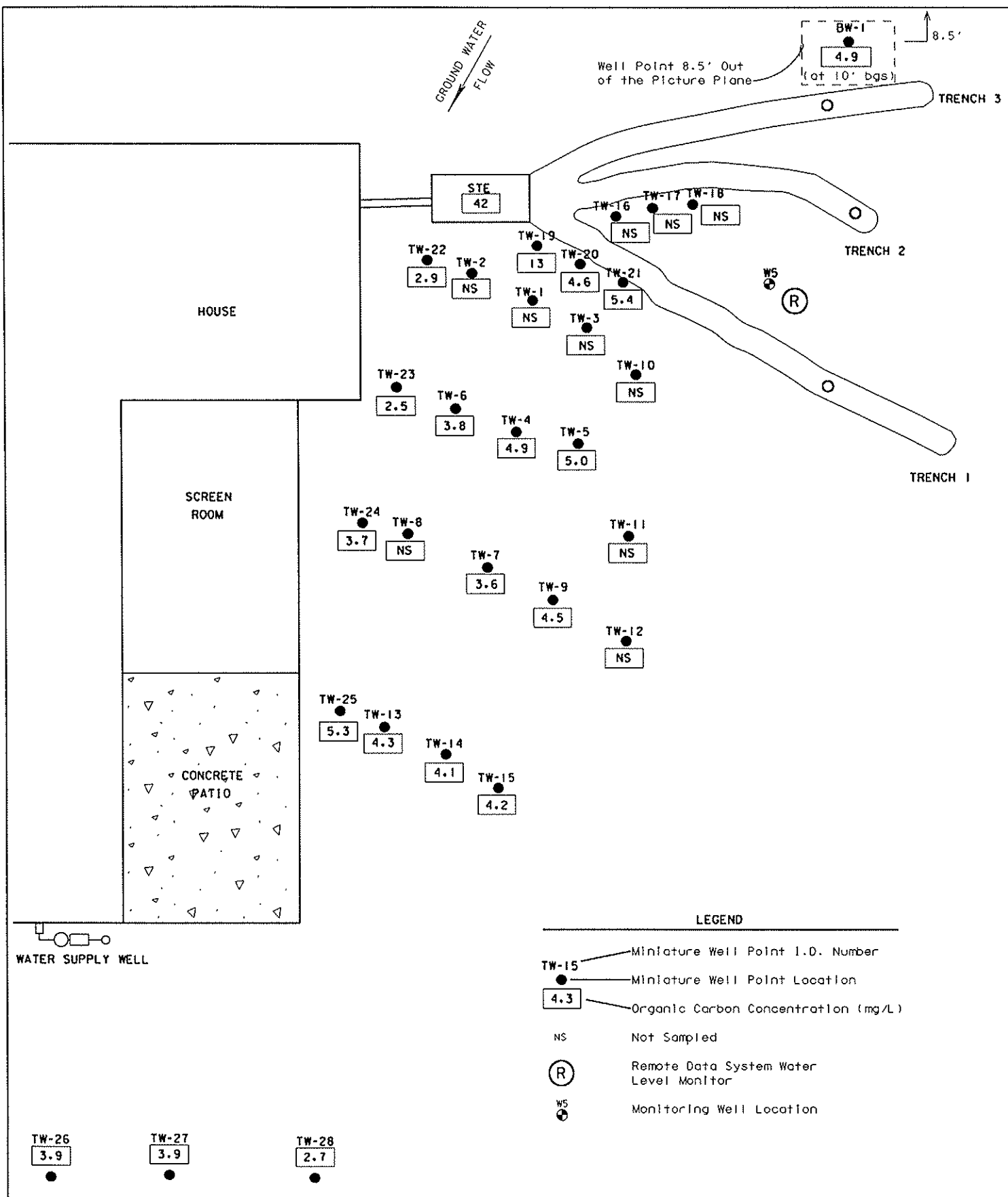
SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT TOTAL PHOSPHORUS CONCENTRATIONS (20' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-13
	DRAWN BY: MAN		DATE: 6/95
CHECKED BY: CGH	DATE: 6/95		
APPROVED BY:	DATE:		
AYRES ASSOCIATES			

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SCALE 1" = 10' 	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT TOTAL ORGANIC CARBON CONCENTRATIONS (6' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-14
	DRAWN BY: MAN DATE: 6/95		
APPROVED BY: _____ DATE: _____			

DATE: 6/95
 PLOT: 36
 D.
 FILE



SCALE 1" = 10'	PROJECT NO. 1 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT TOTAL ORGANIC CARBON CONCENTRATIONS (12' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-15
	DRAWN BY: MAN DATE: 6/95		
CHECKED BY: CGH DATE: 6/95			
APPROVED BY: _____ DATE: _____			

GROUND WATER FLOW

Well Point 8.5' Out of the Picture Plane (at 20' bgs)

8.5'

TRENCH 3

TRENCH 2

TRENCH 1

HOUSE

SCREEN ROOM

CONCRETE PATIO

STE 42

WS (R)

- LEGEND**
- TW-15 — Miniature Well Point I.D. Number
 - — Miniature Well Point Location
 - 4.3 — Organic Carbon Concentration (mg/L)
 - NS — Not Sampled
 - (R) — Remote Data System Water Level Monitor
 - WS — Monitoring Well Location

WATER SUPPLY WELL

TW-26 <1

TW-27 <1

TW-28 1.3

SCALE 1" = 10'



PROJECT NO.: 30-4155.10

DRAWN BY: MAN DATE: 6/95

CHECKED BY: CGH DATE: 6/95

APPROVED BY: DATE:

SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT

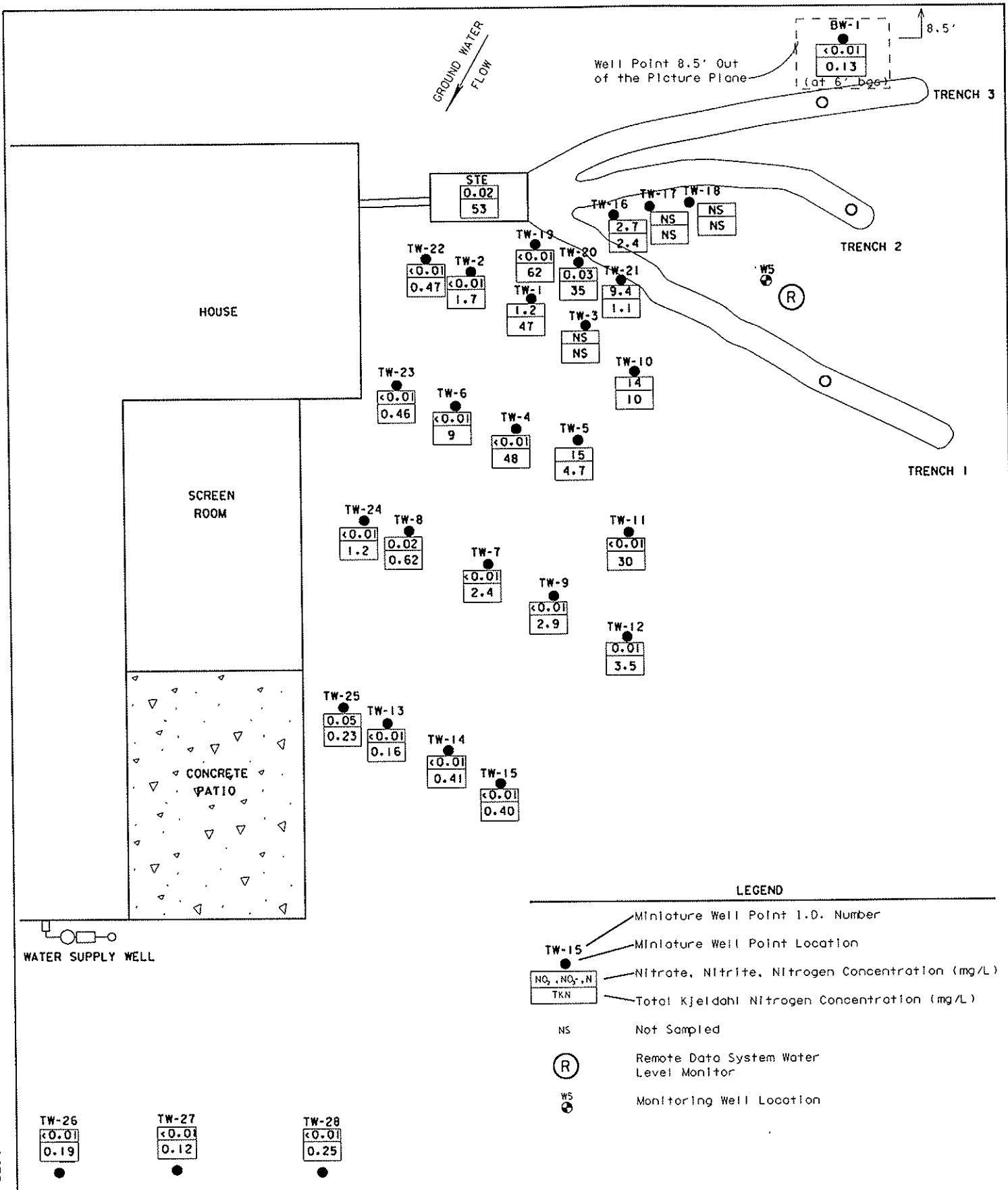
TOTAL ORGANIC CARBON CONCENTRATIONS

(20' bgs) - 5/8-12/95

UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM

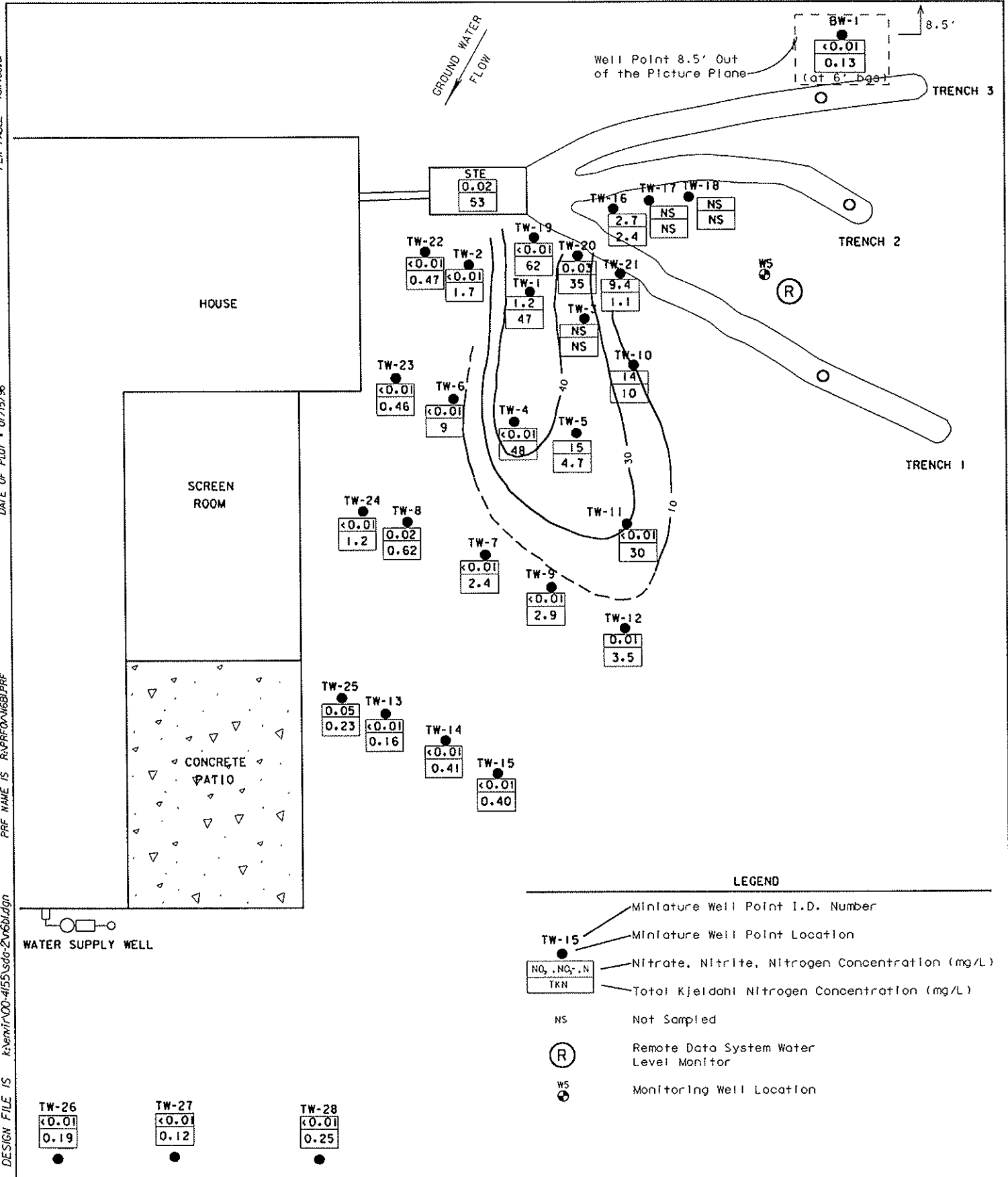
FIGURE: 4-16

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 PLOT: 01/11/96
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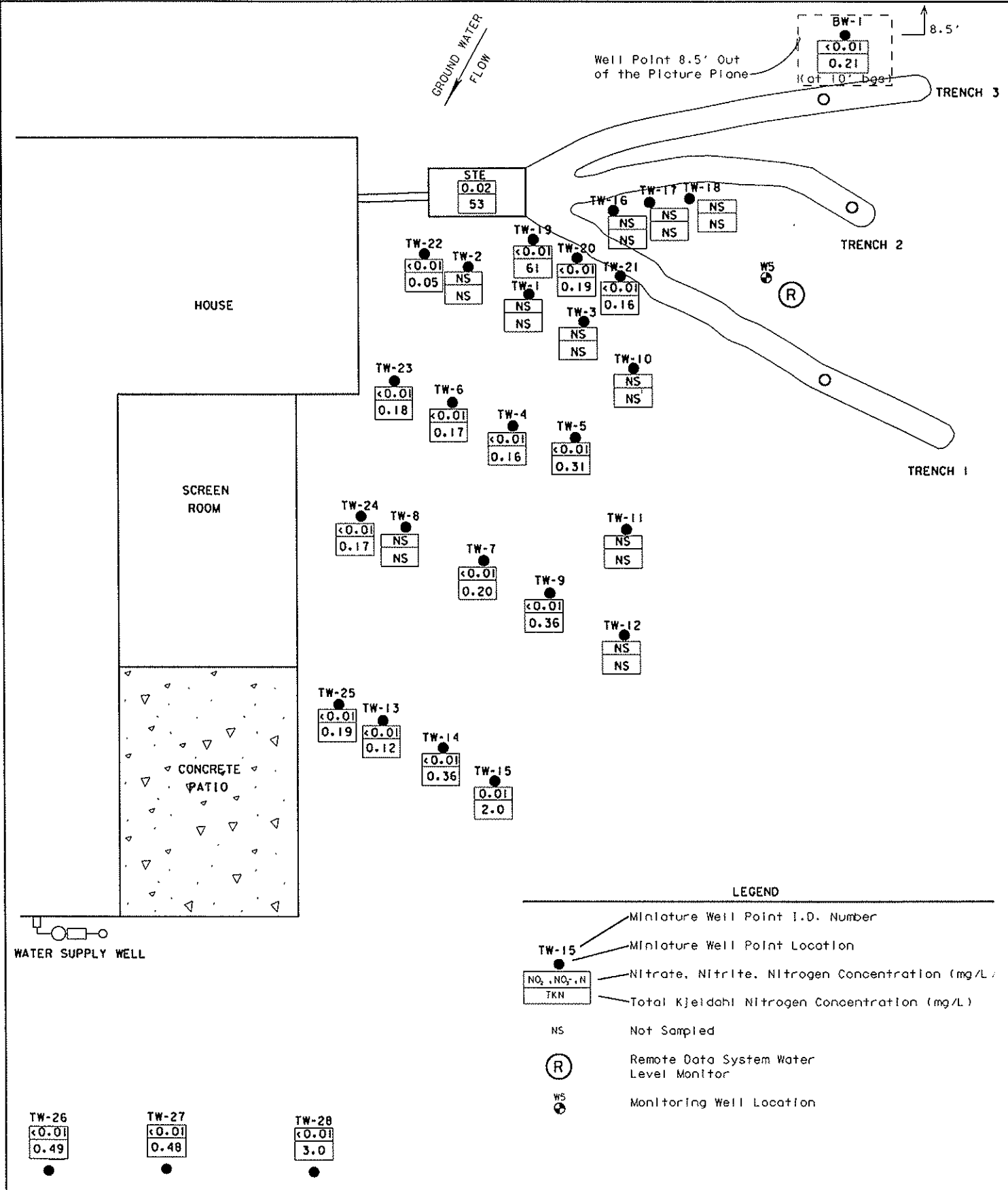
SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT NO ₂ , NO ₃ , N, & TKN CONCENTRATIONS (6' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-17
	DRAWN BY: MAN		
AYRES ASSOCIATES	CHECKED BY: CGH	DATE: 6/95	
	APPROVED BY:	DATE:	

PEN TABLE • 10/1/80/24
 DATE OF PLOT • 07/15/98
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SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT TOTAL KJELDAHL-N CONCENTRATION CONTOURS (6' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-18
	DRAWN BY: MAN		
	CHECKED BY: DLA	DATE: 5-96	
	APPROVED BY:	DATE:	

PEN :
 36
 PLOT -
 D
 RF
 3P HAA
 3P HAA
 3P HAA
 3P HAA
 FILE :
 D



SCALE 1" = 10'

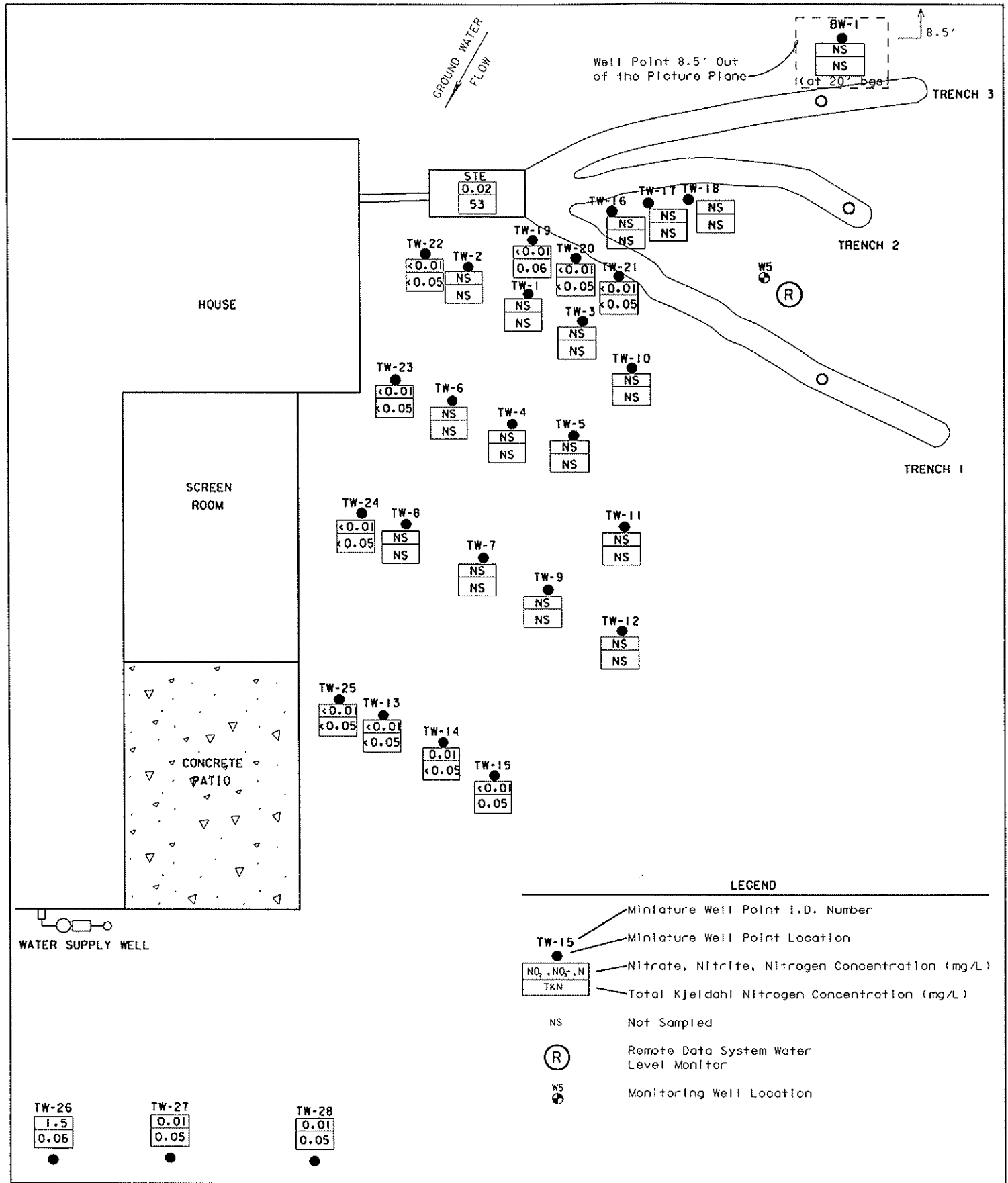


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 DRAWN BY: MAN DATE: 6/95
 CHECKED BY: CGH DATE: 6/95
 APPROVED BY: DATE:

SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT
 NO₂, NO₃, N, & TKN CONCENTRATIONS
 (12' bgs) - 5/8-12/95
 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM

FIGURE:
 4-19

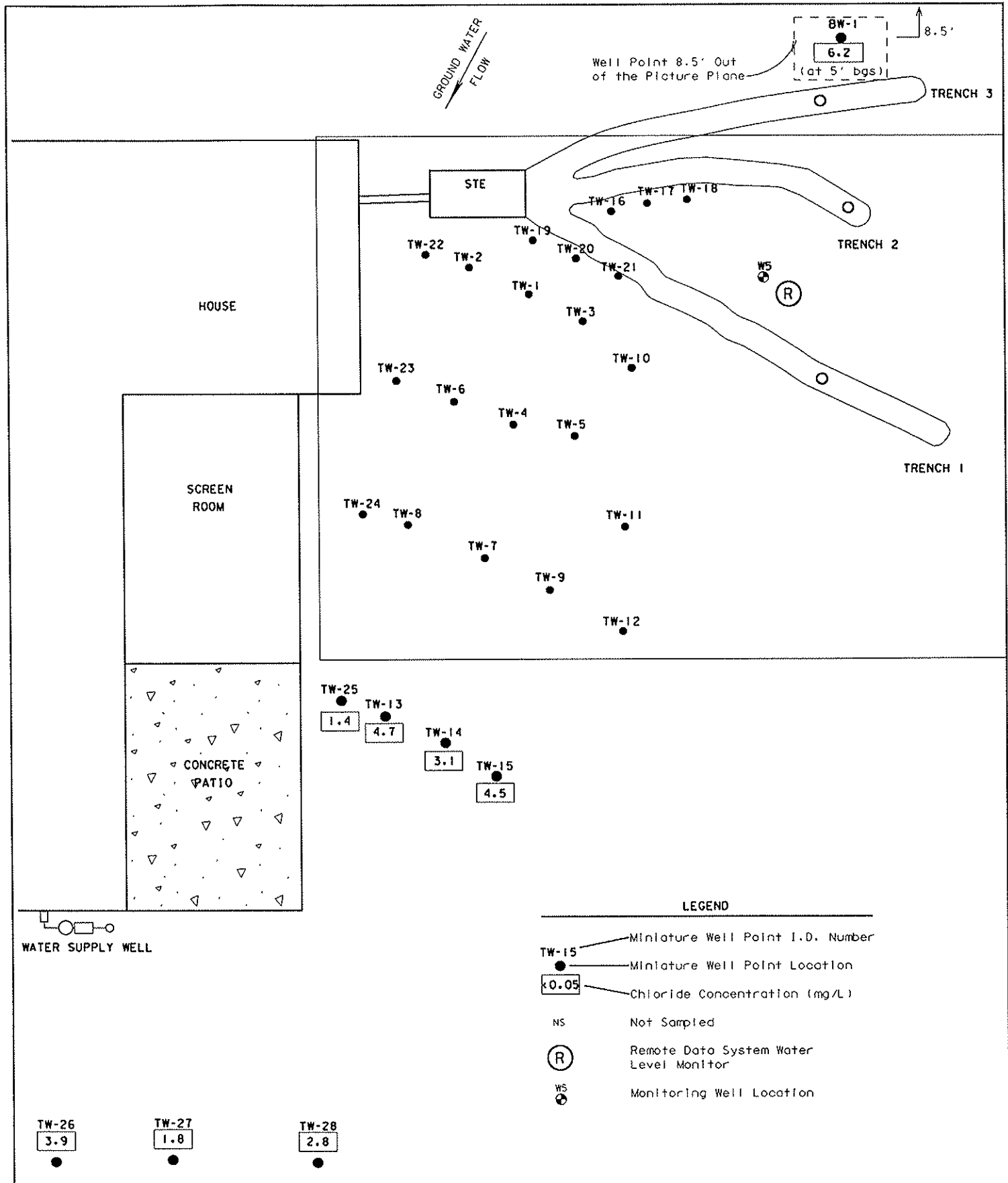
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 DATE IS 6/12/95



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	DRAWN BY: MAN		
CHECKED BY: CGH	DATE: 6/95		
APPROVED BY:	DATE:		



PEN, MOLL - 10/16/95
 DATE OF PLOT - 01/10/96
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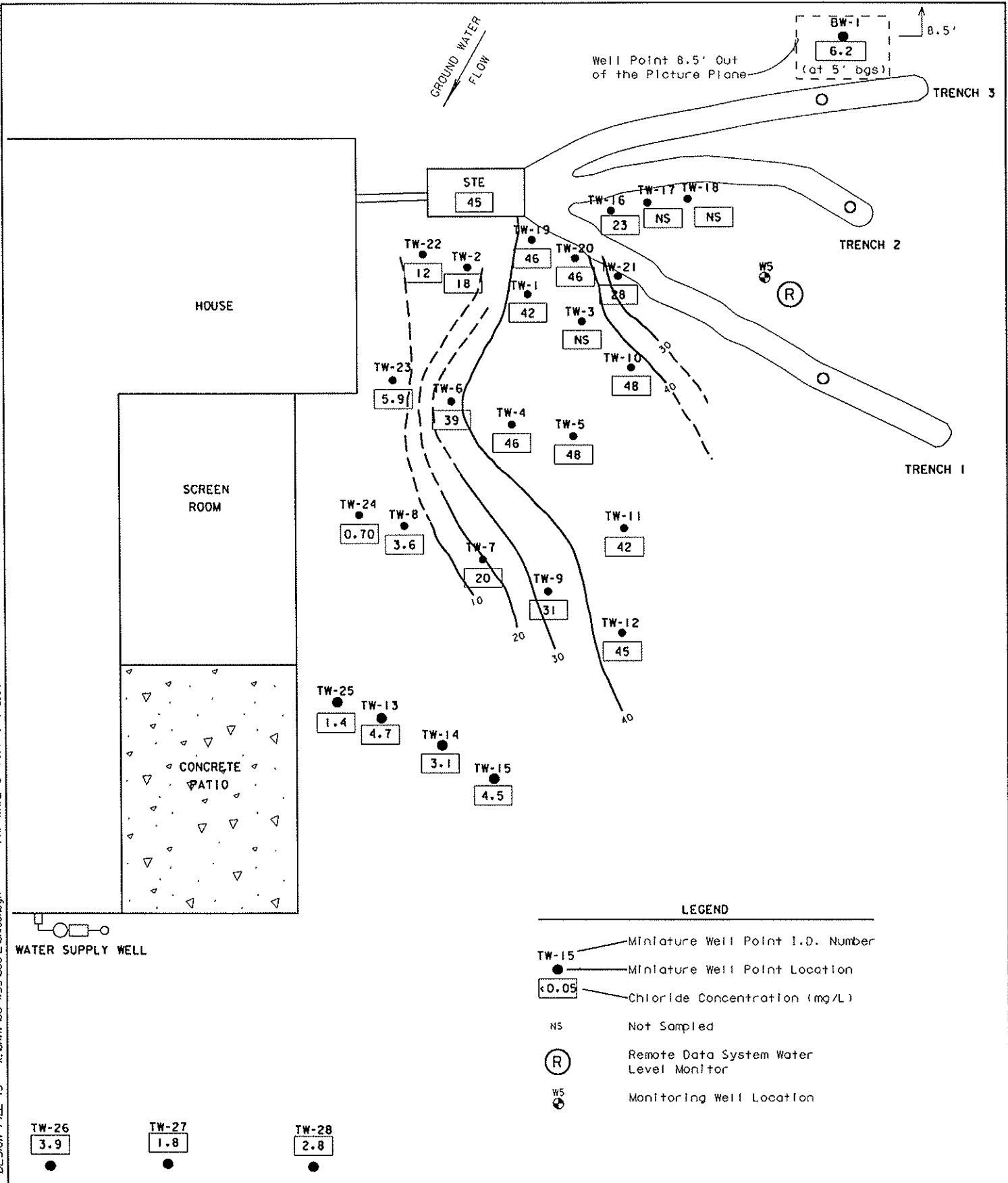
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	DRAWN BY: MAN		
	CHECKED BY: CGH	DATE: 6/95	CHLORIDE CONCENTRATIONS (6 bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM
	APPROVED BY:	DATE:	

PEN TABLE - 02/15/96

DATE OF PLOT - 07/15/96

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SCALE 1"=10'

AYRES
ASSOCIATES

PROJECT NO. 1 30-4155.10	
DRAWN BY: MAN	DATE: 5-96
CHECKED BY: DLA	DATE: 5-96
APPROVED BY:	DATE:

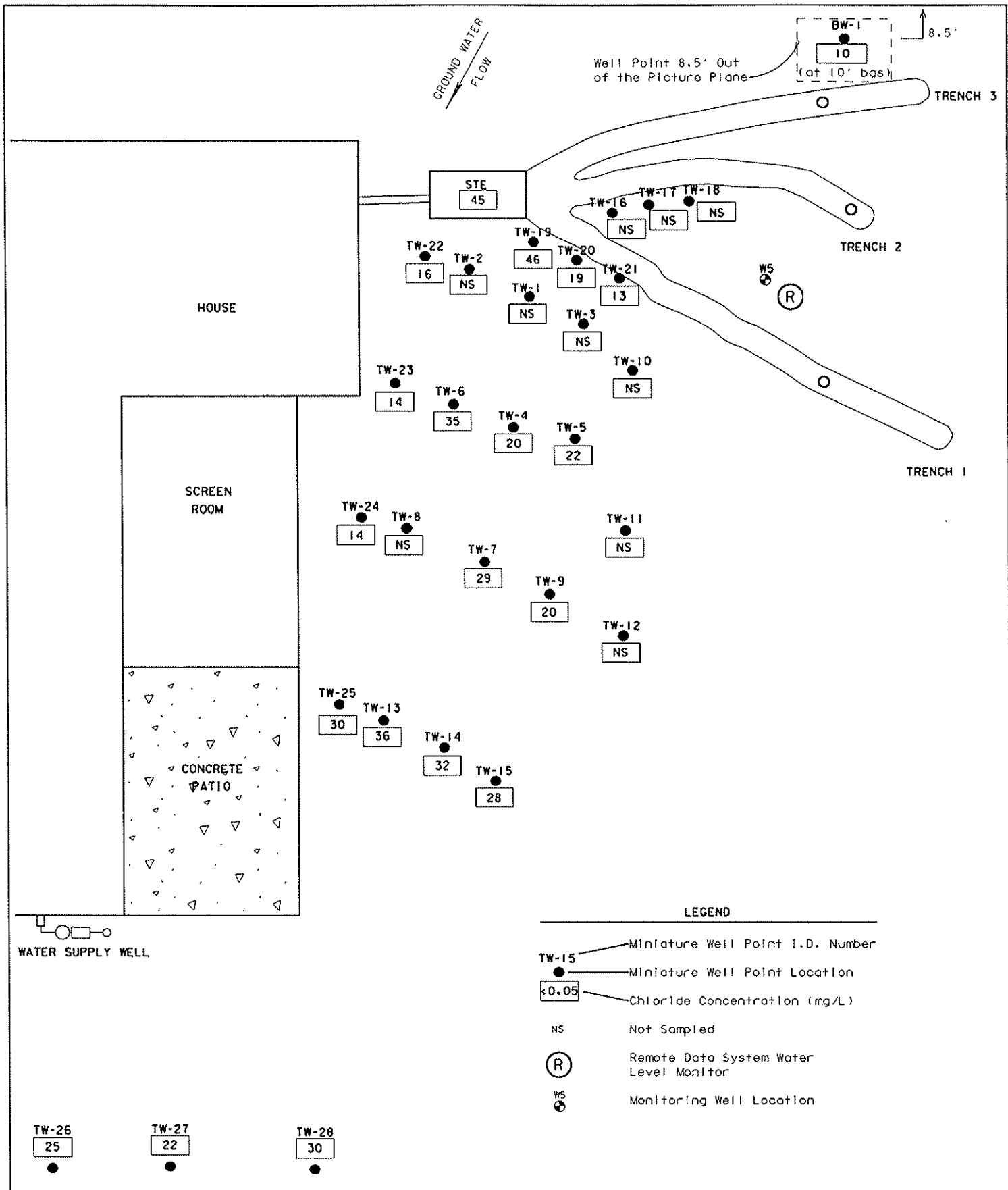
SDA ONSITE WASTEWATER
TREATMENT SYSTEM PROJECT

**CHLORIDE
CONCENTRATION CONTOURS**
(6' bgs) - 5/8-12/95
UNSATURATED THICKNESS 0.69 TO 1.41 FEET
BELOW TRENCH BOTTOM

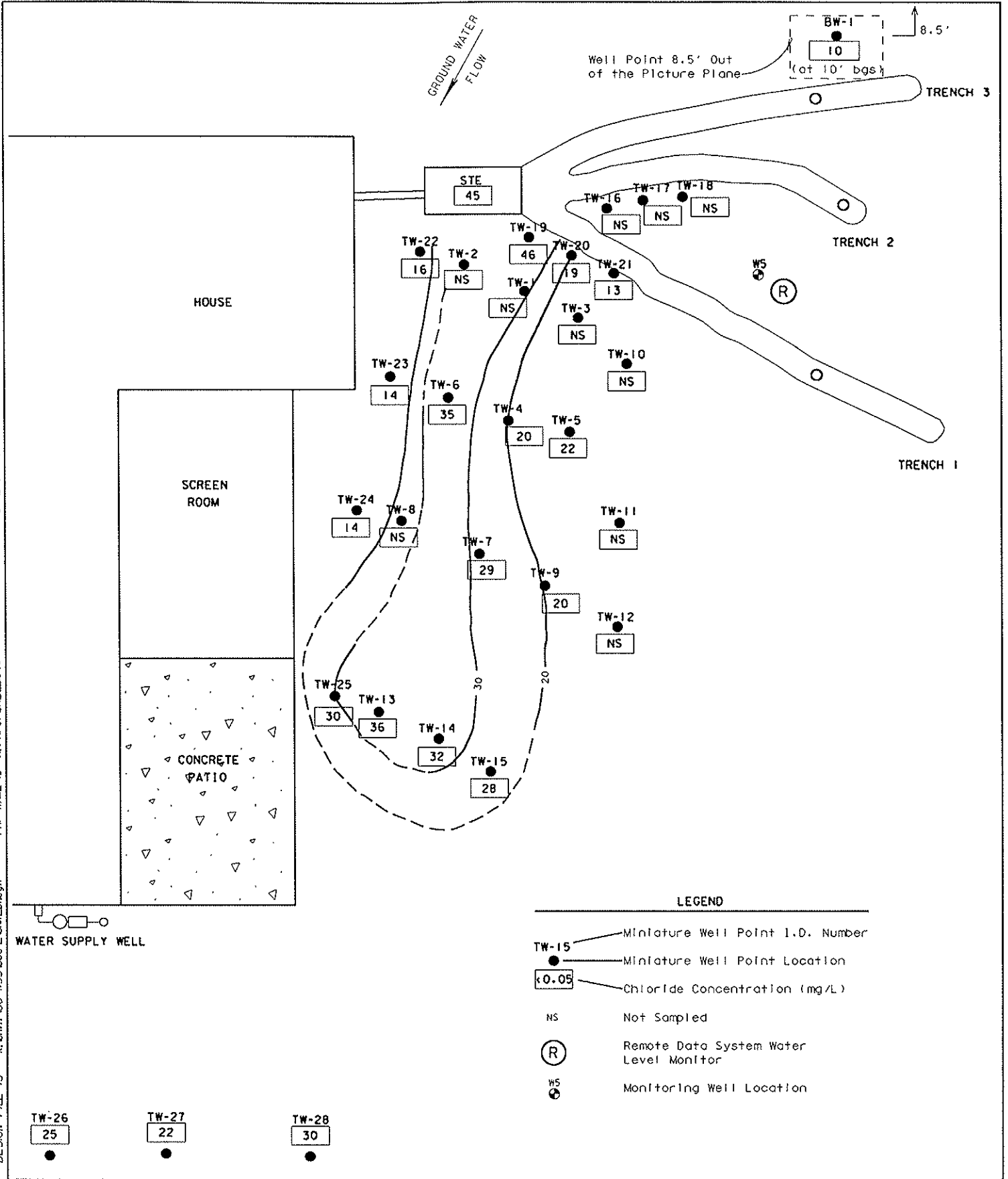
FIGURE:

4-22

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 PEN 13 10/16/95



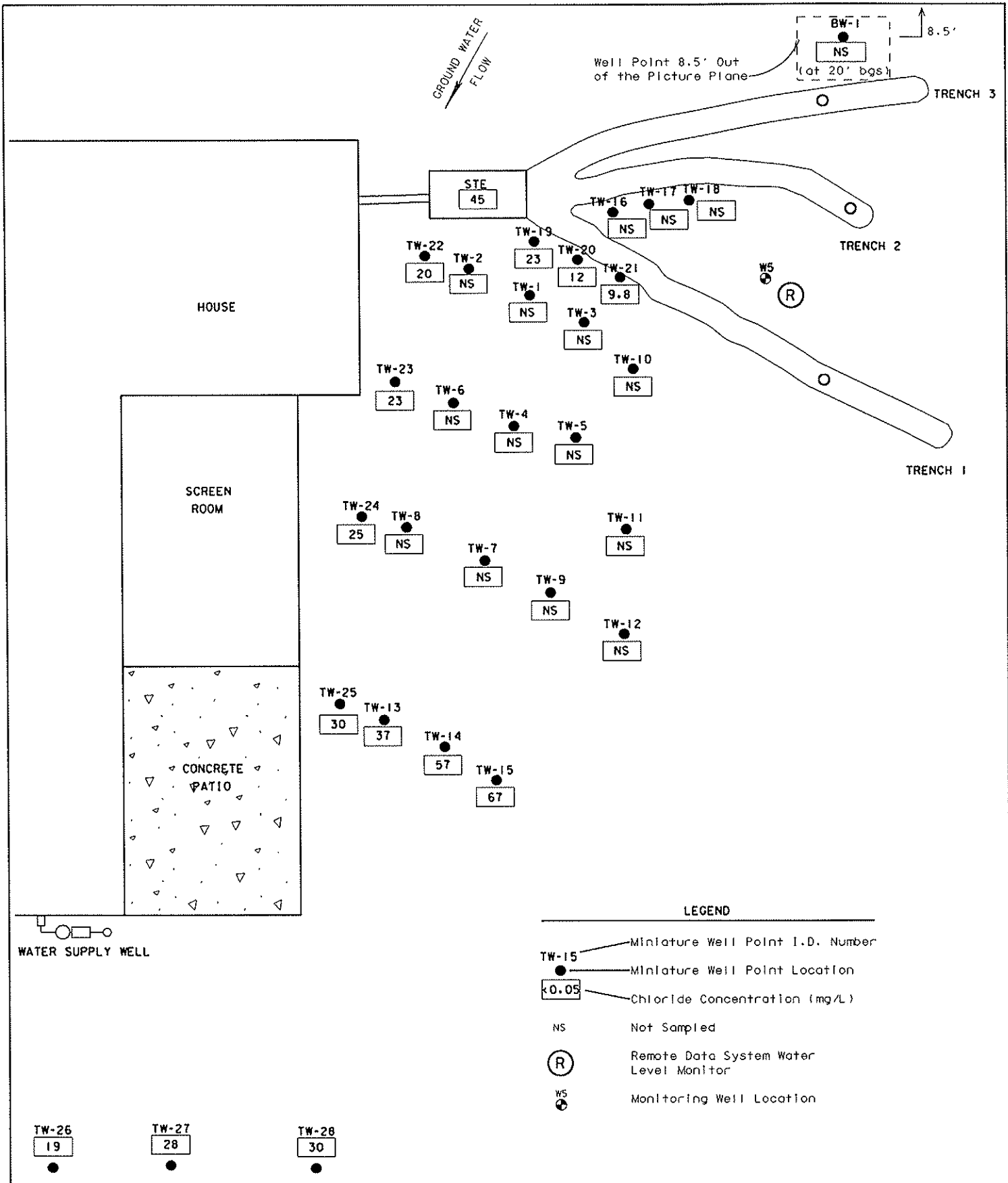
SCALE 1" = 10' AYRES ASSOCIATES	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT CHLORIDE CONCENTRATIONS (12' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM	FIGURE: 4-23
	DRAWN BY: MAN 6/95 CHECKED BY: CGH 6/95 APPROVED BY:		



TW-26 25 TW-27 22 TW-28 30

SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT	FIGURE: 4-24
	DRAWN BY: MAN		
AYRES ASSOCIATES	CHECKED BY: DLA	DATE: 5-96	CHLORIDE CONCENTRATION CONTOURS (12' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM
	APPROVED BY:	DATE:	

DESIGN FILE 13 K:\SMT\WORK\4155\SDA-2\4155\DWG\2000\ALPREF
 PRF NAME 13 R:\PREF\4155\ALPREF
 D.W.S. PLOT 6/12/95
 PEN
 04/11/98



SCALE 1" = 10'	PROJECT NO.: 30-4155.10	SDA ONSITE WASTEWATER TREATMENT SYSTEM PROJECT	FIGURE: 4-25
	DRAWN BY: MAN		
	CHECKED BY: CGH	DATE: 6/95	CHLORIDE CONCENTRATIONS (20' bgs) - 5/8-12/95 UNSATURATED THICKNESS 0.69 TO 1.41 FEET BELOW TRENCH BOTTOM
	APPROVED BY:	DATE:	

5.0 SUMMARY AND RECOMMENDATIONS

This report summarizes the field investigations at a single family OWTS in St. Johns County, Florida. Data has been collected at the site since 1990 and considerable data now exists on the household characteristics, wastewater source (STE), soils, site specific meteorology, groundwater hydrology, and contaminant concentrations. Further field investigations are not recommended at this time. Rather, it is recommended that more detailed analyses of the existing data be conducted to evaluate the cause-effect relationships of contaminant transport for these types of wastewater treatment systems.

Detailed data analyses should include:

- the relationship between rainfall and water table elevation.
- the groundwater flow relationship at the site based on the soils testing and bromide test data.
- the relationship between unsaturated zone thickness and water quality, utilizing the relationships developed above to estimate unsaturated zone thickness at the time downgradient sampled water was below the drainfield.
- the detergent usage data should be evaluated to estimate the various surfactant loadings to the OWTS. This data should also be compared to MBAS data to determine if it can be used as a surrogate for certain surfactants.
- utilizing the above relationships and other existing site data to calibrate and test the recently developed SDA septic system contaminant transport model.

If additional data needs are determined during these analyses, field investigations could then be conducted to obtain the specific data needed.

6.0 REFERENCES

- Ayres Associates, 1989 (Revised 1993). *Performance Monitoring and Groundwater Quality Impact of OSDSs in Subdivision Developments*. Florida Department of Health and Rehabilitative Services; OSDS Research Progress Report under Contract No. LCND2.
- Bouwer, H., and Rice, R., 1976. *A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells*. American Geophysical Union, p. 423-428.
- Cogger, C.G., Hajjar, L.M., Moe, C.L., and Sobsey, M.D., 1988. *Septic system performance on a coastal barrier island*. J. Environ. Qual. 17:217-322.
- Parker, G.G., Ferguson, G.E. Love, S.K. et al., 1955. *Water Resources of Southeastern Florida*, U.S. Geological Survey Water Supply Paper 1255.
- Soil Conservation Service, 1983. *Soil Survey of St. Johns County*. U.S. Department of Agriculture, Washington D.C.
- Soil Science Society of America (SSSA), Inc., 1986. *Methods of Soil Analysis: Part 1-Physical and Mineralogical Methods*. Second Edition, Arnold Klute, Editor. American Society of Agronomy, Madison, WI.
- Stolt, M.H. and R.B. Reneau, Jr. 1991. *Potential for Contamination of Ground and Surface Waters from On-Site Wastewater Disposal Systems*.

A1: Phase II STE Laboratory Reports

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FLORIDA 34677

813-855-1844

Ayres Associates
RSE Group
3901 Coconut Palm Drive
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Tampa, Florida 33619

November 20, 1992
Project No. 04914
Page 1 of 4

LABORATORY REPORT

RECEIVED

NOV 23 1992

AYRES ASSOCIATES

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
Sample Description: 01 - Water, STE-22, sampled 11/5/92, 1200
Date Received: 11/6/92

<u>Parameter</u>	<u>Units</u>	<u>(01) STE-22</u>	<u>Laboratory Blank</u>
BOD (5 Day @ 20°C)	mg/l	204	< 1
Total Suspended Solids	mg/l	74	< 1
Total Dissolved Solids	mg/l	424	< 10
Nitrate-Nitrite Nitrogen	mg/l N	0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	73	0.05
Total Nitrogen	mg/l N	73	0.05
Total Phosphorus	mg/l P	17	< 0.01
Chloride	mg/l	58	< 1
Foaming Agents (MBAS)	mg/l	48	< 0.05
Sulfate	mg/l	6	< 2
Total Organic Carbon	mg/l	76	< 1
Oil and Grease	mg/l	40	< 2
Total Coliforms	Counts/100ml	30,000,000	< 1
Fecal Coliforms	Counts/100ml	16,000,000	< 1
Fecal Streptococci	Counts/100ml	230	< 1
Specific Conductance	umhos/cm	1,100	1.0

Note: Septic tank was backed-up and baffles were submerged at the time of this sample.

IAA



Francis I. Daniels
Laboratory Director

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Tampa, Florida 33619

February 5, 1993
Project No. 05078
Page 1 of 13

LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
Sample Description: 01 - Water, STE, sampled 1/7/93, 1230
Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(01) STE</u>	<u>Method Blank</u>
Specific Conductance	umhos/cm	1,200	0.9
Chloride	mg/l	61	< 1
Sulfate	mg/l	3	< 2
Foaming Agents (MBAS)	mg/l	24	< 0.05
Total Dissolved Solids	mg/l	472	10
Total Suspended Solids	mg/l	38	< 1
Nitrate-Nitrite Nitrogen	mg/l N	0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	78	< 0.05
Total Phosphorus	mg/l P	16	< 0.01
Total Organic Carbon	mg/l	89	< 1
Fecal Coliforms	Cts/100ml	6,600,000	< 1
Fecal Streptococci	Cts/100ml	470	< 1
BOD (5-Day @ 2°C)	mg/l	208	< 1
Oil & Grease	mg/l	34	< 2
Ammonia Nitrogen	mg/l N	75	< 0.01
Total Nitrogen	mg/l N	78	< 0.05



Francis I. Daniels
Laboratory Director

A2: Phase III STE Laboratory Reports

SOUTHERN ANALYTICAL LABORATORIES, INC.

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September 8, 1993
Project No. 05925
Page 1 of 6

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 01 - Water, STE-1, sampled 8/15/93, 1700
02 - Water, STE-2, sampled 8/16/93, 1430
03 - Water, STE-3, sampled 8/17/93, 1445
04 - Water, STE-4, sampled 8/18/93, 1445
Date Received: 8/17 (01,02) 8/19/93 (03,04)

<u>Parameter</u>	<u>Units</u>	<u>(01)</u> <u>STE-1</u>	<u>(02)</u> <u>STE-2</u>	<u>(03)</u> <u>STE-3</u>	<u>(04)</u> <u>STE-4</u>
Chloride	mg/l	65	53	65	56
Sulfate	mg/l	4	< 2	< 2	< 2
Foaming Agents (MBAS)	mg/l	27	24	8.3	21
Total Suspended Solids	mg/l	42	36	36	46
Nitrate Nitrogen	mg/l N	0.05	0.02	0.03	0.02
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	54	57	67	68
Total Phosphorus	mg/l P	8.1	8.3	7.0	7.5
Total Organic Carbon	mg/l	78	79	81	79
BOD (5 Day @ 20°C)	mg/l	174	187	160	168
Ammonia Nitrogen	mg/l N	54	57	62	66
Organic Nitrogen	mg/l N	< 0.05	< 0.05	5.0	2.0
Total Hardness	mg/l CaCO ₃	180	180	180	180



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September 8, 1993
 Project No. 05925
 Page 2 of 6

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 05 - Water, STE-8, sampled 8/18/93, 1615
 06 - Equipment Blank, sampled 8/18/93, 1445
 07 - Spiked Blank, sampled 8/18/93, 1500
 23 - Water, STE-5, sampled 8/19/93, 1400
Date Received: 8/19 (05-07) 8/20/93 (23)

<u>Parameter</u>	<u>Units</u>	<u>(05) STE-8</u>	<u>(06) Equip. Blank</u>	<u>(07) Spiked Blank</u>	<u>(23) STE-5</u>
Chloride	mg/l	55	< 1	--	41
Sulfate	mg/l	< 2	< 2	--	13
Foaming Agents (MBAS)	mg/l	23	< 0.05	17	16
Total Suspended Solids	mg/l	52	< 1	--	35
Nitrate Nitrogen	mg/l N	0.02	0.02	--	0.02
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	--	< 0.01
Total Kjeldahl Nitrogen	mg/l N	68	0.06	--	68
Total Phosphorus	mg/l P	7.7	< 0.01	--	6.9
Total Organic Carbon	mg/l	83	< 1	--	74
BOD (5 Day @ 20°C)	mg/l	171	< 1	--	166
Ammonia Nitrogen	mg/l N	66	< 0.01	--	61
Organic Nitrogen	mg/l N	2.0	0.06	--	7.0
Total Hardness	mg/l CaCO ₃	180	< 2	--	170



Francis I. Daniels
 Laboratory Director

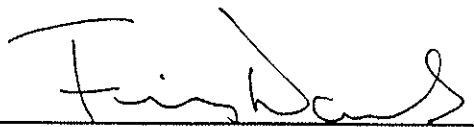
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 Sabal Industrial Park - Suite 100
 Tampa, Florida 33619

September 8, 1993
 Project No. 05925
 Page 3 of 6

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 24 - Water, STE-4, Spiked Eff., sampled 8/18/93, 1740
 25 - Water, STE-6, sampled 8/20/93, 1400
 26 - Water, STE-6, Spiked Eff., sampled 8/20/93, 1430
 27 - Water, STE-7, sampled 8/21/93, 1530
Date Received: 8/23/93

Parameter	Units	(24) STE-4 Spiked Eff.	(25) STE-6	(26) STE-6 Spiked Eff.	(27) STE-7	Method Blank
Chloride	mg/l	--	57	--	51	< 1
Sulfate	mg/l	--	< 2	--	< 2	< 2
Foaming Agents (MBAS)	mg/l	33	18	18	16	< 0.05
Total Suspended Solids	mg/l	--	30	--	28	< 1
Nitrate Nitrogen	mg/l N	--	0.01	--	0.01	< 0.01
Nitrite Nitrogen	mg/l N	--	< 0.01	--	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	--	78	--	77	< 0.05
Total Phosphorus	mg/l P	--	10	--	9.4	< 0.01
Total Organic Carbon	mg/l	--	190	--	184	< 1
BOD (5 Day @ 20°C)	mg/l	--	409	--	419	< 1
Ammonia Nitrogen	mg/l N	--	61	--	64	< 0.01
Organic Nitrogen	mg/l N	--	17	--	13	< 0.05
Total Hardness	mg/l CaCO ₃	--	180	--	180	< 2


 Francis I. Daniels
 Laboratory Director

FIRST COAST ENVIRONMENTAL LABORATORY, INC.

August 18, 1993

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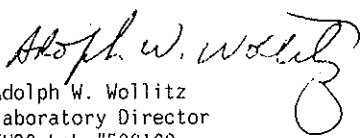
Attn: Jeff Rawles

Reference: FCEL Lab #9308-96
Sample collected 1430 hr. on 8-16-93
Sample received 1715 hr. on 8-16-93
(i) Project Code 4155.i

<u>PARAMETER</u>		<u># 1</u>		<u>DATE/TIME</u>	<u>ANALYST</u>	
Fecal Coliform	#/100 ml	6.6 x 10 ⁶	**	Set/ Off	8-17/1310 8-18/1300	AWW AWW

Note: ** Samples to be out of holding time per prior discussion with Jeff of Ayres & Assoc.
Samples should be done anyway.

Respectfully submitted:


Adolph W. Wollitz
Laboratory Director
FHRS Lab #E82102
FHRS Lab #82110
EPA #FL062
DER Comp QAPP # 8702226

AWW/tb

FIRST COAST ENVIRONMENTAL LABORATORY, INC.

August 19, 1993

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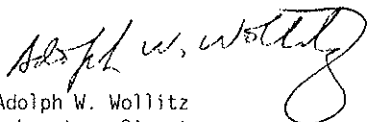
Attn: Jeff Rawles

Reference: FCEL Lab #9308-103
Sample collected 1455 hr. on 8-17-93
Sample received 1612 hr on 8-17-93
(1) Project Code 4155.1

<u>PARAMETER</u>		<u># 1</u>		<u>DATE/TIME</u>	<u>ANALYST</u>	
Fecal Coliform	#/100 ml	1.2 x 10 ⁶	**	Set/ Off	8-18/1300 8-19/1330	AWW AWW

Note: ** Samples to be out of holding time per prior discussion with Jeff of Ayres & Assoc.
Samples should be done anyway.

Respectfully submitted:



Adolph W. Wollitz
Laboratory Director
FHRS Lab #E82102
FHRS Lab #82110
EPA #FL062
DER Comp QAPP # 870222G

AWW/tb

FIRST COAST ENVIRONMENTAL LABORATORY, INC.

August 20, 1993

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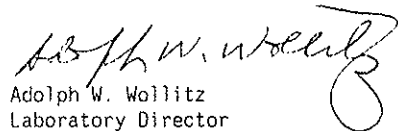
Attn: Jeff Rawles

Reference: FCEL Lab #9308-121
Sample collected 1445 hr. on 8-18-93
Sample received 1040 hr. on 8-19-93
Project Code 4155.1
(1) Equipment Blank
(2) STE- 4
(3) STE -8

<u>PARAMETER</u>		<u># 1</u>	<u># 2</u>	<u># 3</u>		<u>DATE/TIME</u>	<u>ANALYST</u>
Fecal Coliform	#/100 ml	8	3.0×10^6	6.8×10^5	Set/ Off	8-19/1330 8-20/1330	AWW AWW

Note: ** Samples to be out of holding time per prior discussion with Jeff of Ayres & Assoc.
Samples should be done anyway.

Respectfully submitted:



Adolph W. Wollitz
Laboratory Director
FHRS Lab #E82102
FHRS Lab #82110
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DER Comp QAPP # 8702226

AWW/tb

FIRST COAST ENVIRONMENTAL LABORATORY, INC.

August 20, 1993

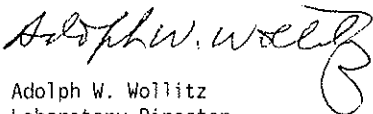
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Tampa, FL 33619

Attn: Jeff Rawles

Reference: FCEL Lab #9308-132
Sample collected 1400 hr. on 8-19-93
Sample received 1548 hr. on 8-19-93
(1) Project Code 4155.1

<u>PARAMETER</u>		<u># 1</u>		<u>DATE/TIME</u>	<u>ANALYST</u>
Fecal Coliform	#/100 ml	1.3 x 10 ⁶	Set/ Off	8-19/1330 8-20/1300	AWW AWW

Respectfully submitted:



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FHRS Lab #82110
EPA #FL062
DER Comp QAPP # 870222G

AWW/tb

A3: Phase IIIA STE Laboratory Reports

SOUTHERN ANALYTICAL LABORATORIES, INC.

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Tampa, Florida 33619

November 30, 1993
Project No. 06174
Page 1 of 21


LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 01 - Water, STE-9, sampled 11/3/93, 1245
02 - Water, Tap/SDA, sampled 11/3/93, 1630
03 - Water, TW13-20, sampled 11/3/93, 1700
04 - Water, TW14-6, sampled 11/3/93, 1630

Date Received: 11/4/93, 1035

<u>Parameter</u>	<u>Units</u>	<u>(01)</u> <u>STE-9</u>	<u>(02)</u> <u>Tap/SDA</u>	<u>(03)</u> <u>TW13-20</u>	<u>(04)</u> <u>TW14-6</u>	<u>Method</u> <u>Blank</u>
Chloride	mg/l	64	9.5	10	12	< 1
Sulfate	mg/l	4	< 2	38	4	< 2
Foaming Agents (MBAS)	mg/l	28	< 0.05	< 0.05	0.12	< 0.05
Total Suspended Solids	mg/l	32	--	--	--	< 1
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	75	0.10	0.16	1.1	< 0.05
Total Phosphorus	mg/l P	8.7	0.05	< 0.01	0.43	< 0.01
Total Organic Carbon	mg/l	82	< 1	1.5	6.1	< 1
BOD (5 Day @ 20°C)	mg/l	199	--	--	--	< 1
Ammonia Nitrogen	mg/l N	69	0.09	0.12	0.67	< 0.01
Organic Nitrogen	mg/l N	6	< 0.05	< 0.05	0.43	< 0.05
Total Hardness	mg/l CaCO ₃	160	160	99	35	< 2



Francis I. Daniels
Laboratory Director

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May 19, 1994
Project No. 06673
Page 1 of 6

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 01 - Water, STE, sampled 4/27/94, 1525
Date Received: 4/28/94, 0955

<u>Parameter</u>	<u>Units</u>	<u>(01) STE</u>	<u>Method Blank</u>
Chloride	mg/l	49	1 U
Sulfate	mg/l	2 U	2 U
Foaming Agents (MBAS)	mg/l	15	0.05 U
Total Suspended Solids	mg/l	46	1 U
Nitrate Nitrogen	mg/l N	0.03	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U
Total Kjeldahl Nitrogen	mg/l N	94	0.05 U
Total Phosphorus	mg/l P	10	0.01 U
Total Organic Carbon	mg/l	69	1 U
BOD (5 Day @ 20°C)	mg/l	169	1 U
Ammonia Nitrogen	mg/l N	86	0.01 U
Organic Nitrogen	mg/l N	8.0	0.05 U
Total Hardness	mg/l CaCO ₃	150	2 U

U - Analyte was not detected; indicated concentration is method detection limit.

FHRS Environmental Lab No. E84129
FHRS Drinking Water Lab No. 84269
Comprehensive QA Plan No. 870317G


Francis I. Daniels
Laboratory Director

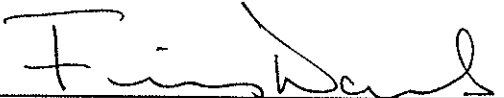
Ayres Associates
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Sabal Industrial Park - Suite 100
Tampa, Florida 33619

May 19, 1994
Project No. 06673
Page 5 of 6

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Chloride	EPA 325.2	1 mg/l	5/2/94
Sulfate	EPA 375.4	2 mg/l	5/5/94
Foaming Agents (MBAS)	SM 5540 C	0.05 mg/l	4/28/94, 1030
Total Suspended Solids	EPA 160.2	1 mg/l	5/2/94
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	4/29/94
Nitrite Nitrogen	EPA 354.1	0.01 mg/l N	4/28/94, 1545
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	5/4/94
Total Phosphorus	EPA 365.2	0.01 mg/l P	5/4/94
Total Organic Carbon	EPA 415.1	1 mg/l	5/10/94
BOD	SM 5210	1 mg/l	4/28/94, 0900
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	5/4/94
Organic Nitrogen	Calc.	0.05 mg/l N	5/3/94
Total Hardness	SM 2340 C	2 mg/l CaCO ₃	5/3/94
Bromide	SM 4500-Br B	0.1 mg/l	5/17/94 (03,M/B) 5/18/94 (05-07, 09-11) 5/19/94 (04,08)


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Laboratory Director


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May 19, 1994
Project No. 06673
Page 6 of 6

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

<u>Parameter</u>	<u>Sample No. Spiked</u>	<u>Accuracy Mean % R</u>	<u>Precision RPD</u>	<u>QC Control Limits Accuracy</u>	<u>Limits Precision</u>
Chloride	06658-03	98	0	82-116	0-5
Sulfate	06678-02	114	1	78-131	0-9
Foaming Agents (MBAS)	06672-01	90	11	77-121	0-16
Total Suspended Solids	06673-01	84	1	76-113	0-8
Nitrate-Nitrite Nitrogen	06676-01	103	1	85-112	0-4
Nitrite Nitrogen	06676-01	99	1	78-114	0-6
Total Kjeldahl Nitrogen	06676-01	89	3	76-114	0-16
Total Phosphorus	06669-01	94	1	77-118	0-17
Total Organic Carbon	06675-01	98	1	83-109	0-4
BOD (5 Day @ 20°C)	IS02621(4/28)	81	4	63-111	0-41
Ammonia Nitrogen	06592-24	97	1	78-125	0-4
Total Hardness	06673-01	99	1	87-115	0-4
Bromide	06673-08	88	6	88-127	0-24


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June 5, 1995
Project No. 07824
Page 1 of 22

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County


Sample Description:
01 - Water, STE, sampled 5/8/95, 1445
02 - Water, TW19-6, sampled 5/8/95, 1605
03 - Water, TW19-12, sampled 5/8/95, 1645
04 - Water, TW19-20, sampled 5/8/95, 1715

Date Received: 5/9/95, 1330

<u>Parameter</u>	<u>Units</u>	<u>(01)</u> <u>STE</u>	<u>(02)</u> <u>TW19-6</u>	<u>(03)</u> <u>TW19-12</u>	<u>(04)</u> <u>TW19-20</u>
Ammonia Nitrogen	mg/l N	48	61	60	0.06
Nitrate Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	5.0	0.67	0.59	0.05 U
Total Kjeldahl Nitrogen	mg/l N	53	62	61	0.06
Total Phosphorus	mg/l P	7.8	11	11	0.04
Chloride	mg/l	45	46	46	23
Foaming Agents (MBAS)	mg/l	31	1.7	1.4	0.05 U
Sulfate	mg/l	5	2 U	2	20
Total Hardness	mg/l CaCO ₃	140	140	150	31
Total Organic Carbon	mg/l	42	12	13	1 U
BOD (5 Day @ 20°C)	mg/l	187	--	--	--
Total Suspended Solids	mg/l	50	--	--	--

U - Analyte was not detected; indicated concentration is method detection limit.

FHRS Environmental Lab No. E84129
FHRS Drinking Water Lab No. 84269
Comprehensive QA Plan No. 870317G


Francis I. Daniels
Laboratory Director

Ayres Associates
RSE Group
3901 Coconut Palm Drive
Sabal Industrial Park - Suite 100
Tampa, Florida 33619

June 5, 1995
Project No. 07824
Page 15 of 22

LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 57 - Water, TW26-20, sampled 5/11/95, 1530
58 - Water, TW26-30, sampled 5/11/95, 1515
59 - Water, TAP, sampled 5/11/95, 1610
60 - Water, STE, sampled 5/11/95, 1635

Date Received: 5/12/95, 1005

Parameter	Units	(57)	(58)	(59)	(60)
		TW26-20	TW26-30	TAP	STE
Ammonia Nitrogen	mg/l N	0.01 U	0.05	0.06	50
Nitrate Nitrogen	mg/l N	1.5	0.01 U	0.01 U	0.05
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.02
Organic Nitrogen	mg/l N	0.06	0.05 U	0.05 U	4.8
Total Kjeldahl Nitrogen	mg/l N	0.06	0.05	0.06	55
Total Phosphorus	mg/l P	0.03	0.01 U	0.07	8.8
Chloride	mg/l	19	30	11	600
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	32
Sulfate	mg/l	22	140	2 U	19
Total Hardness	mg/l CaCO ₃	55	110	150	140
Total Organic Carbon	mg/l	1 U	1 U	1 U	47
BOD (5 Day @ 20°C)	mg/l	--	--	--	196
Total Suspended Solids	mg/l	--	--	--	58

U - Analyte was not detected; indicated concentration is method detection limit.



Francis I. Daniels
Laboratory Director

A4: Water Meter Readings and Estimated Wastewater Flows

SDA Florida OWTS Project
Table A-1 Estimated Wastewater Flows and Loading

Date	Days	Total Water Use			Exterior Uses									Wastewater Flow & Load		
		Meter M3	Volume (gal.)	Daily (gpd)	Heat Pump			N. Side Hose Bib			Front Hose Bib			Est. W.W. Flow		Est. W.W. Loading* (gpd/ft2)
					Meter M4	Volume (gal.)	Daily (gpd.)	Meter M2	Volume (gal.)	Daily (gpd)	Meter M1	Volume (gal)	Daily (gpd)	(gal.)	(gpd)	
11/20/90		98,047.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/27/90	7	102,699.5	4,652	664.57	18,272.0	--	--	176,896.5	--	--				--	--	--
11/28/90	1	103,600.0	--	--	18,272.0	--	--	176,963.9	--	--				--	--	--
AVG.	8		5,553	694.06		0.0	0.00		67.40	8.42		0.00	0.00	5,485	686	3.26
11/5/92	708	955,272.0	851,672	1,202.93	730,233.1	711,961.10		180,702.1	3,738					135,972.7	192.1	0.91
11/23/92	18	961,787.0	6,515	361.94	734,339.0	4,105.90		180,714.1	12					2,397.1	133.2	0.63
11/25/92	2	963,219.0	--	--	734,339.0	--	--	181,183.3	--	--				--	--	--
12/14/92	19	991,672.0	28,453	1,497.53	762,262.2	27,923.20		181,209.5	26					503.6	26.5	0.13
12/14/92	0	--	--	--	--	--	--	--	--	--				--	--	--
12/17/92	3	995,005.0	--	--	764,887.8	--	--	181,718.7	--	--				--	--	--
1/5/93	19	1,007,022.0	12,017	632.47	773,295.9	8,408.10		181,764.8	46					3,562.8	187.5	0.89
1/7/93	2	1,007,722.0	--	--	773,295.9	--	--	182,127.5	--	--				--	--	--
1/12/93	5	1,008,769.0	1,047	209.40	773,717.1	421.20		182,139.5	12					613.8	122.8	0.58
AVG.	776		905,169	1,166.45		755,445.10	973.51		5,176	7		0	0	144,548.30	186.3	0.89
8/15/93	215	1,164,528.0	155,759	724.46	861,824.3	88,107.20		185,668.6	3,529		44,239.00			64,122.7	298.2	1.42
8/20/93	5	1,166,904.7	2,377	475.34	861,824.3	0.00		185,925.8	257		46,375.90	2,136.90		2,119.5	423.9	2.02
8/21/93	1	1,167,883.0	978	978.30	861,824.3	0.00		185,986.8	61		47,228.00	852.10		917.3	917.3	4.37
8/31/93	10	1,169,526.5	1,644	164.35	861,824.3	0.00		185,988.5	2		47,230.40	2.40		1,641.8	164.2	0.78
11/1/93	61	1,179,040.9	9,514	155.97	861,824.3	0.00		186,280.4	292		48,310.70	1,080.30		9,222.5	151.2	0.72
AVG.	292		170,272	583.12		88,107.2	301.74		4,141	14		4.072	14	73,952.1	253.3	1.21
12/23/94	417	1,251,286.0	72,245	173.25	861,824.3	0.00		190,862.0	4,582	11.0	71,942.80	23,632.10	56.7	44,031.4	105.6	0.50
1/16/96	389	1,336,628.4	85,342	219.39	861,824.3	0.00		212,447.5	21,586	55.5	90,069.50	18,126.70	46.6	45,630.2	117.3	0.56
AVG.	806		157,588	195.52		0.0	0.00		26,167	32		41,759	52	89,661.6	111.2	0.53
n	21													15	15	15
Sum	2,958		2,313,209	782.02	2,942.0		1,275	2,303,004.3	43,526					534,720.90	3,964.88	18.88
x	141													35,648.06	264.33	1.26
s	239.6385													49,327.46	240.72	1.15
Min.	0													503.60	26.51	0.13
Max.	776													144,548.30	917.30	4.37

* Based on drainfield area of 210 ft2

B1: Well Completion Logs

**MONITORING WELL CONSTRUCTION
SPECIFICATIONS
INDIVIDUAL HOME IN
ST. JOHNS COUNTY**

WELL I.D.	TOP OF CASING ELEVATION (ft. NGVD)	BOTTOM OF WELL ELEVATION (ft. NGVD)	SCREENED INTERVAL (ft. NGVD)	DATE OF INSTALLATION
W1	49.64	39.64	39.64 - 44.64	1/28/90
W2	49.66	40.31	40.31 - 45.31	1/28/90
W4	49.28	40.96	40.96 - 45.96	1/28/90
W5	49.58	40.38	40.38 - 45.38	1/28/90
P1	49.87	42.47	42.47 - 47.47	1/28/90
P2*	49.75	39.75	39.75 - 44.75	1/28/90
P3	52.76	42.51	42.51 - 47.51	1/28/90
DW-6	53.62	1.44	1.44 - 3.94	11/23/92
SW-7	52.46	42.26	42.26 - 47.26	11/23/92
DW-8	48.94	-0.81	-0.81 - 1.69	11/24/92
SW-9	48.88	41.56	41.56 - 46.56	11/24/92
DW-10	49.71	-0.89	-0.89 - 1.61	11/24/92
SW-11	49.58	42.16	42.16 - 47.16	11/24/92

* All wells constructed of 2" diameter Schedule 40 PVC solid riser coupled to 2" Schedule 40 PVC 0.010" slotted screen. With the exception of P2 which was constructed of 1.25" diameter Schedule 40 PVC solid riser coupled to 1.25" diameter Schedule 40 PVC 0.010" slotted screen.

WELL COMPLETION LOG

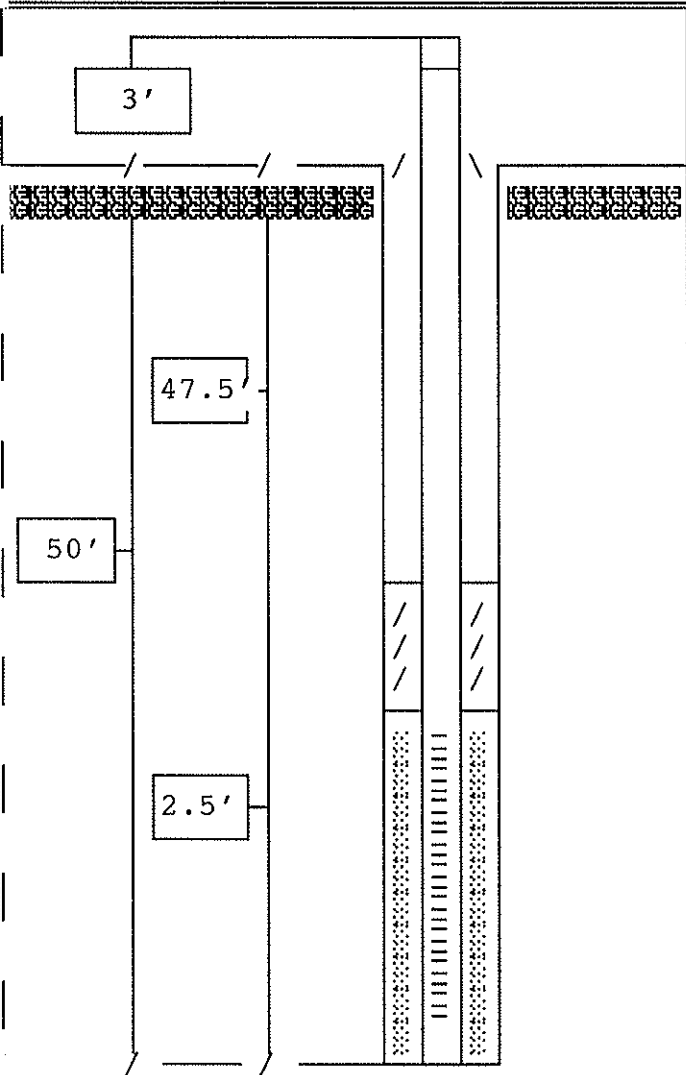
LOCATION: MR. FREDENHAGEN'S HOUSE WORK ORDER # 4287

ADDRESS: 1291 TANGERINE DR. FRUIT COVE, FLORIDA

CLIENT: AYRES & ASSOCIATES DATE _____

WELL NUMBER: DW-6 CONTACT: JENNIFER MCNEILLIE

INSTALLED BY: GEORGE LEEPER



FLUSH MANHOLE
 ABOVE GRADE PROTECTOR
 _____ NONE

GROUT 1/2 BAG

RISER - TYPE PVC
 RISER - SIZE 2"

BENTONITE _____
 FINE SAND X

SCREEN - TYPE PVC
 SCREEN - SIZE 2" .010 SLOT

FILTER TYPE 20/30 SILICA SAND
2 X 50 LB BAGS

DEVELOPMENT: BAILED _____ PUMPED AIR LIFT _____ SURGE _____ SWAB _____ NONE _____

TOTAL TIME: 30 MINUTES TOTAL GALLONS: _____

WATER APPEARANCE: START SILTY FINISH CLEAR

WELL COMPLETION LOG

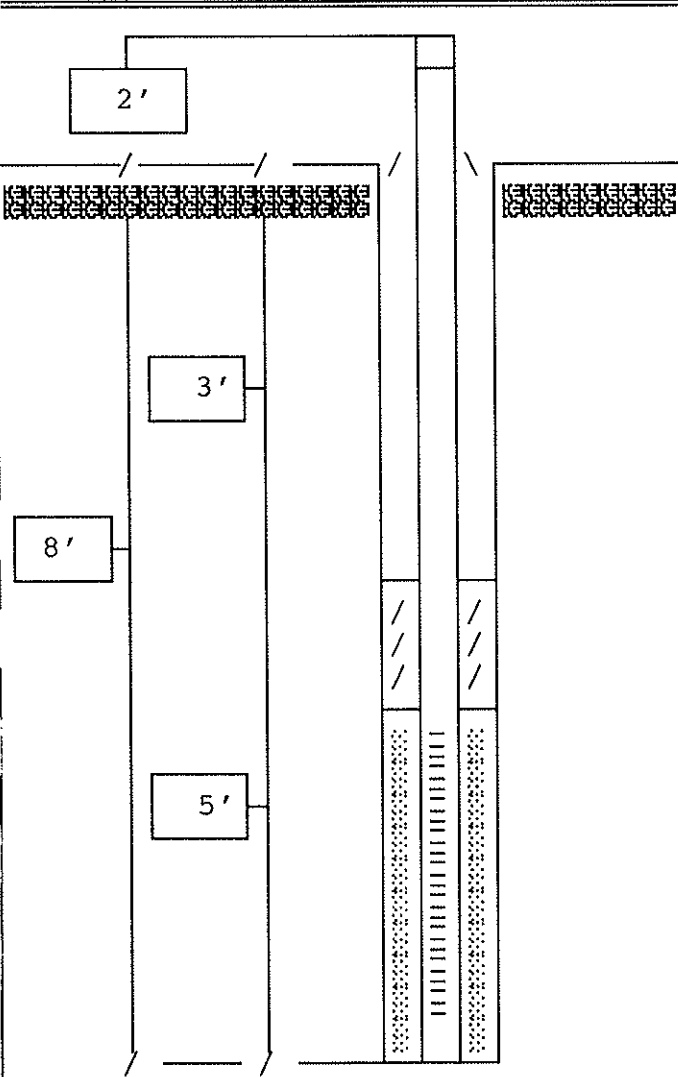
LOCATION: MR. FREDENHAGEN'S HOUSE WORK ORDER # 4287

ADDRESS: 1291 TANGERINE DR. FRUIT COVE, FLORIDA

CLIENT: AYRES & ASSOCIATES DATE _____

WELL NUMBER: SW-7 CONTACT: JENNIFER MCNEILLIE

INSTALLED BY: GEORGE LEEPER



FLUSH MANHOLE
 ABOVE GRADE PROTECTOR

 NONE

GROUT 1/2 BAG

RISER - TYPE PVC
 RISER - SIZE 2"

BENTONITE X
 FINE SAND _____

SCREEN - TYPE PVC
 SCREEN - SIZE 2" .010 SLOT

FILTER TYPE 20/30 SILICA SAND
4 X 50 LB BAGS

DEVELOPMENT: BAILED _____ PUMPED AIR LIFT _____ SURGE _____ SWAB _____ NONE _____

TOTAL TIME: 15 MINUTES TOTAL GALLONS: _____

WATER APPEARANCE: START CLOUDY FINISH CLEAR

WELL COMPLETION LOG

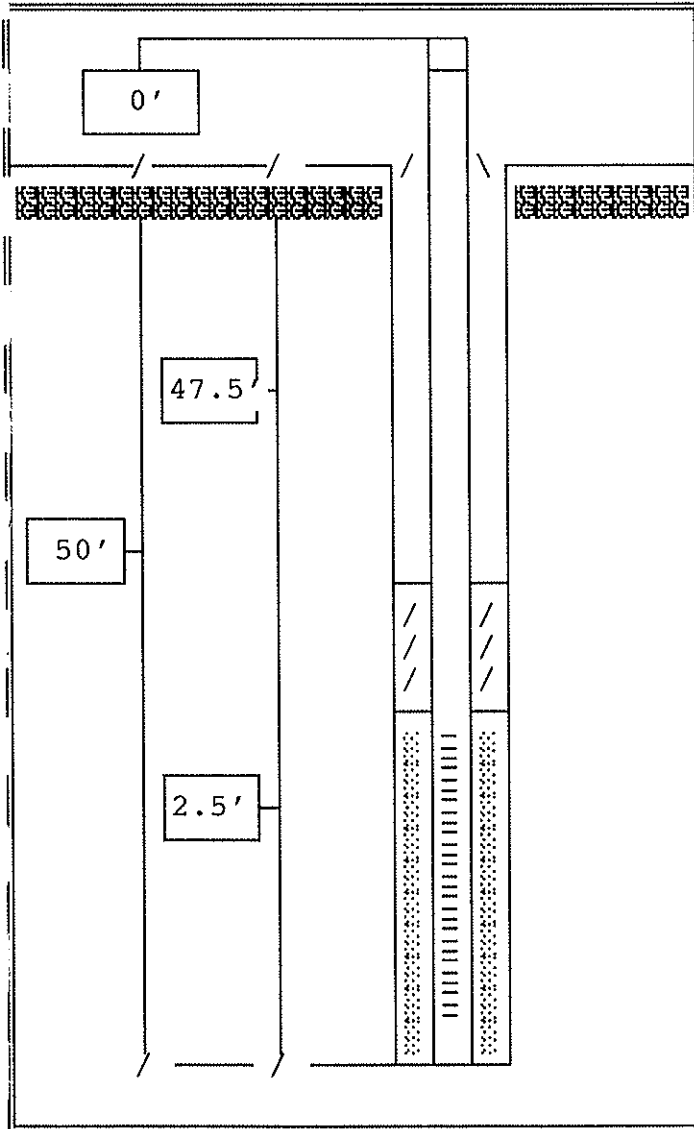
LOCATION: MR. FREDENHAGEN'S HOUSE WORK ORDER # 4287

ADDRESS: 1291 TANGERINE DR. FRUIT COVE, FLORIDA

CLIENT: AYRES & ASSOCIATES DATE _____

WELL NUMBER: DW-8 CONTACT: JENNIFER MCNEILLIE

INSTALLED BY: GEORGE LEEPER



X FLUSH MANHOLE
 _____ ABOVE GRADE PROTECTOR
 _____ NONE

GROUT 1 BAG

RISER - TYPE PVC
 RISER - SIZE 2"

BENTONITE _____
 FINE SAND X

SCREEN - TYPE PVC
 SCREEN - SIZE 2" .010 SLOT

FILTER TYPE 20/30 SILICA SAND
2 X 50 LB BAGS

DEVELOPMENT: BAILED _____ PUMPED X AIR LIFT _____ SURGE _____ SWAB _____ NONE _____

TOTAL TIME: 30 MINUTES TOTAL GALLONS: _____

WATER APPEARANCE: START SILTY FINISH CLEAR

WELL COMPLETION LOG

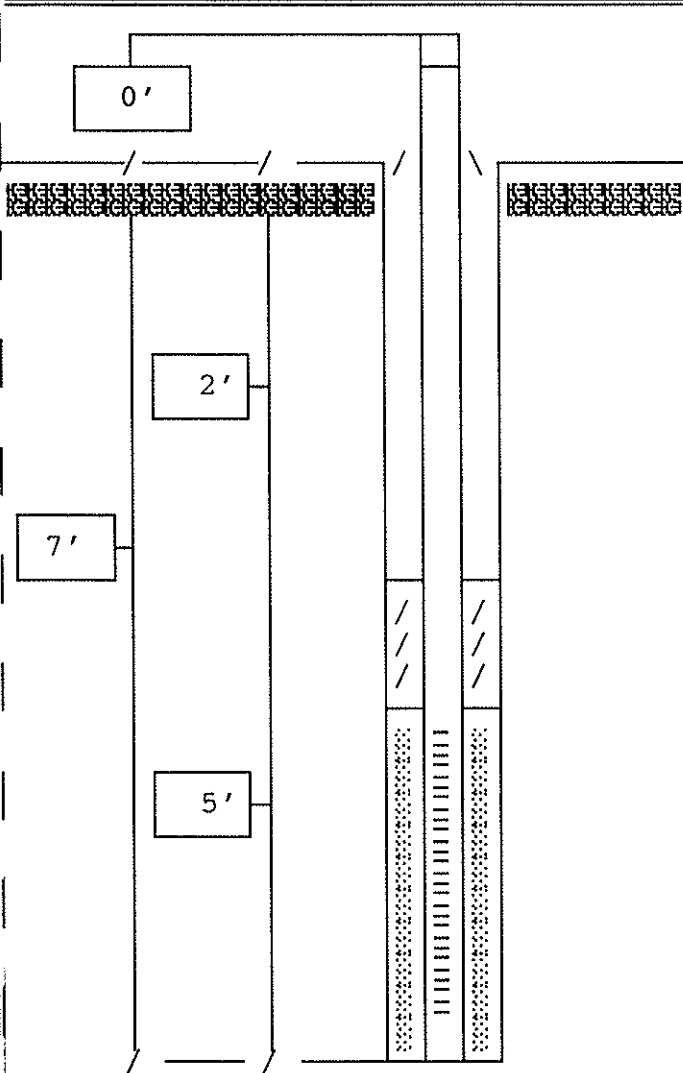
LOCATION: MR. FREDENHAGEN'S HOUSE WORK ORDER # 4287

ADDRESS: 1291 TANGERINE DR. FRUIT COVE, FLORIDA

CLIENT: AYRES & ASSOCIATES DATE _____

WELL NUMBER: SW-9 CONTACT: JENNIFER MCNEILLIE

INSTALLED BY: GEORGE LEEPER



X FLUSH MANHOLE
 _____ ABOVE GRADE PROTECTOR
 _____ NONE

GROUT 1/2 BAG

RISER - TYPE PVC
 RISER - SIZE 2"

BENTONITE X
 FINE SAND _____

SCREEN - TYPE PVC
 SCREEN - SIZE 2" .010 SLOT

FILTER TYPE 20/30 SILICA SAND
4 X 50 LB BAGS

DEVELOPMENT: BAILED _____ PUMPED X AIR LIFT _____ SURGE _____ SWAB _____ NONE _____

TOTAL TIME: 15 MINUTES TOTAL GALLONS: _____

WATER APPEARANCE: START SILTY FINISH CLEAR

WELL COMPLETION LOG

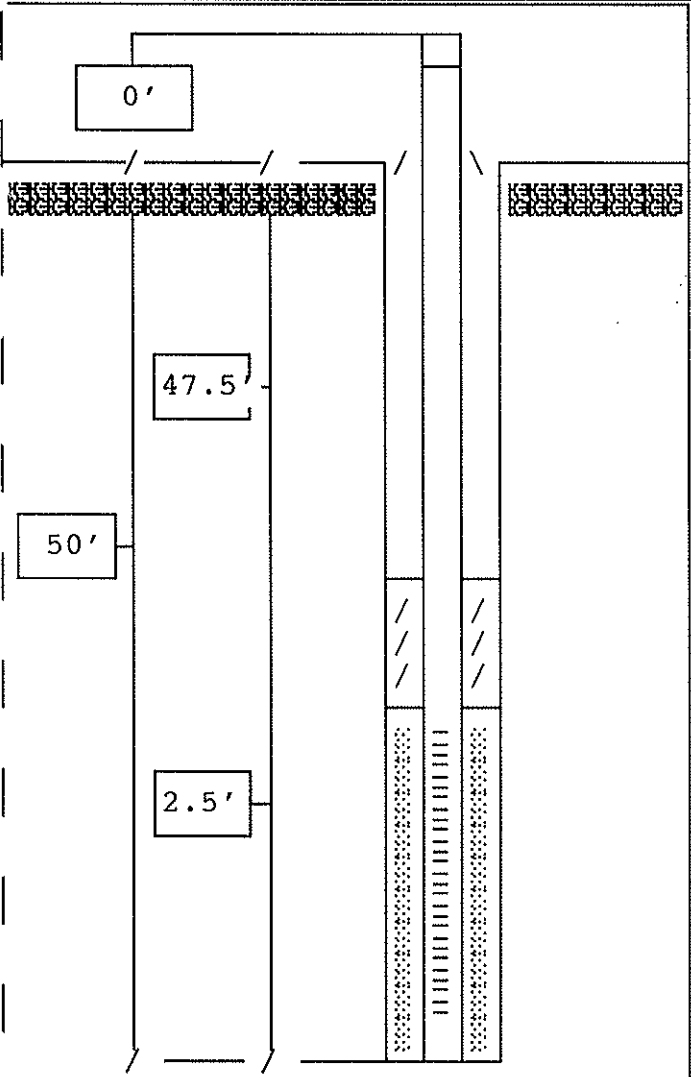
LOCATION: MR. FREDENHAGEN'S HOUSE WORK ORDER # 4287

ADDRESS: 1291 TANGERINE DR. FRUIT COVE, FLORIDA

CLIENT: AYRES & ASSOCIATES DATE _____

WELL NUMBER: DW-10 CONTACT: JENNIFER MCNEILLIE

INSTALLED BY: GEORGE LEEPER



X FLUSH MANHOLE
 _____ ABOVE GRADE PROTECTOR
 _____ NONE

GROUT 1 BAG

RISER - TYPE PVC
 RISER - SIZE 2"

BENTONITE _____
 FINE SAND X

SCREEN - TYPE PVC
 SCREEN - SIZE 2" .010 SLOT

FILTER TYPE 20/30 SILICA SAND
2 X 50 LB BAGS

DEVELOPMENT: BAILED _____ PUMPED X AIR LIFT _____ SURGE _____ SWAB _____ NONE _____

TOTAL TIME: 30 MINUTES TOTAL GALLONS: _____

WATER APPEARANCE: START _____ FINISH _____

WELL COMPLETION LOG

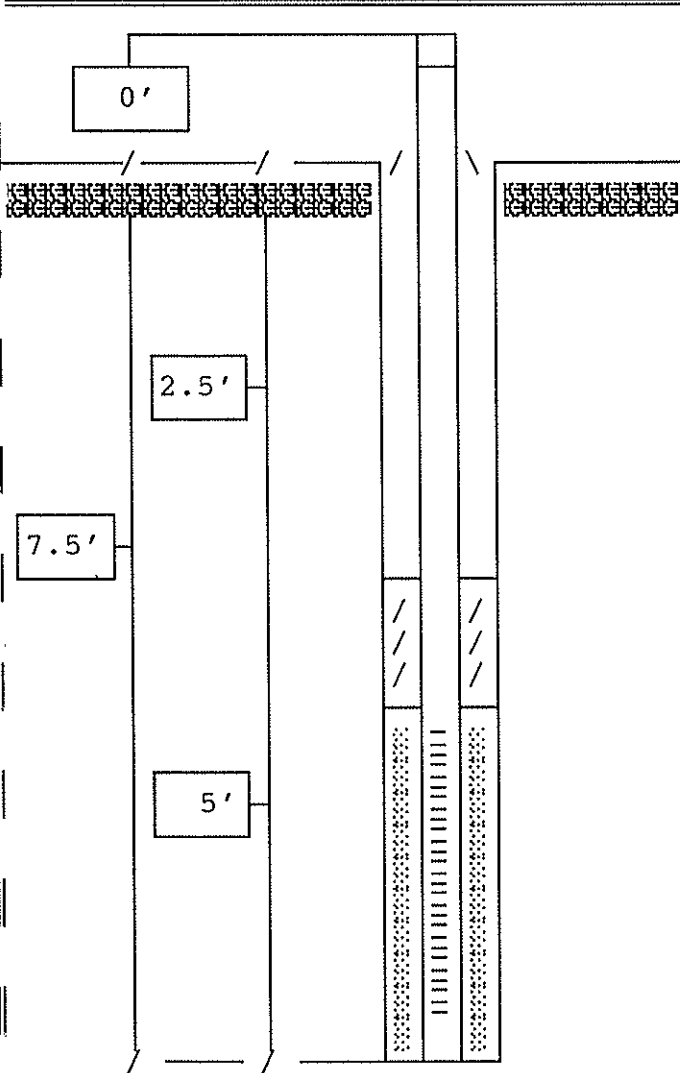
LOCATION: MR. FREDENHAGEN'S HOUSE WORK ORDER # 4287

ADDRESS: 1291 TANGERINE DR. FRUIT COVE, FL

CLIENT: AYRES & ASSOCIATES DATE

WELL NUMBER: SW-11 CONTACT: JENNIFER MCNEILEE

INSTALLED BY: GEORGE LEEPER



FLUSH MANHOLE

ABOVE GRADE PROTECTOR

NONE

GROUT 1/2 BAG

RISER - TYPE PVC

RISER - SIZE 2"

BENTONITE X

FINE SAND

SCREEN - TYPE PVC

SCREEN - SIZE 2" .010 SLOT

FILTER TYPE 20/30 SILICA SAND

4 X 50 LB. BAGS

DEVELOPMENT: BAILED PUMPED X AIR LIFT SURGE SWAB NONE

TOTAL TIME: 15 MINUTES TOTAL GALLONS:

WATER APPEARANCE: START FINISH CLEAR

B2: Drilled Well Lithologic Logs and Grainsize Distribution

MONITORING WELL NO.: DW-6

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	DATE COMPLETED: 11/23/92 DRILLING METHOD: Hollow-Stem Auger SAMPLE METHOD: Split-Spoon WELL MATERIAL: PVC SCREENED INTERVAL: 47.5-50.0 ft. BGS SCREEN SLOT SIZE: 0.01" STATIC WATER TABLE DEPTH: 3-4 ft. BGS MANHOLE TYPE: N/A	DRILLING CO.: Groundwater Protection GEOLOGIST: J. McNeillie
---------------	-------------------------	---------------------------------	--	-----------	---	---

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	DESCRIPTION
-2					
-2 to -4			sp		Very Dark Gray (10YR 3/1) Fine-Grained Quartz Sand With Roots with <5% Fines
-4 to -6		4/6 10/10	SP		Medium Dense Light Gray (10YR 7/2) Fine-Grained Quartz Sand with Thin Layer of Gray Brown Clay at 8.0'
-6 to -8		7/4 3/3			
-8 to -10		6/4 3/10			
-10 to -12		2/3 8/10	sp		Medium Dense Light Brownish Gray (10YR 6/2) With Dark Gayish Brown (10YR 4/2) Mottling Fine-Grained Quartz Sand
-12 to -14		3/6 6/10			
-14 to -16		12/17 28/30			
-16 to -18		7/12 26/25	SP		Very Dense Light Gray (10YR 7/1) to White (10YR 8/2) Fine-Grained Quartz Sand With Some Gray Streaks of Clay
-18 to -20		21/30 29/25			
-20 to -22		12/15 20/22			
-22 to -24		8/13 19/23			
-24 to -26		5/13 14/21	SP		Dense Light Gray (10YR 7/1) to Light Brownish Gray Fine-Grained Quartz Sand
-26 to -28		10/20 20/30			
-28 to -30		6/14 20/30	SP		Dense Dark Grayish Brown (10YR 3/2) Fine-Grained Quartz Sand
-30 to -32		12/15 18/25	sp		Dense Gray (10YR 5/1) Fine-Grained Sand
-32 to -34		26/17 19/21	sp		Dense Dark Gray (10YR 4/1) Fine-Grained Quartz Sand
-34 to -36		8/9 20/22			
-36 to -38		9/10 20/35	SP		Dense Gray (10YR 5/1) Fine-Grained Quartz Sand
-38 to -40		5/8 14/22			
-40 to -42	7/8 10/12	sp		Medium Dense Yellow (10YR 7/8) Fine-Grained Quartz Sand	
-42 to -44	9/6 8/12	sp		Medium Dense Light Gray and Pale Brown Fine-Grained Sand	
-44 to -46	7/7 13/15	sp		Grayish Brown to Gray Fine-Grained Quartz Sand	
-46 to -48	7/5 10/16				
-48 to -50	6/10 18/19	SP		Medium Dense Gray (10YR 5/1) Fine-Grained Quartz Sand	

*NOTE: One (1) Foot of Fine Sand Above Silica Sand Pack
 SP = Grain size determined by grain size analysis
 sp = Grain size visually determined

	GEOLOGIC WELL LOG DW-6 PRIVATE RESIDENCE ST. JOHNS COUNTY, FLORIDA	SCALE: As Shown	DRAWN BY: CGH
			DATE: 4-7-93

MONITORING WELL NO.: SW-7

DATE COMPLETED: 11/23/92
 DRILLING METHOD: Hollow-Stem Auger
 SAMPLE METHOD: Auger Cuttings
 WELL MATERIAL: PVC
 SCREENED INTERVAL: 3.0-8.0 ft. BGS
 SCREEN SLOT SIZE: 0.01"
 STATIC WATER TABLE DEPTH: 3-4 ft. BGS
 MANHOLE TYPE: N/A

DRILLING CO.: Groundwater Protection
 GEOLOGIST: J. McNeillie

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	DESCRIPTION
2					
-1					
-0					
-1					
-2			sp		Very Dark Gray (10YR 3/1) Fine-Grained Quartz Sand
-3					
-4					
-5					
-6			sp		Light Gray (10YR 7/1) Fine-Grained Quartz Sand
-7					
-8					
-9					
-10					
-11					
-12					
-13					
-14					
-15					
-16					
-17					
-18					
-19					
-20					
					SP = Grain size determined by grain size analysis sp = Grain size visually determined

	GEOLOGIC WELL LOG SW-7 PRIVATE RESIDENCE ST. JOHNS COUNTY, FLORIDA	SCALE: As Shown	DRAWN BY: CGH
		DATE: 4-7-93	PROJECT No.: 4155.00

MONITORING WELL NO.: DW-8

DATE COMPLETED: 11/24/92
 DRILLING METHOD: Hollow--Stem Auger
 SAMPLE METHOD: Auger Cuttings
 WELL MATERIAL: PVC
 SCREENED INTERVAL: 47.5--50.0 ft. BGS
 SCREEN SLOT SIZE: 0.01"
 STATIC WATER TABLE DEPTH: 2--3 ft. BGS
 MANHOLE TYPE: Flush Mounted
 DRILLING CO.: Groundwater Protection
 GEOLOGIST: J. McNeillie

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	DESCRIPTION	
-2	<p style="font-size: small;"> BACKFILL GROUT RISER SCREEN SILICA SAND </p>				<p>*NOTE: One (1) Foot of Fine Sand Above Silica Sand SP = Grain size determined by grain size analysis sp = Grain size visually determined</p>	
-4						
-6						
-8						
-10						
-12			SP		Dark Gray Fine Grained Quartz Sand with Roots, Organic Material	
-14			SP		Light Gray to White Fine--Grained Quartz Sand with Some Gray Streaks of Clay	
-16						
-18						
-20						
-22			SP		Brown Fine--Grained Quartz Sand	
-24						
-26						
-28						
-30						
-32						
-34			SP		Light Gray to Light Brownish Gray Fine--Grained Quartz Sand	
-36						
-38						
-40						
-42						
-44						
-46			SP		Light Grayish Brown Sand with Dark Gray Slightly Silty Fine--Grained Quartz Sand	
-48						
-50						

	<p style="text-align: center;">GEOLOGIC WELL LOG DW-8</p> <p style="text-align: center;">PRIVATE RESIDENCE ST. JOHNS COUNTY, FLORIDA</p>
<p>SCALE: As Shown</p> <p>DATE: 4-1-93</p>	<p>DRAWN BY: CCH</p> <p>PROJECT No.: 4155.00</p>

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	MONITORING WELL NO.: SW-9	
					DATE COMPLETED: 11/24/92	DRILLING CO.: Groundwater Protection
					DRILLING METHOD: Hollow-Stem Auger SAMPLE METHOD: Auger Cuttings WELL MATERIAL: PVC SCREENED INTERVAL: 2.0-7.0 ft. BGS SCREEN SLOT SIZE: 0.01" STATIC WATER TABLE DEPTH: 2-3 ft. BGS MANHOLE TYPE: N/A	GEOLOGIST: J. McNeillie
					DESCRIPTION	
-1			sp	Dark Gray Fine-Grained Quartz Sand		
-2			sp	Light Grayish Brown Fine-Grained Quartz Sand		
-3			sp	Gray Fine-Grained Quartz Sand		
-4						
-5						
-6						
-7						
-8						
-9						
-10						
-11						
-12						
-13						
-14						
-15						
-16						
-17						
-18						
-19						
-20						
					SP = Grain size determined by grain size analysis sp = Grain size visually determined	



GEOLOGIC WELL LOG SW-9
 PRIVATE RESIDENCE
 ST. JOHNS COUNTY,
 FLORIDA

SCALE:
 As Shown
 DATE:
 4-7-93

DRAWN BY:
 CGH
 PROJECT No.:
 4155.00

MONITORING WELL NO.: DW-10

DATE COMPLETED: 11/24/92
 DRILLING METHOD: Hollow-Stem Auger
 SAMPLE METHOD: Split-Spoon
 WELL MATERIAL: PVC
 SCREENED INTERVAL: 47.5-50.0 ft. BGS
 SCREEN SLOT SIZE: 0.01"
 STATIC WATER TABLE DEPTH: 3-4 ft. BGS
 MANHOLE TYPE: N/A

DRILLING CO.: Groundwater Protection
 GEOLOGIST: J. McNeillie

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	DESCRIPTION
-2-	<p style="font-size: small; text-align: center;"> BACKFILL RISER SILICA SAND* SCREEN </p>		sp		
-4-		2/2	SP		Very Pale Brown (10YR 7/4) Fine-Grained Quartz Sand
-6-					Very Loose Dark Brown Fine-Grained Quartz Sand
-8-					Dense Light Gray (10YR 7/1) Fine-Grained Quartz Sand
-10-					Dense Very Dark Brown (10YR 2/2) Fine-Grained Quartz Sand
-12-					Dense Very Pale Brown (10YR 7/4) Fine-Grained Quartz Sand
-14-					Dense Very Dark Brown (10YR 2/2) Fine-Grained Quartz Sand
-16-					Dense Very Pale Brown (10YR 7/4) Fine-Grained Quartz Sand
-18-					Dense Very Dark Brown (10YR 2/2) Fine-Grained Quartz Sand
-20-					Dense Very Pale Brown (10YR 7/4) Fine-Grained Quartz Sand
-22-		3/10	sp		Dense Very Pale Brown (10YR 7/4) Fine-Grained Quartz Sand
-24-		13/20	sp		Dense Very Pale Brown (10YR 7/4) Fine-Grained Quartz Sand
-26-		2/5	sp		Medium Dense White Fine-Grained Quartz Sand Turning Gray At 26.5 Feet BGS.
-28-		10/12	sp		Dense Dark Gray Fine-Grained Quartz Sand
-30-		6/13	SP		Dense Dark Gray Fine-Grained Quartz Sand
-32-		16/25	SP		Dense Dark Gray Fine-Grained Quartz Sand
-34-		5/11	SP		Dense Dark Gray Fine-Grained Quartz Sand
-36-		16/23	SP		Dense Dark Gray Fine-Grained Quartz Sand
-38-		14/15	sp		Dense Gray Fine-Grained Quartz Sand
-40-		17/22	sp		Dense Gray Fine-Grained Quartz Sand
-42-					
-44-					
-46-					
-48-		9/16			
-50-		21/18			
-52-		11/8			
-54-		21/25			

*NOTE: One (1) Foot of Fine Sand Above Silica Sand
 SP = Grain size determined by grain size analysis
 sp = Grain size visually determined

AYRES
ASSOCIATES

GEOLOGIC WELL LOG DW-10

PRIVATE RESIDENCE
ST. JOHNS COUNTY,
FLORIDA

SCALE:
As Shown

DATE:
4-7-93

DRAWN BY:
CGH

PROJECT No.:
4155.00

DEPTH IN FEET	WELL COMPLETION SUMMARY	STANDARD PENETRATION TEST (SPT)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL	LITHOLOGY	MONITORING WELL NO.: SW-11	
					DATE COMPLETED: 11/24/92	DRILLING CO.: Groundwater Protection
					DRILLING METHOD: Hollow-Stem Auger	GEOLOGIST: J. McNeillie
					SAMPLE METHOD: Auger Cuttings	
					WELL MATERIAL: PVC	
					SCREENED INTERVAL: 2.5-7.5 ft. BGS	
					SCREEN SLOT SIZE: 0.01"	
					STATIC WATER TABLE DEPTH: 3-4 ft. BGS	
					MANHOLE TYPE: Flush Mounted	
-1			sp	Dark Gray Fine-Grained Quartz Sand		
-2			sp	Pale Brown Fine-Grained Quartz Sand		
-3			sp	Light Gray To White Fine-Grained Quartz Sand		
-4						
-5						
-6						
-7						
-8						
-9						
-10						
-11						
-12						
-13						
-14						
-15						
-16						
-17						
-18						
-19						
-20						
					SP = Grain size determined by grain size analysis sp = Grain size visually determined	



GEOLOGIC WELL LOG SW-11
 PRIVATE RESIDENCE
 ST. JOHNS COUNTY,
 FLORIDA

SCALE:
 As Shown

DATE:
 4-7-93

DRAWN BY:
 CGH

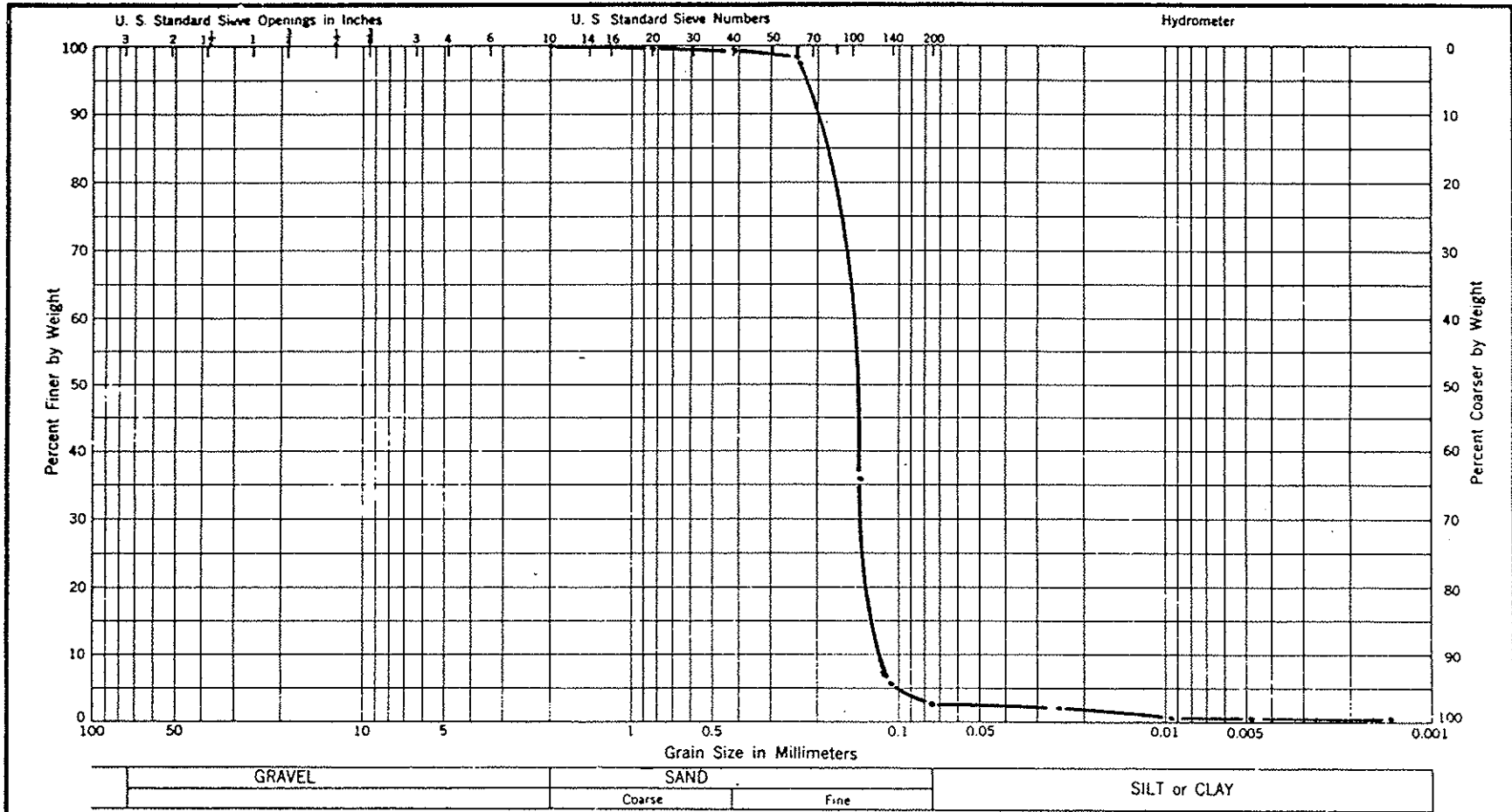
PROJECT No.:
 4155.00

GRAINSIZE DATA SUMMARY

<u>Sample No.</u>	<u>Depth (FT.)</u>	<u>Visual Description</u>	<u>Unified Classification</u>	<u>Percent Passing 200 Sieve</u>
DW-6	4- 6'	Gray Fine SAND	SP	2.8%*
DW-6	14-16'	Gray Fine SAND	SP	2.7%
DW-6	27'	Gray and brown Fine SAND	SP	5.0%
DW-6	36-38'	Gray and brown Fine SAND	SP	3.8%
DW-6	48-50'	Gray Fine SAND	SP	4.6%
DW-8	3- 4'	Dark gray Fine SAND with trace of finely divided organic material	SP-SM	6.0%*
DW-8	10-12'	Grayish brown Fine SAND	SP	1.0%
DW-8	25-27'	Brown Fine SAND	SP	1.4%
DW-8	48-50'	Gray and brown Fine SAND	SP	1.1%
DW-10	3- 4'	Dark brown Fine SAND	SP	4.2%*
DW-10	10-12'	Tan Fine SAND	SP	0.9%
DW-10	15-17'	Dark brown Fine SAND	SP	3.0%
DW-10	30-32'	Gray and brown Fine SAND	SP	1.5%
DW-10	50-52'	Gray and brown slighty silty Fine SAND	SPSM	5.6%

* Hydrometer Test Performed.

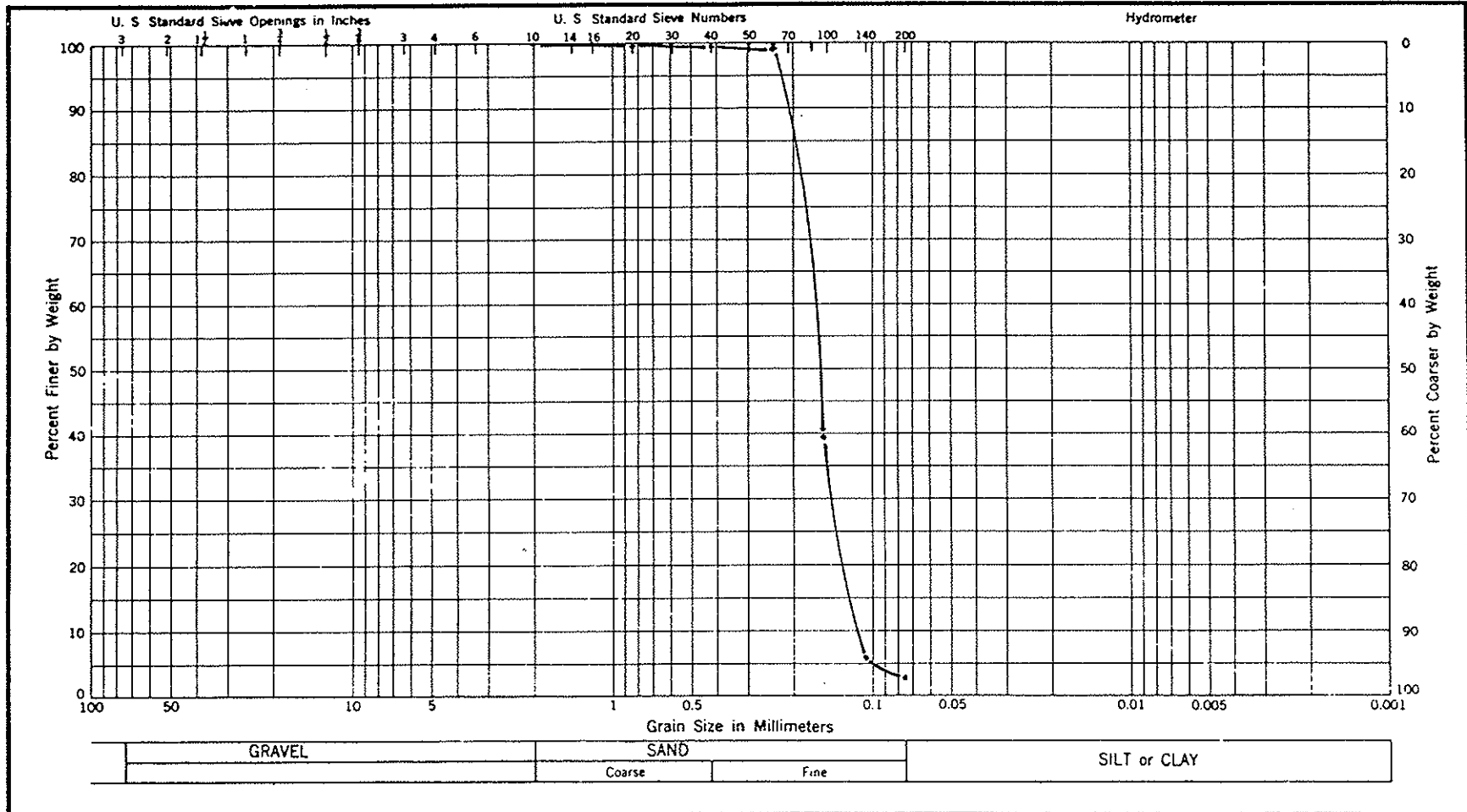
DRIGGERS ENGINEERING SERVICES, INC.
 Clearwater, Florida



GRAVEL	SAND	SILT or CLAY
	Coarse Fine	

Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification	
DW-6	4' - 6'		N/O	N/P		Gray Fine SAND (SP)	FILE: L933057 REPORT: 1
						% Passing -200 Sieve = 2.8%	PROJECT: SDA - St. Johns
							CLIENT: Ayres Associates

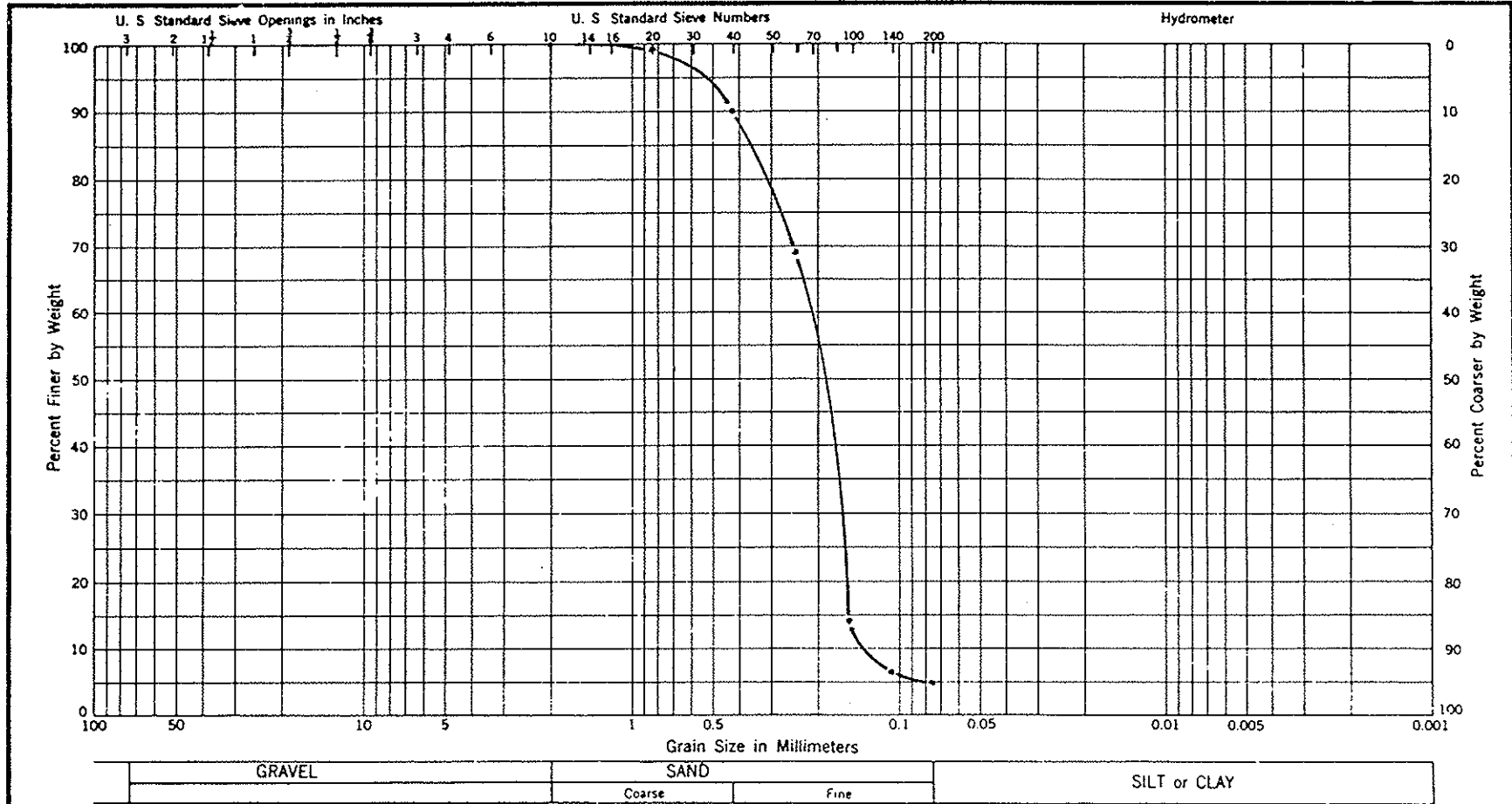
DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



GRAVEL		SAND		SILT or CLAY
		Coarse	Fine	

Number	Depth	Natural Moisture	L. L.	P. L.	P. I.	Classification	FILE: L933057	REPORT: 1
DW-6	14' - 16'		N/O	N/P		Gray Fine SAND (SP)	PROJECT: SDA - St. Johns	
						% Passing -200 Sieve = 2.7%	CLIENT: Ayres Associates	

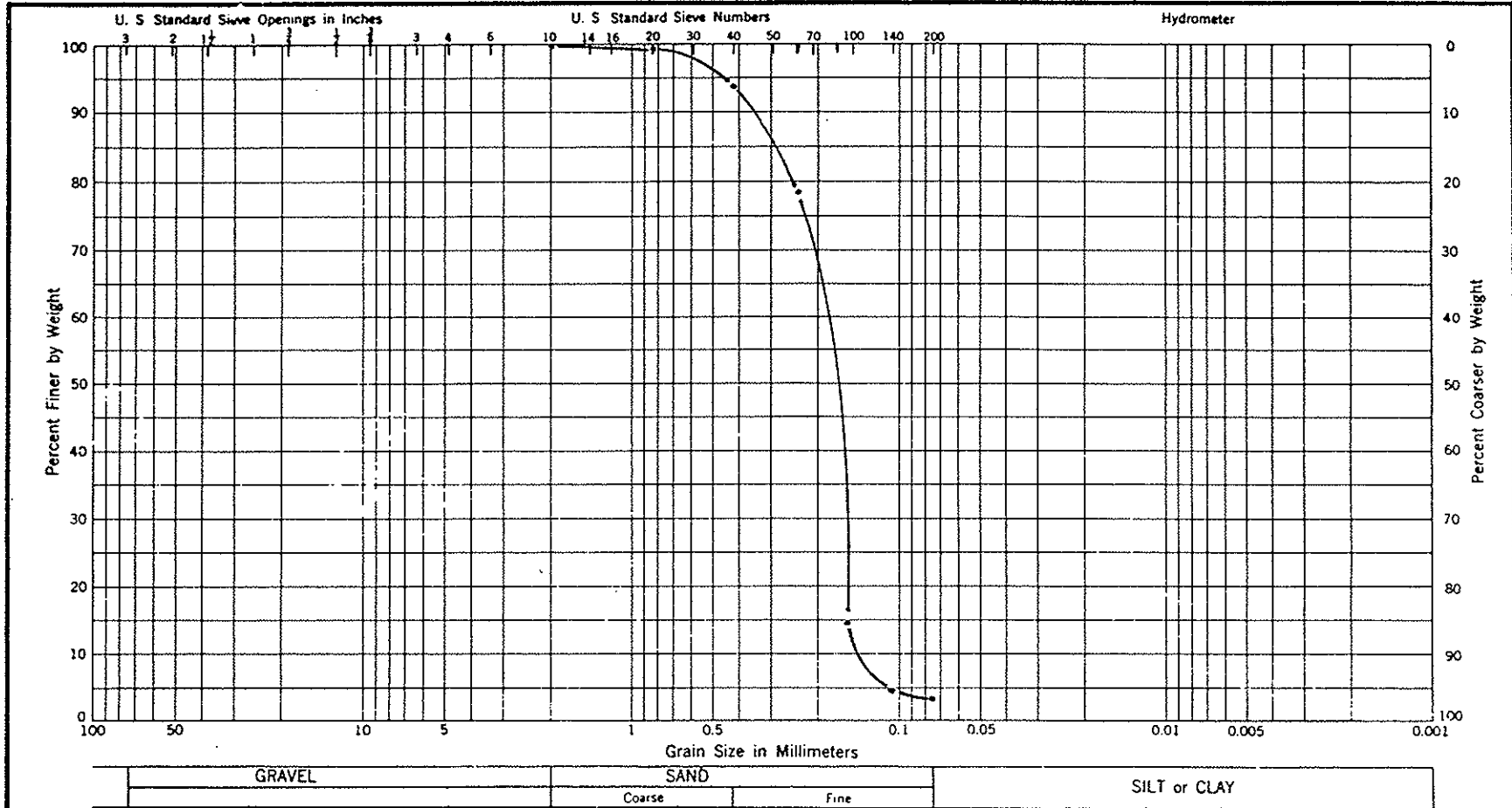
DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L L	P. L	P. I.	Classification
DW-6	27'		N/O	N/P		Gray and brown Fine SAND (SP)
						% Passing -200 Sieve = 5.0%

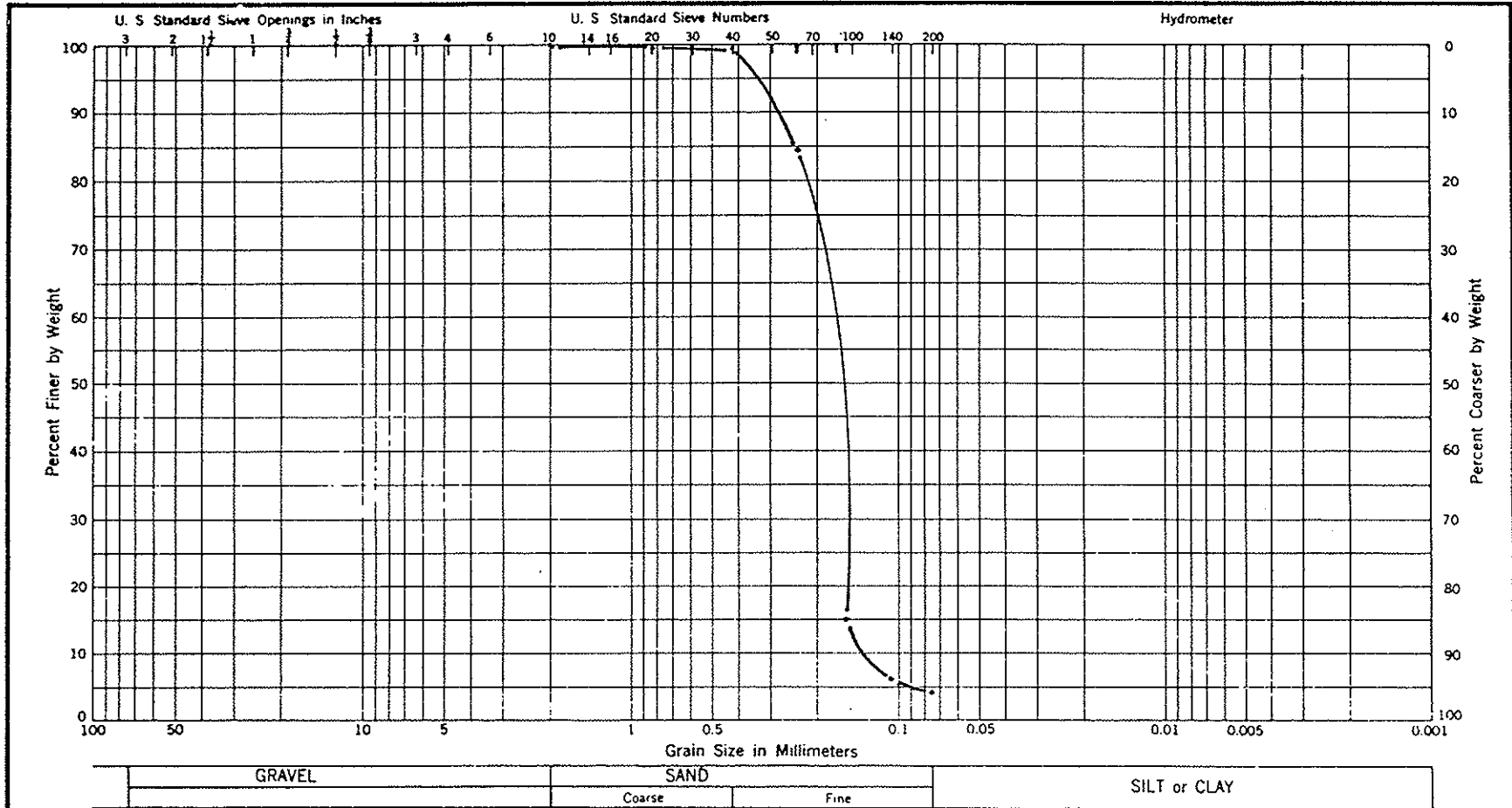
FILE: L933057 REPORT: 1
 PROJECT: SDA - St. Johns
 CLIENT: Ayres Associates

DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L L	P. L	P. I.	Classification	FILE: L933057	REPORT: 1
DW-6	36' - 38'		N/O	N/P		Gray and brown Fine SAND (SP)	PROJECT: SDA - St. Johns	
						% Passing -200 Sieve = 3.8%	CLIENT: Avres Associates	

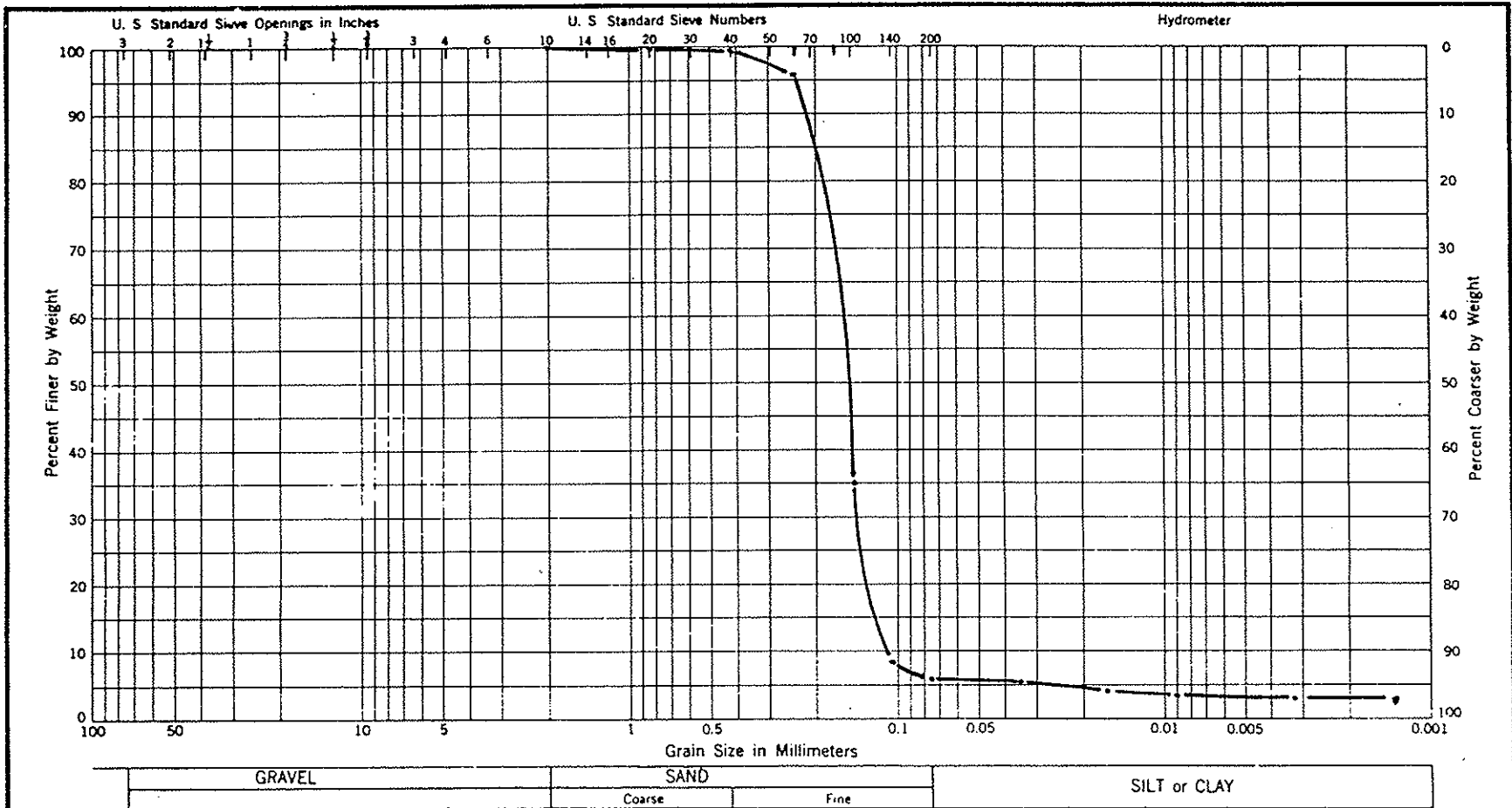
DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



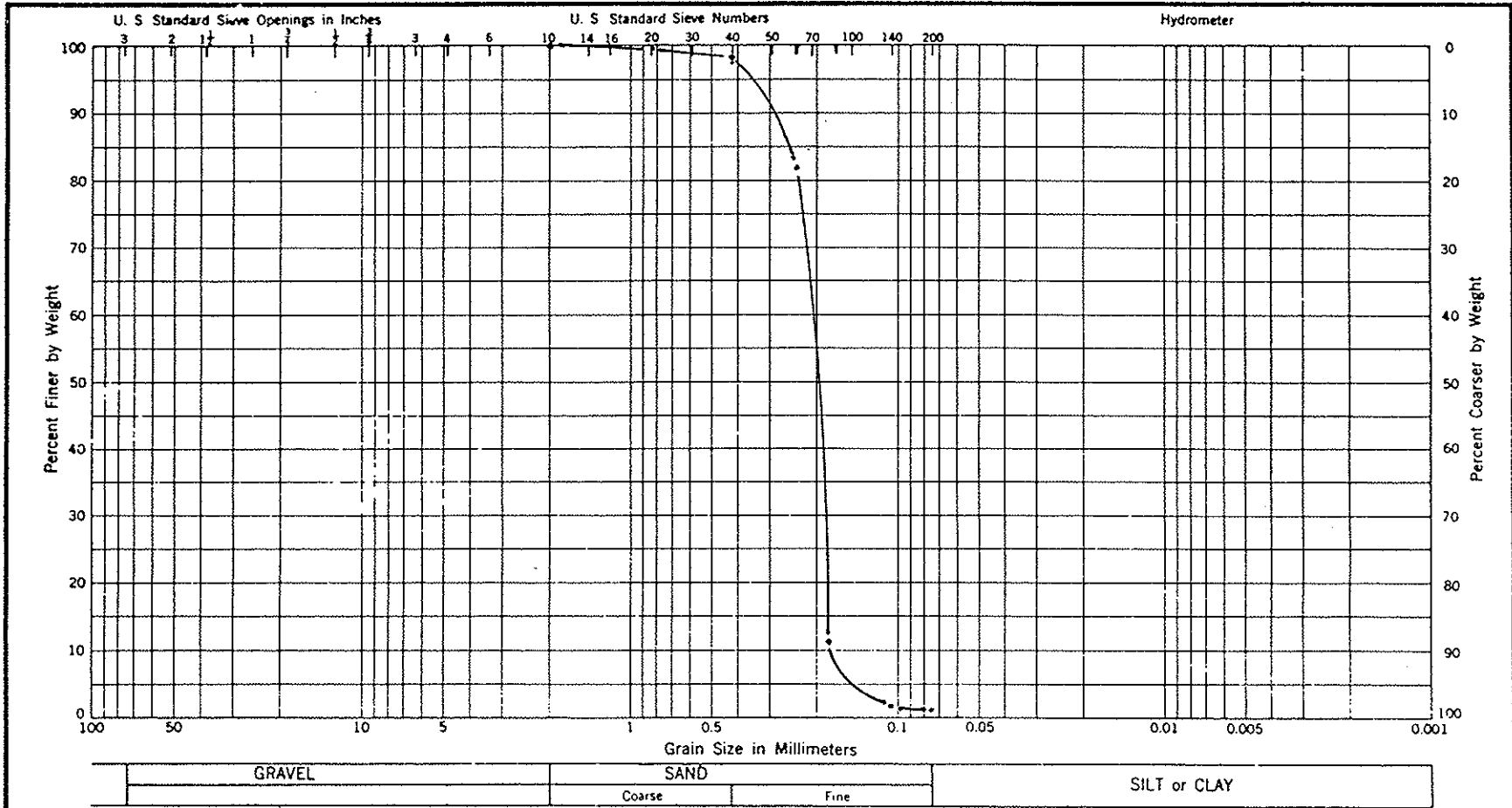
Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification
DW-6	48' - 50'		N/O	N/P		Gray Fine SAND (SP)
						% Passing -200 Sieve = 4.6%

FILE: L933057 REPORT: 1
 PROJECT: SDA - St. Johns
 CLIENT: Ayres Associates

DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



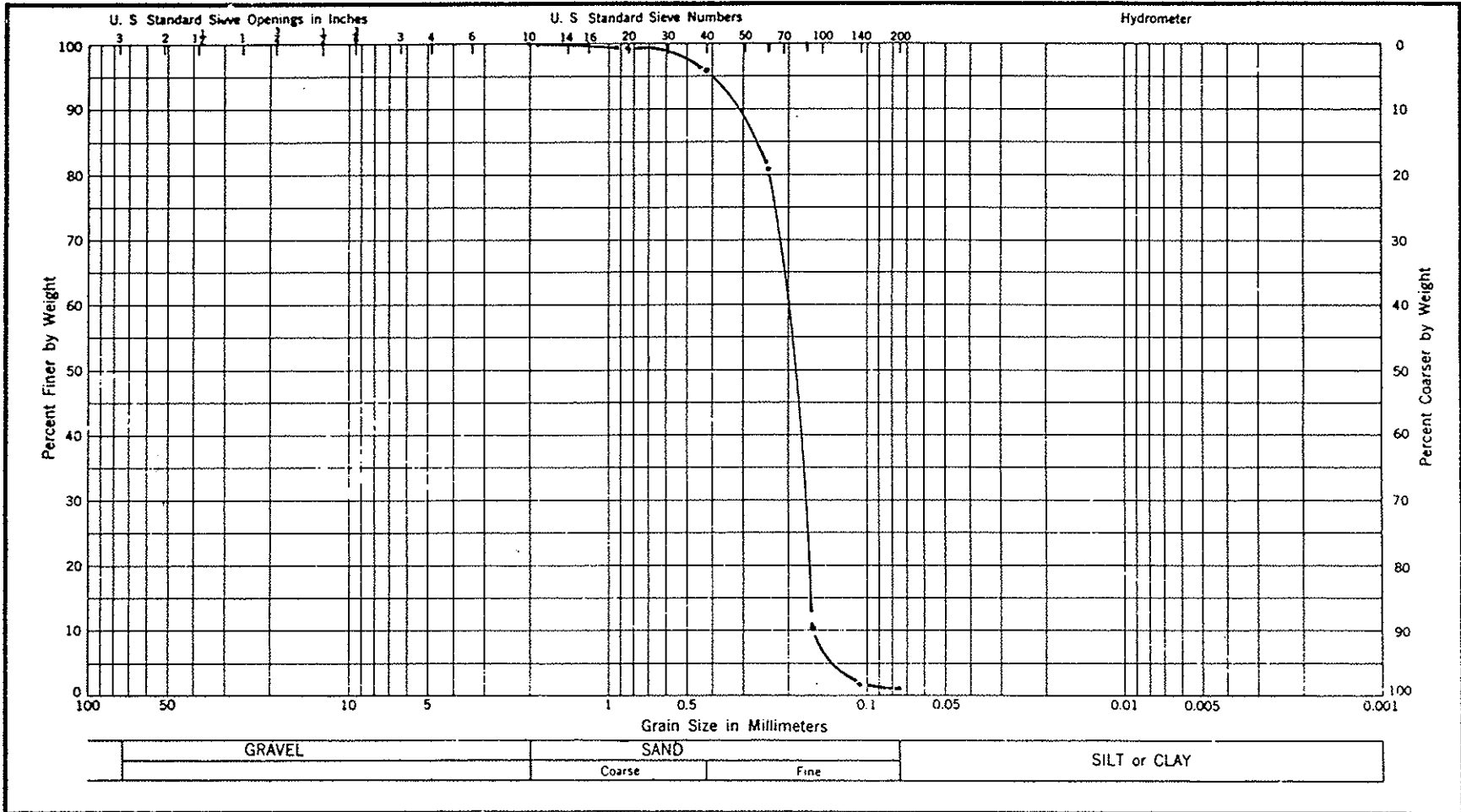
DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification
DW-8	10' - 12'		N/O	N/P		Grayish brown Fine SAND (SP)
						% Passing -200 Sieve = 1.0%

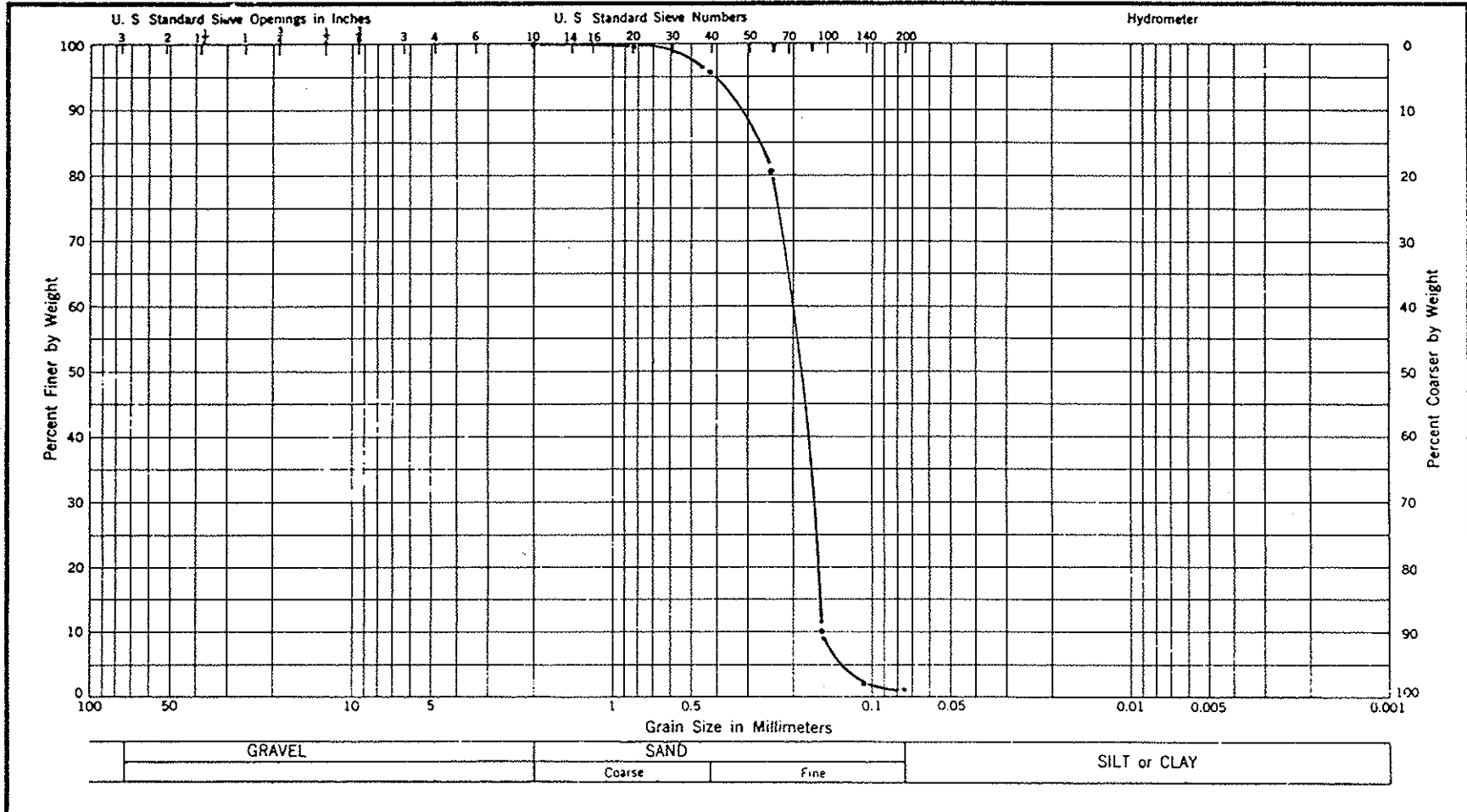
FILE: L933057 REPORT: 1
PROJECT: SDA - St. Johns
CLIENT: Ayres Associates

DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification	
DW-8	25' - 27'		N/O	N/P		Brown Fine SAND (SP)	FILE: L933057 REPORT: 1
						% Passing -200 Sieve = 1.4%	PROJECT: SDA - St. Johns
							CLIENT: Ayres Associates

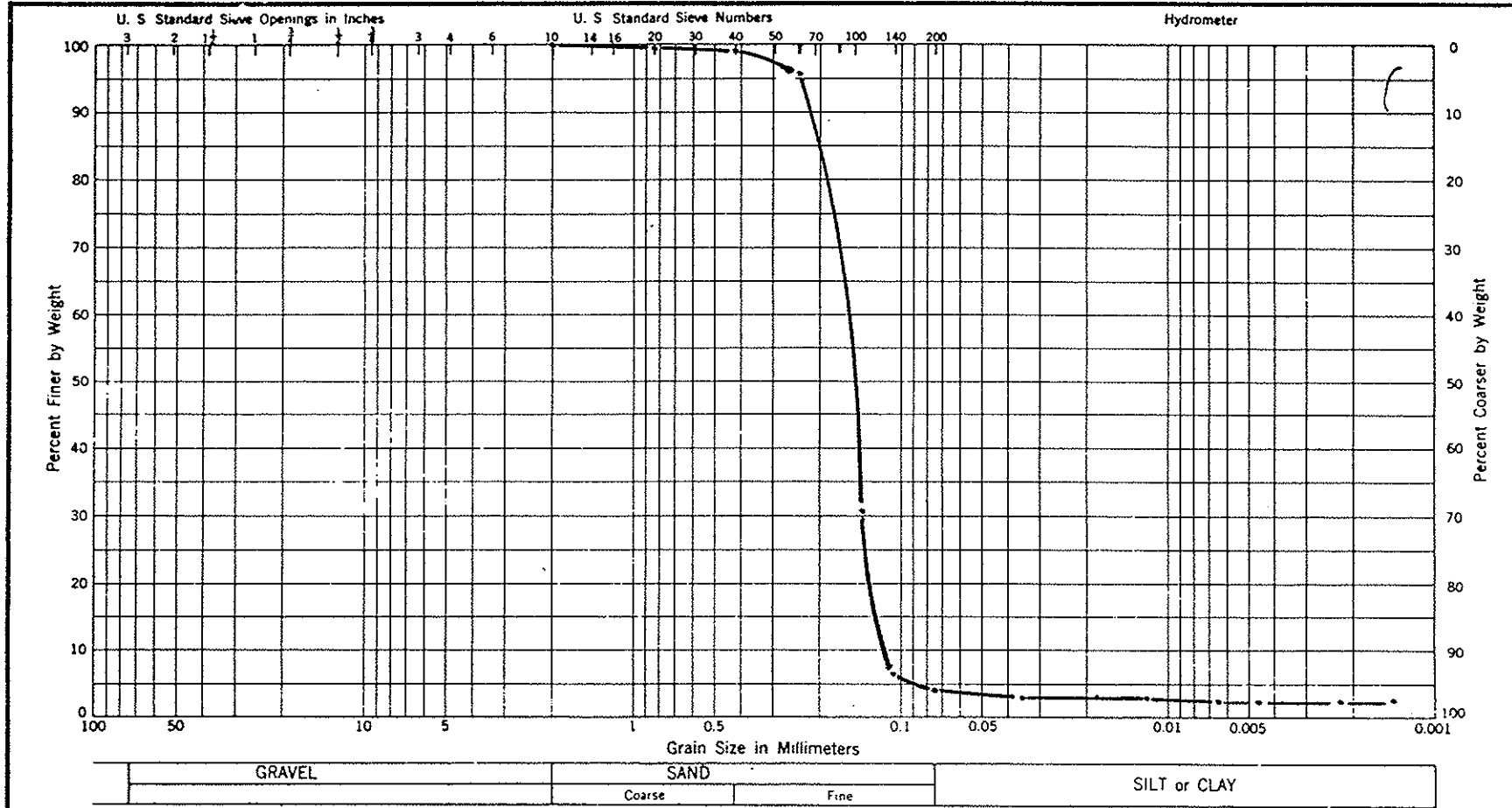
DRIGGERS ENGINEERING SERVICES, INC.
 Clearwater, Florida



GRAVEL		SAND		SILT or CLAY
		Coarse	Fine	

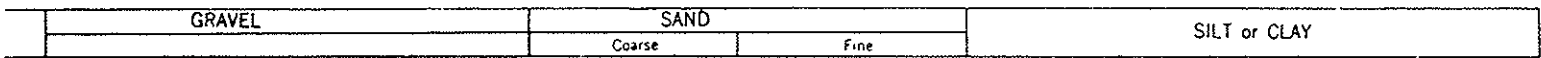
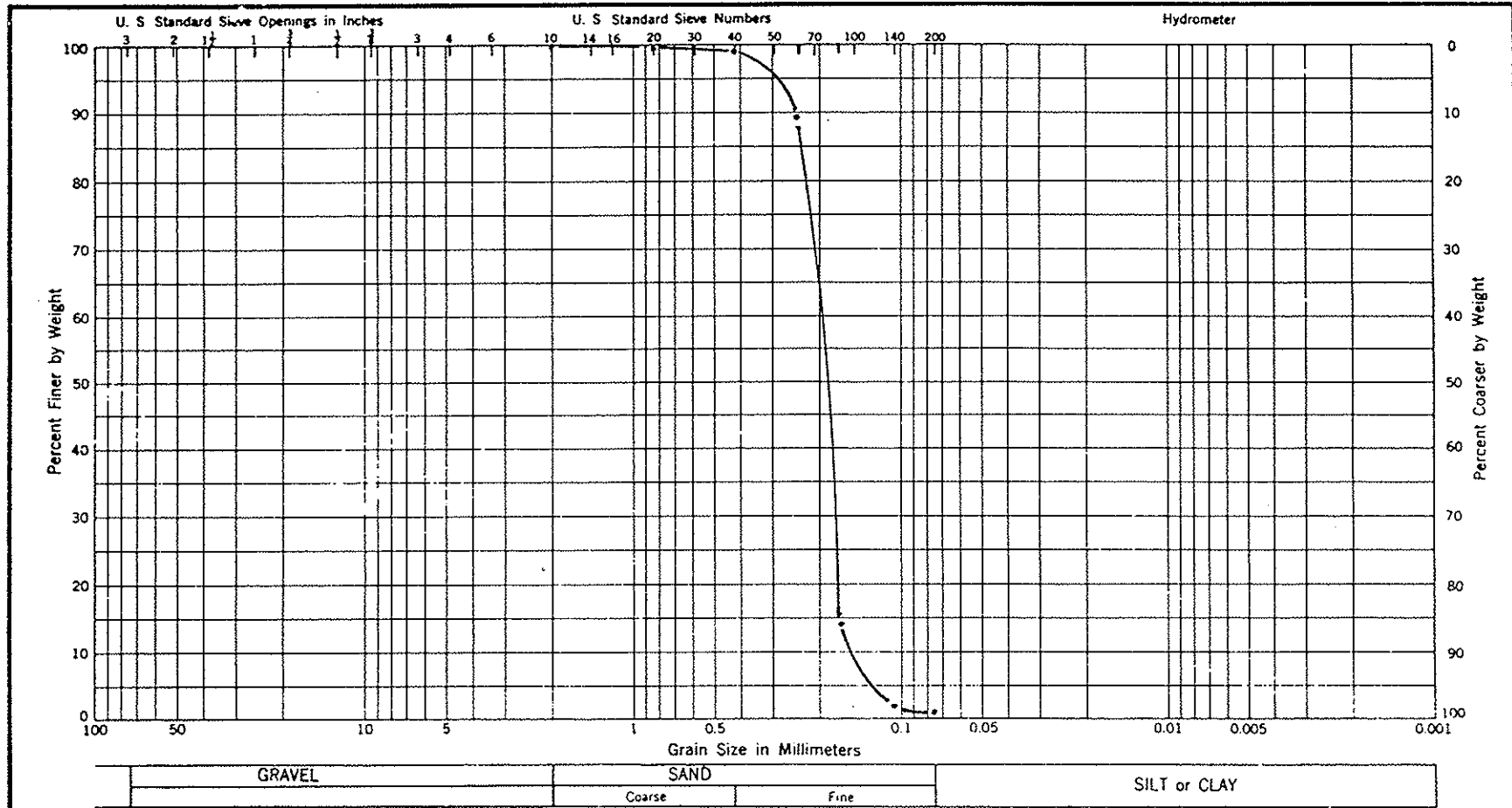
Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification	FILE: L933057	REPORT: 1
DW-8	48' - 50'		N/O	N/P		Gray and brown Fine SAND (SP)	PROJECT: SDA - St. Johns	
						% Passing -200 Sieve = 1.1%	CLIENT: Ayres Associates	

DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L. L.	P. L.	P. I.	Classification	
DW-10	3' - 4'		N/O	N/P		Dark brown Fine SAND (SP)	FILE: L933057 REPORT: 1
						% Passing -200 Sieve = 4.2%	PROJECT: SDA - St. Johns
							CLIENT: Ayres Associates

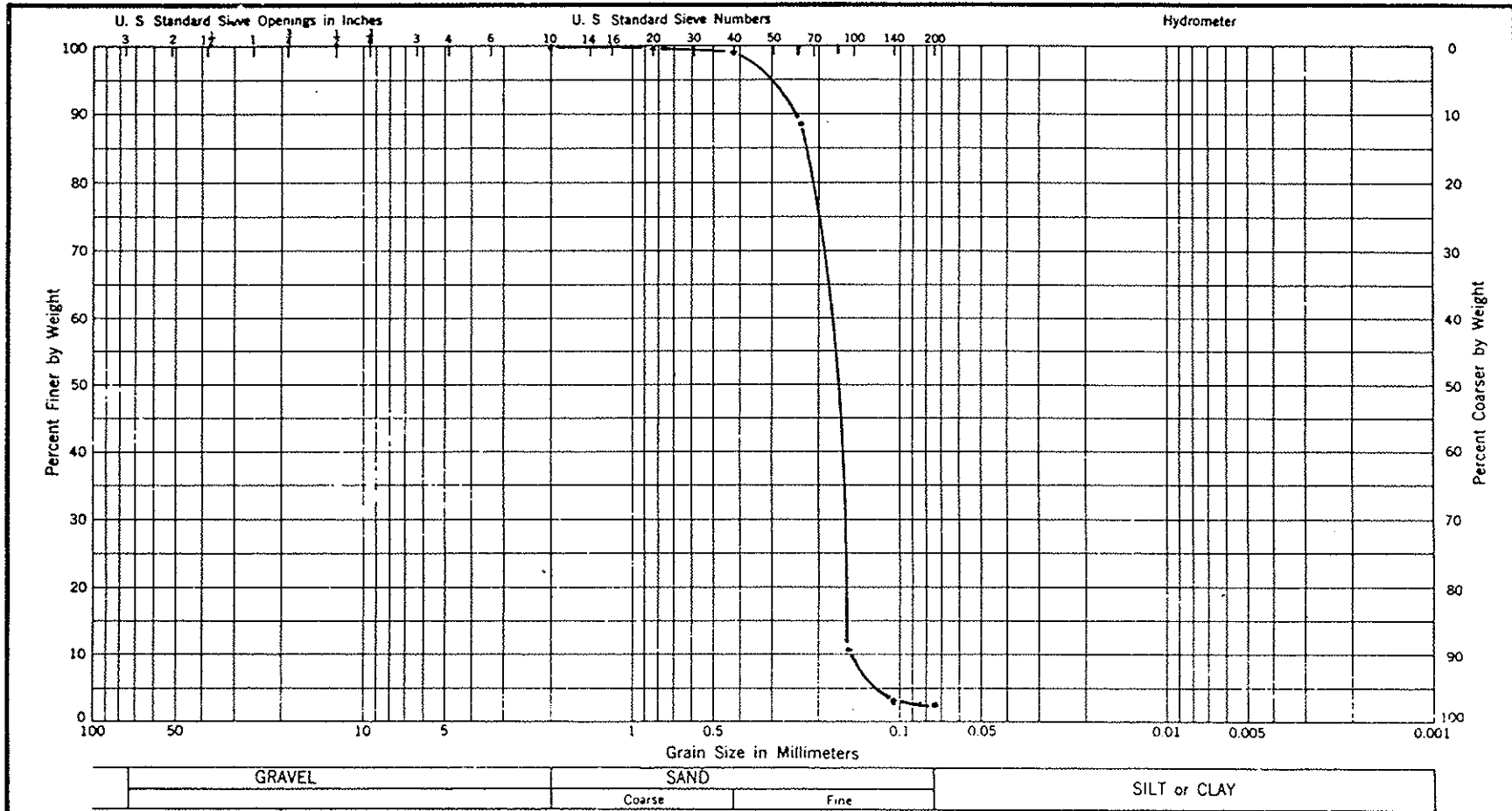
DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification
DW-10	10' - 12'		N/O	N/P		Tan Fine SAND (SP)
						% Passing -200 Sieve = .9%

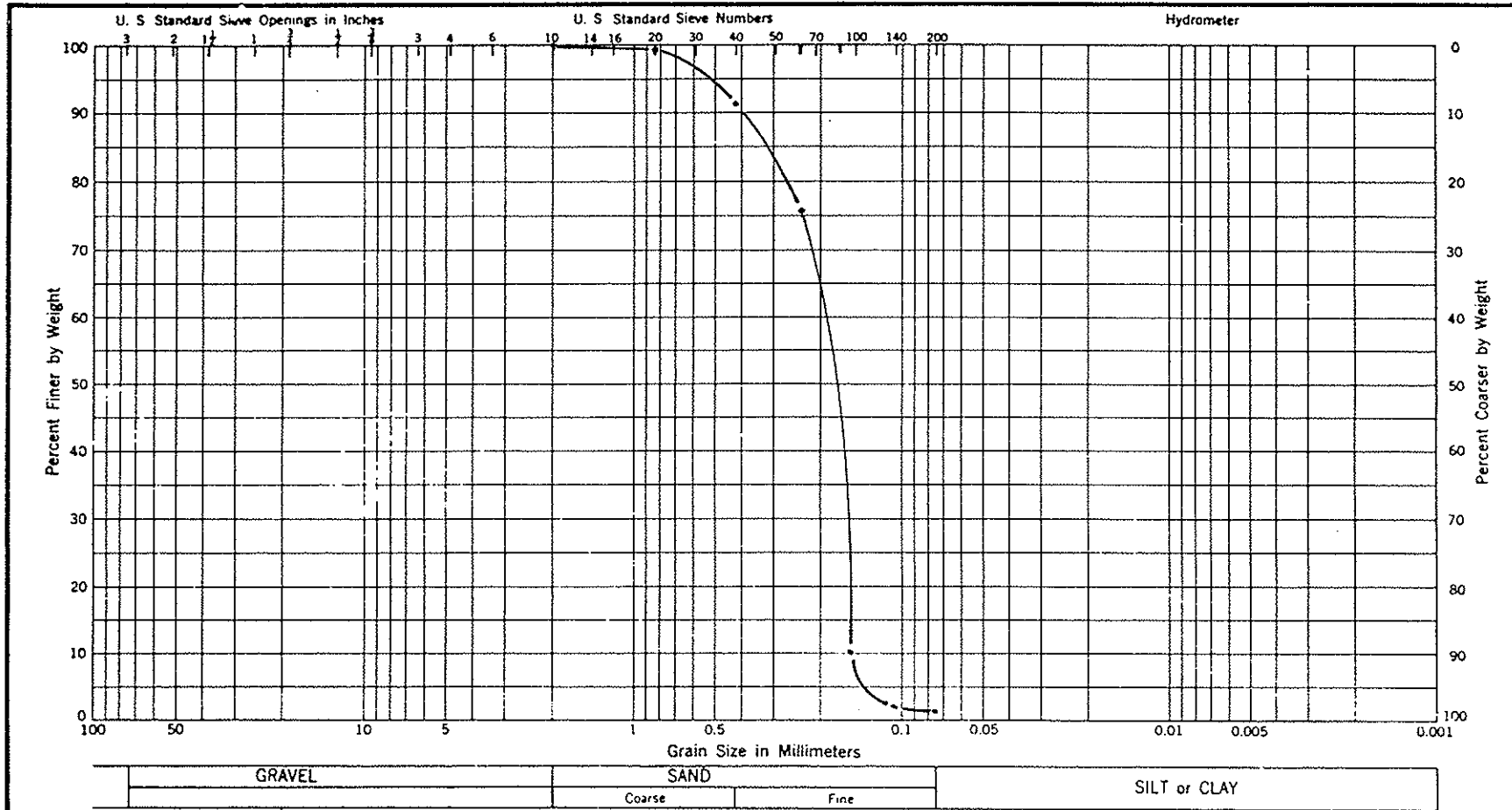
FILE: L933057 REPORT: 1
 PROJECT: SDA - St. Johns
 CLIENT: Ayres Associates

DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L. L.	P. L.	P. I.	Classification	
DW-10	15' - 17'		N/O	N/P		Dark brown Fine SAND (SP)	FILE: L933057 REPORT: 1
							PROJECT: SDA - St. Johns
						% Passing -200 Sieve = 3.0%	CLIENT: Ayres Associates

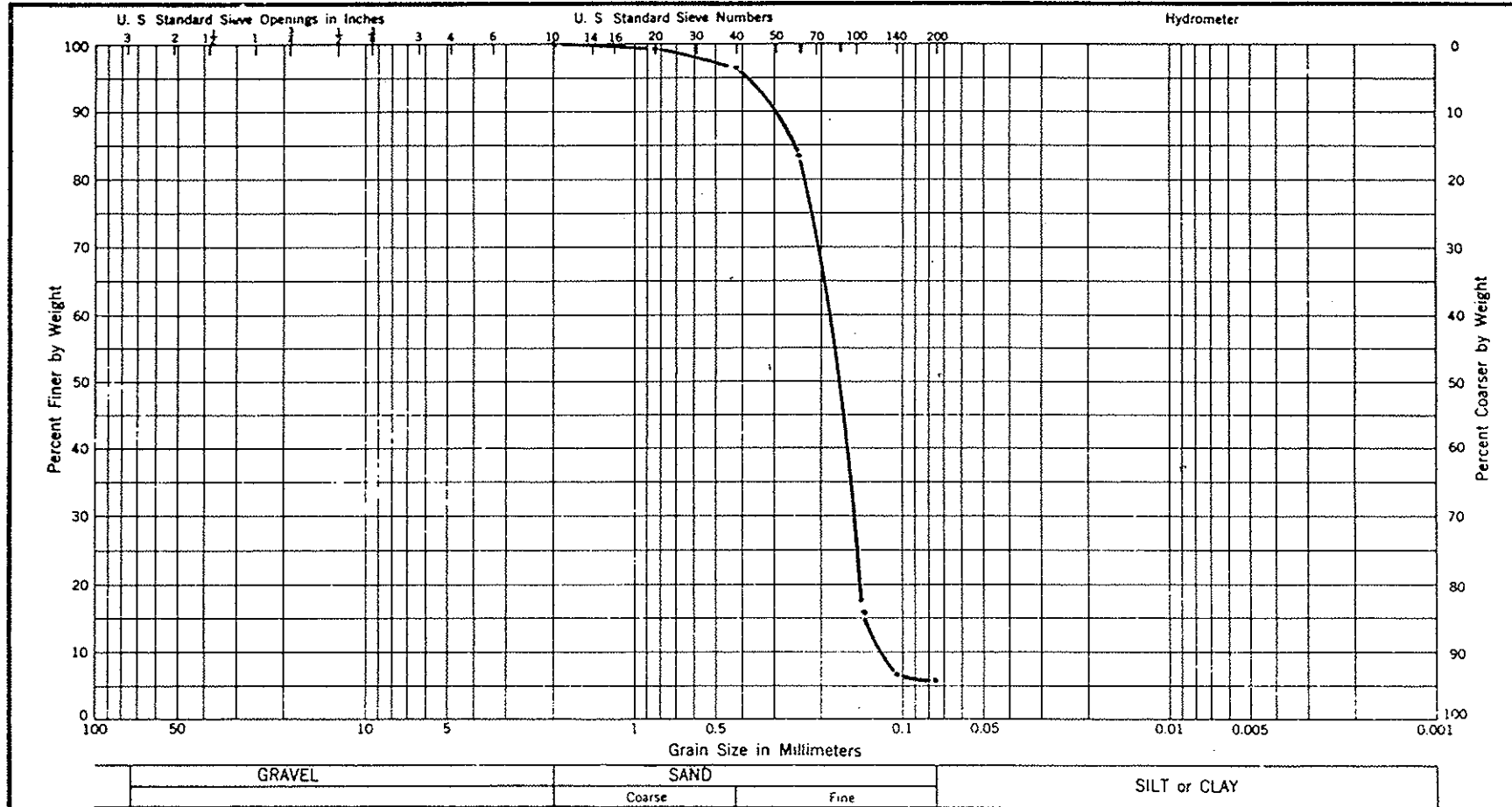
DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L.L.	P.L.	P.I.	Classification
DW-10	30' - 32'		N/O	N/P		Gray and brown Fine SAND
						% Passing -200 Sieve = 1.5%

FILE: L933057 REPORT: 1
PROJECT: SDA - St. Johns
CLIENT: Ayres Associates

DRIGGERS ENGINEERING SERVICES, INC.
Clearwater, Florida



Number	Depth	Natural Moisture	L. L.	P. L.	P. I.	Classification
DW-10	50' - 52'		N/O	N/P		Gray and brown slightly silty Fine SAND (SP-SM)
						% Passing -200 Sieve = 5.6%

FILE: L933057 REPORT: 1
PROJECT: SDA - St. Johns
CLIENT: Ayres Associates

B3: Drainfield Soil Core Data

- Saturated Hydraulic Conductivity
- Soil Moisture Retention
- Field Moisture Content
- Bulk Density
- Porosity

SDA Florida OWTS Project
Table B-3 Summary of Drainfield Soil Core Data

Soil Parameter*	Sample Identification**					
	SC-1		SC-2		SC-3	
Bulk Density (gm/cc)	1.43		1.54		1.53	
Porosity (%)	46.10		41.90		42.30	
Field Water Content (% wt.)	23.60		26.00		30.10	
Saturated Hydraulic Condition (cm/d)	324.00		410.00		514.00	
Soil Moisture Retention @ Pressure (cm)	% vol.	% wt.	% vol.	% wt.	% vol.	% wt.
3.5	37.98	26.59	38.96	25.29	39.17	25.59
20.0	36.95	25.87	37.98	24.66	38.74	25.05
30.0	35.32	24.73	37.73	24.50	38.50	25.15
45.0	24.37	17.07	35.75	23.21	34.16	22.31
60.0	16.67	11.67	17.27	11.21	15.60	10.19
80.0	12.67	8.87	9.19	5.97	8.34	5.45
100.0	11.12	7.78	7.49	4.87	6.73	4.4
150.0	9.43	6.60	5.81	3.77	5.24	3.42
200.0	8.96	6.27	5.53	3.59	4.84	3.16
345.0	7.23	5.06	4.32	2.80	3.61	2.36
15000.0	4.00	2.80	1.10	0.71	0.69	0.45

* Soils analyses performed according to Soil Science Society of America (SSA), 1986, Methods of Soil Analysis, Part 1

** SC-1 composite taken directly below Trench 1, 28-36" bgs

SC-2 composite taken directly below SC-1, 48-56" bgs

SC-3 composite taken downgradient from Trench 1, between TW-4 and TW-5, at 48-56" bgs

C1: Homeowner Questionnaires

JUNE 1992

The following questionnaire is designed to give us more information about your home so that we can better characterize the results of our study here. Please answer the questions honestly and to the best of your knowledge. Return the completed questionnaire to the following address at your earliest convenience:

T.A. Fredenhagen
1291 Tangerine Dr.
Fruit Cove, FL 32259

Mr. Damann L. Anderson
Ayres Associates
3901 Coconut Palm Drive, Suite 100
Tampa, Florida 33619
Telephone: (813) 628-0742

Please return within two (2) weeks.

1. How long have you lived in your present home? Since 4 (month), 1982 (year)
2. When was your home constructed? 1977 (month) (year)
3. How many persons live in your home? 1__ 2__ 3__ 4 5__ 6__ 7__ 8__
4. Please list age of each occupant: 42/40/10/5 yrs
5. What water-using fixtures and appliances are in your home? List number if more than 1.

<u>Kitchen:</u>	Sink	<u>one</u>	<u>Bathroom(s):</u>	Sink(s)	<u>TWO</u>
	Dishwasher	<u>one</u>		Shower(s)	<u>TWO</u>
	Garbage Disposal	<u>NONE</u>		Tub(s)	<u>ONE</u>
				Toilet(s)	<u>TWO</u>
<u>Laundry:</u>	Clotheswasher	<u>ONE</u>	<u>Other:</u>	Water Softener	<u>NONE</u>
	Sink(s)	<u>NONE</u>			
6. Automatic Dishwashing
 - (a) Approximately how many loads of dishes are washed in the automatic dishwashing machine per week? Use Very Rarely - once Every 2-3 mo
 - (b) What brands of automatic dishwashing detergents do you use, in order of more to less frequent use?
Liquid Brands: Cascade Liq. Gel
Powder Brands: NONE
 - (c) Are any rinse aids or other products used in your dishwasher?
Yes ___ No If so, please identify:

7. Hand Dishwashing
 - (a) Approximately how many loads of dishes are washed by hand per week? 7-10
 - (b) What brands of detergents do you use, in order of more to less frequent use?
Liquid Brands: Palmolive / Sunlight / Joy
Powder Brands: NONE
8. Clothes Washing
 - (a) Approximately how many loads of laundry are washed per week? 4-5
 - (b) What brands of laundry detergents do you use, in order of more to less frequent use?
Liquid Brands: Dynamo 2
Powder Brands: Ultra Gain
 - (c) What brands of fabric softener do you use, in order of more to less frequent use?
Calgon Water Softener
 - (d) What brands of bleach do you use, in order of more to less frequent use?
Clorox
9. Please identify other cleaning products used in the household that end up going down a drain.
 - (a) Chemical Drain Openers: Draino - Rarely
 - (b) Toilet Cleaners: Sno-Bol, Pine-sol
 - (c) Mildew Removers: Tilax
 - (d) Other: _____

Thank you very much for taking the time to complete this survey. We will be in touch with you soon regarding further involvement in our study.

The Soap and Detergent Association
Septic Tank System Research Program

RECEIVED

FEB 06 1995

HOMEOWNER'S QUESTIONNAIRE

January 19, 1995

The following questionnaire is designed to give us more information about your home so that we can better characterize the results of our study here. Please answer questions honestly and to the best of your knowledge. Return the complete questionnaire to the following address at your earliest convenience:

Mr. Damann L. Anderson
Ayres Associates
3901 Coconut Palm Drive, Suite 100
Tampa, Florida 33619
Telephone: (813) 628-0742

Fredenhagen
1291 Tangerine Dr.
Jacksonville, FL 32259-3155

Please return within two (2) weeks.

1. How long have you lived in your present home? Since Spring 1982 904-287-202
(month) (year)
2. When was your home constructed? Fall 1976
(month) (year)
3. How many persons live in your home? 1 _____ 2 _____ 3 _____ 4 _____
5 _____ 6 _____ 7 _____ 8 _____
4. How many in each age group? Less than 2 yrs. _____ 3-7 yrs. one 8-12 yrs. _____
13-18 yrs. one 19 yrs. & older two
5. What water-using fixtures and appliances are in your home? List number if more than 1.
- | | | | |
|-----------------|------------------------------|-----------------|-------------------|
| <u>Kitchen:</u> | Sink <u>one</u> | <u>Laundry:</u> | Sink <u>none</u> |
| | Dishwasher <u>one</u> | | Washer <u>one</u> |
| | Garbage Disposal <u>none</u> | | |
-
- | | | | |
|-------------------|----------------------|---------------|---|
| <u>Bathrooms:</u> | Sink(s) <u>TWO</u> | <u>Other:</u> | Water Softener <u>None</u> |
| | Shower(s) <u>one</u> | | Swimming Pool _____ |
| | Tub(s) <u>one</u> | | Spa Tub _____ |
| | Toilet(s) <u>TWO</u> | | Jacuzzi <input checked="" type="checkbox"/> _____ |
6. Automatic Dishwashing
- (a) Approximately how many loads of dishes are washed in the automatic dishwashing machine per week? Three

(Please see reverse side)

(b) What brands of automatic dishwashing detergents do you use, in order of more to less frequent use?

Liquid Brands: PALMOLIVE GEL, SUNLIGHT

Powder Brands: NONE

(c) Are any rinse aids or other products used in your dishwasher?
Yes No X If so, please identify:

7. Hand Dishwashing

(a) Approximately how many loads of dishes are washed by hand per week? TWO

(b) What brands of detergents do you use, in order of more to less frequent use?

Liquid Brands: DAWN, PALMOLIVE REGULAR + ANTIBACTERIAL, JOY, IVORY

Powder Brands: NONE

8. Clothes Washing

(a) Approximately how many loads of laundry are washed per week? 5-7

(b) What brands of laundry detergent do you use, in order of more to less frequent use?

Liquid Brands: ^① CHEER, ^③ DYNAMO, ^② ULTRA GAIN, ^⑤ SPRAY + WASH, ERA PLUS
TIDE w/ Bleach, RIZ, STAIN OUT

Powder Brands: ^④ ULTRA GAIN

9. Please identify other cleaning products used in the household that end up going down a drain.

Clorox Toilet Bowl cleaner, Pine-Sol, Tilex Mildew Remover, Light Scrub w/ Bleach, Lysol Toilet Bowl cleaner, Bleach, Bathroom Cleaner (Scrubbing Bubbles), GOOP, Hand + Bath Soaps, Ammonia

Thank you very much for taking the time to complete this survey. We will be in touch with you soon regarding further involvement in our study.

Fredennagen
1201 Tangerine Dr.
Jacksonville, FL 32259-3155

904-287-2021

C2: Detergent Usage Logs

SDA Florida OWTS Project

Table C-1 Homeowner Detergent Usage Data Summary

Date	Dishwashing			Laundry			Comment
	Hand Wash	Machine Wash	Product	Hand Wash	Machine Wash	Product	
4/12/95	1		Joy & Dawn mixed	1		Cheer Liquid	
4/13/95		1	Palmolive Gel	1		Gain Liquid	
4/14/95	1		Joy & Dawn mixed				
4/15/95	1		Joy & Dawn mixed	1		Ivory	
4/15/95					1	Gain	
4/16/95					2	Cheer	
4/16/95					1	Ultra Gain	
4/17/95				1		Cheer	
4/18/95	1		Joy & Dawn mixed				
4/18/95		1	Palmolive Gel				
4/19/95					1	Ultra Gain	
4/21/95					1	Cheer	
4/22/95	1		Joy & Dawn mixed		1	Cheer	
4/22/95		1	Palmolive Gel				
4/23/95					1	Ultra Gain	
4/25/95					1	Cheer	
4/25/95				3		Cheer	
4/26/95					1	Cheer	
4/26/95					2	Ultra Gain	
4/27/95	1		Joy & Dawn mixed				
4/27/95		1	Palmolive Gel				
4/28/95				1		Cheer	
4/29/95					1	Ultra Gain	
4/30/95	1		Joy & Dawn mixed	2		Cheer	
4/30/95					2	Cheer	
4/30/95					3	Gain	
5/02/95	1		Palmolive Plus w/ Antibacterial				
5/03/95				1		Cheer	
5/05/95				1		Cheer	
5/05/95					1	Ultra Gain	
5/06/95					2	Gain	
5/06/95					1	Cheer	
5/07/95		1	Palmolive Gel	1		Tide	
5/07/95				1		Cheer	
5/07/95				1		Gain	
5/07/95					2	Gain	
5/07/95					1	Cheer	
5/08/95				1		Cheer	
5/10/95				1		Fab	
5/11/95	1		Palmolive Plus w/ Antibacterial	1		Fab	

Date	Dishwashing		Laundry			Comment
	Hand Wash	Machine Wash	Product	Hand Wash	Machine Wash	
5/11/95		1	Palmolive Gel		1	Ultra Gain
5/13/95					2	Ultra Gain
5/14/95					2	Cheer
5/14/95					1	Ultra Gain
5/14/95				3		Cheer
5/16/95		1	Palmolive Gel	1		Tide w/ Bleach
5/17/95	1		Palmolive Plus		1	Ultra Gain
5/19/95				3		Tide w/ Bleach
5/20/95		1	Palmolive Gel			
5/21/95				1		Ultra Gain
5/21/95					3	Cheer
5/21/95					2	Ultra Gain
5/23/95				2		Biz
5/23/95				1		Fab
5/23/95				1		Tide w/ Bleach
5/23/95					2	Ultra Gain
5/24/95	1		Palmolive Plus		1	Ultra Gain
5/24/95		1	Palmolive Gel			
5/27/95					3	Ultra Gain
5/27/95					1	Cheer
5/28/95		1	Palmolive Gel	2		Cheer
5/28/95	1		Palmolive Plus			
5/29/95				1		Ultra Gain
5/29/95					4	Ultra Gain
5/30/95				1		Tide w/ Bleach
5/30/95				1		Cheer
5/30/95					1	Ultra Gain
6/01/95		1	Palmolive Gel			
6/02/95	1		Palmolive Plus		1	Ultra Gain
6/03/95		1	Palmolive Gel			
6/04/95	1		Palmolive Plus	2		Ultra Gain
6/04/95					2	Cheer
6/04/95					1	Ultra Gain
6/05/95				1		Cheer
6/05/95					1	Ultra Gain
6/08/95		1	Palmolive Gel		1	Ultra Gain
6/08/95	1		Dawn-Lemon Scent			
6/09/95				1		Ultra Biz
6/10/95	1		Dawn-Lemon Scent			
6/10/95		1	Palmolive Gel			
6/11/95				1		Fab
6/11/95					1	Cheer
6/13/95				1		Fab
6/14/95	1		Dawn-Lemon Scent		1	Ultra Gain Liquid
6/14/95	1		Dial w/ Antibacterial	1		Cheer
6/17/95		1	Palmolive Gel	1		Fab

Date	Dishwashing			Laundry			Comment
	Hand Wash	Machine Wash	Product	Hand Wash	Machine Wash	Product	
6/17/95				1		Biz	
6/17/95					1	Cheer	
6/17/95					1	Ultra Gain	
6/18/95					1	Ultra Gain Powder	
6/18/95					1	Ultra Gain Liquid	
6/18/95				1		Tide w/ Bleach	
6/18/95				1		Cheer Liquid	
6/19/95					1	Ultra Gain Powder	
6/19/95				2		Cheer	
6/19/95				1		Tide w/ Bleach	
6/19/95				1		Ultra Gain Liquid	
6/20/95				1		Ultra Gain Liquid	
6/21/95	1		Dawn-Lemon Scent				
6/21/95		1	Palmolive Gel				
6/24/95		1	Palmolive Gel	1		Biz Bleach	
6/25/95				1		Fab	
6/25/95				1		Tide w/ Bleach	
6/25/95					1	Cheer	
6/25/95					1	Ultra Gain Powder	
6/25/95					2	Ultra Gain Liquid	
6/26/95	1		Dawn-Lemon Scent		1	Ultra Gain Powder	
7/01/95	1		Dawn-Lemon Scent	1		Tide w/ Bleach	
7/01/95		1	Palmolive Gel	1		Cheer	
7/01/95					1	Ultra Gain Powder	
7/01/95					1	Cheer	
7/02/95				1		Tide w/ Bleach	
7/02/95					1	Ultra Gain Powder	
7/06/95					1	Ultra Gain Powder	
7/09/95	1		Dawn	1		Ultra Gain Powder	
7/09/95					1	Ultra Gain Powder	
7/11/95				1		Cheer	
7/13/95	1		Dawn		1	Ultra Gain Liquid	
7/13/95		1	Palmolive Gel	1		Cheer	
7/15/95				1		Tide w/ Bleach	

Date	Dishwashing			Laundry			Comment
	Hand Wash	Machine Wash	Product	Hand Wash	Machine Wash	Product	
7/15/95				1		Gain Powder	
7/16/95				1		Cheer	
7/16/95					1	Gain Powder	
7/16/95					2	Cheer	
7/18/95				1		Gain Powder	
7/18/95					1	Cheer	
7/19/95	1		Dawn		1	Ultra Gain Powder	
7/19/95		1	Palmolive Gel				
7/20/95				1		Cheer Liquid	
7/22/95				1		Fab Liquid	
7/22/95					1	Cheer	
7/22/95					1	Gain Powder	
7/23/95				1		Fab Liquid	
7/23/95				1		Biz	
7/23/95				1		Tide w/ Bleach	
7/23/95					1	Ultra Gain	
7/24/95				1		Tide w/ Bleach	
7/24/95					1	Ultra Gain Powder	
7/25/95	1		Palmolive Plus	1		Cheer	
7/25/95		1	Palmolive Gel		1	Ultra Gain Powder	
7/26/95					1	Cheer	
7/26/95					2	Ultra Gain Liquid	
7/28/95				1		Cheer	
7/30/95					1	Ultra Gain Powder	
7/31/95					1	Cheer	
8/02/95					1	Cheer	
8/03/95				1		Fab	
8/03/95					2	Cheer	
8/03/95					1	Ultra Gain Powder	
8/04/95		1	Palmolive Gel				
8/04/95	1		Palmolive Plus				
8/06/95	1		Palmolive Plus		1	Ultra Gain Powder	
8/13/95	1		Palmolive Plus				
8/17/95	1		Palmolive Plus				
8/19/95		1	Palmolive Gel	1		Fab	
8/19/95					1	Ultra Gain Liquid	
8/19/95					1	Ultra Gain Powder	
8/20/95					1	Ultra Gain Powder	

Date	Dishwashing		Laundry			Comment
	Hand Wash	Machine Wash	Product	Hand Wash	Machine Wash	
8/20/95				2	Cheer	
8/22/95	1		Palmolive Plus			
8/22/95		1	Palmolive Gel			
8/23/95				2	Cheer	
8/23/95					1	Ultra Gain Powder
8/27/95		1	Palmolive Gel		1	Ultra Gain Powder
8/27/95					2	Cheer
8/27/95				1		Fab
8/27/95				1		Tide w/ Bleach
8/27/95				1		Cheer
8/29/95	1		Palmolive Plus			
8/29/95		1	Palmolive Gel			
8/30/95					1	Ultra Gain Powder
8/31/95				1		Ultra Gain Liquid
9/02/95					1	Cheer
9/04/95				2		Gain Liquid
9/04/95					1	Cheer
9/04/95					1	Biz & Gain Powder
9/04/95					1	Gain Liquid
9/05/95		1	Palmolive Gel			
9/06/95	1		Palmolive Plus			
9/09/95					1	Cheer Liquid
9/10/95	1		Dial		2	Cheer Liquid
9/10/95	1		Palmolive Plus		2	Biz
9/10/95		1	Palmolive Gel		1	Tide w/ Bleach
9/10/95					2	Ultra Gain Powder
9/10/95					1	Cheer Liquid
9/10/95					1	Ultra Gain Powder
9/14/95				1		Cheer Liquid
9/16/95					1	Ultra Gain Powder
9/17/95	1		Palmolive Plus		3	Cheer Liquid
9/17/95		1	Palmolive Gel		1	Ultra Gain Powder
9/17/95					1	Ultra Gain Liquid
9/17/95				2		Cheer Liquid
9/17/95				2		Ultra Gain Liquid
9/20/95	1		Palmolive Plus			
9/20/95		1	Palmolive Gel			

Date	Dishwashing		Laundry			Comment
	Hand Wash	Machine Wash	Product	Hand Wash	Machine Wash	
9/23/95	1		Palmolive Plus			
9/23/95		1	Palmolive Gel			
9/24/95					2	Cheer Liquid
9/24/95					2	Ultra Gain Powder
9/28/95		1	Palmolive Gel			
9/28/95	1		Palmolive Plus		1	Cheer Liquid
9/30/95	1		Palmolive Plus	1		Fab
9/30/95		1	Palmolive Gel		1	Cheer Liquid
9/30/95					2	Ultra Gain Powder
10/01/95					2	Ultra Gain Powder
10/01/95					1	Cheer Liquid
10/01/95				1		Biz
10/05/95		1	Palmolive Gel			
10/07/95					1	Cheer Liquid
10/09/95	1		Palmolive Plus	1		Cheer Liquid, Biz
10/09/95		1	Palmolive Gel		2	Gain Powder
10/10/95					1	Cheer Liquid
10/11/95					1	Gain Powder
10/14/95					1	Cheer Liquid
10/15/95		1	Palmolive Gel		2	Gain
10/15/95					1	Cheer Liquid
10/19/95		1	Palmolive Gel		1	Cheer Liquid
10/19/95	1		Dawn Ultra	2		Cheer Liquid
10/21/95				2		Cheer Liquid
10/21/95					1	Cheer Liquid
10/22/95				2		Fab
10/22/95				1		Tide w/ Bleach
10/22/95				1		Biz
10/22/95					1	
10/23/95		1	Palmolive Gel			
10/25/95	1		Dawn Ultra		1	Gain Powder
10/29/95		1	Palmolive Gel			
11/01/95	1		Dawn Ultra		1	Gain Powder
11/02/95		1	Palmolive Gel			
11/06/95		1	Palmolive Gel			
11/06/95	1		Dawn Ultra			
11/08/95					1	Gain Powder
11/08/95					1	Cheer Liquid
11/13/95		1	Palmolive Gel			
11/14/95	1		Palmolive Plus			
11/14/95		1	Palmolive Gel			
11/15/95	1		Palmolive Plus			
11/22/95	1		Palmolive Plus		1	Gain Powder

Date	Dishwashing		Product	Laundry		Product	Comment
	Hand Wash	Machine Wash		Hand Wash	Machine Wash		
11/22/95		1	Palmolive Gel				
11/25/95	1		Palmolive Plus				
11/25/95		1	Palmolive Gel				
11/26/95					1	Gain Powder	
11/29/95		1	Palmolive Gel				
11/30/96	1		Palmolive Plus				
12/02/95		1	Palmolive Gel				
12/03/95					1	Ultra Gain Powder	
12/04/95	1		Palmolive Plus				
12/05/95		1	Palmolive Gel				
12/09/95	1		Palmolive Plus		1	Ultra Gain Powder	
12/09/95		1	Palmolive Gel				
12/12/95	1		Palmolive Plus				
12/12/95		1	Palmolive Gel				
12/16/95		1	Palmolive Gel				
12/17/95					1	Ultra Gain Powder	
12/20/95	1		Palmolive Plus				
12/20/95		1	Palmolive Gel				
12/23/95		1	Palmolive Gel				
12/25/95	1		Palmolive Plus				
12/25/95		1	Palmolive Gel				
12/27/95					1	Ultra Gain Powder	
12/28/95		1	Palmolive Gel				
12/29/95	1		Palmolive Plus				
12/30/95					1	Ultra Gain Powder	
01/09/96	1		Palmolive Plus		1	Ultra Gain Powder	
01/09/96		1	Palmolive Gel				
01/14/96	1		Dawn Ultra				
01/17/96	1		Dawn Ultra				
01/18/96		1	Palmolive Gel				
Total Loads	58	57		98	158		
Average Loads Per Day*	0.21	0.20		0.35	0.56		

*Total Loads ÷ Total Days (281)

Dishwashing Detergent Log

FREDENHAGEN
1291 TANGERINE DR
JACKSONVILLE FL 32259-3155

Ex. {

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
4-5-95	✓	✓	2	Ivory Liquid
"	✓	✓	2	1-Cascade, 1 Palmolive Gel
4-12-95	✓		one ①	Joy + Dawn mixed
4-13-95		✓	one ①	Palmolive Gel
4-14-95	✓		one ①	Joy + Dawn Mixed
4-15-95	✓		one ①	Joy + Dawn "
4-18-95	✓	✓	one ①	Joy + Dawn "
"		✓	one ①	Palmolive Gel
4-22-95	✓		1	Joy + Dawn Mixed
4-22-95		✓	①	Palmolive Gel
4-27-95	✓	✓	1 each	Joy / Dawn, Palmolive Gel
4-30-95	✓		one	Joy / Dawn
5-2-95	✓		one	Palmolive Plus Antibacterial
5-3-95	✓		1	1
5-5-95	✓		1	1
5-7-95		✓	one	Palmolive Gel
5-11-95	✓		one	Palmolive Plus Antibacterial
5-11-95		✓	one	Palmolive Gel
5-16-95		✓	one	" "

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Frederickson
 1291 Tangerine Dr.
 Jacksonville, FL 32259-3155

Dishwashing Detergent Log

Frederickson
 1291 Tangerine Dr.
 Jacksonville, FL 32259-3155

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
5/17/95	✓		one	Palmolive Plus
5-20-95		✓	one	Palmolive Gel
5-24-95	✓		one	Palmolive Plus
" " "		✓	one	" Gel
5-28-95		✓	one	" "
" " "	✓		one	" Plus
6-1-95		✓	one	" Gel
6-2-95	✓		one	" Plus
6-4-95	✓		one	" "
6-8-95		✓	one	" Gel
6-3-95		✓	"	" "
6-8-95	✓	✓	one	Dawn - Lemon Scent
6-10-95	✓		one	" " "
6-10-95		✓	one	Palmolive Gel
6-14-95	✓		one	Dawn - L.S.
6-14-95	✓		one	Dial Antibacterial
6-17-95		✓	one	Palmolive Gel

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Dishwashing Detergent Log

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
11-29-95		✓	one	Palmolive Gel
11-30-95	✓		one	" Plus
12-2-95		✓	one	Palmolive Gel
12-4-95	✓		one	" Plus
12-5-95		✓	one	" Gel
12-9-95	✓	✓	one each	" Gel + Plus
12-12-95	✓	✓	" "	" " "
12-16-95		✓	one	" Gel
12-20-95	✓	✓	one each	" " + Plus
12-23-95		✓	one	" Gel
12-25-95	✓	✓	one each	" " + "
12-28-95		✓	one	" Gel
12-29-95	✓		one	" Plus
1-9-96	✓	✓	one each	Palmolive Gel, Dawn Ultra
1-14-96	✓		one	Dawn Ultra
1-17-96	✓		one	" "
1-18-96		✓	one	Palmolive Gel

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Laundry Detergent Log

FREDENHAGEN
 1291 TANGERINE DR
 JACKSONVILLE FL 32259-3155

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
4/5/95	✓	✓	1	X - Woolite
X	✓	✓	3	2 - Cheer, 1 - Tide Ultra
4-12-95	✓		1	Cheer lig.
4-13-95	✓		1	Gain lig.
4-15-95	✓	✓	1 ea.	Ivory (hand); Gain (machine)
4-16-95		✓	2	1 - Cheer; 1 Gain Ultra
4-17-95	✓			Cheer
4-19-95		✓	①	Ultra Gain
4-21-95		✓	1	Cheer
4-22-95		✓	1	Cheer
4-23-95		✓	1	Ultra Gain
4-25-95		✓	1	Cheer
"	✓		3	Cheer
4-26-95		✓	one	Cheer
"		✓	one (two)	Ultra Gain
4/29/95		✓	one	" "
4/28/95	✓		1	Cheer
4/30/95		✓	5	2 Cheer; 3 Gain
✓	✓		2	2 Cheer
5-3-95	✓		1	Cheer
5-5-95	✓		1	Cheer
5-5-95		✓	1	Ultra Gain
5-6-95		✓	3	2 Gain, 1 Cheer
5-7-95	✓		3	1 Tide, 1 Cheer, 1 Gain
5-7-95		✓	3	2 Gain, 1 Cheer
5-8-95	✓		1	Cheer
5-10-95	✓		5 1	Fab
5-10-95	✓		1	Fab
5-11-95		✓	1	Ultra Gain
5-13-95		✓	2	Ultra Gain

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Fredenhagen
1291 Tangerine Dr.
Jacksonville, FL 32259-3155

Laundry Detergent Log

Fredenhagen
1291 Tangerine Dr.
Jacksonville, FL 32259-3155

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
5-14-95		✓	3	2 Cheer, 1 Ultra Gain
✓	✓		3 3	Cheer
5-16-95	✓		1	Tide w/ Bleach
5-17-95		✓	one	Ultra Gain
5-19-95	✓		1	Ultra Gain
5-21-95	✓		4	3 Tide w/ Bleach, 1 Ultra Gain
5-21-95		✓	5	3 Cheer, 2 Ultra Gain
5-23-95	✓		4	2 Biz, 1 Fab, 1 Tide w/ Bleach
5-23-95		✓	2	2 Ultra Gain
5-24-95		✓	one	Ultra Gain
5-27-95		✓	4	3 Ultra Gain, 1 Cheer
5-28-95	✓		2	2 Cheer
5-29-95	✓		1	1 Ultra Gain
"		✓	4	4 Ultra Gain
5-30-95	✓		2	1 Tide w/ Bleach; 1 Cheer
"		✓	1	1 Ultra Gain
6-2-95		✓	one	Ultra Gain
6-4-95	✓		2	2 Ultra Gain
"		✓	3	2 Cheer, 1 Ultra Gain
6-5-95	✓		1	Cheer
"		✓	1	Ultra Gain
6-8-95		✓	one	" "
6-9-95	✓		1	Ultra Biz
6-10-95	✓		1	Fab
✓		✓	1	Cheer
6-14-95		✓	one	Ultra Gain Lig
6-13-95	✓		1	Fab
6-14-95	✓		1	Cheer
6-17-95	✓		2	1 Fab, 1 Biz
"		✓	2	1 Cheer, 1 Ultra Gain

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FROM: FREDENHAGEN
 1291 TANGERINE DR
 JACKSONVILLE, FL 32259

Laundry Detergent Log

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
6-18-95		✓	one	Ultra Gain Powder
"		✓	one one	Ultra Gain liq.
"	✓		2	1 Tide w/ Bleach; 1 Cheer liq.
6-19-95		✓	1	Ultra Gain pdr.
"	✓		3	2 Cheer; 1 Tide w/ Bleach
"	✓		1	Ultra Gain liq.
6-20-95	✓		1	" " "
6-24-95	✓		1	Bis Bleach
6-25-95	✓			1 Fab, 1 Tide w/ Bleach
"		✓	4	1 Cheer; 1 Ultra Gain pdr; 2 Ultra Gain liq.
6-26-95		✓	one	Ultra Gain Powder
7-1-95	✓		2	1 Tide w/ Bleach; 1 Cheer
"		✓	2	1 Ultra Gain pdr; 1 Cheer
7-2-95	✓		1	1 Tide w/ Bleach
"		✓	1	1 Ultra Gain pdr.
7-6-95		✓	one	" " "
7-9-95	✓		1	Ultra Gain pdr.
"		✓	1	" " "
7-11-95	✓		1	Cher
7-13-95		✓	1	Ultra Gain liq.
"	✓		1	Cher
7-15-95	✓		2	1 Tide w/ Bleach, 1 Gain pdr.
7-16-95	✓		1	Cher
"		✓	3 3	1 Gain pdr, 2 Cher.
7-18-95	✓		1	Ultra Gain Gain pdr.
"		✓	1	Cher
7-19-95		✓	one	Ultra Gain Powder

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Laundry Detergent Log

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
7-20-95	✓		1	Cheer lig.
7-22-95	✓		1	Cheer Fab lig.
"	✓	✓	2	Cheer / Cheer; 1 Gain
7-23-95	✓		3	1 Fab lig; 1 Biz; 1 Tide w/ bleach
"		✓	1	1 Ultra Gain
7-24-95	✓		1	Tide with Bleach
"		✓	1	Ultra Gain pdr.
7-25-95	✓		1	Cheer
"		✓	1	Ultra Gain powder
7-26-95		✓	1	Cheer
7-26-95		✓	two	Ultra Gain Lig
7-28-95	✓		1	Cheer
7-30-95		✓	1	Ultra Gain pdr.
7-31-95		✓	1	Cheer
8-2-95		✓	1	Cheer
8-3-95	✓		1	Fab
"		✓	3	2 Cheer; 1 Ultra Gain pdr.
8-6-95		✓	one	Ultra Gain Powder
8-19-95	✓		1	Fab
"		✓	2	1 Ultra Gain lig.; 1 Ultra Gain pdr.
8-20-95	✓	✓	3	1 Ultra Gain pdr.; 2 Cheer
8-23-95	✓	✓	2 one	2 Cheer " "

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Laundry Detergent Log

FREDENHAGEN
1291 TANGERINE DR

JACKSONVILLE/FRUIT COVE

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
8/29/95		✓	3 loads	1 Ultra Gain Powder; 2 Cheer
8/27/95	✓		3	1 Fab; 1 Tide w/ Bleach; 1 Cheer
8/30/95		✓	1	Ultra Gain powder
8/31/95	✓		1	Ultra Gain liq.
9/2/95		✓	1	Cheer
9/4/95	✓		2	2 Gain liq.
"		✓	3	1 Cheer; 1 Big Gain pdr; 1 Gain liq.
9-9-95		✓	1	Cheer liq.
9-10-95	✓		5	2 Cheer liq; 2 Big; 1 Tide w/ Bleach
✓		✓	3	2 Ultra Gain powder; 1 Cheer liq.
"		✓	one	Ultra Gain Powder
9-14-95	✓		1	Cheer liq.
9-16-95		✓	1	Ultra Gain powder
9-17-95		✓	5	3 Cheer liq, 1 Ultra Gain pdr, 1 ultra Gain liq
"	✓		4	2 Cheer liq, 2 Ultra Gain liq
9-24-95		✓	4	2 Cheer liq, 2 Ultra Gain pdr.
9-28-95		✓	1	Cheer liq
9-30-95	✓			Fab
"		✓	3	1 Cheer liq; 2 Ultra Gain pdr.
10-1-95		✓	3	2 Ultra Gain pdr., 1 Cheer liq.
"	✓		1	Big

Return to: Hal Vincent
Ayres Associates
3901 Coconut Palm Drive, Suite 100
Tampa, FL 33619 Tel (813) 628-0742

Laundry Detergent Log

FREDENHAGEN
1291 TANGERINE DR

FRUIT COVE FL
Brand(s) Used (by load)

Date	Hand Wash	Machine Wash	# of Loads	Brand(s) Used (by load)
10-7-95		✓	1	Cheer lig.
10-9-95	✓		1	Cheer lig, Biz
"		✓	2	2 2 Hairin pds
10-10-11-95		✓	1	Cheer lig.
10-14-95		✓	1	Cheer lig
10-15-95		✓	3	2 Hairin; 1 cheer lig
10-11-95		✓	one	Hair powder
10-19-95		✓	1	1 Cheer lig
"	✓		2	2 " "
10-21-95	✓		2	2 " "
"		✓	1	1 " "
10-22-95	✓			2 Fab, 1 Tide w/Bleach, 1 Biz
"		✓		
10-25-95		✓	one	Hair Powder
11-1-95		✓	one	" "
11-8-95		✓	one	" "
11-8-95		✓	one	Cheer Lig
11-22-95		✓	one	Hair Powder
11-26-95		✓	one	" "

Return to: Hal Vincent
Ayres Associates
3901 Coconut Palm Drive, Suite 100
Tampa, FL 33619 Tel (813) 628-0742

C3: Detergent Purchase Records

SDA Florida OWTS Project

Table C-2 Homeowner Detergent Purchases

Date Purchased	Product Description	Price	Store
4/15/95	ULTRA DETG X 003700090790	4.08 J	WalMart
4/15/95	LIQ DETG RFL 003700097807	4.17 J	WalMart
5/07/95	PALMOLIVE DISH DET	1.99 N	Food Lion
5/10/95	06 038150 GAIN 1T	5.00	Target
5/14/95	DIAL DISH DETG	1.29 N	Food Lion
6/04/95	DAWN LEM DISH DETG	1.99 N	Food Lion
6/13/95	757872 ULT CHEER 5 1T	2.49	Eckerd
6/25/95	PALMOLIVE DISH DET	2.19 N	Food Lion
7/01/95	GAIN ULTRA 2 PWDR	4.99 T	Publix
7/02/95	757872 ULT CHEER 5 1T	3.59	Eckerd
7/15/95	ULTRA DETG 003700090790	3.25 J	WalMart
7/15/95	PALMOLIVE DISH DET	2.19 N	Food Lion
7/19/95	DIAL DISH DETG	1.29 N	Food Lion
7/30/95	TIDE DETG W/ BLEACH	2.99 N	Food Lion
8/02/95	PALMOLIVE DISH DET	2.19 N	Food Lion
8/02/95	PALMOLIVE LEM AUTO	1.99 N	Food Lion

WALMART

WE SELL
FOR LESS
#1082 MANDARIN, FL (904)260-4403

ST# 1082 OF# 00000029 TE# 04 TR# 01813
~~00000000000000000000~~
~~00000000000000000000~~
SUBTOTAL 8.25
SALES TAX 1 0.54
TOTAL 8.79
VENDOR COUPON 0.50
SUBTOTAL 7.75
SALES TAX 1 0.54
TOTAL 8.29
CASH TEND 10.29
CHANGE DUE 2.00

TC# 993279626650233
THANK YOU FOR SHOPPING WAL-MART
04/15/95 10:06:27

FOOD LION #553 STORE PHONE 287-1921
CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
CINDY, CASHIER

LIFE CINNAMON 2.85 B
PALMOLIVE BISH DET 1.99 N
STOUF H/S VEAL PAR 2.09 R
1 @ 2/5.00
TYSON S/F BREAST F 2.50 R
ON FUN PAK TKY/AME 1.59 M
MC SCANNED COUPON 1.00-
MC SCANNED COUPON .75-
ADF TOTAL .02
**** TAX .80 BAL 44.09
WF CHECK 44.09
CHANGE .00
COUPONS TENDERED 7.55
TOTAL ITEMS PURCHASED 27
5/07/95 09:38 0553 06 0070 29
SAVE UP TO 20% ON SELECTED ITEMS
REGISTER NOW FOR W.V.P. PROGRAM

FOOD LION #553 STORE PHONE 287-1921
CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
DEANA, CASHIER

12PK ON BUD LT 5.89 B
CHARMIN DBL WHITE 2.19 M
ON FAT/FREE TH O/R 1.59 M
DIAL BISH DETG 1.29 N
ADF .02
POT CHIP PRINGL RI 2.49 B
2.71 LB @ .59 /LB
W7 POTATOES/RUSSETS L 1.60 F
SMALL BAG OF ICE L .89 B
FL GAL SKIN PLAS.4 2.39 B
ADF .01
AGH ROLLON UNSC A/ 1.99 R
NR DIET PEPSI .99 B
NR DIET PEPSI .99 B
ON FUN PAK TKY/AME 2.09 M
ON FUN PAK HAM/AME 2.09 M
PILL BRAND R/F BTK 1.29 R
MC SCANNED COUPON .25-
MC SCANNED COUPON .10-
MC SCANNED COUPON .30-
MC SCANNED COUPON .40-
MC SCANNED COUPON .35-
ADF TOTAL .04
**** TAX .92 BAL 28.73
CASH .00
WF CHECK 28.73
CHANGE .00

COUPONS TENDERED 1.40
TOTAL ITEMS PURCHASED 14
3/14/95 09:05 0553 06 0043 26
SAVE UP TO 20% ON SELECTED ITEMS
REGISTER NOW FOR W.V.P. PROGRAM

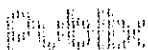
6/04/95 08:42 0553 06 0002 09
 FOOD LION #553 STORE PHONE 287-1921
 CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
 BELI DEPT, CASHIER

FRUITY PEBBLES	3.09	G
FROST FLAKE KELOG	2.89	G
HONEY COMB POST	2.39	G
HARDISGRAS 2PLY P T	.69	N
SPARKLE BIG ROLL P	.99	N
DRAWNY BES P TOWEL	.59	N
BREAST TENDERS #6	1.53	H
BREAST TENDERS #6	1.43	H
MEAT	1.41	H
MEAT	1.41	H
DAWN LEM-DISH-DETO	1.99	N
MC SCANNED COUPON	.25-	
MC SCANNED COUPON	.25-	
MC SCANNED COUPON	.40-	
MC SCANNED COUPON	.35-	
MC SCANNED COUPON	.50-	
MC SCANNED COUPON	1.00-	
MC SCANNED COUPON	.25-	
MC SCANNED COUPON	.15-	
MC SCANNED COUPON	.20-	
MC SCANNED COUPON	.70-	
ADF TOTAL	.02	
**** TAX	1.12	DAL 48.67
VF CHECK		48.67
CHANGE		.00

COUPONS TENDERED 5.75
 TOTAL ITEMS PURCHASED 34

6/04/95 08:46 0553 06 0002 09
 SAVE UP TO 20% ON SELECTED ITEMS
 REGISTER NOW FOR M.V.P. PROGRAM



WALMART STORE #0275
 ** MORE SHOPPING IS A PLEASURE **

FRUITY PEBBLES	3.09	G
FROST FLAKE KELOG	2.89	G
HONEY COMB POST	2.39	G
HARDISGRAS 2PLY P T	.69	N
SPARKLE BIG ROLL P	.99	N
DRAWNY BES P TOWEL	.59	N
BREAST TENDERS #6	1.53	H
BREAST TENDERS #6	1.43	H
MEAT	1.41	H
MEAT	1.41	H
DAWN LEM-DISH-DETO	1.99	N
MC SCANNED COUPON	.25-	
MC SCANNED COUPON	.25-	
MC SCANNED COUPON	.40-	
MC SCANNED COUPON	.35-	
MC SCANNED COUPON	.50-	
MC SCANNED COUPON	1.00-	
MC SCANNED COUPON	.25-	
MC SCANNED COUPON	.15-	
MC SCANNED COUPON	.20-	
MC SCANNED COUPON	.70-	
ADF TOTAL	.02	
**** TAX	1.12	DAL 48.67
VF CHECK		48.67
CHANGE		.00

WALMART STORE #0275
 ** MORE SHOPPING IS A PLEASURE **

WALMART

WE SELL
 FOR LESS
 #1082 MANDARIN, FL (904)260-4403

ST# 1082 DP# 00000520 TE# 02 TR# 04678	
ULTRA DETG 003700090790	3.25 J
DECO TUM 20 007165716606	0.75 A
REDFATCHZBLL 002900007148 F	0.97 D
10-30 OIL X 007413012912	13.08 J
FL ADF 007874248523	0.24 J
SUBTOTAL	18.29
VENDOR COUPON	0.50-H
SUBTOTAL	17.79
SALES TAX 1	1.13
TOTAL	18.92
DISCV TEND	18.92

ACCOUNT APPROVAL
 TRANS ID - 0025197067490035
 VALIDATION - B24F
 PAYMENT SERVICE - E
 CHANGE DUE 0.00

TC# 024061083346647
 THANK YOU
 FOR SHOPPING WITH US
 07/15/95 21:31:28

CUSTOMER COPY

**ECKERD DRUG
 STORE #0275**

** ECKERD DRUG STORE #0275 **
 ** 10601 SAN JOSE BLVD JAX, FL **

ASSOC #6886 REG #002 DRAWER #1
 TRANS #8326 TYPE 10 STORE #0275

763904 *JHIRMACK N/ IT 1.99 SALE
 #57872 -ULT-CHEER 5-IT 1.59
 N 757872 ULT CHEER 5 IT .00

*TAXABLE ADF FEE .02

FL 6.5% TAX	.37
TOTAL	5.97
MFG COUP	.50
CASH	5.47
CHANGE	.00

JULY 2, 1995 4:02 PM

FOOD LION #553 STORE PHONE 287-1921
CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
JOYCE, CASHIER

APPLEJACK	3.35 G
1 B 3/5.00	
FROST FLAKES KELOG	1.67 G
1 B 3/5.00	
FROST FLAKES KELOG	1.67 G
1 B 3/4.00	
HORN GRILL CHIC SA	1.34 R
1 B 3/4.00	
HORN GRILL CHIC SA	1.33
TURK CHILI W/BEAN	1.13 B
*PALMOLIVE BISH DET	2.19
MC SCANNED COUPON	.25-
MC SCANNED COUPON	.25-
MC SCANNED COUPON	1.00-
MC GROCERY	.25-6
MVP DISCOUNT	-.83
DISCOUNT OF 20% ON MVP ITEMS	
**** TAX .81 BAL	55.52
MF CHECK	55.52
CF CHANGE	.00

COUPONS TENDERED 7.10

TOTAL ITEMS PURCHASED 40

7/15/95 15:02 0553 03 0121 19

SAVE UP TO 20% ON SELECTED ITEMS
REGISTER NOW FOR M.V.P. PROGRAM

W/BEAN CHIC SA 1.33
TAX W/BEAN 1.13

FOOD LION #553 STORE PHONE 287-1921
CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
KENNY, CASHIER

TIDE DETG W/BLEACH	2.99
MC SCANNED COUPON	.50-
**** TAX .18 BAL	2.67
CASH	5.00
CHANGE	2.33

TOTAL ITEMS PURCHASED 1

7/30/95 11:18 0553 05 0075 31

THANK YOU FOR SHOPPING FOOD LION!
SAVE UP TO 20% ON SELECTED ITEMS
JOIN OUR MVP PROGRAM TODAY!

FOOD LION #553 STORE PHONE 287-1921
CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
BRYON, CASHIER

SOFT DR. W/ F TO	1.34 M
LETTUCE W/ WOODR	1.34 R
W/ WOODR	
W/ WOODR	
W/ WOODR	
PALMOLIVE BISH DET	2.19
PALMOLIVE LEM AUTO	1.99

YOU ARE A VALUED MVP CUSTOMER
YOU MAY BECOME ELIGIBLE TO
WIN A FREE CRUISE

FOOD LION #553 STORE PHONE 287-1921
CUSTOMER SERVICE 1-800-210-9569

THANK YOU FOR LETTING ME SERVE YOU!
LORRAINE, CASHIER

DIAL BISH DETG	1.29
ADF	.02
PZ. POCK. PEPPERON	1.89 R
SWIFT BF. SIZZLEAN	1.89 M
HEAT	3.36 M
HEAT	3.36 M
MC PERISHABLE	1.00-R
MC SCANNED COUPON	1.00-
MC SCANNED COUPON	1.00-
MC GROCERY	.40-6
MC SCANNED COUPON	.75-
MC SCANNED COUPON	.40-
MC SCANNED COUPON	.30-
MC SCANNED COUPON	.20-
MC SCANNED COUPON	.20-
MC NON FOOD	.30-M
MC SCANNED COUPON	.30-
MC SCANNED COUPON	.10-
MC SCANNED COUPON	1.00-
MC SCANNED COUPON	1.00-
ADF TOTAL	.22

MVP DISCOUNT - 1.47

DISCOUNT OF 20% ON MVP ITEMS

**** TAX 1.65 BAL	43.76
MF CHECK	43.76
CHANGE	.00

COUPONS TENDERED 7.55

TOTAL ITEMS PURCHASED 29

7/19/95 14:44 0553 06 0173 21

SAVE UP TO 20% ON SELECTED ITEMS
REGISTER NOW FOR M.V.P. PROGRAM

D1: Rainfall and Temperature Data

SDA Florida OWTS Project
 Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
3/14/95	85.2	61.7	0.01		
3/15/95	87.3	60.1	0		
3/16/95	91.1	60.1	0.2		
3/17/95	78.1	61.9	1.27		
3/18/95	81.4	59.4	0.28		
3/19/95	83.4	57.3	0.68		
3/20/95	88.1	55.0	0		
3/21/95	88.4	57.4	0		
3/22/95	90.7	62.3	0		
3/23/95	94.0	68.6	0		
3/24/95	90.3	61.2	0		
3/25/95	89.4	58.8	0		
3/26/95	89.2	53.5	0		
3/27/95	89.6	56.7	0		
3/28/95	88.9	64.9	0		
3/29/95	86.4	61.7	0.03		
3/30/95	90.8	62.3	0		
3/31/95	67.0	58.9	1.4		
4/1/95	80.1	56.0	0.32		
4/2/95	81.3	52.6	0		
4/3/95	84.6	49.7	0		
4/4/95	88.7	53.5	0		
4/5/95	73.4	62.8	0.35		
4/6/95	70.3	62.1	2.55		
4/7/95	85.6	57.4	0		
4/8/95	87.2	56.0	0		
4/9/95	93.7	59.6	0		
4/10/95	96.0	59.2	0		
4/11/95	91.0	65.5	0		
4/12/95	79.3	66.9	0.05		
4/13/95	90.3	65.0	0		
4/14/95	84.7	57.4	0		
4/15/95	89.6	53.8	0		
4/16/95	92.7	57.8	0		
4/17/95	96.1	60.9	0		
4/18/95	96.7	62.5	0		
4/19/95	98.1	64.7	0		
4/20/95	99.4	70.1	0		
4/21/95	97.8	69.9	0		
4/22/95	102.8	66.6	0		
4/23/95	96.6	69.6	0		
4/24/95	84.0	62.9	1.85		
4/25/95	78.1	53.9	0		

SDA Florida OWTS Project

Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
4/26/95	82.3	56.2	0		
4/27/95	91.8	65.7	0		
4/28/95	92.9	66.5	0		
4/29/95	95.6	62.0	0		
4/30/95	94.7	64.0	0		5.12
5/1/95	98.9	66.0	0		
5/2/95	95.6	71.0	0.02		
5/3/95	92.4	63.9	0		
5/4/95	93.3	65.7	0		
5/5/95	98.7	69.7	0		
5/6/95	94.5	69.2	0		
5/7/95	99.0	64.4	0		
5/8/95	96.4	62.1	0		
5/9/95	95.4	67.2	0		
5/10/95	93.1	73.0	0		
5/11/95	88.1	70.9	1.1		
5/12/95	95.3	68.9	0.62		
5/13/95	97.9	68.8	0.01		
5/14/95	102.0	73.1	0		
5/15/95	100.5	75.0	0		
5/16/95	100.5	72.2	0		
5/17/95	102.4	71.3	0		
5/18/95	100.5	74.2	0		
5/19/95	93.7	77.0	0.11		
5/20/95	93.2	72.5	0.04		
5/21/95	95.7	71.3	0		
5/22/95	92.0	67.7	0		
5/23/95	91.1	72.1	0.12		
5/24/95	95.3	67.5	0		
5/25/95	97.4	68.5	0		
5/26/95	99.7	67.5	0		
5/27/95	97.1	68.0	0		
5/28/95	96.9	70.1	0		
5/29/95	101.5	71.2	0		
5/30/95	101.1	75.0	0.42		
5/31/95	101.9	73.1	0		2.44
6/1/95	101.6	75.3	0		
6/2/95	90.6	73.1	0.62		
6/3/95	95.3	73.4	0.25		
6/4/95	87.0	74.6	1.82		
6/5/95	89.5	74.9	0.34		
6/6/95	98.2	74.5	0		
6/7/95	99.2	77.0	0		

SDA Florida OWTS Project
Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
6/8/95	102.1	77.1	0		
6/9/95	104.8	77.9	0		
6/10/95	102.6	76.6	0		
6/11/95	102.5	75.1	0		
6/12/95	95.7	77.3	0.05		
6/13/95	95.4	69.8	0.08		
6/14/95	96.5	67.3	0		
6/15/95	97.9	64.9	0		
6/16/95	87.0	72.0	0.09		
6/17/95	91.9	68.0	0.77		
6/18/95	90.1	69.9	0.03		
6/19/95	94.4	69.0	0.12		
6/20/95	97.9	66.8	0.12		
6/21/95	94.4	73.5	0		
6/22/95	93.5	73.8	0		
6/23/95	98.9	73.9	0		
6/24/95	99.2	75.4	0		
6/25/95	81.0	75.4	0.49		
6/26/95	94.9	72.6	0.05		
6/27/95	99.5	74.3	0		
6/28/95	104.0	74.3	1.27		
6/29/95	102.3	71.8	0.28		
6/30/95	98.6	72.3	0.35		6.73
7/1/95	101.7	73.7	0	0.00	
7/2/95	98.8	76.7	0	0.00	
7/3/95	99.0	76.9	0	0.00	
7/4/95	104.1	76.4	0	T	
7/5/95	106.7	77.3	0.05	0.00	
7/7/95	105.7	76.4	0	0.21	
7/8/95	106.1	75.8	0	0.00	
7/9/95	103.6	76.6	0	0.00	
7/10/95	103.6	77.0	0	0.00	
7/11/95	104.7	75.3	0.4	0.08	
7/12/95	101.5	75.5	0	0.00	
7/13/95	103.5	76.2	0.01	T	
7/14/95	102.1	74.4	0.03	0.00	
7/15/95	102.1	76.1	0.13	0.12	
7/16/95	102.4	74.9	ND	0.41	
7/17/95	89.1	73.6	ND	0.50	
7/18/95	96.3	73.0	ND	0.00	
7/19/95	100.2	74.8	ND	0.00	
7/20/95	104.7	75.8	ND	0.00	
7/21/95	103.5	78.3	ND	1.20	

SDA Florida OWTS Project

Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
7/22/95	97.4	80.0	ND	0.07	
7/23/95	103.8	78.8	ND	0.00	
7/24/95	104.6	78.7	ND	0.43	
7/25/95	102.3	75.9	ND	0.53	
7/26/95	99.7	75.9	ND	0.00	
7/27/95	100.2	74.3	ND	0.17	
7/28/95	99.8	72.5	ND	0.10	
7/29/95	93.4	73.7	ND	0.52	
7/30/95	100.5	74.9	ND	0.00	
7/31/95	103.2	75.5	ND	0.03	4.37
8/1/95	101.9	75.7	ND	0.39	
8/2/95	90.1	74.0	ND	0.94	
8/3/95	90.2	76.5	ND	0.44	
8/4/95	101.5	74.6	ND	0.00	
8/5/95	102.1	75.2	ND	0.00	
8/6/95	104.0	77.1	ND	0.00	
8/7/95	106.0	75.8	ND	0.00	
8/8/95	107.6	78.4	ND	0.33	
8/9/95	97.0	76.2	ND	0.00	
8/10/95	94.4	76.4	ND	1.14	
8/11/95	106.1	75.6	ND	0.00	
8/12/95	105.9	75.9	ND	0.00	
8/13/95	104.0	74.7	ND	0.00	
8/14/95	113.9	78.6	ND	0.00	
8/15/95	105.8	80.6	ND	0.00	
8/16/95	103.0	78.5	ND	0.00	
8/17/95	107.1	76.9	ND	0.00	
8/18/95	107.9	77.3	ND	0.00	
8/19/95	95.2	74.0	ND	0.49	
8/20/95	84.0	74.8	ND	0.20	
8/21/95	95.8	74.5	ND	T	
8/22/95	97.6	76.3	ND	0.02	
8/23/95	97.3	76.1	ND	0.28	
8/24/95	83.8	76.1	ND	5.64	
8/25/95	81.6	76.0	ND	0.81	
8/26/95	96.6	78.1	ND	0.07	
8/27/95	99.7	78.2	ND	0.70	
8/28/95	101.2	79.9	ND	T	
8/29/95	88.2	76.7	ND	0.28	
8/30/95	98.2	77.1	ND	0.00	
8/31/95	96.3	77.1	ND	0.00	11.73
9/1/95	89.7	76.7	ND	0.00	
9/2/95	101.3	75.6	ND	0.00	

SDA Florida OWTS Project
Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
9/3/95	100.3	74.3	ND	0.00	
9/4/95	95.7	74.0	ND	0.00	
9/5/95	79.3	70.6	ND	1.03	
9/6/95	95.4	71.1	ND	0.18	
9/7/95	99.5	73.0	ND	1.71	
9/8/95	91.6	72.6	ND	T	
9/9/95	101.4	73.5	ND	T	
9/10/95	97.6	70.6	ND	0.00	
9/11/95	95.1	71.5	ND	0.00	
9/12/95	95.1	73.2	ND	0.02	
9/13/95	102.6	74.5	ND	0.21	
9/14/95	103.2	74.3	ND	2.21	
9/15/95	97.3	73.9	ND	0.02	
9/16/95	99.1	75.1	ND	0.00	
9/17/95	99.6	75.8	ND	0.00	
9/18/95	103.0	77.1	ND	0.00	
9/19/95	99.2	74.6	ND	0.00	
9/20/95	95.9	71.3	ND	0.00	
9/21/95	103.1	73.0	ND	0.00	
9/22/95	99.8	74.8	ND	0.00	
9/23/95	97.4	74.7	ND	1.61	
9/24/95	79.4	67.5	ND	T	
9/25/95	92.4	67.5	ND	T	
9/26/95	92.2	74.3	ND	0.01	
9/27/95	97.5	73.2	ND	1.31	
9/28/95	91.0	73.2	ND	0.31	
9/29/95	94.1	74.2	ND	0.69	
9/30/95	88.9	74.1	ND	0.31	9.62
10/1/95	97.4	74.0	ND	0.12	
10/2/95	98.3	70.1	ND	0.00	
10/3/95	98.9	72.2	ND	0.07	
10/4/95	96.9	76.8	0.01	0.01	
10/5/95	96.7	76.6	0.34	0.70	
10/6/95	88.5	75.6	0.33	0.53	
10/7/95	95.1	74.0	0	0.01	
10/8/95	92.1	73.3	0.36	0.00	
10/9/95	85.8	74.4	2.07	1.85	
10/10/95	79.0	74.3	1.81	1.58	
10/11/95	81.8	73.9	0.03	0.03	
10/12/95	89.6	71.8	0	0.00	
10/13/95	97.8	72.1	0	0.00	
10/14/95	94.5	73.9	0.61	1.26	
10/15/95	84.2	62.5	0.67	0.52	

SDA Florida OWTS Project
Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
10/16/95	86.3	59.8	0	0.00	
10/17/95	88.7	63.7	0	0.00	
10/18/95	85.3	68.8	0.01	0.00	
10/19/95	92.6	72.6	0.01	0.00	
10/20/95	82.7	71.7	0	0.00	
10/21/95	83.6	56.3	0	0.00	
10/22/95	88.2	53.0	0	0.00	
10/23/95	92.7	62.4	0	0.00	
10/24/95	90.9	66.7	0	0.00	
10/25/95	92.9	66.6	0	0.00	
10/26/95	96.2	67.1	0	0.00	
10/27/95	95.2	68.3	0	0.00	
10/28/95	95.1	67.8	0	0.00	
10/29/95	85.2	55.7	0	0.00	
10/30/95	85.9	57.8	0	0.00	
10/31/95	91.6	67.6	0	0.00	6.68
11/1/95	88.7	70.8	0.59	0.11	
11/2/95	93.7	70.3	0.07	0.00	
11/3/95	90.0	70.6	0.13	T	
11/4/95	81.5	59.5	0	0.00	
11/5/95	84.9	56.3	0	T	
11/6/95	82.6	57.6	0	T	
11/7/95	87.7	63.0	0.76	0.51	
11/8/95	78.9	54.6	0.76	0.00	
11/9/95	75.8	46.5	0	0.00	
11/10/95	83.6	52.3	0	T	
11/11/95	87.1	55.7	0.41	0.59	
11/12/95	68.3	43.1	0	0.00	
11/13/95	80.3	45.5	0	0.00	
11/14/95	74.9	52.0	0	0.00	
11/15/95	67.3	41.4	0	0.00	
11/16/95	74.0	41.8	0	0.00	
11/17/95	79.5	50.2	0	0.00	
11/18/95	75.0	48.1	0	0.00	
11/19/95	83.3	50.4	0	0.00	
11/20/95	68.7	51.8	0	T	
11/21/95	83.1	57.3	0	0.00	
11/22/95	73.9	45.2	0	0.00	
11/23/95	78.0	40.3	0	0.00	
11/24/95	80.3	48.1	0.03	0.02	
11/25/95	61.8	52.8	0.02	T	
11/26/95	72.2	45.0	0	0.00	
11/27/95	82.9	46.9	0	0.00	

SDA Florida OWTS Project
Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
11/28/95	83.1	54.9	0	0.00	
11/29/95	72.5	60.8	0.12	0.45	
11/30/95	74.3	51.7	0	0.00	2.89
12/1/95	81.5	50.7	0	0.00	
12/2/95	81.4	51.6	0	0.00	
12/3/95	85.0	57.5	0	0.00	
12/4/95	84.5	55.0	0	0.00	
12/5/95	86.3	57.9	0	0.00	
12/6/95	84.1	56.8	0.07	0.15	
12/7/95	81.6	57.0	0	0.01	
12/8/95	68.1	56.6	0	0.00	
12/9/95	71.1	53.9	0.07	0.05	
12/10/95	61.2	39.5	0.07	T	
12/11/95	61.2	35.0	0	0.00	
12/12/95	73.8	37.3	0	0.00	
12/13/95	80.2	43.9	0	0.00	
12/14/95	84.8	58.8	0	0.00	
12/15/95	87.7	56.6	0	0.00	
12/16/95	87.9	57.2	0	0.00	
12/17/95	77.4	59.5	0.23	0.53	
12/18/95	81.6	64.2	0.04	0.03	
12/19/95	71.9	60.9	0.68	0.93	
12/20/95	63.2	46.2	0	0.00	
12/21/95	58.7	40.3	0	0.00	
12/22/95	53.9	43.7	0.05	0.01	
12/23/95	62.1	39.6	0.02	0.01	
12/24/95	56.4	34.8	0	0.00	
12/25/95	58.3	34.5	0	0.00	
12/26/95	61.2	39.4	0	0.00	
12/27/95	65.2	37.3	0	0.00	
12/28/95	57.5	41.0	0	0.00	
12/29/95	65.0	41.4	0	0.00	
12/30/95	63.3	49.2	0.01	0.02	
12/31/95	66.2	57.6	0.24	0.00	1.48
1/1/96	68.0	63.9	0.86		
1/2/96	77.0	64.1	0.8		
1/3/96	68.3	45.6	0.01		
1/4/96	62.0	39.4	0		
1/5/96	69.8	38.6	0		
1/6/96	76.9	40.5	0		
1/7/96	62.4	34.9	0.06		
1/8/96	50.4	30.2	0		
1/9/96	60.3	31.0	0		

SDA Florida OWTS Project
Table D-1 Rainfall and Temperature Data

Date	Hi Temp °F	Lo Temp °F	Rain (in)	Rain (in)*	Monthly Total Rainfall (in)**
1/10/96	72.2	42.6	0		
1/11/96	70.9	36.5	0		
1/12/96	65.4	46.3	0.01		
1/13/96	67.5	40.0	0		
1/14/96	77.4	40.7	0		
*Rainfall data from Jacksonville Naval Air Station, approx. 9 miles from OWTS site.					
**Monthly Total Rainfall for July through October is from Jacksonville NAS.					

SDA Florida OWTS Project

Table D-2 Temperature and Precipitation Data: Mandarin Middle School

MANDARIN MIDDLE SCHOOL WEATER STATION - MANDARIN, FLORIDA				
Date	Weekday	Precipitation (inches)	Temperature (degrees Fahrenheit)	
		Daily Total	Maximum	Minimum
5/1/94	Sunday	0.19	91	65
5/2/94	Monday			
5/3/94	Tuesday	1.16	87	68
5/4/94	Wednesday	0.11	88	66
5/5/94	Thursday	0.00	84	57
5/6/94	Friday	0.00	88	56
5/7/94	Saturday	0.00	91	59
5/8/94	Sunday	0.00	89	63
5/9/94	Monday	0.00	91	60
5/10/94	Tuesday	0.00	86	66
5/11/94	Wednesday	0.00	87	65
5/12/94	Thursday	0.00	94	65
5/13/94	Friday	0.00	91	72
5/14/94	Saturday	0.00	90	71
5/15/94	Sunday	0.00	97	69
5/16/94	Monday	0.00	96	70
5/17/94	Tuesday	0.00	91	67
5/18/94	Wednesday	0.00	87	61
5/19/94	Thursday	1.19	73	62
5/20/94	Friday	0.00	73	59
5/21/94	Saturday	0.00	74	56
5/22/94	Sunday	0.00	84	55
5/23/94	Monday			
5/24/94	Tuesday	0.00	96	62
5/25/94	Wednesday	0.00	94	64
5/26/94	Thursday	0.00	93	64
5/27/94	Friday	0.00	92	71
5/28/94	Saturday	0.01	90	70
5/29/94	Sunday	0.19	82	68
5/30/94	Monday	0.80	85	69
5/31/94	Tuesday	0.07	93	68
6/1/94	Wednesday	0.16	96	71
6/2/94	Thursday	0.01	95	70
6/3/94	Friday	0.14	96	73
6/4/94	Saturday	0.05	96	71
6/5/94	Sunday	0.14	94	69
6/6/94	Monday	0.42	93	71
6/7/94	Tuesday	0.79	84	71
6/8/94	Wednesday	0.68	90	74
6/9/94	Thursday	1.36	96	71
6/10/94	Friday	0.66	95	70
6/11/94	Saturday	0.97	98	69
6/12/94	Sunday	0.02	98	68

SDA Florida OWTS Project

Table D-2 Temperature and Precipitation Data: Mandarin Middle School

MANDARIN MIDDLE SCHOOL WEATER STATION - MANDARIN, FLORIDA				
Date	Weekday	Precipitation (inches)	Temperature (degrees Fahrenheit)	
		Daily Total	Maximum	Minimum
6/13/94	Monday	0.54	98	70
6/14/94	Tuesday	0.17	99	73
6/15/94	Wednesday	0.00	97	71
6/16/94	Thursday	1.84	93	70
6/17/94	Friday	0.09	87	71
6/18/94	Saturday	0.00	88	69
6/19/94	Sunday	0.01	91	71
6/20/94	Monday	0.00	93	72
6/21/94	Tuesday	0.14	98	72
6/22/94	Wednesday	0.00	97	76
6/23/94	Thursday	0.75	91	73
6/24/94	Friday	0.06	94	73
6/25/94	Saturday	0.04	93	74
6/26/94	Sunday	0.79	95	66
6/27/94	Monday	0.00	96	75
6/28/94	Tuesday	0.00	97	75
6/29/94	Wednesday	0.00	98	73
6/30/94	Thursday	1.13	94	71
7/1/94	Friday	0.00	95	70
7/2/94	Saturday	0.73	94	70
7/3/94	Sunday	1.24	93	70
7/4/94	Monday	0.22	90	71
7/5/94	Tuesday	0.99	96	72
7/6/94	Wednesday	3.10	96	69
7/7/94	Thursday	0.08	93	69
7/8/94	Friday	0.03	94	73
7/9/94	Saturday	0.00	96	73
7/10/94	Sunday	0.00	100	74
7/11/94	Monday	0.00	99	72
7/12/94	Tuesday	0.01	98	71
7/13/94	Wednesday	0.98	98	69
7/14/94	Thursday	0.00	99	72
7/15/94	Friday	0.00	100	74
7/16/94	Saturday	0.00	100	74
7/17/94	Sunday	0.00	100	76
7/18/94	Monday	0.00	101	74
7/19/94	Tuesday	0.00	99	75
7/20/94	Wednesday	0.03	92	74
7/21/94	Thursday	0.00	95	72
7/22/94	Friday	1.60	96	70
7/23/94	Saturday	0.12	96	71
7/24/94	Sunday	0.12	92	73
7/25/94	Monday	0.00	95	74

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Table D-2 Temperature and Precipitation Data: Mandarin Middle School

MANDARIN MIDDLE SCHOOL WEATER STATION - MANDARIN, FLORIDA				
Date	Weekday	Precipitation (inches)	Temperature (degrees Fahrenheit)	
		Daily Total	Maximum	Minimum
7/26/94	Tuesday	0.52	88	73
7/27/94	Wednesday	0.06	94	74
7/28/94	Thursday	0.18	91	72
7/29/94	Friday	0.78	92	70
7/30/94	Saturday	0.22	95	70
7/31/94	Sunday	0.15	95	70
8/1/94	Monday	0.00	97	71
8/2/94	Tuesday	0.00	97	74
8/3/94	Wednesday	0.00	94	73
8/4/94	Thursday	0.00	94	74
8/5/94	Friday	0.92	99	70
8/6/94	Saturday	0.74	98	70
8/7/94	Sunday	0.71	92	72
8/8/94	Monday	0.51	85	72
8/9/94	Tuesday	0.00	87	72
8/10/94	Wednesday	0.01	90	73
8/11/94	Thursday	0.01	91	73
8/12/94	Friday	0.92	89	72
8/13/94	Saturday	0.00	92	74
8/14/94	Sunday	0.13	94	73
8/15/94	Monday	0.26	93	70
8/16/94	Tuesday	0.55	83	70
8/17/94	Wednesday	0.75	91	74
8/18/94	Thursday	0.00	95	74
8/19/94	Friday	0.03	99	72
8/20/94	Saturday	0.00	98	70
8/21/94	Sunday	0.00	96	74
8/22/94	Monday	0.55	89	75
8/23/94	Tuesday	0.25	93	72
8/24/94	Wednesday	0.04	89	74
8/25/94	Thursday	0.00	87	74
8/26/94	Friday	0.00	88	73
8/27/94	Saturday	0.00	92	70
8/28/94	Sunday	0.00	93	68
8/29/94	Monday	0.00	99	69
8/30/94	Tuesday	0.00	99	70
8/31/94	Wednesday	0.00	98	70
9/1/94	Thursday	0.00	99	73
9/2/94	Friday	0.15	98	74
9/3/94	Saturday	0.00	91	75
9/4/94	Sunday	0.00	79	68
9/5/94	Monday	0.00	85	65
9/6/94	Tuesday			

SDA Florida OWTS Project

Table D-2 Temperature and Precipitation Data: Mandarin Middle School

MANDARIN MIDDLE SCHOOL WEATER STATION - MANDARIN, FLORIDA				
Date	Weekday	Precipitation (inches)	Temperature (degrees Fahrenheit)	
		Daily Total	Maximum	Minimum
9/7/94	Wednesday			
9/8/94	Thursday			
9/9/94	Friday			
9/10/94	Saturday			
9/11/94	Sunday			
9/12/94	Monday			
9/13/94	Tuesday			
9/14/94	Wednesday			
9/15/94	Thursday			
9/16/94	Friday	1.44	90	72
9/17/94	Saturday	0.00	91	70
9/18/94	Sunday	0.14	90	73
9/19/94	Monday	0.06	84	73
9/20/94	Tuesday	3.53	81	66
9/21/94	Wednesday	0.01	82	69
9/22/94	Thursday	0.00	84	62
9/23/94	Friday	0.62	89	62
9/24/94	Saturday	1.18	92	72
9/25/94	Sunday	0.90	83	69
9/26/94	Monday	0.01	89	69
9/27/94	Tuesday	0.00	89	67
9/28/94	Wednesday	0.00	92	67
9/29/94	Thursday	0.00	96	67
9/30/94	Friday	0.00	89	65
10/1/94	Saturday	0.01	86	69
10/2/94	Sunday	1.92	81	72
10/3/94	Monday	1.21	94	72
10/4/94	Tuesday	0.76	72	64
10/5/94	Wednesday	0.00	81	61
10/6/94	Thursday	0.00	81	63
10/7/94	Friday	0.28	85	70
10/8/94	Saturday	0.13	86	68
10/9/94	Sunday	0.00	92	65
10/10/94	Monday	2.07	88	68
10/11/94	Tuesday	2.14	73	69
10/12/94	Wednesday	0.36	78	67
10/13/94	Thursday	0.01	87	67
10/14/94	Friday	0.00	87	69
10/15/94	Saturday	0.00	69	61
10/16/94	Sunday	0.00	73	63
10/17/94	Monday	0.00	78	59
10/18/94	Tuesday	0.00	82	62
10/19/94	Wednesday	0.00	90	60

SDA Florida OWTS Project

Table D-2 Temperature and Precipitation Data: Mandarin Middle School

MANDARIN MIDDLE SCHOOL WEATER STATION - MANDARIN, FLORIDA				
Date	Weekday	Precipitation (inches)	Temperature (degrees Fahrenheit)	
		Daily Total	Maximum	Minimum
10/20/94	Thursday	0.00	89	61
10/21/94	Friday	0.00	89	64
10/22/94	Saturday	0.00	89	66
10/23/94	Sunday	0.00	90	68
n		164	164	164
Sum		49.15	NA	NA
Average		0.30	90.99	69.27
Min		0.00	69.00	55.00
Max		3.53	101.00	76.00
St. Dev.		0.57	6.46	4.47

Blank Cell - No Data

E1: Relative Groundwater Elevations at Monitoring Wells

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

Location ID	T.O.C. Elevation	August 16, 1993		August 31, 1993		November 1, 1993		November 5, 1993	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	4.64	44.64	4.03	45.25	1.76	47.52	2.18	47.10
W5	49.58	4.85	44.73	4.24	45.34	1.87	47.71	2.30	47.28
P1	49.87	5.16	44.71	4.61	45.26	2.18	47.69	2.59	47.28
P3	52.76	7.89	44.87	7.33	45.43	4.83	47.93	5.24	47.52
DW-6	53.62	8.75	44.87	8.21	45.41	5.71	47.91	6.10	47.52
SW-7	52.46	7.59	44.87	7.04	45.42	4.54	47.92	4.94	47.52
DW-8	48.94	4.39	44.55	3.72	45.22	1.53	47.41	1.93	47.01
SW-9	48.88	4.19	44.69	3.57	45.31	1.35	47.53	1.77	47.11
DW-10	49.71	5.14	44.57	4.54	45.17	2.22	47.49	2.65	47.06
SW-11	49.58	4.99	44.59	4.41	45.17	2.06	47.52	2.50	47.08

Location ID	T.O.C. Elevation	April 26, 1994		April 27, 1994		June 17, 1994		July 1, 1994	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	3.53	45.75	3.57	45.71	DNM	DNM	DNM	DNM
W5	49.58	3.70	45.88	3.74	45.84	1.48	48.10	2.00	47.58
P1	49.87	4.00	45.87	4.04	45.83	1.75	48.12	2.32	47.55
P3	52.76	6.71	46.05	6.75	46.01	4.43	48.33	4.95	47.81
DW-6	53.62	7.56	46.06	7.60	46.02	5.35	48.27	5.80	47.82
SW-7	52.46	6.41	46.05	6.45	46.01	4.15	48.31	4.65	47.81
DW-8	48.94	3.28	45.66	3.32	45.62	1.18	47.76	1.65	47.29
SW-9	48.88	3.13	45.75	3.16	45.72	1.00	47.88	1.44	47.44
DW-10	49.71	4.00	45.71	4.04	45.67	1.85	47.86	2.30	47.41
SW-11	49.58	3.85	45.73	3.89	45.69	2.16	47.42	2.16	47.42

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

Location ID	T.O.C. Elevation	July 22,1994		August 5,1994		August 19 1994		September 6 1994	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	DNM	DNM	DNM	DNM	DNM	DNM	DNM	DNM
W5	49.58	2.65	46.93	1.95	47.63	2.22	47.36	3.25	46.33
P1	49.87	2.95	46.92	2.60	47.27	2.50	47.37	2.60	47.27
P3	52.76	5.55	47.21	5.10	47.66	5.13	47.63	6.30	46.46
DW-6	53.62	6.30	47.32	5.95	47.67	6.00	47.62	7.10	46.52
SW-7	52.46	5.24	47.22	4.75	47.71	4.85	47.61	6.00	46.46
DW-8	48.94	2.17	46.77	1.60	47.34	1.80	47.14	2.85	46.09
SW-9	48.88	2.00	46.88	1.37	47.51	1.65	47.23	2.74	46.14
DW-10	49.71	2.96	46.75	2.25	47.46	2.55	47.16	3.65	46.06
SW-11	49.58	2.85	46.73	2.15	47.43	2.40	47.18	3.54	46.04

Location ID	T.O.C. Elevation	September 22,1994		October 6,1994		October 17 1994		November 3 1994	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	DNM	DNM	DNM	DNM	DNM	DNM	DNM	DNM
W5	49.58	1.58	48.00	1.95	47.63	1.37	48.21	2.24	47.34
P1	49.87	1.70	48.17	2.60	47.27	1.80	48.07	2.50	47.37
P3	52.76	4.51	48.25	5.10	47.66	4.20	48.56	5.15	47.61
DW-6	53.62	5.36	48.26	5.95	47.67	4.90	48.72	5.98	47.64
SW-7	52.46	4.18	48.28	4.75	47.71	3.88	48.58	4.80	47.66
DW-8	48.94	1.15	47.79	1.60	47.34	1.28	47.66	1.86	47.08
SW-9	48.88	1.03	47.85	1.37	47.51	1.02	47.86	1.73	47.15
DW-10	49.71	1.97	47.74	2.25	47.46	1.75	47.96	1.57	48.14
SW-11	49.58	1.85	47.73	2.15	47.43	1.60	47.98	1.43	48.15

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

Location ID	T.O.C. Elevation	November 25,1994		December 2,1994		December 9 1994		December 16 1994	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	DNM	DNM	DNM	DNM	2.12	47.16	3.30	45.98
W5	49.58	1.70	47.88	1.98	47.60	2.20	47.38	2.42	47.16
P1	49.87	1.96	47.91	2.30	47.57	2.52	47.35	2.72	47.15
P3	52.76	4.50	48.26	4.90	47.86	5.12	47.64	5.34	47.42
DW-6	53.62	5.40	48.22	5.74	47.88	5.95	47.67	6.18	47.44
SW-7	52.46	4.23	48.23	4.55	47.91	4.79	47.67	5.01	47.45
DW-8	48.94	1.40	47.54	1.66	47.28	1.87	47.07	2.00	46.94
SW-9	48.88	1.22	47.66	1.54	47.34	1.73	47.15	1.83	47.05
DW-10	49.71	1.73	47.98	2.36	47.35	2.57	47.14	3.72	45.99
SW-11	49.58	1.97	47.61	2.24	47.34	2.43	47.15	3.62	45.96

Location ID	T.O.C. Elevation	December 23,1994		December 30,1994		January 6 1994		January 13 1994	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	1.84	47.44	2.00	47.28	2.48	46.80	2.46	46.82
W5	49.58	1.98	47.60	2.20	47.38	2.57	47.01	2.56	47.02
P1	49.87	2.35	47.52	2.55	47.32	2.95	46.92	2.92	46.95
P3	52.76	4.98	47.78	5.23	47.53	5.58	47.18	5.54	47.22
DW-6	53.62	5.83	47.79	6.11	47.51	6.42	47.20	6.38	47.24
SW-7	52.46	4.67	47.79	4.95	47.51	5.26	47.20	5.25	47.21
DW-8	48.94	1.65	47.29	1.74	47.20	2.11	46.83	2.19	46.75
SW-9	48.88	1.44	47.44	1.61	47.27	1.95	46.93	2.04	46.84
DW-10	49.71	2.35	47.36	2.56	47.15	2.93	46.78	2.92	46.79
SW-11	49.58	2.18	47.40	2.38	47.20	2.80	46.78	2.75	46.83

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

		January 20 1995		January 27 1995		February 3 1995		February 10 1995	
Location ID	T.O.C. Elevation	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	2.21	47.07	2.45	46.83	2.68	46.60	2.74	46.54
W5	49.58	2.26	47.32	2.59	46.99	2.80	46.78	2.92	46.66
P1	49.87	2.65	47.22	3.00	46.87	3.16	46.71	3.31	46.56
P3	52.76	5.28	47.48	5.60	47.16	5.81	46.95	5.91	46.85
DW-6	53.62	6.08	47.54	6.42	47.20	6.62	47.00	6.79	46.83
SW-7	52.46	4.64	47.82	5.28	47.18	5.50	46.96	5.58	46.88
DW-8	48.94	2.00	46.94	2.12	46.82	2.37	46.57	2.47	46.47
SW-9	48.88	1.88	47.00	2.08	46.80	2.23	46.65	2.37	46.51
DW-10	49.71	2.66	47.05	2.94	46.77	3.14	46.57	3.27	46.44
SW-11	49.58	2.44	47.14	2.79	46.79	3.00	46.58	3.08	46.50

		February 17 1995		February 24 1995	
Location ID	T.O.C. Elevation	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	2.46	46.82	2.68	46.60
W5	49.58	2.56	47.02	2.76	46.82
P1	49.87	3.00	46.87	3.22	46.65
P3	52.76	5.53	47.23	5.76	47.00
DW-6	53.62	6.43	47.19	6.59	47.03
SW-7	52.46	5.36	47.10	5.44	47.02
DW-8	48.94	2.17	46.77	2.35	46.59
SW-9	48.88	2.07	46.81	N/A	N/A
DW-10	49.71	2.94	46.77	N/A	N/A
SW-11	49.58	2.81	46.77	N/A	N/A

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

		March 6 1995		March 10 1995		March 14 1995		March 17 1995	
Location ID	T.O.C. Elevation	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	2.93	46.35	2.95	46.33	3.06	46.22	2.53	46.75
W5	49.58	3.07	46.51	3.11	46.47	3.20	46.38	2.80	46.78
P1	49.87	3.45	46.42	3.50	46.37	3.58	46.29	3.25	46.62
P3	52.76	6.07	46.69	6.13	46.63	6.21	46.55	6.05	46.71
DW-6	53.62	6.93	46.69	6.97	46.65	7.05	46.57	6.82	46.80
SW-7	52.46	5.76	46.70	5.81	46.65	5.91	46.55	5.73	46.73
DW-8	48.94	2.64	46.30	2.67	46.27	2.78	46.16	2.20	46.74
SW-9	48.88	2.50	46.38	2.55	46.33	2.66	46.22	2.22	46.66
DW-10	49.71	3.34	46.37	3.42	46.29	3.55	46.16	3.19	46.52
SW-11	49.58	3.27	46.31	3.31	46.27	3.41	46.17	3.07	46.51
RDS-CL	48.43	1.77	46.66	1.79	46.64	1.95	46.48	1.94	46.49

		March 24 1995		March 31 1995		April 11 1995		April 18 1995	
Location ID	T.O.C. Elevation	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	2.69	46.59	3.04	46.24	2.22	47.06	2.60	46.68
W5	49.58	2.82	46.76	3.17	46.41	2.35	47.23	2.72	46.86
P1	49.87	3.22	46.65	3.58	46.29	2.72	47.15	3.09	46.78
P3	52.76	5.83	46.93	6.20	46.56	5.30	47.46	5.71	47.05
DW-6	53.62	6.67	46.95	7.04	46.58	6.15	47.47	6.55	47.07
SW-7	52.46	5.52	46.94	5.89	46.57	4.99	47.47	5.41	47.05
DW-8	48.94	2.38	46.56	2.71	46.23	1.97	46.97	2.35	46.59
SW-9	48.88	2.27	46.61	2.63	46.25	1.83	47.05	2.31	46.57
DW-10	49.71	3.17	46.54	3.56	46.15	2.70	47.01	3.06	46.65
SW-11	49.58	3.04	46.54	3.40	46.18	2.55	47.03	2.62	46.96
RDS-CL	48.43	1.62	46.81	1.93	46.50	1.52	46.91	1.33	47.10

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

		April 21, 1995		April 28, 1995		May 4, 1995		May 8, 1995	
Location ID	T.O.C. Elevation	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	2.77	46.51	2.53	46.75	2.93	46.35	3.11	46.17
W5	49.58	2.93	46.65	2.69	46.89	3.11	46.47	2.95	46.63
P1	49.87	3.28	46.59	3.00	46.87	3.42	46.45	3.61	46.26
P3	52.76	5.92	46.84	5.64	47.12	6.12	46.64	6.26	46.50
DW-6	53.62	6.74	46.88	6.47	47.15	6.91	46.71	7.10	46.52
SW-7	52.46	5.60	46.86	5.33	47.13	5.76	46.70	5.64	46.82
DW-8	48.94	2.54	46.40	2.19	46.75	2.69	46.25	2.88	46.06
SW-9	48.88	2.39	46.49	2.13	46.75	2.58	46.30	2.74	46.14
DW-10	49.71	3.27	46.44	2.99	46.72	3.37	46.34	3.59	46.12
SW-11	49.58	3.11	46.47	2.85	46.73	3.22	46.36	3.11	46.47
RDS-CL	48.43	1.62	46.81	1.28	47.15	1.95	46.48		

		May 12, 1995		May 22, 1995		May 26, 1995		June 1, 1995	
Location ID	T.O.C. Elevation	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	2.64	46.64	3.28	46.00	3.45	45.83	3.53	45.75
W5	49.58	2.53	47.05	3.43	46.15	3.60	45.98	3.43	46.15
P1	49.87	3.25	46.62			3.92	45.95	4.09	45.78
P3	52.76	5.93	46.83	6.50	46.26			6.79	45.97
DW-6	53.62	6.75	46.87	7.31	46.31	7.47	46.15	7.62	46.00
SW-7	52.46	5.63	46.83	6.15	46.31	6.31	46.15	6.49	45.97
DW-8	48.94	2.35	46.59	2.96	45.98	3.19	45.75	3.43	45.51
SW-9	48.88	2.24	46.64	2.90	45.98	3.05	45.83	3.16	45.72
DW-10	49.71	3.15	46.56	3.75	45.96	3.94	45.77	4.03	45.68
SW-11	49.58	2.65	46.93	3.60	45.98	3.76	45.82	3.88	45.70
RDS-CL	48.43	1.62	46.81	1.79	46.64	1.95	46.48	2.42	46.01

SDA Florida OWTS Project
Table E-1 Relative Groundwater Elevation Data

Location ID	T.O.C. Elevation	July 25,1995		July 27,1995		Aug 24,1995		Sept 21,1995	
		Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.	Depth to Water	Relative W.T.E.
W4	49.28	3.34	45.94	3.49	45.79	3.49	45.79	3.49	45.79
W5	49.58	3.63	45.95	3.70	45.88	3.70	45.88	3.70	45.88
P1	49.87	4.01	45.86	4.09	45.78	4.09	45.78	4.09	45.78
P3	52.76	6.76	46.00	6.80	45.96	6.80	45.96	6.80	45.96
DW-6	53.62	7.57	46.05	7.64	45.98	7.64	45.98	7.64	45.98
SW-7	52.46	6.32	46.14	6.48	45.98	6.48	45.98	6.48	45.98
DW-8	48.94	3.07	45.87	3.21	45.73	3.21	45.73	3.21	45.73
SW-9	48.88	2.94	45.94	3.10	45.78	3.10	45.78	3.10	45.78
DW-10	49.71	3.88	45.83	4.00	45.71	4.00	45.71	4.00	45.71
SW-11	49.58	3.76	45.82	3.85	45.73	3.85	45.73	3.85	45.73
RDS-CL	48.43			2.30	46.13	1.82	46.61	0.86	47.57

E2: Relative Groundwater Elevations at Remote Data Sensing
(RDS) Unit and Unsaturated Zone Thickness at Drainfield

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
3/22/95	0:00:00	1.44	46.99	0.75
3/22/95	6:00:00	1.49	46.94	0.8
3/22/95	12:00:00	1.46	46.97	0.77
3/22/95	18:00:00	1.52	46.91	0.83
3/23/95	0:00:00	1.48	46.96	0.78
3/23/95	6:00:00	1.55	46.88	0.86
3/23/95	12:00:00	1.58	46.85	0.89
3/23/95	18:00:00	1.57	46.86	0.88
3/24/95	0:00:00	1.63	46.81	0.93
3/24/95	6:00:00	1.62	46.81	0.93
3/24/95	12:00:00	1.62	46.81	0.93
3/24/95	18:00:00	1.64	46.79	0.95
3/25/95	0:00:00	1.62	46.81	0.93
3/25/95	6:00:00	1.63	46.81	0.93
3/25/95	12:00:00	1.62	46.81	0.93
3/25/95	18:00:00	1.66	46.77	0.97
3/26/95	0:00:00	1.71	46.72	1.02
3/26/95	6:00:00	1.71	46.72	1.02
3/26/95	12:00:00	1.74	46.69	1.05
3/26/95	18:00:00	1.73	46.71	1.03
3/27/95	0:00:00	1.75	46.68	1.06
3/27/95	6:00:00	1.77	46.66	1.08
3/27/95	12:00:00	1.8	46.63	1.11
3/27/95	18:00:00	1.77	46.66	1.08
3/28/95	0:00:00	1.77	46.66	1.08
3/28/95	6:00:00	1.82	46.61	1.13
3/28/95	12:00:00	1.8	46.63	1.11
3/28/95	18:00:00	1.85	46.58	1.16
3/29/95	0:00:00	1.83	46.6	1.14
3/29/95	6:00:00	1.73	46.71	1.03
3/29/95	12:00:00	1.73	46.71	1.03
3/29/95	18:00:00	1.69	46.74	1
3/30/95	0:00:00	1.8	46.63	1.11
3/30/95	6:00:00	1.87	46.56	1.18
3/30/95	12:00:00	1.88	46.55	1.19
3/30/95	18:00:00	1.89	46.54	1.2
3/31/95	0:00:00	1.91	46.52	1.22
3/31/95	6:00:00	1.93	46.51	1.23
3/31/95	12:00:00	1.93	46.51	1.23
3/31/95	18:00:00	1.96	46.47	1.27
4/1/95	0:00:00	1.96	46.47	1.27
4/1/95	6:00:00	1.96	46.47	1.27
4/1/95	12:00:00	1.98	46.46	1.28
4/1/95	18:00:00	1.98	46.46	1.28
4/2/95	0:00:00	1.96	46.47	1.27
4/2/95	6:00:00	1.99	46.44	1.3
4/2/95	12:00:00	1.94	46.49	1.25

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
4/2/95	18:00:00	1.48	46.96	0.78
4/3/95	0:00:00	1.46	46.97	0.77
4/3/95	6:00:00	1.44	46.99	0.75
4/3/95	12:00:00	1.27	47.16	0.58
4/3/95	18:00:00	1.21	47.22	0.52
4/4/95	0:00:00	1.27	47.16	0.58
4/4/95	6:00:00	1.3	47.13	0.61
4/4/95	12:00:00	1.33	47.1	0.64
4/4/95	18:00:00	1.38	47.06	0.68
4/5/95	0:00:00	1.38	47.06	0.68
4/5/95	6:00:00	1.44	46.99	0.75
4/5/95	12:00:00	1.44	46.99	0.75
4/5/95	18:00:00	1.5	46.93	0.81
4/6/95	0:00:00	1.5	46.93	0.81
4/6/95	6:00:00	1.57	46.86	0.88
4/6/95	12:00:00	1.6	46.83	0.91
4/6/95	18:00:00	1.64	46.79	0.95
4/7/95	0:00:00	1.68	46.76	0.98
4/7/95	6:00:00	1.6	46.83	0.91
4/7/95	12:00:00	1.73	46.71	1.03
4/7/95	18:00:00	1.77	46.66	1.08
4/8/95	0:00:00	1.75	46.68	1.06
4/8/95	6:00:00	1.8	46.63	1.11
4/8/95	12:00:00	1.73	46.71	1.03
4/8/95	18:00:00	1.83	46.6	1.14
4/9/95	0:00:00	1.87	46.56	1.18
4/9/95	6:00:00	1.88	46.55	1.19
4/9/95	12:00:00	1.89	46.54	1.2
4/9/95	18:00:00	1.73	46.71	1.03
4/10/95	0:00:00	1.3	47.13	0.61
4/10/95	6:00:00	1.27	47.16	0.58
4/10/95	12:00:00	1.28	47.15	0.59
4/10/95	18:00:00	1.28	47.15	0.59
4/11/95	0:00:00	1.44	46.99	0.75
4/11/95	6:00:00	1.5	46.93	0.81
4/11/95	12:00:00	1.52	46.91	0.83
4/11/95	18:00:00	1.55	46.88	0.86
4/12/95	0:00:00	1.55	46.88	0.86
4/12/95	6:00:00	1.58	46.85	0.89
4/12/95	12:00:00	0.28	48.15	-0.41
4/12/95	18:00:00	0.36	48.07	-0.33
4/13/95	0:00:00	0.53	47.9	-0.16
4/13/95	6:00:00	0.59	47.84	-0.1
4/13/95	12:00:00	0.75	47.68	0.06
4/13/95	18:00:00	0.78	47.65	0.09
4/14/95	0:00:00	0.84	47.59	0.15
4/14/95	6:00:00	0.88	47.56	0.18

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project

Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
4/14/95	12:00:00	0.94	47.49	0.25
4/14/95	18:00:00	1	47.43	0.31
4/15/95	0:00:00	0.98	47.45	0.29
4/15/95	6:00:00	1.08	47.35	0.39
4/15/95	12:00:00	1.08	47.35	0.39
4/15/95	18:00:00	1.11	47.32	0.42
4/16/95	0:00:00	1.08	47.35	0.39
4/16/95	6:00:00	1.18	47.26	0.48
4/16/95	12:00:00	1.21	47.22	0.52
4/16/95	18:00:00	1.25	47.18	0.56
4/17/95	0:00:00	1.28	47.15	0.59
4/17/95	6:00:00	1.32	47.11	0.63
4/17/95	12:00:00	1.33	47.1	0.64
4/17/95	18:00:00	1.38	47.06	0.68
4/18/95	0:00:00	1.35	47.08	0.66
4/18/95	6:00:00	1.43	47.01	0.73
4/18/95	12:00:00	1.33	47.1	0.64
4/18/95	18:00:00	1.46	46.97	0.77
4/19/95	0:00:00	1.5	46.93	0.81
4/19/95	6:00:00	1.49	46.94	0.8
4/19/95	12:00:00	1.49	46.94	0.8
4/19/95	18:00:00	1.53	46.9	0.84
4/20/95	0:00:00	1.52	46.91	0.83
4/20/95	6:00:00	1.53	46.9	0.84
4/20/95	12:00:00	1.55	46.88	0.86
4/20/95	18:00:00	1.58	46.85	0.89
4/21/95	0:00:00	1.58	46.85	0.89
4/21/95	6:00:00	1.57	46.86	0.88
4/21/95	12:00:00	1.62	46.81	0.93
4/21/95	18:00:00	1.6	46.83	0.91
4/22/95	0:00:00	1.64	46.79	0.95
4/22/95	6:00:00	1.63	46.81	0.93
4/22/95	12:00:00	1.64	46.79	0.95
4/22/95	18:00:00	1.68	46.76	0.98
4/23/95	0:00:00	1.66	46.77	0.97
4/23/95	6:00:00	1.69	46.74	1
4/23/95	12:00:00	1.68	46.76	0.98
4/23/95	18:00:00	1.71	46.72	1.02
4/24/95	0:00:00	1.73	46.71	1.03
4/24/95	6:00:00	1.74	46.69	1.05
4/24/95	12:00:00	1.27	47.16	0.58
4/24/95	18:00:00	0.98	47.45	0.29
4/25/95	0:00:00	0.98	47.45	0.29
4/25/95	6:00:00	1.02	47.41	0.33
4/25/95	12:00:00	1.03	47.4	0.34
4/25/95	18:00:00	1.1	47.33	0.41
4/26/95	0:00:00	1.13	47.31	0.43

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
4/26/95	6:00:00	1.14	47.29	0.45
4/26/95	12:00:00	1.16	47.27	0.47
4/26/95	18:00:00	1.18	47.26	0.48
4/27/95	0:00:00	1.23	47.21	0.53
4/27/95	6:00:00	1.23	47.2	0.54
4/27/95	12:00:00	1.23	47.2	0.54
4/27/95	18:00:00	1.25	47.18	0.56
4/28/95	0:00:00	1.27	47.16	0.58
4/28/95	6:00:00	1.28	47.15	0.59
4/28/95	12:00:00	1.28	47.15	0.59
4/28/95	18:00:00	1.35	47.08	0.66
4/29/95	0:00:00	1.35	47.08	0.66
4/29/95	6:00:00	1.39	47.04	0.7
4/29/95	12:00:00	1.41	47.02	0.72
4/29/95	18:00:00	1.44	46.99	0.75
4/30/95	0:00:00	1.46	46.97	0.77
4/30/95	6:00:00	1.48	46.96	0.78
4/30/95	12:00:00	1.44	46.99	0.75
4/30/95	18:00:00	1.5	46.93	0.81
5/1/95	0:00:00	1.49	46.94	0.8
5/1/95	6:00:00	1.5	46.93	0.81
5/1/95	12:00:00	1.53	46.9	0.84
5/1/95	18:00:00	1.58	46.85	0.89
5/2/95	0:00:00	1.58	46.85	0.89
5/2/95	6:00:00	1.58	46.85	0.89
5/2/95	12:00:00	1.62	46.81	0.93
5/2/95	18:00:00	1.64	46.79	0.95
5/3/95	0:00:00	1.64	46.79	0.95
5/3/95	6:00:00	1.68	46.76	0.98
5/3/95	12:00:00	1.68	46.76	0.98
5/3/95	18:00:00	1.71	46.72	1.02
5/4/95	0:00:00	1.74	46.69	1.05
5/4/95	6:00:00	1.74	46.69	1.05
5/4/95	12:00:00	1.74	46.69	1.05
5/4/95	18:00:00	1.77	46.66	1.08
5/5/95	0:00:00	1.77	46.66	1.08
5/5/95	6:00:00	1.78	46.65	1.09
5/5/95	12:00:00	1.78	46.65	1.09
5/5/95	18:00:00	1.82	46.61	1.13
5/6/95	0:00:00	1.83	46.6	1.14
5/6/95	6:00:00	1.8	46.63	1.11
5/6/95	12:00:00	1.82	46.61	1.13
5/6/95	18:00:00	1.87	46.56	1.18
5/7/95	0:00:00	1.88	46.55	1.19
5/7/95	6:00:00	1.88	46.55	1.19
5/7/95	12:00:00	1.88	46.55	1.19
5/7/95	18:00:00	1.91	46.52	1.22

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
5/8/95	0:00:00	1.89	46.54	1.2
5/8/95	6:00:00	1.93	46.51	1.23
5/8/95	12:00:00	1.93	46.51	1.23
5/8/95	18:00:00	1.98	46.46	1.28
5/9/95	0:00:00	1.94	46.49	1.25
5/9/95	6:00:00	1.99	46.44	1.3
5/9/95	12:00:00	1.98	46.46	1.28
5/9/95	18:00:00	2.01	46.42	1.32
5/10/95	0:00:00	2.01	46.42	1.32
5/10/95	6:00:00	2.02	46.41	1.33
5/10/95	12:00:00	2.02	46.41	1.33
5/10/95	18:00:00	2.07	46.36	1.38
5/11/95	0:00:00	2.08	46.35	1.39
5/11/95	6:00:00	2.1	46.33	1.41
5/11/95	12:00:00	2.08	46.35	1.39
5/11/95	18:00:00	1.75	46.68	1.06
5/12/95	0:00:00	1.64	46.79	0.95
5/12/95	6:00:00	1.62	46.81	0.93
5/12/95	12:00:00	1.53	46.9	0.84
5/12/95	18:00:00	1.53	46.9	0.84
5/13/95	0:00:00	1.46	46.97	0.77
5/13/95	6:00:00	1.43	47.01	0.73
5/13/95	12:00:00	1.35	47.08	0.66
5/13/95	18:00:00	1.43	47.01	0.73
5/14/95	0:00:00	1.44	46.99	0.75
5/14/95	6:00:00	1.44	46.99	0.75
5/14/95	12:00:00	1.44	46.99	0.75
5/14/95	18:00:00	1.52	46.91	0.83
5/15/95	0:00:00	1.48	46.96	0.78
5/15/95	6:00:00	1.52	46.91	0.83
5/15/95	12:00:00	1.52	46.91	0.83
5/15/95	18:00:00	1.62	46.81	0.93
5/16/95	0:00:00	1.63	46.81	0.93
5/16/95	6:00:00	1.64	46.79	0.95
5/16/95	12:00:00	1.66	46.77	0.97
5/16/95	18:00:00	1.74	46.69	1.05
5/17/95	0:00:00	1.75	46.68	1.06
5/17/95	6:00:00	1.77	46.66	1.08
5/17/95	12:00:00	1.78	46.65	1.09
5/17/95	18:00:00	1.8	46.63	1.11
5/18/95	0:00:00	1.85	46.58	1.16
5/18/95	6:00:00	1.87	46.56	1.18
5/18/95	12:00:00	1.87	46.56	1.18
5/18/95	18:00:00	1.93	46.51	1.23
5/19/95	0:00:00	1.96	46.47	1.27
5/19/95	6:00:00	1.96	46.47	1.27
5/19/95	12:00:00	1.98	46.46	1.28

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
5/19/95	18:00:00	2.02	46.41	1.33
5/20/95	0:00:00	2.02	46.41	1.33
5/20/95	6:00:00	2.02	46.41	1.33
5/20/95	12:00:00	2.02	46.41	1.33
5/20/95	18:00:00	2.05	46.38	1.36
5/21/95	0:00:00	2.07	46.36	1.38
5/21/95	6:00:00	2.07	46.36	1.38
5/21/95	12:00:00	2.02	46.41	1.33
5/21/95	18:00:00	2.1	46.33	1.41
5/22/95	0:00:00	2.08	46.35	1.39
5/22/95	6:00:00	2.12	46.31	1.43
5/22/95	12:00:00	2.12	46.31	1.43
5/22/95	18:00:00	2.13	46.3	1.44
5/23/95	0:00:00	2.14	46.29	1.45
5/23/95	6:00:00	2.14	46.29	1.45
5/23/95	12:00:00	2.16	46.27	1.47
5/23/95	18:00:00	2.18	46.26	1.48
5/24/95	0:00:00	2.19	46.24	1.5
5/24/95	6:00:00	2.18	46.26	1.48
5/24/95	12:00:00	2.18	46.26	1.48
5/24/95	18:00:00	2.19	46.24	1.5
5/25/95	0:00:00	2.21	46.22	1.52
5/25/95	6:00:00	2.23	46.21	1.53
5/25/95	12:00:00	2.23	46.21	1.53
5/25/95	18:00:00	2.26	46.17	1.57
5/26/95	0:00:00	2.27	46.16	1.58
5/26/95	6:00:00	2.27	46.16	1.58
5/26/95	12:00:00	2.27	46.16	1.58
5/26/95	18:00:00	2.3	46.13	1.61
5/27/95	0:00:00	2.32	46.11	1.63
5/27/95	6:00:00	2.32	46.11	1.63
5/27/95	12:00:00	2.3	46.13	1.61
5/27/95	18:00:00	2.33	46.1	1.64
5/28/95	0:00:00	2.35	46.08	1.66
5/28/95	6:00:00	2.35	46.08	1.66
5/28/95	12:00:00	2.35	46.08	1.66
5/28/95	18:00:00	2.37	46.06	1.68
5/29/95	0:00:00	2.38	46.05	1.69
5/29/95	6:00:00	2.38	46.05	1.69
5/29/95	12:00:00	2.4	46.03	1.71
5/29/95	18:00:00	2.4	46.03	1.71
5/30/95	0:00:00	2.4	46.03	1.71
5/30/95	6:00:00	2.41	46.02	1.72
5/30/95	12:00:00	2.4	46.03	1.71
5/30/95	18:00:00	2.43	46.01	1.73
5/31/95	0:00:00	2.4	46.03	1.71
5/31/95	6:00:00	2.37	46.06	1.68

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
5/31/95	12:00:00	2.37	46.06	1.68
5/31/95	18:00:00	2.41	46.02	1.72
6/1/95	0:00:00	2.43	46.01	1.73
6/1/95	6:00:00	2.43	46.01	1.73
6/1/95	12:00:00	2.43	46.01	1.73
6/1/95	12:00:00	2.43	46.01	1.73
6/1/95	18:00:00	2.49	45.94	1.8
6/2/95	0:00:00	2.48	45.96	1.78
6/2/95	6:00:00	2.48	45.96	1.78
6/2/95	12:00:00	2.48	45.96	1.78
6/2/95	18:00:00	2.48	45.96	1.78
6/3/95	0:00:00	2.46	45.97	1.77
6/3/95	6:00:00	2.38	46.05	1.69
6/3/95	12:00:00	2.33	46.1	1.64
6/3/95	18:00:00	2.35	46.08	1.66
6/4/95	0:00:00	2.33	46.1	1.64
6/4/95	6:00:00	2.3	46.13	1.61
6/4/95	12:00:00	2.21	46.22	1.52
6/4/95	18:00:00	2.1	46.33	1.41
6/5/95	0:00:00	1.82	46.61	1.13
6/5/95	6:00:00	1.64	46.79	0.95
6/5/95	12:00:00	1.53	46.9	0.84
6/5/95	18:00:00	1.53	46.9	0.84
6/6/95	0:00:00	1.5	46.93	0.81
6/6/95	6:00:00	1.5	46.93	0.81
6/6/95	12:00:00	1.49	46.94	0.8
6/6/95	18:00:00	1.5	46.93	0.81
6/7/95	0:00:00	1.53	46.9	0.84
6/7/95	6:00:00	1.57	46.86	0.88
6/7/95	12:00:00	1.58	46.85	0.89
6/7/95	18:00:00	1.68	46.76	0.98
6/8/95	0:00:00	1.69	46.74	1
6/8/95	6:00:00	1.71	46.72	1.02
6/8/95	12:00:00	1.71	46.72	1.02
6/8/95	18:00:00	1.75	46.68	1.06
6/9/95	0:00:00	1.75	46.68	1.06
6/9/95	6:00:00	1.77	46.66	1.08
6/9/95	12:00:00	1.75	46.68	1.06
6/9/95	18:00:00	1.83	46.6	1.14
6/10/95	0:00:00	1.88	46.55	1.19
6/10/95	6:00:00	1.88	46.55	1.19
6/10/95	12:00:00	1.89	46.54	1.2
6/10/95	18:00:00	1.94	46.49	1.25
6/11/95	0:00:00	1.96	46.47	1.27
6/11/95	6:00:00	1.98	46.46	1.28
6/11/95	12:00:00	1.98	46.46	1.28
6/11/95	18:00:00	2.01	46.42	1.32

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
 Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
6/12/95	0:00:00	2.01	46.42	1.32
6/12/95	6:00:00	2.03	46.4	1.34
6/12/95	12:00:00	2.05	46.38	1.36
6/12/95	18:00:00	2.08	46.35	1.39
6/13/95	0:00:00	2.1	46.33	1.41
6/13/95	6:00:00	2.12	46.31	1.43
6/13/95	12:00:00	2.12	46.31	1.43
6/13/95	18:00:00	2.14	46.29	1.45
6/14/95	0:00:00	2.14	46.29	1.45
6/14/95	6:00:00	2.16	46.27	1.47
6/14/95	12:00:00	2.16	46.27	1.47
6/14/95	18:00:00	2.19	46.24	1.5
6/15/95	0:00:00	2.21	46.22	1.52
6/15/95	6:00:00	2.24	46.19	1.55
6/15/95	12:00:00	2.24	46.19	1.55
6/15/95	18:00:00	2.28	46.15	1.59
6/16/95	0:00:00	2.28	46.15	1.59
6/16/95	6:00:00	2.3	46.13	1.61
6/16/95	12:00:00	2.3	46.13	1.61
6/16/95	18:00:00	2.32	46.11	1.63
6/17/95	0:00:00	2.33	46.1	1.64
6/17/95	6:00:00	2.33	46.1	1.64
6/17/95	12:00:00	2.26	46.17	1.57
6/17/95	18:00:00	2.16	46.27	1.47
6/18/95	0:00:00	2.14	46.29	1.45
6/18/95	6:00:00	2.14	46.29	1.45
6/18/95	12:00:00	2.07	46.36	1.38
6/18/95	18:00:00	2.12	46.31	1.43
6/19/95	0:00:00	2.16	46.27	1.47
6/19/95	6:00:00	2.19	46.24	1.5
6/19/95	12:00:00	2.16	46.27	1.47
6/19/95	18:00:00	2.23	46.21	1.53
6/20/95	0:00:00	2.26	46.17	1.57
6/20/95	6:00:00	2.27	46.16	1.58
6/20/95	12:00:00	2.26	46.17	1.57
6/20/95	18:00:00	2.3	46.13	1.61
6/21/95	0:00:00	2.28	46.15	1.59
6/21/95	6:00:00	2.32	46.11	1.63
6/21/95	12:00:00	2.32	46.11	1.63
6/21/95	18:00:00	2.33	46.1	1.64
6/22/95	0:00:00	2.33	46.1	1.64
6/22/95	6:00:00	2.37	46.06	1.68
6/22/95	12:00:00	2.37	46.06	1.68
6/22/95	18:00:00	2.38	46.05	1.69
6/23/95	0:00:00	2.38	46.05	1.69
6/23/95	6:00:00	2.4	46.03	1.71
6/23/95	12:00:00	2.4	46.03	1.71

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project

Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
6/23/95	18:00:00	2.43	46.01	1.73
6/24/95	0:00:00	2.44	45.99	1.75
6/24/95	6:00:00	2.46	45.97	1.77
6/24/95	12:00:00	2.46	45.97	1.77
6/24/95	18:00:00	2.49	45.94	1.8
6/25/95	0:00:00	2.49	45.94	1.8
6/25/95	6:00:00	2.51	45.92	1.82
6/25/95	12:00:00	2.46	45.97	1.77
6/25/95	18:00:00	2.48	45.96	1.78
6/26/95	0:00:00	2.41	46.02	1.72
6/26/95	6:00:00	2.43	46.01	1.73
6/26/95	12:00:00	2.38	46.05	1.69
6/26/95	18:00:00	2.44	45.99	1.75
6/27/95	0:00:00	2.44	45.99	1.75
6/27/95	6:00:00	2.46	45.97	1.77
6/27/95	12:00:00	2.44	45.99	1.75
6/27/95	18:00:00	2.48	45.96	1.78
6/28/95	0:00:00	2.49	45.94	1.8
6/28/95	6:00:00	2.49	45.94	1.8
6/28/95	12:00:00	2.48	45.96	1.78
6/28/95	18:00:00	2.53	45.9	1.84
6/29/95	0:00:00	2.21	46.22	1.52
6/29/95	6:00:00	2.08	46.35	1.39
6/29/95	12:00:00	1.99	46.44	1.3
6/29/95	18:00:00	2.01	46.42	1.32
6/30/95	0:00:00	1.94	46.49	1.25
6/30/95	6:00:00	1.94	46.49	1.25
6/30/95	12:00:00	1.89	46.54	1.2
6/30/95	18:00:00	1.91	46.52	1.22
7/1/95	0:00:00	1.88	46.55	1.19
7/1/95	6:00:00	1.87	46.56	1.18
7/1/95	12:00:00	1.8	46.63	1.11
7/1/95	18:00:00	1.8	46.63	1.11
7/2/95	0:00:00	1.8	46.63	1.11
7/2/95	6:00:00	1.82	46.61	1.13
7/2/95	12:00:00	1.8	46.63	1.11
7/2/95	18:00:00	1.88	46.55	1.19
7/3/95	0:00:00	1.91	46.52	1.22
7/3/95	6:00:00	1.93	46.51	1.23
7/3/95	12:00:00	1.94	46.49	1.25
7/3/95	18:00:00	1.99	46.44	1.3
7/4/95	0:00:00	2.02	46.41	1.33
7/4/95	6:00:00	2.03	46.4	1.34
7/4/95	12:00:00	2.05	46.38	1.36
7/4/95	18:00:00	2.1	46.33	1.41
7/5/95	0:00:00	2.13	46.3	1.44
7/5/95	6:00:00	2.13	46.3	1.44

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
 Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
7/5/95	12:00:00	2.16	46.27	1.47
7/5/95	18:00:00	2.21	46.22	1.52
7/6/95	0:00:00	2.23	46.21	1.53
7/6/95	6:00:00	2.23	46.21	1.53
7/6/95	12:00:00	2.24	46.19	1.55
7/6/95	18:00:00	2.28	46.15	1.59
7/7/95	0:00:00	2.32	46.11	1.63
7/7/95	6:00:00	2.3	46.13	1.61
7/7/95	12:00:00	2.32	46.11	1.63
7/7/95	18:00:00	2.37	46.06	1.68
7/8/95	0:00:00	2.38	46.05	1.69
7/8/95	6:00:00	2.37	46.06	1.68
7/8/95	12:00:00	2.4	46.03	1.71
7/8/95	18:00:00	2.43	46.01	1.73
7/9/95	0:00:00	2.43	46.01	1.73
7/9/95	6:00:00	2.43	46.01	1.73
7/9/95	12:00:00	2.44	45.99	1.75
7/9/95	18:00:00	2.46	45.97	1.77
7/10/95	0:00:00	2.48	45.96	1.78
7/10/95	6:00:00	2.49	45.94	1.8
7/10/95	12:00:00	2.49	45.94	1.8
7/10/95	18:00:00	2.53	45.91	1.83
7/11/95	0:00:00	2.51	45.92	1.82
7/11/95	6:00:00	2.53	45.91	1.83
7/11/95	12:00:00	2.53	45.91	1.83
7/11/95	18:00:00	2.55	45.88	1.86
7/12/95	0:00:00	2.53	45.91	1.83
7/12/95	6:00:00	2.49	45.94	1.8
7/12/95	12:00:00	2.51	45.92	1.82
7/12/95	18:00:00	2.55	45.88	1.86
7/13/95	0:00:00	2.53	45.9	1.84
7/13/95	6:00:00	2.53	45.91	1.83
7/13/95	12:00:00	2.53	45.9	1.84
7/13/95	18:00:00	2.58	45.85	1.89
7/14/95	0:00:00	2.57	45.86	1.88
7/14/95	6:00:00	2.57	45.86	1.88
7/14/95	12:00:00	2.57	45.86	1.88
7/14/95	18:00:00	2.57	45.86	1.88
7/15/95	0:00:00	2.4	46.03	1.71
7/15/95	6:00:00	2.35	46.08	1.66
7/15/95	12:00:00	2.32	46.11	1.63
7/15/95	18:00:00	2.33	46.1	1.64
7/16/95	0:00:00	2.28	46.15	1.59
7/16/95	6:00:00	2.26	46.17	1.57
7/16/95	12:00:00	2.21	46.22	1.52
7/16/95	18:00:00	2.21	46.22	1.52
7/17/95	0:00:00	2.19	46.24	1.5

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
 Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
7/17/95	6:00:00	2.16	46.27	1.47
7/17/95	12:00:00	2.01	46.42	1.32
7/17/95	18:00:00	1.89	46.54	1.2
7/18/95	0:00:00	1.85	46.58	1.16
7/18/95	6:00:00	1.85	46.58	1.16
7/18/95	12:00:00	1.8	46.63	1.11
7/18/95	18:00:00	1.85	46.58	1.16
7/19/95	0:00:00	1.85	46.58	1.16
7/19/95	6:00:00	1.87	46.56	1.18
7/19/95	12:00:00	1.87	46.56	1.18
7/19/95	18:00:00	1.89	46.54	1.2
7/20/95	0:00:00	1.89	46.54	1.2
7/20/95	6:00:00	1.94	46.49	1.25
7/20/95	12:00:00	1.96	46.47	1.27
7/20/95	18:00:00	2.05	46.38	1.36
7/21/95	0:00:00	2.07	46.36	1.38
7/21/95	6:00:00	2.08	46.35	1.39
7/21/95	12:00:00	2.08	46.35	1.39
7/21/95	18:00:00	2.14	46.29	1.45
7/22/95	0:00:00	2.14	46.29	1.45
7/22/95	6:00:00	2.14	46.29	1.45
7/22/95	12:00:00	2.12	46.31	1.43
7/22/95	18:00:00	2.16	46.27	1.47
7/23/95	0:00:00	2.19	46.24	1.5
7/23/95	6:00:00	2.21	46.22	1.52
7/23/95	12:00:00	2.21	46.22	1.52
7/23/95	18:00:00	2.26	46.17	1.57
7/24/95	0:00:00	2.28	46.15	1.59
7/24/95	6:00:00	2.28	46.15	1.59
7/24/95	12:00:00	2.3	46.13	1.61
7/24/95	18:00:00	2.37	46.06	1.68
7/25/95	0:00:00	2.37	46.06	1.68
7/25/95	6:00:00	2.28	46.15	1.59
7/25/95	12:00:00	2.23	46.21	1.53
7/25/95	18:00:00	2.26	46.17	1.57
7/26/95	0:00:00	2.23	46.21	1.53
7/26/95	6:00:00	2.21	46.22	1.52
7/26/95	12:00:00	2.16	46.27	1.47
7/26/95	18:00:00	2.24	46.19	1.55
7/27/95	0:00:00	2.28	46.15	1.59
7/27/95	6:00:00	2.3	46.13	1.61
7/27/95	12:00:00	2.3	46.13	1.61
7/27/95	18:00:00	2.37	46.06	1.68
7/28/95	0:00:00	2.37	46.06	1.68
7/28/95	6:00:00	2.37	46.06	1.68
7/28/95	12:00:00	2.35	46.08	1.66
7/28/95	18:00:00	2.38	46.05	1.69

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
 Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
7/29/95	0:00:00	2.4	46.03	1.71
7/29/95	6:00:00	2.41	46.02	1.72
7/29/95	12:00:00	2.38	46.05	1.69
7/29/95	18:00:00	2.43	46.01	1.73
7/30/95	0:00:00	2.44	45.99	1.75
7/30/95	6:00:00	2.44	45.99	1.75
7/30/95	12:00:00	2.46	45.97	1.77
7/30/95	18:00:00	2.49	45.94	1.8
7/31/95	0:00:00	2.49	45.94	1.8
7/31/95	6:00:00	2.53	45.91	1.83
7/31/95	12:00:00	2.53	45.91	1.83
7/31/95	18:00:00	2.55	45.88	1.86
8/1/95	0:00:00	2.57	45.86	1.88
8/1/95	6:00:00	2.58	45.85	1.89
8/1/95	12:00:00	2.58	45.85	1.89
8/1/95	18:00:00	2.6	45.83	1.91
8/2/95	0:00:00	2.53	45.91	1.83
8/2/95	6:00:00	2.4	46.03	1.71
8/2/95	12:00:00	2.14	46.29	1.45
8/2/95	18:00:00	2.02	46.41	1.33
8/3/95	0:00:00	1.94	46.49	1.25
8/3/95	6:00:00	1.91	46.52	1.22
8/3/95	12:00:00	1.87	46.56	1.18
8/3/95	18:00:00	1.87	46.56	1.18
8/4/95	0:00:00	1.8	46.63	1.11
8/4/95	6:00:00	1.82	46.61	1.13
8/4/95	12:00:00	1.8	46.63	1.11
8/4/95	18:00:00	1.87	46.56	1.18
8/5/95	0:00:00	1.89	46.54	1.2
8/5/95	6:00:00	1.89	46.54	1.2
8/5/95	12:00:00	1.89	46.54	1.2
8/5/95	18:00:00	1.96	46.47	1.27
8/6/95	0:00:00	1.98	46.46	1.28
8/6/95	6:00:00	1.98	46.46	1.28
8/6/95	12:00:00	1.99	46.44	1.3
8/6/95	18:00:00	2.02	46.41	1.33
8/7/95	0:00:00	2.05	46.38	1.36
8/7/95	6:00:00	2.08	46.35	1.39
8/7/95	12:00:00	2.1	46.33	1.41
8/7/95	18:00:00	2.16	46.27	1.47
8/8/95	0:00:00	2.19	46.24	1.5
8/8/95	6:00:00	2.19	46.24	1.5
8/8/95	12:00:00	2.19	46.24	1.5
8/8/95	18:00:00	2.24	46.19	1.55
8/9/95	0:00:00	2.26	46.17	1.57
8/9/95	6:00:00	2.26	46.17	1.57
8/9/95	12:00:00	2.26	46.17	1.57

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
8/9/95	18:00:00	2.27	46.16	1.58
8/10/95	0:00:00	2.28	46.15	1.59
8/10/95	6:00:00	2.28	46.15	1.59
8/10/95	12:00:00	2.3	46.13	1.61
8/10/95	18:00:00	2.33	46.1	1.64
8/11/95	0:00:00	2.35	46.08	1.66
8/11/95	6:00:00	2.37	46.06	1.68
8/11/95	12:00:00	2.37	46.06	1.68
8/11/95	18:00:00	2.4	46.03	1.71
8/12/95	0:00:00	2.43	46.01	1.73
8/12/95	6:00:00	2.43	46.01	1.73
8/12/95	12:00:00	2.44	45.99	1.75
8/12/95	18:00:00	2.46	45.97	1.77
8/13/95	0:00:00	2.48	45.96	1.78
8/13/95	6:00:00	2.49	45.94	1.8
8/13/95	12:00:00	2.49	45.94	1.8
8/13/95	18:00:00	2.53	45.91	1.83
8/14/95	0:00:00	2.53	45.9	1.84
8/14/95	6:00:00	2.55	45.88	1.86
8/14/95	12:00:00	2.57	45.86	1.88
8/14/95	18:00:00	2.6	45.83	1.91
8/15/95	0:00:00	2.58	45.85	1.89
8/15/95	6:00:00	2.6	45.83	1.91
8/15/95	12:00:00	2.62	45.81	1.93
8/15/95	18:00:00	2.63	45.8	1.94
8/16/95	0:00:00	2.63	45.8	1.94
8/16/95	6:00:00	2.65	45.78	1.96
8/16/95	12:00:00	2.63	45.8	1.94
8/16/95	18:00:00	2.65	45.78	1.96
8/17/95	0:00:00	2.69	45.74	2
8/17/95	6:00:00	2.69	45.74	2
8/17/95	12:00:00	2.69	45.74	2
8/17/95	18:00:00	2.73	45.71	2.03
8/18/95	0:00:00	2.74	45.69	2.05
8/18/95	6:00:00	2.74	45.69	2.05
8/18/95	12:00:00	2.74	45.69	2.05
8/18/95	18:00:00	2.78	45.66	2.08
8/19/95	0:00:00	2.78	45.66	2.08
8/19/95	6:00:00	2.69	45.74	2
8/19/95	12:00:00	2.78	45.66	2.08
8/19/95	18:00:00	2.78	45.65	2.09
8/20/95	0:00:00	2.26	46.17	1.57
8/20/95	6:00:00	2.13	46.3	1.44
8/20/95	12:00:00	2.03	46.4	1.34
8/20/95	18:00:00	1.94	46.49	1.25
8/21/95	0:00:00	1.87	46.56	1.18
8/21/95	6:00:00	1.87	46.56	1.18

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
8/21/95	12:00:00	1.82	46.61	1.13
8/21/95	18:00:00	1.82	46.61	1.13
8/22/95	0:00:00	1.83	46.6	1.14
8/22/95	6:00:00	1.83	46.6	1.14
8/22/95	12:00:00	1.83	46.6	1.14
8/22/95	18:00:00	1.83	46.6	1.14
8/23/95	0:00:00	1.83	46.6	1.14
8/23/95	6:00:00	1.85	46.58	1.16
8/23/95	12:00:00	1.83	46.6	1.14
8/23/95	18:00:00	1.85	46.58	1.16
8/24/95	0:00:00	1.85	46.58	1.16
8/24/95	6:00:00	1.85	46.58	1.16
8/24/95	12:00:00	1.82	46.61	1.13
8/24/95	18:00:00	1.74	46.69	1.05
8/25/95	0:00:00	0.07	48.36	-0.62
8/25/95	6:00:00	0.05	48.38	-0.64
8/25/95	12:00:00	0.09	48.34	-0.6
8/25/95	18:00:00	0.09	48.34	-0.6
8/26/95	0:00:00	0.09	48.34	-0.6
8/26/95	6:00:00	0.05	48.38	-0.64
8/26/95	12:00:00	0.02	48.41	-0.67
8/26/95	18:00:00	0.14	48.29	-0.55
8/27/95	0:00:00	0.22	48.21	-0.47
8/27/95	6:00:00	0.27	48.16	-0.42
8/27/95	12:00:00	0.09	48.34	-0.6
8/27/95	18:00:00	0.09	48.34	-0.6
8/28/95	0:00:00	0.05	48.38	-0.64
8/28/95	6:00:00	0.16	48.27	-0.53
8/28/95	12:00:00	0.27	48.16	-0.42
8/28/95	18:00:00	0.38	48.06	-0.32
8/29/95	0:00:00	0.41	48.02	-0.28
8/29/95	6:00:00	0.08	48.36	-0.62
8/29/95	12:00:00	0.05	48.38	-0.64
8/29/95	18:00:00	0.2	48.23	-0.49
8/30/95	0:00:00	0.27	48.16	-0.42
8/30/95	6:00:00	0.34	48.09	-0.35
8/30/95	12:00:00	0.44	47.99	-0.25
8/30/95	18:00:00	0.52	47.91	-0.17
8/31/95	0:00:00	0.53	47.9	-0.16
8/31/95	6:00:00	0.52	47.91	-0.17
8/31/95	12:00:00	0.57	47.86	-0.12
8/31/95	18:00:00	0.63	47.81	-0.07
9/1/95	0:00:00	0.61	47.82	-0.08
9/1/95	6:00:00	0.59	47.84	-0.1
9/1/95	12:00:00	0.43	48.01	-0.27
9/1/95	18:00:00	0.47	47.96	-0.22
9/2/95	0:00:00	0.53	47.9	-0.16

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
 Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
9/2/95	6:00:00	0.58	47.85	-0.11
9/2/95	12:00:00	0.48	47.95	-0.21
9/2/95	18:00:00	0.69	47.74	0
9/3/95	0:00:00	0.71	47.72	0.02
9/3/95	6:00:00	0.73	47.7	0.04
9/3/95	12:00:00	0.77	47.66	0.08
9/3/95	18:00:00	0.82	47.61	0.13
9/4/95	0:00:00	0.83	47.6	0.14
9/4/95	6:00:00	0.84	47.59	0.15
9/4/95	12:00:00	0.73	47.7	0.04
9/4/95	18:00:00	0.88	47.56	0.18
9/5/95	0:00:00	0.89	47.54	0.2
9/5/95	6:00:00	0.93	47.51	0.23
9/5/95	12:00:00	0.94	47.49	0.25
9/5/95	18:00:00	0.88	47.56	0.18
9/6/95	0:00:00	0.88	47.56	0.18
9/6/95	6:00:00	0.91	47.52	0.22
9/6/95	12:00:00	0.75	47.68	0.06
9/6/95	18:00:00	0.82	47.61	0.13
9/7/95	0:00:00	0.84	47.59	0.15
9/7/95	6:00:00	0.88	47.56	0.18
9/7/95	12:00:00	0.91	47.52	0.22
9/7/95	18:00:00	0.96	47.47	0.27
9/8/95	0:00:00	0.57	47.86	-0.12
9/8/95	6:00:00	0.59	47.84	-0.1
9/8/95	12:00:00	0.64	47.79	-0.05
9/8/95	18:00:00	0.72	47.71	0.03
9/9/95	0:00:00	0.77	47.66	0.08
9/9/95	6:00:00	0.82	47.61	0.13
9/9/95	12:00:00	0.83	47.6	0.14
9/9/95	18:00:00	0.91	47.52	0.22
9/10/95	0:00:00	0.94	47.49	0.25
9/10/95	6:00:00	0.96	47.47	0.27
9/10/95	12:00:00	0.94	47.49	0.25
9/10/95	18:00:00	0.98	47.45	0.29
9/11/95	0:00:00	1.02	47.41	0.33
9/11/95	6:00:00	1.05	47.38	0.36
9/11/95	12:00:00	1.05	47.38	0.36
9/11/95	18:00:00	0.91	47.52	0.22
9/12/95	0:00:00	1.08	47.35	0.39
9/12/95	6:00:00	1.08	47.35	0.39
9/12/95	12:00:00	1.07	47.36	0.38
9/12/95	18:00:00	1.1	47.33	0.41
9/13/95	0:00:00	1.1	47.33	0.41
9/13/95	6:00:00	1.11	47.32	0.42
9/13/95	12:00:00	1.14	47.29	0.45
9/13/95	18:00:00	1.16	47.27	0.47

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
 Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
9/14/95	0:00:00	0.39	48.04	-0.3
9/14/95	6:00:00	0.46	47.97	-0.23
9/14/95	12:00:00	0.53	47.9	-0.16
9/14/95	18:00:00	0.64	47.79	-0.05
9/15/95	0:00:00	0.09	48.34	-0.6
9/15/95	6:00:00	0.09	48.34	-0.6
9/15/95	12:00:00	0.09	48.34	-0.6
9/15/95	18:00:00	0.02	48.41	-0.67
9/16/95	0:00:00	0.05	48.38	-0.64
9/16/95	6:00:00	0.13	48.31	-0.57
9/16/95	12:00:00	0.19	48.24	-0.5
9/16/95	18:00:00	0.27	48.16	-0.42
9/17/95	0:00:00	0.32	48.11	-0.37
9/17/95	6:00:00	0.33	48.11	-0.37
9/17/95	12:00:00	0.3	48.13	-0.39
9/17/95	18:00:00	0.38	48.06	-0.32
9/18/95	0:00:00	0.43	48.01	-0.27
9/18/95	6:00:00	0.47	47.96	-0.22
9/18/95	12:00:00	0.52	47.91	-0.17
9/18/95	18:00:00	0.58	47.85	-0.11
9/19/95	0:00:00	0.61	47.82	-0.08
9/19/95	6:00:00	0.59	47.84	-0.1
9/19/95	12:00:00	0.64	47.79	-0.05
9/19/95	18:00:00	0.69	47.74	0
9/20/95	0:00:00	0.71	47.72	0.02
9/20/95	6:00:00	0.73	47.7	0.04
9/20/95	12:00:00	0.77	47.66	0.08
9/20/95	18:00:00	0.82	47.61	0.13
9/21/95	0:00:00	0.83	47.6	0.14
9/21/95	6:00:00	0.84	47.59	0.15
9/21/95	12:00:00	0.86	47.57	0.17
9/21/95	18:00:00	0.89	47.54	0.2
9/22/95	0:00:00	0.91	47.52	0.22
9/22/95	6:00:00	0.93	47.51	0.23
9/22/95	12:00:00	0.94	47.49	0.25
9/22/95	18:00:00	0.98	47.46	0.28
9/23/95	0:00:00	0.96	47.47	0.27
9/23/95	6:00:00	0.98	47.46	0.28
9/23/95	12:00:00	0.98	47.45	0.29
9/23/95	18:00:00	0.98	47.45	0.29
9/24/95	0:00:00	0.57	47.86	-0.12
9/24/95	6:00:00	0.44	47.99	-0.25
9/24/95	12:00:00	0.47	47.96	-0.22
9/24/95	18:00:00	0.39	48.04	-0.3
9/25/95	0:00:00	0.58	47.85	-0.11
9/25/95	6:00:00	0.66	47.77	-0.03
9/25/95	12:00:00	0.69	47.74	0

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
9/25/95	18:00:00	0.73	47.7	0.04
9/26/95	0:00:00	0.77	47.66	0.08
9/26/95	6:00:00	0.75	47.68	0.06
9/26/95	12:00:00	0.77	47.66	0.08
9/26/95	18:00:00	0.82	47.61	0.13
9/27/95	0:00:00	0.84	47.59	0.15
9/27/95	6:00:00	0.86	47.57	0.17
9/27/95	12:00:00	0.88	47.56	0.18
9/27/95	18:00:00	0.38	48.06	-0.32
9/28/95	0:00:00	0	48.43	-0.69
9/28/95	6:00:00	0.13	48.31	-0.57
9/28/95	12:00:00	0.2	48.23	-0.49
9/28/95	18:00:00	0.32	48.11	-0.37
9/29/95	0:00:00	0.38	48.06	-0.32
9/29/95	6:00:00	0.41	48.02	-0.28
9/29/95	12:00:00	0.47	47.96	-0.22
9/29/95	18:00:00	0.53	47.9	-0.16
9/30/95	0:00:00	0.57	47.86	-0.12
9/30/95	6:00:00	0.58	47.85	-0.11
9/30/95	12:00:00	0.61	47.82	-0.08
9/30/95	18:00:00	0.61	47.82	-0.08
10/1/95	0:00:00	0	48.43	-0.69
10/1/95	6:00:00	0.02	48.41	-0.67
10/1/95	12:00:00	0.07	48.36	-0.62
10/1/95	18:00:00	0.11	48.32	-0.58
10/2/95	0:00:00	0.27	48.16	-0.42
10/2/95	6:00:00	0.36	48.07	-0.33
10/2/95	12:00:00	0.39	48.04	-0.3
10/2/95	18:00:00	0.5	47.93	-0.19
10/3/95	0:00:00	0.52	47.91	-0.17
10/3/95	6:00:00	0.53	47.9	-0.16
10/3/95	12:00:00	0.58	47.85	-0.11
10/3/95	18:00:00	0.59	47.84	-0.1
10/4/95	0:00:00	0.57	47.86	-0.12
10/4/95	6:00:00	0.55	47.88	-0.14
10/4/95	12:00:00	0.61	47.82	-0.08
10/4/95	18:00:00	0.64	47.79	-0.05
10/5/95	0:00:00	0.66	47.77	-0.03
10/5/95	6:00:00	0.52	47.91	-0.17
10/5/95	12:00:00	0.46	47.97	-0.23
10/5/95	12:00:00	0.46	47.97	-0.23
10/5/95	18:00:00	0.57	47.86	-0.12
10/6/95	0:00:00	0.68	47.76	-0.02
10/6/95	6:00:00	0.66	47.77	-0.03
10/6/95	12:00:00	0.64	47.79	-0.05
10/6/95	18:00:00	0.43	48.01	-0.27
10/7/95	0:00:00	0.47	47.96	-0.22

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
10/7/95	6:00:00	0.52	47.91	-0.17
10/7/95	12:00:00	0.57	47.86	-0.12
10/7/95	18:00:00	0.71	47.72	0.02
10/8/95	0:00:00	0.73	47.7	0.04
10/8/95	6:00:00	0.73	47.7	0.04
10/8/95	12:00:00	0.58	47.85	-0.11
10/8/95	18:00:00	0.71	47.72	0.02
10/9/95	0:00:00	0.66	47.77	-0.03
10/9/95	6:00:00	0.25	48.18	-0.44
10/9/95	12:00:00	0.09	48.34	-0.6
10/9/95	18:00:00	0.09	48.34	-0.6
10/10/95	0:00:00	0.09	48.34	-0.6
10/10/95	6:00:00	0.09	48.34	-0.6
10/10/95	12:00:00	0.09	48.34	-0.6
10/10/95	18:00:00	0.09	48.34	-0.6
10/11/95	0:00:00	0.09	48.34	-0.6
10/11/95	6:00:00	0.09	48.34	-0.6
10/11/95	12:00:00	0.09	48.34	-0.6
10/11/95	18:00:00	0.09	48.34	-0.6
10/12/95	0:00:00	0.09	48.34	-0.6
10/12/95	6:00:00	0.09	48.34	-0.6
10/12/95	12:00:00	0.09	48.34	-0.6
10/12/95	18:00:00	0.09	48.34	-0.6
10/13/95	0:00:00	0.08	48.36	-0.62
10/13/95	6:00:00	0.03	48.4	-0.66
10/13/95	12:00:00	0.03	48.4	-0.66
10/13/95	18:00:00	0.05	48.38	-0.64
10/14/95	0:00:00	0.07	48.36	-0.62
10/14/95	6:00:00	0.09	48.34	-0.6
10/14/95	12:00:00	0.09	48.34	-0.6
10/14/95	18:00:00	0.09	48.34	-0.6
10/15/95	0:00:00	0.09	48.34	-0.6
10/15/95	6:00:00	0.09	48.34	-0.6
10/15/95	12:00:00	0.09	48.34	-0.6
10/15/95	18:00:00	0.09	48.34	-0.6
10/16/95	0:00:00	0.09	48.34	-0.6
10/16/95	6:00:00	0.09	48.34	-0.6
10/16/95	12:00:00	0.09	48.34	-0.6
10/16/95	18:00:00	0.02	48.41	-0.67
10/17/95	0:00:00	0.03	48.4	-0.66
10/17/95	6:00:00	0.08	48.36	-0.62
10/17/95	12:00:00	0.11	48.32	-0.58
10/17/95	18:00:00	0.16	48.27	-0.53
10/18/95	0:00:00	0.16	48.27	-0.53
10/18/95	6:00:00	0.19	48.24	-0.5
10/18/95	12:00:00	0.19	48.24	-0.5
10/18/95	18:00:00	0.23	48.2	-0.46

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
10/19/95	0:00:00	0.23	48.2	-0.46
10/19/95	6:00:00	0.25	48.18	-0.44
10/19/95	12:00:00	0.25	48.18	-0.44
10/19/95	18:00:00	0.28	48.15	-0.41
10/20/95	0:00:00	0.27	48.16	-0.42
10/20/95	6:00:00	0.27	48.16	-0.42
10/20/95	12:00:00	0.25	48.18	-0.44
10/20/95	18:00:00	0.23	48.2	-0.46
10/21/95	0:00:00	0.3	48.13	-0.39
10/21/95	6:00:00	0.39	48.04	-0.3
10/21/95	12:00:00	0.41	48.02	-0.28
10/21/95	18:00:00	0.41	48.02	-0.28
10/22/95	0:00:00	0.43	48.01	-0.27
10/22/95	6:00:00	0.47	47.96	-0.22
10/22/95	12:00:00	0.46	47.97	-0.23
10/22/95	18:00:00	0.5	47.93	-0.19
10/23/95	0:00:00	0.52	47.91	-0.17
10/23/95	6:00:00	0.53	47.9	-0.16
10/23/95	12:00:00	0.52	47.91	-0.17
10/23/95	18:00:00	0.5	47.93	-0.19
10/24/95	0:00:00	0.46	47.97	-0.23
10/24/95	6:00:00	0.46	47.97	-0.23
10/24/95	12:00:00	0.46	47.97	-0.23
10/24/95	18:00:00	0.53	47.9	-0.16
10/25/95	0:00:00	0.5	47.93	-0.19
10/25/95	6:00:00	0.52	47.91	-0.17
10/25/95	12:00:00	0.53	47.9	-0.16
10/25/95	18:00:00	0.59	47.84	-0.1
10/26/95	0:00:00	0.57	47.86	-0.12
10/26/95	6:00:00	0.57	47.86	-0.12
10/26/95	12:00:00	0.58	47.85	-0.11
10/26/95	18:00:00	0.61	47.82	-0.08
10/27/95	0:00:00	0.61	47.82	-0.08
10/27/95	6:00:00	0.63	47.81	-0.07
10/27/95	12:00:00	0.63	47.81	-0.07
10/27/95	18:00:00	0.71	47.72	0.02
10/28/95	0:00:00	0.66	47.77	-0.03
10/28/95	6:00:00	0.71	47.72	0.02
10/28/95	12:00:00	0.72	47.71	0.03
10/28/95	18:00:00	0.8	47.63	0.11
10/29/95	0:00:00	0.83	47.6	0.14
10/29/95	6:00:00	0.8	47.63	0.11
10/29/95	12:00:00	0.8	47.63	0.11
10/29/95	18:00:00	0.8	47.63	0.11
10/30/95	0:00:00	0.88	47.56	0.18
10/30/95	6:00:00	0.73	47.7	0.04
10/30/95	12:00:00	0.59	47.84	-0.1

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
10/30/95	18:00:00	0.96	47.47	0.27
10/31/95	0:00:00	0.98	47.46	0.28
10/31/95	6:00:00	0.98	47.46	0.28
10/31/95	12:00:00	0.98	47.46	0.28
10/31/95	18:00:00	0.96	47.47	0.27
11/1/95	0:00:00	0.93	47.51	0.23
11/1/95	6:00:00	0.93	47.51	0.23
11/1/95	12:00:00	0.91	47.52	0.22
11/1/95	18:00:00	0.55	47.88	-0.14
11/2/95	0:00:00	0.48	47.95	-0.21
11/2/95	6:00:00	0.57	47.86	-0.12
11/2/95	12:00:00	0.57	47.86	-0.12
11/2/95	18:00:00	0.66	47.77	-0.03
11/3/95	0:00:00	0.64	47.79	-0.05
11/3/95	6:00:00	0.66	47.77	-0.03
11/3/95	12:00:00	0.66	47.77	-0.03
11/3/95	18:00:00	0.68	47.76	-0.02
11/4/95	0:00:00	0.59	47.84	-0.1
11/4/95	6:00:00	0.59	47.84	-0.1
11/4/95	12:00:00	0.48	47.95	-0.21
11/4/95	18:00:00	0.78	47.65	0.09
11/5/95	0:00:00	0.73	47.7	0.04
11/5/95	6:00:00	0.71	47.72	0.02
11/5/95	12:00:00	0.75	47.68	0.06
11/5/95	18:00:00	0.91	47.52	0.22
11/6/95	0:00:00	0.86	47.57	0.17
11/6/95	6:00:00	0.84	47.59	0.15
11/6/95	12:00:00	0.94	47.49	0.25
11/6/95	18:00:00	0.93	47.51	0.23
11/7/95	0:00:00	0.94	47.49	0.25
11/7/95	6:00:00	0.89	47.54	0.2
11/7/95	12:00:00	0.89	47.54	0.2
11/7/95	18:00:00	0.94	47.49	0.25
11/8/95	0:00:00	0.66	47.77	-0.03
11/8/95	6:00:00	0.55	47.88	-0.14
11/8/95	12:00:00	0.59	47.84	-0.1
11/8/95	18:00:00	0.63	47.81	-0.07
11/9/95	0:00:00	0.61	47.82	-0.08
11/9/95	6:00:00	0.71	47.72	0.02
11/9/95	12:00:00	0.66	47.77	-0.03
11/9/95	18:00:00	0.75	47.68	0.06
11/10/95	0:00:00	0.77	47.66	0.08
11/10/95	6:00:00	0.78	47.65	0.09
11/10/95	12:00:00	0.77	47.66	0.08
11/10/95	18:00:00	0.77	47.66	0.08
11/11/95	0:00:00	0.75	47.68	0.06
11/11/95	6:00:00	0.75	47.68	0.06

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
11/11/95	12:00:00	0.73	47.7	0.04
11/11/95	18:00:00	0.8	47.63	0.11
11/12/95	0:00:00	0.78	47.65	0.09
11/12/95	6:00:00	0.77	47.66	0.08
11/12/95	12:00:00	0.78	47.65	0.09
11/12/95	18:00:00	0.78	47.65	0.09
11/13/95	0:00:00	0.78	47.65	0.09
11/13/95	6:00:00	0.8	47.63	0.11
11/13/95	12:00:00	0.78	47.65	0.09
11/13/95	18:00:00	0.78	47.65	0.09
11/14/95	0:00:00	0.84	47.59	0.15
11/14/95	6:00:00	0.82	47.61	0.13
11/14/95	12:00:00	0.8	47.63	0.11
11/14/95	18:00:00	0.78	47.65	0.09
11/15/95	0:00:00	0.78	47.65	0.09
11/15/95	6:00:00	0.8	47.63	0.11
11/15/95	12:00:00	0.82	47.61	0.13
11/15/95	18:00:00	0.84	47.59	0.15
11/16/95	0:00:00	0.88	47.56	0.18
11/16/95	6:00:00	0.91	47.52	0.22
11/16/95	12:00:00	0.94	47.49	0.25
11/16/95	18:00:00	0.98	47.45	0.29
11/17/95	0:00:00	0.98	47.45	0.29
11/17/95	6:00:00	1.08	47.35	0.39
11/17/95	12:00:00	1.1	47.33	0.41
11/17/95	18:00:00	1.13	47.31	0.43
11/18/95	0:00:00	1.16	47.27	0.47
11/18/95	6:00:00	1.18	47.26	0.48
11/18/95	12:00:00	1.16	47.27	0.47
11/18/95	18:00:00	1.23	47.2	0.54
11/19/95	0:00:00	1.25	47.18	0.56
11/19/95	6:00:00	1.27	47.16	0.58
11/19/95	12:00:00	1.25	47.18	0.56
11/19/95	18:00:00	1.3	47.13	0.61
11/20/95	0:00:00	1.18	47.26	0.48
11/20/95	6:00:00	1.25	47.18	0.56
11/20/95	12:00:00	1.23	47.21	0.53
11/20/95	18:00:00	1.23	47.2	0.54
11/21/95	0:00:00	1.07	47.36	0.38
11/21/95	6:00:00	1.21	47.22	0.52
11/21/95	12:00:00	1.25	47.18	0.56
11/21/95	18:00:00	1.25	47.18	0.56
11/22/95	0:00:00	1.27	47.16	0.58
11/22/95	6:00:00	1.23	47.21	0.53
11/22/95	12:00:00	1.18	47.26	0.48
11/22/95	18:00:00	1.25	47.18	0.56
11/23/95	0:00:00	1.25	47.18	0.56

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
11/23/95	6:00:00	1.27	47.16	0.58
11/23/95	12:00:00	1.27	47.16	0.58
11/23/95	18:00:00	1.28	47.15	0.59
11/24/95	0:00:00	1.3	47.13	0.61
11/24/95	6:00:00	1.28	47.15	0.59
11/24/95	12:00:00	1.27	47.16	0.58
11/24/95	18:00:00	1.32	47.11	0.63
11/25/95	0:00:00	1.27	47.16	0.58
11/25/95	6:00:00	1.28	47.15	0.59
11/25/95	12:00:00	1.25	47.18	0.56
11/25/95	18:00:00	1.23	47.2	0.54
11/26/95	0:00:00	1.23	47.2	0.54
11/26/95	6:00:00	1.23	47.21	0.53
11/26/95	12:00:00	1.18	47.26	0.48
11/26/95	18:00:00	1.25	47.18	0.56
11/27/95	0:00:00	1.32	47.11	0.63
11/27/95	6:00:00	1.28	47.15	0.59
11/27/95	12:00:00	1.33	47.1	0.64
11/27/95	18:00:00	1.36	47.07	0.67
11/28/95	0:00:00	1.35	47.08	0.66
11/28/95	6:00:00	1.32	47.11	0.63
11/28/95	12:00:00	1.36	47.07	0.67
11/28/95	18:00:00	1.35	47.08	0.66
11/29/95	0:00:00	1.32	47.11	0.63
11/29/95	6:00:00	1.23	47.21	0.53
11/29/95	12:00:00	1.27	47.16	0.58
11/29/95	18:00:00	1.19	47.24	0.5
11/30/95	0:00:00	1.23	47.21	0.53
11/30/95	6:00:00	1.16	47.27	0.47
11/30/95	12:00:00	1.16	47.27	0.47
11/30/95	18:00:00	1.19	47.24	0.5
12/1/95	0:00:00	1.27	47.16	0.58
12/1/95	6:00:00	1.28	47.15	0.59
12/1/95	12:00:00	1.3	47.13	0.61
12/1/95	18:00:00	1.25	47.18	0.56
12/2/95	0:00:00	1.28	47.15	0.59
12/2/95	6:00:00	1.28	47.15	0.59
12/2/95	12:00:00	1.28	47.15	0.59
12/2/95	18:00:00	1.35	47.08	0.66
12/3/95	0:00:00	1.33	47.1	0.64
12/3/95	6:00:00	1.3	47.13	0.61
12/3/95	12:00:00	1.23	47.2	0.54
12/3/95	18:00:00	1.35	47.08	0.66
12/4/95	0:00:00	1.36	47.07	0.67
12/4/95	6:00:00	1.39	47.04	0.7
12/4/95	12:00:00	1.36	47.07	0.67
12/4/95	18:00:00	1.35	47.08	0.66

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
12/5/95	0:00:00	1.36	47.07	0.67
12/5/95	6:00:00	1.35	47.08	0.66
12/5/95	12:00:00	1.36	47.07	0.67
12/5/95	18:00:00	1.36	47.07	0.67
12/6/95	0:00:00	1.39	47.04	0.7
12/6/95	6:00:00	1.36	47.07	0.67
12/6/95	12:00:00	1.35	47.08	0.66
12/6/95	18:00:00	1.36	47.07	0.67
12/7/95	0:00:00	1.44	46.99	0.75
12/7/95	6:00:00	1.43	47.01	0.73
12/7/95	12:00:00	1.39	47.04	0.7
12/7/95	18:00:00	1.39	47.04	0.7
12/8/95	0:00:00	1.38	47.06	0.68
12/8/95	6:00:00	1.36	47.07	0.67
12/8/95	12:00:00	1.36	47.07	0.67
12/8/95	18:00:00	1.38	47.06	0.68
12/9/95	0:00:00	1.36	47.07	0.67
12/9/95	6:00:00	1.36	47.07	0.67
12/9/95	12:00:00	1.36	47.07	0.67
12/9/95	18:00:00	1.46	46.97	0.77
12/10/95	0:00:00	1.44	46.99	0.75
12/10/95	6:00:00	1.44	46.99	0.75
12/10/95	12:00:00	1.46	46.97	0.77
12/10/95	18:00:00	1.55	46.88	0.86
12/11/95	0:00:00	1.5	46.93	0.81
12/11/95	6:00:00	1.62	46.81	0.93
12/11/95	12:00:00	1.64	46.79	0.95
12/11/95	18:00:00	1.68	46.76	0.98
12/12/95	0:00:00	1.71	46.72	1.02
12/12/95	6:00:00	1.73	46.71	1.03
12/12/95	12:00:00	1.73	46.71	1.03
12/12/95	18:00:00	1.73	46.71	1.03
12/13/95	0:00:00	1.73	46.71	1.03
12/13/95	6:00:00	1.73	46.71	1.03
12/13/95	12:00:00	1.71	46.72	1.02
12/13/95	18:00:00	1.74	46.69	1.05
12/14/95	0:00:00	1.75	46.68	1.06
12/14/95	6:00:00	1.75	46.68	1.06
12/14/95	12:00:00	1.75	46.68	1.06
12/14/95	18:00:00	1.73	46.71	1.03
12/15/95	0:00:00	1.73	46.71	1.03
12/15/95	6:00:00	1.74	46.69	1.05
12/15/95	12:00:00	1.74	46.69	1.05
12/15/95	18:00:00	1.75	46.68	1.06
12/16/95	0:00:00	1.77	46.66	1.08
12/16/95	6:00:00	1.77	46.66	1.08
12/16/95	12:00:00	1.74	46.69	1.05

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
12/16/95	18:00:00	1.82	46.61	1.13
12/17/95	0:00:00	1.82	46.61	1.13
12/17/95	6:00:00	1.83	46.6	1.14
12/17/95	12:00:00	1.82	46.61	1.13
12/17/95	18:00:00	1.82	46.61	1.13
12/18/95	0:00:00	1.8	46.63	1.11
12/18/95	6:00:00	1.78	46.65	1.09
12/18/95	12:00:00	1.75	46.68	1.06
12/18/95	18:00:00	1.75	46.68	1.06
12/19/95	0:00:00	1.74	46.69	1.05
12/19/95	6:00:00	1.73	46.71	1.03
12/19/95	12:00:00	1.68	46.76	0.98
12/19/95	18:00:00	1.53	46.9	0.84
12/20/95	0:00:00	1.46	46.97	0.77
12/20/95	6:00:00	1.46	46.97	0.77
12/20/95	12:00:00	1.33	47.1	0.64
12/20/95	18:00:00	1.44	46.99	0.75
12/21/95	0:00:00	1.44	46.99	0.75
12/21/95	6:00:00	1.49	46.94	0.8
12/21/95	12:00:00	1.5	46.93	0.81
12/21/95	18:00:00	1.53	46.9	0.84
12/22/95	0:00:00	1.55	46.88	0.86
12/22/95	6:00:00	1.58	46.85	0.89
12/22/95	12:00:00	1.6	46.83	0.91
12/22/95	18:00:00	1.63	46.81	0.93
12/23/95	0:00:00	1.64	46.79	0.95
12/23/95	6:00:00	1.64	46.79	0.95
12/23/95	12:00:00	1.6	46.83	0.91
12/23/95	18:00:00	1.66	46.77	0.97
12/24/95	0:00:00	1.68	46.76	0.98
12/24/95	6:00:00	1.69	46.74	1
12/24/95	12:00:00	1.58	46.85	0.89
12/24/95	18:00:00	1.82	46.61	1.13
12/25/95	0:00:00	1.85	46.58	1.16
12/25/95	6:00:00	1.87	46.56	1.18
12/25/95	12:00:00	1.88	46.55	1.19
12/25/95	18:00:00	1.89	46.54	1.2
12/26/95	0:00:00	1.89	46.54	1.2
12/26/95	6:00:00	1.91	46.52	1.22
12/26/95	12:00:00	1.93	46.51	1.23
12/26/95	18:00:00	1.93	46.51	1.23
12/27/95	0:00:00	1.94	46.49	1.25
12/27/95	6:00:00	1.96	46.47	1.27
12/27/95	12:00:00	1.89	46.54	1.2
12/27/95	18:00:00	1.96	46.47	1.27
12/28/95	0:00:00	1.98	46.46	1.28
12/28/95	6:00:00	1.99	46.44	1.3

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
12/28/95	12:00:00	1.96	46.47	1.27
12/28/95	18:00:00	1.99	46.44	1.3
12/29/95	0:00:00	1.98	46.46	1.28
12/29/95	6:00:00	2.01	46.42	1.32
12/29/95	12:00:00	1.91	46.52	1.22
12/29/95	18:00:00	1.99	46.44	1.3
12/30/95	0:00:00	2.01	46.42	1.32
12/30/95	6:00:00	2.01	46.42	1.32
12/30/95	12:00:00	1.98	46.46	1.28
12/30/95	18:00:00	1.99	46.44	1.3
12/31/95	0:00:00	1.93	46.51	1.23
12/31/95	6:00:00	1.99	46.44	1.3
12/31/95	12:00:00	1.98	46.46	1.28
12/31/95	18:00:00	1.94	46.49	1.25
1/1/96	0:00:00	1.98	46.46	1.28
1/1/96	6:00:00	1.96	46.47	1.27
1/1/96	12:00:00	1.69	46.74	1
1/1/96	18:00:00	1.53	46.9	0.84
1/2/96	0:00:00	1.44	46.99	0.75
1/2/96	6:00:00	1.48	46.96	0.78
1/2/96	12:00:00	1.44	46.99	0.75
1/2/96	18:00:00	1.33	47.1	0.64
1/3/96	0:00:00	1.18	47.26	0.48
1/3/96	6:00:00	1.18	47.26	0.48
1/3/96	12:00:00	1.14	47.29	0.45
1/3/96	18:00:00	1.16	47.27	0.47
1/4/96	0:00:00	1.14	47.29	0.45
1/4/96	6:00:00	1.23	47.2	0.54
1/4/96	12:00:00	1.19	47.24	0.5
1/4/96	18:00:00	1.32	47.11	0.63
1/5/96	0:00:00	1.33	47.1	0.64
1/5/96	6:00:00	1.35	47.08	0.66
1/5/96	12:00:00	1.35	47.08	0.66
1/5/96	18:00:00	1.38	47.06	0.68
1/6/96	0:00:00	1.39	47.04	0.7
1/6/96	6:00:00	1.41	47.02	0.72
1/6/96	12:00:00	1.35	47.08	0.66
1/6/96	18:00:00	1.39	47.04	0.7
1/7/96	0:00:00	1.35	47.08	0.66
1/7/96	6:00:00	1.39	47.04	0.7
1/7/96	12:00:00	1.43	47.01	0.73
1/7/96	18:00:00	1.43	47.01	0.73
1/8/96	0:00:00	1.44	46.99	0.75
1/8/96	6:00:00	1.48	46.96	0.78
1/8/96	12:00:00	1.48	46.96	0.78
1/8/96	18:00:00	1.48	46.96	0.78
1/9/96	0:00:00	1.48	46.96	0.78

*As recorded on Remote Data Sensing Unit and subsequently downloaded.

SDA Florida OWTS Project
Table E-2 Unsaturated Zone Thickness

Date	Time	DTW*	WTE	Unsat.
1/9/96	6:00:00	1.49	46.94	0.8
1/9/96	12:00:00	1.49	46.94	0.8
1/9/96	18:00:00	1.49	46.94	0.8
1/10/96	0:00:00	1.48	46.96	0.78
1/10/96	6:00:00	1.52	46.91	0.83
1/10/96	12:00:00	1.52	46.91	0.83
1/10/96	18:00:00	1.55	46.88	0.86
1/11/96	0:00:00	1.53	46.9	0.84
1/11/96	6:00:00	1.58	46.85	0.89
1/11/96	12:00:00	1.53	46.9	0.84
1/11/96	18:00:00	1.58	46.85	0.89
1/12/96	0:00:00	1.5	46.93	0.81
1/12/96	6:00:00	1.6	46.83	0.91
1/12/96	12:00:00	1.6	46.83	0.91
1/12/96	18:00:00	1.63	46.81	0.93
1/13/96	0:00:00	1.64	46.79	0.95
1/13/96	6:00:00	1.64	46.79	0.95
1/13/96	12:00:00	1.66	46.77	0.97
1/13/96	18:00:00	1.68	46.76	0.98
1/14/96	0:00:00	1.69	46.74	1
1/14/96	6:00:00	1.68	46.76	0.98
1/14/96	12:00:00	1.69	46.74	1
1/14/96	18:00:00	1.71	46.72	1.02
1/15/96	0:00:00	1.74	46.69	1.05
1/15/96	6:00:00	1.74	46.69	1.05
1/15/96	12:00:00	1.74	46.69	1.05

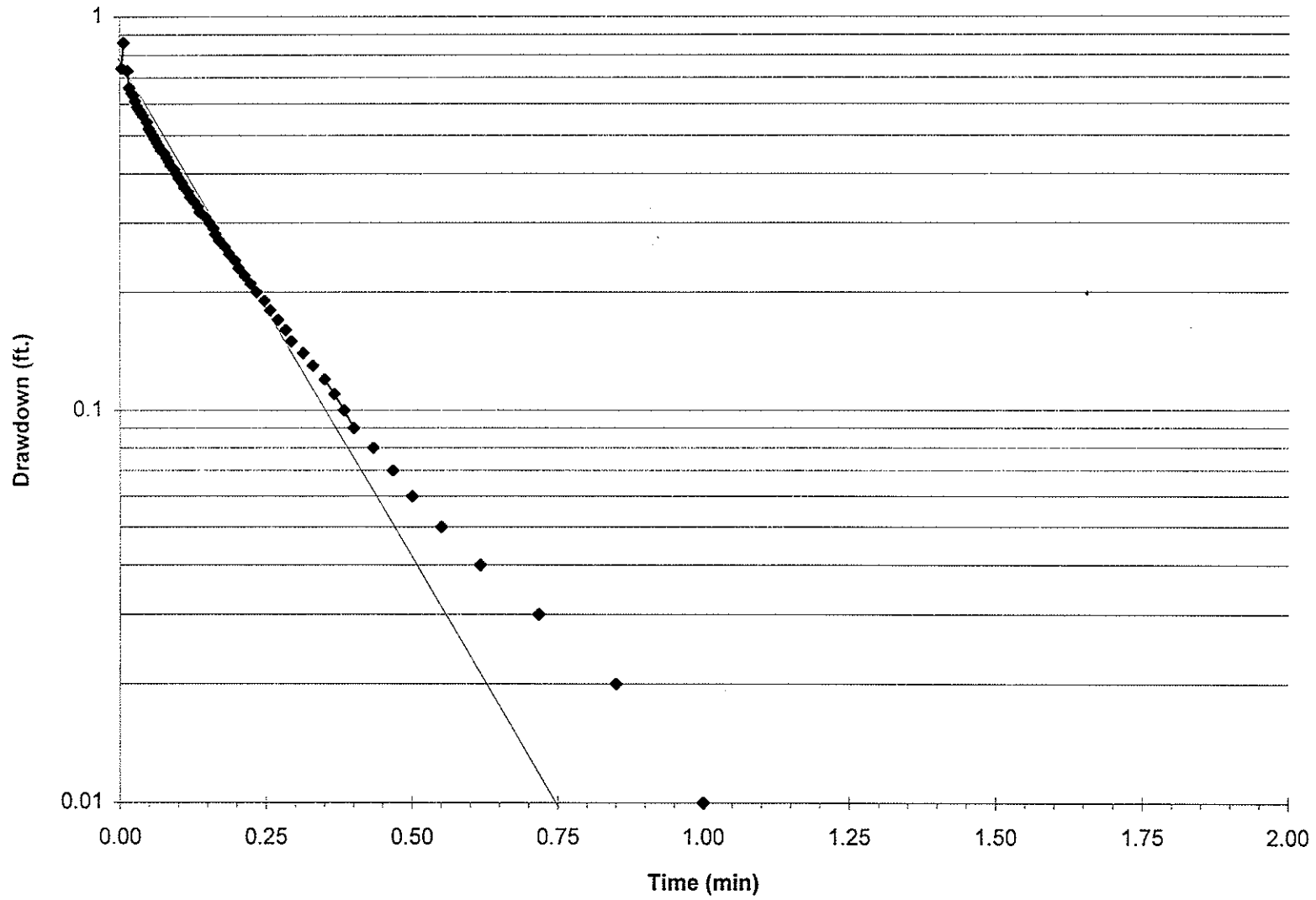
*As recorded on Remote Data Sensing Unit and subsequently downloaded.

F1: Well W5 Slug Test Data

SDA Florida OWTS Project
Table F-1 Well W-5 Slug Test Analysis

SLUG TEST ANALYSIS					
W-5					
Location:		SDA St. Johns County, Fl			
Project #:		00-4155.30			
Date:		2/23/95			
Well #		W-5			
Well Depth (ft)		8.8			
Static Water Depth (ft)		2.72			
Depth to Screen Top (ft)		0.5			
Well Radius (ft)		0.0833			
Annulus Radius (ft)		0.2812			
Aquifer Thickness (ft)		50			
Standing Water Height (ft)		6.08			
Screen Length (t)		8.8			
Screened Aquifer		6.08			
Slug Removed					
Bailer Radius (ft.)		0.06			
Bailer length (ft)		2.85			
Slug Volume (gal.)		0.27			
Initial Drawdown (ft)		0.90			
Bower Rice Empirical Values					
		L/rw		B	C
		5	1.7	0.25	0.09
		10	1.8	0.3	1.25
		50	3.05	0.5	2.6
		100	4.4	0.075	4.1
		500	8.1	2.12	10.55
		1000	9.1	2.83	12.25
L/Rw for well		21.621622			
Now Display Type Curve Graph To Find A, B, and C					
A-value	2			1.88	ln (Re/rw) when D<H
B-value	0.35			2.28	ln (Re/rw) when D=H
C-value	1.75				
Where: D = Standing Water Height					
H = Aquifer Thickness					
Now Graph/Name/Display/Drawdown to find T and Yt					
Time-Value(sec)	0	45			
Time-Drawdown	0.9	0.01			
Conductivity (ft/sec)		1.07E-04			
Conductivity (ft/min)		6.43E-03			
Conductivity (ft/day)		9.26E+00			
Conductivity (cm/sec)		3.27E-03			
Conductivity (cm/day)		2.82E+02			
Conductivity (ft/yr)		3383.892			

Aquifer Test W-5
SDA St. Johns County, FL



SDA Florida OWTS Project
Table F-1 Well W-5 Slug Test Analysis

02/24 1	7:22				
Unit# 11745	Test 10				
Setups:	INPUT 1				
-----	-----				
Type	Function				
I.D.	52				
Linearity	0.1				
Scale factor	14.91				
Offset	0				
Delay mSEC	50				
Step 0 02/23	13:05:08				
Elapsed Time	INPUT 1	Elapsed Time	Drawdown		
-----	-----	(min.)	(ft.)	Time (min)	Drawdown (ft)
0	2.299	0	2.3	0	0.18
0.0033	1.735	0.0033	1.74	0.0033	0.74
0.0066	1.623	0.0066	1.62	0.0066	0.86
0.01	1.866	0.01	1.87	0.01	
0.0133	1.745	0.0133	1.75	0.0133	0.73
0.0166	1.823	0.0166	1.82	0.0166	0.66
0.02	1.84	0.02	1.84	0.02	0.64
0.0233	1.848	0.0233	1.85	0.0233	0.63
0.0266	1.868	0.0266	1.87	0.0266	0.61
0.03	1.887	0.03	1.89	0.03	0.59
0.0333	1.901	0.0333	1.9	0.0333	0.58
0.0366	1.913	0.0366	1.91	0.0366	0.57
0.04	1.922	0.04	1.92	0.04	0.56
0.0433	1.938	0.0433	1.94	0.0433	
0.0466	1.936	0.0466	1.94	0.0466	0.54
0.05	1.961	0.05	1.96	0.05	0.52
0.0533	1.967	0.0533	1.97	0.0533	0.51
0.0566	1.981	0.0566	1.98	0.0566	0.5
0.06	1.989	0.06	1.99	0.06	0.49
0.0633	1.999	0.0633	2	0.0633	0.48
0.0666	2.01	0.0666	2.01	0.0666	0.47
0.07	2.016	0.07	2.02	0.07	0.46
0.0733	2.028	0.0733	2.03	0.0733	
0.0766	2.034	0.0766	2.03	0.0766	0.45
0.08	2.042	0.08	2.04	0.08	0.44
0.0833	2.051	0.0833	2.05	0.0833	0.43
0.0866	2.061	0.0866	2.06	0.0866	0.42
0.09	2.067	0.09	2.07	0.09	
0.0933	2.073	0.0933	2.07	0.0933	0.41
0.0966	2.083	0.0966	2.08	0.0966	0.4
0.1	2.088	0.1	2.09	0.1	0.39
0.1033	2.096	0.1033	2.1	0.1033	
0.1066	2.104	0.1066	2.1	0.1066	0.38

SDA Florida OWTS Project
Table F-1 Well W-5 Slug Test Analysis

0.11	2.11	0.11	2.11	0.11	0.37
0.1133	2.116	0.1133	2.12	0.1133	
0.1166	2.124	0.1166	2.12	0.1166	0.36
0.12	2.131	0.12	2.13	0.12	0.35
0.1233	2.135	0.1233	2.14	0.1233	
0.1266	2.141	0.1266	2.14	0.1266	0.34
0.13	2.147	0.13	2.15	0.13	
0.1333	2.153	0.1333	2.15	0.1333	0.33
0.1366	2.159	0.1366	2.16	0.1366	0.32
0.14	2.165	0.14	2.17	0.14	
0.1433	2.169	0.1433	2.17	0.1433	
0.1466	2.174	0.1466	2.17	0.1466	0.31
0.15	2.18	0.15	2.18	0.15	
0.1533	2.184	0.1533	2.18	0.1533	0.3
0.1566	2.192	0.1566	2.19	0.1566	
0.16	2.194	0.16	2.19	0.16	0.29
0.1633	2.2	0.1633	2.2	0.1633	0.28
0.1666	2.206	0.1666	2.21	0.1666	
0.17	2.21	0.17	2.21	0.17	0.27
0.1733	2.215	0.1733	2.22	0.1733	
0.1766	2.219	0.1766	2.22	0.1766	
0.18	2.223	0.18	2.22	0.18	0.26
0.1833	2.227	0.1833	2.23	0.1833	
0.1866	2.231	0.1866	2.23	0.1866	0.25
0.19	2.235	0.19	2.24	0.19	
0.1933	2.239	0.1933	2.24	0.1933	
0.1966	2.243	0.1966	2.24	0.1966	0.24
0.2	2.247	0.2	2.25	0.2	
0.2033	2.251	0.2033	2.25	0.2033	0.23
0.2066	2.256	0.2066	2.26	0.2066	
0.21	2.26	0.21	2.26	0.21	
0.2133	2.262	0.2133	2.26	0.2133	0.22
0.2166	2.266	0.2166	2.27	0.2166	
0.22	2.268	0.22	2.27	0.22	
0.2233	2.274	0.2233	2.27	0.2233	0.21
0.2266	2.276	0.2266	2.28	0.2266	
0.23	2.278	0.23	2.28	0.23	
0.2333	2.282	0.2333	2.28	0.2333	0.2
0.2366	2.286	0.2366	2.29	0.2366	
0.24	2.288	0.24	2.29	0.24	
0.2433	2.292	0.2433	2.29	0.2433	
0.2466	2.294	0.2466	2.29	0.2466	0.19
0.25	2.299	0.25	2.3	0.25	
0.2533	2.301	0.2533	2.3	0.2533	
0.2566	2.303	0.2566	2.3	0.2566	0.18
0.26	2.305	0.26	2.31	0.26	
0.2633	2.309	0.2633	2.31	0.2633	

SDA Florida OWTS Project
Table F-1 Well W-5 Slug Test Analysis

0.2666	2.311	0.2666	2.31	0.2666	
0.27	2.313	0.27	2.31	0.27	0.17
0.2733	2.317	0.2733	2.32	0.2733	
0.2766	2.319	0.2766	2.32	0.2766	
0.28	2.323	0.28	2.32	0.28	
0.2833	2.323	0.2833	2.32	0.2833	0.16
0.2866	2.325	0.2866	2.33	0.2866	
0.29	2.327	0.29	2.33	0.29	
0.2933	2.331	0.2933	2.33	0.2933	0.15
0.2966	2.335	0.2966	2.34	0.2966	
0.3	2.338	0.3	2.34	0.3	
0.3033	2.338	0.3033	2.34	0.3033	
0.3066	2.34	0.3066	2.34	0.3066	
0.31	2.342	0.31	2.34	0.31	
0.3133	2.344	0.3133	2.34	0.3133	0.14
0.3166	2.346	0.3166	2.35	0.3166	
0.32	2.35	0.32	2.35	0.32	
0.3233	2.35	0.3233	2.35	0.3233	
0.3266	2.352	0.3266	2.35	0.3266	
0.33	2.354	0.33	2.35	0.33	0.13
0.3333	2.358	0.3333	2.36	0.3333	
0.35	2.364	0.35	2.36	0.35	0.12
0.3666	2.374	0.3666	2.37	0.3666	0.11
0.3833	2.383	0.3833	2.38	0.3833	0.1
0.4	2.389	0.4	2.39	0.4	0.09
0.4166	2.397	0.4166	2.4	0.4166	
0.4333	2.401	0.4333	2.4	0.4333	0.08
0.45	2.407	0.45	2.41	0.45	
0.4666	2.413	0.4666	2.41	0.4666	0.07
0.4833	2.419	0.4833	2.42	0.4833	
0.5	2.422	0.5	2.42	0.5	0.06
0.5166	2.426	0.5166	2.43	0.5166	
0.5333	2.43	0.5333	2.43	0.5333	
0.55	2.434	0.55	2.43	0.55	0.05
0.5666	2.438	0.5666	2.44	0.5666	
0.5833	2.438	0.5833	2.44	0.5833	
0.6	2.442	0.6	2.44	0.6	
0.6166	2.444	0.6166	2.44	0.6166	0.04
0.6333	2.446	0.6333	2.45	0.6333	
0.65	2.448	0.65	2.45	0.65	
0.6666	2.45	0.6666	2.45	0.6666	
0.6833	2.452	0.6833	2.45	0.6833	
0.7	2.454	0.7	2.45	0.7	
0.7166	2.454	0.7166	2.45	0.7166	0.03
0.7333	2.456	0.7333	2.46	0.7333	
0.75	2.458	0.75	2.46	0.75	
0.7666	2.46	0.7666	2.46	0.7666	

SDA Florida OWTS Project
Table F-1 Well W-5 Slug Test Analysis

0.7833	2.46	0.7833	2.46	0.7833	
0.8	2.46	0.8	2.46	0.8	
0.8166	2.462	0.8166	2.46	0.8166	
0.8333	2.462	0.8333	2.46	0.8333	
0.85	2.462	0.85	2.46	0.85	0.02
0.8666	2.465	0.8666	2.47	0.8666	
0.8833	2.467	0.8833	2.47	0.8833	
0.9	2.469	0.9	2.47	0.9	
0.9166	2.467	0.9166	2.47	0.9166	
0.9333	2.469	0.9333	2.47	0.9333	
0.95	2.469	0.95	2.47	0.95	
0.9666	2.471	0.9666	2.47	0.9666	
0.9833	2.471	0.9833	2.47	0.9833	
1	2.471	1	2.47	1	0.01
1.2	2.475	1.2	2.48	1.2	0
1.4	2.477	1.4	2.48	1.4	0
1.6	2.477	1.6	2.48	1.6	0
1.8	2.479	1.8	2.48	1.8	0
2	2.479	2	2.48	2	0
2.2	2.481	2.2	2.48	2.2	0
2.4	2.481	2.4	2.48	2.4	0
2.6	2.483	2.6	2.48	2.6	0
2.8	2.481	2.8	2.48	2.8	0
3	2.483	3	2.48	3	0
3.2	2.483	3.2	2.48	3.2	0
3.4	2.483	3.4	2.48	3.4	0
3.6	2.485	3.6	2.49	3.6	-0.01
3.8	2.483	3.8	2.48	3.8	0
4	2.483	4	2.48	4	0
4.2	2.483	4.2	2.48	4.2	0
4.4	2.483	4.4	2.48	4.4	0
4.6	2.483	4.6	2.48	4.6	0
4.8	2.481	4.8	2.48	4.8	0
5	2.483	5	2.48	5	0
5.2	2.483	5.2	2.48	5.2	0
5.4	2.483	5.4	2.48	5.4	0
5.6	2.483	5.6	2.48	5.6	0
5.8	2.483	5.8	2.48	5.8	0
6	2.483	6	2.48	6	0
6.2	2.483	6.2	2.48	6.2	0
6.4	2.483	6.4	2.48	6.4	0
6.6	2.481	6.6	2.48	6.6	0
6.8	2.481	6.8	2.48	6.8	0
7	2.481	7	2.48	7	0
7.2	2.481	7.2	2.48	7.2	0
7.4	2.483	7.4	2.48	7.4	0
7.6	2.483	7.6	2.48	7.6	0

SDA Florida OWTS Project
Table F-1 Well W-5 Slug Test Analysis

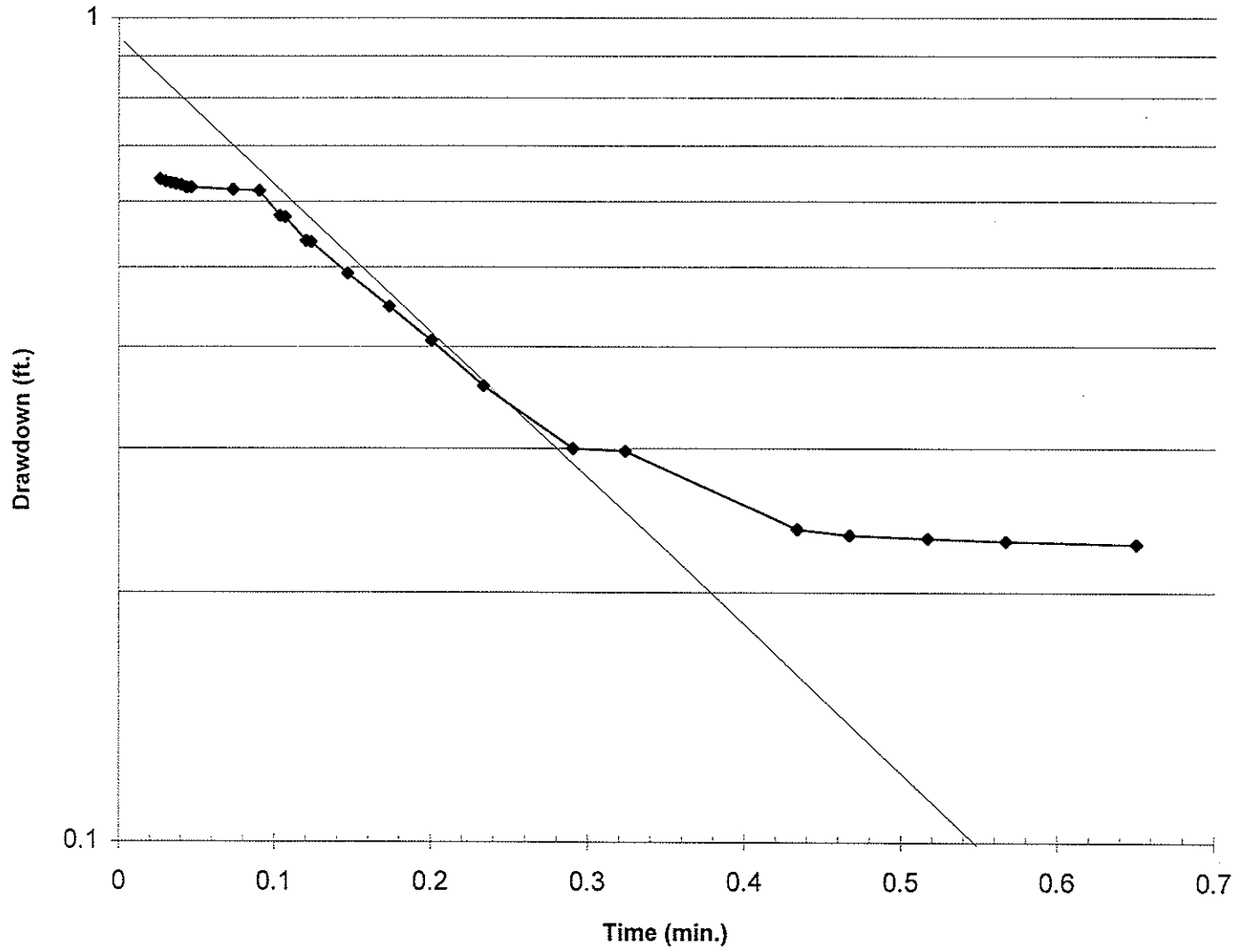
7.8	2.483		7.8	2.48	7.8	0
8	2.483		8	2.48	8	0
8.2	2.483		8.2	2.48	8.2	0
8.4	2.483		8.4	2.48	8.4	0
8.6	2.483		8.6	2.48	8.6	0
8.8	2.483		8.8	2.48	8.8	0
9	2.483		9	2.48	9	0
9.2	2.483		9.2	2.48	9.2	0
9.4	2.483		9.4	2.48	9.4	0
9.6	2.483		9.6	2.48	9.6	0
9.8	2.483		9.8	2.48	9.8	0
10	2.483		10	2.48	10	0

F2: Well SW-9 Slug Test Data

SDA Florida OWTS Project
Table F-2 Well SW-9 Slug Test Analysis

SLUG TEST ANALYSIS					
SW-9					
Location:		SDA St. Johns County, Fl			
Project #:		00-4155.30			
Date:		2/23/95			
Well #		SW-9			
Well Depth (ft)		7.32			
Static Water Depth (ft)		2.17			
Depth to Screen Top (ft)		2.32			
Well Radius (ft)		0.0833			
Annulus Radius (ft)		0.2812			
Aquifer Thickness (ft)		50			
Standing Water Height (ft)		5.15			
Screen Length (t)		7.32			
Screened Aquifer		5.15			
Slug Removed					
Bailer Radius (ft.)		0.06			
Bailer length (ft)		2.85			
Slug Volume (gal.)		0.27			
Initial Drawdown (ft)		0.90			
Bouwer Rice Empirical Values					
		L/rw		B	C
		5	1.7	0.25	0.09
		10	1.8	0.3	1.25
		50	3.05	0.5	2.6
		100	4.4	0.075	4.1
		500	8.1	2.12	10.55
		1000	9.1	2.83	12.25
L/Rw for well		18.314367			
Now Display Type Curve Graph To Find A, B, and C					
A-value	2			1.80	ln (Re/rw) when D<H
B-value	0.25			2.15	ln (Re/rw) when D=H
C-value	1.6				
Where: D = Standing Water Height					
H = Aquifer Thickness					
Now Graph/Name/Display/Drawdown to find T and Yt					
Time-Value(sec)	0	33			
Time-Drawdown	0.9	0.1			
Conductivity (ft/sec)		8.06E-05			
Conductivity (ft/min)		4.83E-03			
Conductivity (ft/day)		6.96E+00			
Conductivity (cm/sec)		2.46E-03			
Conductivity (cm/day)		2.12E+02			
Conductivity (ft/yr)		2542.49			

Aquifer Test MW-9
SDA St. Johns County, FL



SDA Florida OWTS Project
Table F-2 Well SW-9 Slug Test Analysis

SE100	OC			
Environment	al Logger			
02/24 1	7:04			
Unit# 11745	Test 9			
Setups:	INPUT 1			
-----	-----			
Type	Function			
I.D.	51			
Linearity	0.1			
Scale factor	14.91			
Offset	0		tran 2.05	
Delay mSEC	50			
Step 0 02/23	12:29:01			
Elapsed Time	INPUT 1			
-----	-----		Time (min.)	Drawdown (ft.)
0	2.053			
0.0033	2.028		0.0033	
0.0066	1.866		0.0066	
0.01	1.281		0.01	
0.0133	1.234		0.0133	0.816
0.0166	1.524		0.0166	0.526
0.02	1.41		0.02	0.64
0.0233	1.412		0.0233	0.638
0.0266	1.412		0.0266	0.638
0.03	1.416		0.03	0.634
0.0333	1.418		0.0333	0.632
0.0366	1.42		0.0366	0.63
0.04	1.422		0.04	0.628
0.0433	1.426		0.0433	0.624
0.0466	1.426		0.0466	0.624
0.05	1.43		0.05	
0.0533	1.428		0.0533	
0.0566	1.43		0.0566	
0.06	1.43		0.06	
0.0633	1.43		0.0633	
0.0666	1.43		0.0666	
0.07	1.43		0.07	
0.0733	1.43		0.0733	0.62
0.0766	1.432		0.0766	

SDA Florida OWTS Project
Table F-2 Well SW-9 Slug Test Analysis

0.08	1.432		0.08	
0.0833	1.432		0.0833	
0.0866	1.432		0.0866	
0.09	1.432		0.09	0.618
0.0933	1.479		0.0933	
0.0966	1.473		0.0966	
0.1	1.473		0.1	
0.1033	1.473		0.1033	0.577
0.1066	1.475		0.1066	0.575
0.11	1.518		0.11	
0.1133	1.516		0.1133	
0.1166	1.512		0.1166	
0.12	1.512		0.12	0.538
0.1233	1.514		0.1233	0.536
0.1266	1.565		0.1266	
0.13	1.561		0.13	
0.1333	1.559		0.1333	
0.1366	1.559		0.1366	
0.14	1.559		0.14	
0.1433	1.559		0.1433	
0.1466	1.559		0.1466	0.491
0.15	1.608		0.15	
0.1533	1.604		0.1533	
0.1566	1.604		0.1566	
0.16	1.604		0.16	
0.1633	1.604		0.1633	
0.1666	1.604		0.1666	
0.17	1.604		0.17	
0.1733	1.602		0.1733	0.448
0.1766	1.645		0.1766	
0.18	1.643		0.18	
0.1833	1.641		0.1833	
0.1866	1.643		0.1866	
0.19	1.641		0.19	
0.1933	1.643		0.1933	
0.1966	1.641		0.1966	
0.2	1.643		0.2	0.407
0.2033	1.696		0.2033	
0.2066	1.692		0.2066	
0.21	1.69		0.21	
0.2133	1.692		0.2133	
0.2166	1.69		0.2166	
0.22	1.69		0.22	
0.2233	1.69		0.2233	

SDA Florida OWTS Project
Table F-2 Well SW-9 Slug Test Analysis

0.2266	1.69		0.2266	
0.23	1.69		0.23	
0.2333	1.692		0.2333	0.358
0.2366	1.69		0.2366	
0.24	1.69		0.24	
0.2433	1.69		0.2433	
0.2466	1.756		0.2466	
0.25	1.754		0.25	
0.2533	1.75		0.2533	
0.2566	1.75		0.2566	
0.26	1.75		0.26	
0.2633	1.748		0.2633	
0.2666	1.75		0.2666	
0.27	1.75		0.27	
0.2733	1.748		0.2733	
0.2766	1.75		0.2766	
0.28	1.75		0.28	
0.2833	1.75		0.2833	
0.2866	1.75		0.2866	
0.29	1.75		0.29	0.3
0.2933	1.752		0.2933	
0.2966	1.752		0.2966	
0.3	1.75		0.3	
0.3033	1.75		0.3033	
0.3066	1.752		0.3066	
0.31	1.75		0.31	
0.3133	1.752		0.3133	
0.3166	1.75		0.3166	
0.32	1.75		0.32	
0.3233	1.752		0.3233	0.298
0.3266	1.75		0.3266	
0.33	1.815		0.33	
0.3333	1.809		0.3333	
0.35	1.807		0.35	
0.3666	1.805		0.3666	
0.3833	1.811		0.3833	
0.4	1.811		0.4	
0.4166	1.813		0.4166	
0.4333	1.811		0.4333	0.239
0.45	1.815		0.45	
0.4666	1.815		0.4666	0.235
0.4833	1.817		0.4833	
0.5	1.817		0.5	
0.5166	1.817		0.5166	0.233

SDA Florida OWTS Project
Table F-2 Well SW-9 Slug Test Analysis

0.5333	1.819		0.5333	
0.55	1.817		0.55	
0.5666	1.819		0.5666	0.231
0.5833	1.821		0.5833	
0.6	1.817		0.6	
0.6166	1.821		0.6166	
0.6333	1.821		0.6333	
0.65	1.821		0.65	0.229
0.6666	2.032		0.6666	0.018
0.6833	2.036		0.6833	
0.7	2.036		0.7	0.014
0.7166	2.038		0.7166	
0.7333	2.038		0.7333	
0.75	2.038		0.75	0.012
0.7666	2.04		0.7666	
0.7833	2.04		0.7833	0.01
0.8	2.042		0.8	
0.8166	2.04		0.8166	
0.8333	2.042		0.8333	
0.85	2.042		0.85	0.008
0.8666	2.045		0.8666	
0.8833	2.045		0.8833	
0.9	2.045		0.9	
0.9166	2.045		0.9166	
0.9333	2.045		0.9333	
0.95	2.045		0.95	
0.9666	2.045		0.9666	
0.9833	2.045		0.9833	
1	2.047		1	0.003
1.2	2.051		1.2	-0.001
1.4	2.051		1.4	-0.001
1.6	2.051		1.6	-0.001
1.8	2.053		1.8	-0.003
2	2.051		2	-0.001
2.2	2.051		2.2	-0.001
2.4	2.053		2.4	-0.003
2.6	2.053		2.6	-0.003
2.8	2.053		2.8	-0.003
3	2.051		3	-0.001
3.2	2.053		3.2	-0.003
3.4	2.051		3.4	-0.001
3.6	2.051		3.6	-0.001
3.8	2.053		3.8	-0.003
4	2.051		4	-0.001

SDA Florida OWTS Project
Table F-2 Well SW-9 Slug Test Analysis

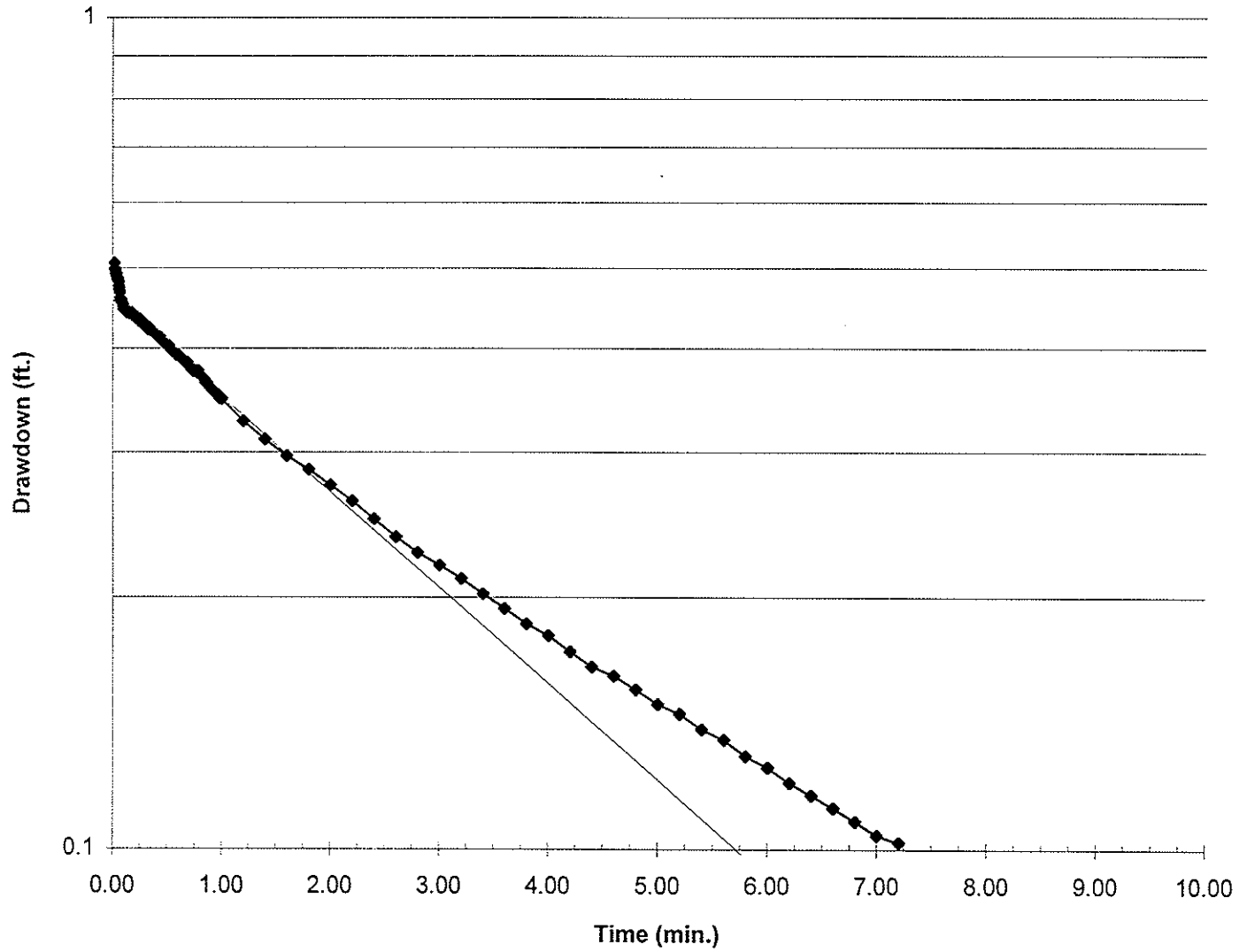
4.2	2.051		4.2	-0.001
4.4	2.051		4.4	-0.001
4.6	2.053		4.6	-0.003
4.8	2.053		4.8	-0.003
5	2.051		5	-0.001
5.2	2.051		5.2	-0.001
5.4	2.051		5.4	-0.001
5.6	2.051		5.6	-0.001
5.8	2.051		5.8	-0.001
6	2.051		6	-0.001
6.2	2.053		6.2	-0.003
6.4	2.053		6.4	-0.003
6.6	2.053		6.6	-0.003
6.8	2.051		6.8	-0.001
7	2.051		7	-0.001
7.2	2.053		7.2	-0.003
7.4	2.051		7.4	-0.001
7.6	2.053		7.6	-0.003
7.8	2.053		7.8	-0.003
8	2.053		8	-0.003
8.2	2.051		8.2	-0.001
8.4	2.051		8.4	-0.001
8.6	2.053		8.6	-0.003
8.8	2.051		8.8	-0.001
9	2.051		9	-0.001
9.2	2.053		9.2	-0.003
9.4	2.053		9.4	-0.003
9.6	2.053		9.6	-0.003
9.8	2.051		9.8	-0.001
10	2.051		10	-0.001
12	2.051		12	-0.001
14	2.051		14	-0.001

F3: Well SW-7 Slug Test Data

SDA Florida OWTS Project
Table F-3 Well SW-7 Slug Test Analysis

SLUG TEST ANALYSIS					
SW-7					
Location:		SDA St. Johns County, Fl			
Project #:		00-4155.30			
Date:		2/23/95			
Well #		SW-7			
Well Depth (ft)		10.2			
Depth to Water (ft)		5.41			
Depth to Screen Top (ft)		5.2			
Well Radius (ft)		0.0833			
Annulus Radius (ft)		0.2812			
Aquifer Thickness (ft)		50			
Standing Water Height (ft)		4.79			
Screen Length (t)		5			
Screened Aquifer		4.79			
Slug Removed					
Bailer Radius (ft.)		0.06			
Bailer length (ft)		2.85			
Slug Volume (gal.)		0.27			
Initial Drawdown (ft)		0.90			
Bouwer Rice Empirical Values					
		L/rw		B	C
		5	1.7	0.25	0.09
		10	1.8	0.3	1.25
		50	3.05	0.5	2.6
		100	4.4	0.075	4.1
		500	8.1	2.12	10.55
		1000	9.1	2.83	12.25
L/Rw for well		17.034139			
Now Display Type Curve Graph To Find A, B, and C					
A-value	2			1.64	ln (Re/rw) when D<H
B-value	0.35			2.10	ln (Re/rw) when D=H
C-value	1.5				
Where: D = Standing Water Height					
H = Aquifer Thickness					
Now Graph/Name/Display/Drawdown to find T and Yt					
Time-Value(sec)	0	345			
Time-Drawdown	0.45	0.1			
Conductivity (ft/sec)		5.18E-06			
Conductivity (ft/min)		3.11E-04			
Conductivity (ft/day)		4.47E-01			
Conductivity (cm/sec)		1.58E-04			
Conductivity (cm/day)		1.36E+01			
Conductivity (ft/yr)		163.4239			

Aquifer Test MW-7
SDA St. Johns County, FL



SDA Florida OWTS Project
Table F-3 Well SW-7 Slug Test Analysis

SE1000C						
Environmental Logger						
02/24 1	6:45					
Unit# 1174	Test 6					
Setups:	INPUT 1					
-----	-----					
Type	Function					
I.D.	72					
Linearity	0.1					
Scale fact	14.91					
Offset	0					
Delay mS	50					
Step 0 02/	10:22:16					
Elapsed Ti	INPUT 1	Elapsed Ti	INPUT 1			
-----	-----	-----	-----	Time (min)	Drawdown (ft)	
0	2.049	0	2.049			
0.0033	2.01	0.0033	2.01			
0.0066	1.555	0.0066	1.555			
0.01	1.612	0.01	1.612			
0.0133	1.588	0.0133	1.588			
0.0166	1.533	0.0166	1.533	0.017	0.507	
0.02	1.541	0.02	1.541	0.020	0.499	
0.0233	1.543	0.0233	1.543	0.023	0.497	
0.0266	1.547	0.0266	1.547	0.027	0.493	
0.03	1.547	0.03	1.547	0.030	0.493	
0.0333	1.549	0.0333	1.549	0.033	0.491	
0.0366	1.553	0.0366	1.553	0.037	0.487	
0.04	1.555	0.04	1.555	0.040	0.485	
0.0433	1.555	0.0433	1.555	0.043	0.485	
0.0466	1.555	0.0466	1.555	0.047	0.485	
0.05	1.557	0.05	1.557	0.050	0.483	
0.0533	1.559	0.0533	1.559	0.053	0.481	
0.0566	1.565	0.0566	1.565	0.057	0.475	
0.06	1.569	0.06	1.569	0.060	0.471	
0.0633	1.573	0.0633	1.573	0.063	0.467	
0.0666	1.58	0.0666	1.58	0.067	0.46	
0.07	1.582	0.07	1.582	0.070	0.458	
0.0733	1.582	0.0733	1.582	0.073	0.458	
0.0766	1.582	0.0766	1.582	0.077	0.458	
0.08	1.584	0.08	1.584	0.080	0.456	
0.0833	1.584	0.0833	1.584	0.083	0.456	
0.0866	1.586	0.0866	1.586	0.087	0.454	
0.09	1.588	0.09	1.588	0.090	0.452	

SDA Florida OWTS Project
Table F-3 Well SW-7 Slug Test Analysis

0.0933	1.588		0.0933	1.588	0.093	0.452
0.0966	1.592		0.0966	1.592	0.097	0.448
0.1	1.594		0.1	1.594	0.100	0.446
0.1033	1.592		0.1033	1.592	0.103	0.448
0.1066	1.594		0.1066	1.594	0.107	0.446
0.11	1.594		0.11	1.594	0.110	0.446
0.1133	1.596		0.1133	1.596	0.113	0.444
0.1166	1.596		0.1166	1.596	0.117	0.444
0.12	1.596		0.12	1.596	0.120	0.444
0.1233	1.596		0.1233	1.596	0.123	0.444
0.1266	1.596		0.1266	1.596	0.127	0.444
0.13	1.598		0.13	1.598	0.130	0.442
0.1333	1.598		0.1333	1.598	0.133	0.442
0.1366	1.598		0.1366	1.598	0.137	0.442
0.14	1.598		0.14	1.598	0.140	0.442
0.1433	1.598		0.1433	1.598	0.143	0.442
0.1466	1.598		0.1466	1.598	0.147	0.442
0.15	1.598		0.15	1.598	0.150	0.442
0.1533	1.598		0.1533	1.598	0.153	0.442
0.1566	1.598		0.1566	1.598	0.157	0.442
0.16	1.598		0.16	1.598	0.160	0.442
0.1633	1.598		0.1633	1.598	0.163	0.442
0.1666	1.598		0.1666	1.598	0.167	0.442
0.17	1.6		0.17	1.6	0.170	0.44
0.1733	1.598		0.1733	1.598	0.173	0.442
0.1766	1.6		0.1766	1.6	0.177	0.44
0.18	1.6		0.18	1.6	0.180	0.44
0.1833	1.6		0.1833	1.6	0.183	0.44
0.1866	1.6		0.1866	1.6	0.187	0.44
0.19	1.602		0.19	1.602	0.190	0.438
0.1933	1.602		0.1933	1.602	0.193	0.438
0.1966	1.602		0.1966	1.602	0.197	0.438
0.2	1.604		0.2	1.604	0.200	0.436
0.2033	1.604		0.2033	1.604	0.203	0.436
0.2066	1.604		0.2066	1.604	0.207	0.436
0.21	1.604		0.21	1.604	0.210	0.436
0.2133	1.604		0.2133	1.604	0.213	0.436
0.2166	1.604		0.2166	1.604	0.217	0.436
0.22	1.604		0.22	1.604	0.220	0.436
0.2233	1.604		0.2233	1.604	0.223	0.436
0.2266	1.606		0.2266	1.606	0.227	0.434
0.23	1.606		0.23	1.606	0.230	0.434
0.2333	1.606		0.2333	1.606	0.233	0.434
0.2366	1.608		0.2366	1.608	0.237	0.432
0.24	1.608		0.24	1.608	0.240	0.432
0.2433	1.606		0.2433	1.606	0.243	0.434
0.2466	1.606		0.2466	1.606	0.247	0.434
0.25	1.608		0.25	1.608	0.250	0.432

SDA Florida OWTS Project
Table F-3 Well SW-7 Slug Test Analysis

0.2533	1.608		0.2533	1.608	0.253	0.432
0.2566	1.608		0.2566	1.608	0.257	0.432
0.26	1.61		0.26	1.61	0.260	0.43
0.2633	1.608		0.2633	1.608	0.263	0.432
0.2666	1.61		0.2666	1.61	0.267	0.43
0.27	1.61		0.27	1.61	0.270	0.43
0.2733	1.61		0.2733	1.61	0.273	0.43
0.2766	1.61		0.2766	1.61	0.277	0.43
0.28	1.61		0.28	1.61	0.280	0.43
0.2833	1.612		0.2833	1.612	0.283	0.428
0.2866	1.612		0.2866	1.612	0.287	0.428
0.29	1.612		0.29	1.612	0.290	0.428
0.2933	1.614		0.2933	1.614	0.293	0.426
0.2966	1.612		0.2966	1.612	0.297	0.428
0.3	1.614		0.3	1.614	0.300	0.426
0.3033	1.616		0.3033	1.616	0.303	0.424
0.3066	1.614		0.3066	1.614	0.307	0.426
0.31	1.616		0.31	1.616	0.310	0.424
0.3133	1.616		0.3133	1.616	0.313	0.424
0.3166	1.616		0.3166	1.616	0.317	0.424
0.32	1.616		0.32	1.616	0.320	0.424
0.3233	1.616		0.3233	1.616	0.323	0.424
0.3266	1.619		0.3266	1.619	0.327	0.421
0.33	1.616		0.33	1.616	0.330	0.424
0.3333	1.616		0.3333	1.616	0.333	0.424
0.35	1.619		0.35	1.619	0.350	0.421
0.3666	1.621		0.3666	1.621	0.367	0.419
0.3833	1.623		0.3833	1.623	0.383	0.417
0.4	1.625		0.4	1.625	0.400	0.415
0.4166	1.627		0.4166	1.627	0.417	0.413
0.4333	1.627		0.4333	1.627	0.433	0.413
0.45	1.631		0.45	1.631	0.450	0.409
0.4666	1.633		0.4666	1.633	0.467	0.407
0.4833	1.635		0.4833	1.635	0.483	0.405
0.5	1.637		0.5	1.637	0.500	0.403
0.5166	1.637		0.5166	1.637	0.517	0.403
0.5333	1.641		0.5333	1.641	0.533	0.399
0.55	1.643		0.55	1.643	0.550	0.397
0.5666	1.645		0.5666	1.645	0.567	0.395
0.5833	1.647		0.5833	1.647	0.583	0.393
0.6	1.647		0.6	1.647	0.600	0.393
0.6166	1.649		0.6166	1.649	0.617	0.391
0.6333	1.651		0.6333	1.651	0.633	0.389
0.65	1.653		0.65	1.653	0.650	0.387
0.6666	1.655		0.6666	1.655	0.667	0.385
0.6833	1.655		0.6833	1.655	0.683	0.385
0.7	1.659		0.7	1.659	0.700	0.381
0.7166	1.662		0.7166	1.662	0.717	0.378

SDA Florida OWTS Project
Table F-3 Well SW-7 Slug Test Analysis

0.7333	1.664		0.7333	1.664	0.733	0.376
0.75	1.664		0.75	1.664	0.750	0.376
0.7666	1.664		0.7666	1.664	0.767	0.376
0.7833	1.664		0.7833	1.664	0.783	0.376
0.8	1.668		0.8	1.668	0.800	0.372
0.8166	1.67		0.8166	1.67	0.817	0.37
0.8333	1.672		0.8333	1.672	0.833	0.368
0.85	1.676		0.85	1.676	0.850	0.364
0.8666	1.676		0.8666	1.676	0.867	0.364
0.8833	1.68		0.8833	1.68	0.883	0.36
0.9	1.682		0.9	1.682	0.900	0.358
0.9166	1.684		0.9166	1.684	0.917	0.356
0.9333	1.686		0.9333	1.686	0.933	0.354
0.95	1.688		0.95	1.688	0.950	0.352
0.9666	1.688		0.9666	1.688	0.967	0.352
0.9833	1.692		0.9833	1.692	0.983	0.348
1	1.692		1	1.692	1.000	0.348
1.2	1.713		1.2	1.713	1.200	0.327
1.4	1.729		1.4	1.729	1.400	0.311
1.6	1.743		1.6	1.743	1.600	0.297
1.8	1.754		1.8	1.754	1.800	0.286
2	1.766		2	1.766	2.000	0.274
2.2	1.778		2.2	1.778	2.200	0.262
2.4	1.791		2.4	1.791	2.400	0.249
2.6	1.803		2.6	1.803	2.600	0.237
2.8	1.813		2.8	1.813	2.800	0.227
3	1.821		3	1.821	3.000	0.219
3.2	1.829		3.2	1.829	3.200	0.211
3.4	1.838		3.4	1.838	3.400	0.202
3.6	1.846		3.6	1.846	3.600	0.194
3.8	1.854		3.8	1.854	3.800	0.186
4	1.86		4	1.86	4.000	0.18
4.2	1.868		4.2	1.868	4.200	0.172
4.4	1.875		4.4	1.875	4.400	0.165
4.6	1.879		4.6	1.879	4.600	0.161
4.8	1.885		4.8	1.885	4.800	0.155
5	1.891		5	1.891	5.000	0.149
5.2	1.895		5.2	1.895	5.200	0.145
5.4	1.901		5.4	1.901	5.400	0.139
5.6	1.905		5.6	1.905	5.600	0.135
5.8	1.911		5.8	1.911	5.800	0.129
6	1.915		6	1.915	6.000	0.125
6.2	1.92		6.2	1.92	6.200	0.12
6.4	1.924		6.4	1.924	6.400	0.116
6.6	1.928		6.6	1.928	6.600	0.112
6.8	1.932		6.8	1.932	6.800	0.108
7	1.936		7	1.936	7.000	0.104
7.2	1.938		7.2	1.938	7.200	0.102

SDA Florida OWTS Project
Table F-3 Well SW-7 Slug Test Analysis

7.4	1.94		7.4	1.94	7.400	0.1
7.6	1.944		7.6	1.944	7.600	0.096
7.8	1.948		7.8	1.948	7.800	0.092
8	1.95		8	1.95	8.000	0.09
8.2	1.952		8.2	1.952	8.200	0.088
8.4	1.954		8.4	1.954	8.400	0.086
8.6	1.958		8.6	1.958	8.600	0.082
8.8	1.958		8.8	1.958	8.800	0.082
9	1.963		9	1.963	9.000	0.077
9.2	1.965		9.2	1.965	9.200	0.075
9.4	1.967		9.4	1.967	9.400	0.073
9.6	1.969		9.6	1.969	9.600	0.071
9.8	1.973		9.8	1.973	9.800	0.067
10	1.973		10	1.973	10.000	0.067
12	1.989		12	1.989	12.000	0.051

G1: Summary of Bromide Tracer Test #1 (September 1993)

Figure G-1 Bromide Concentration Curve Below
Input Point (BR 5.5)
Bromide Tracer Test #1 (September 1993)

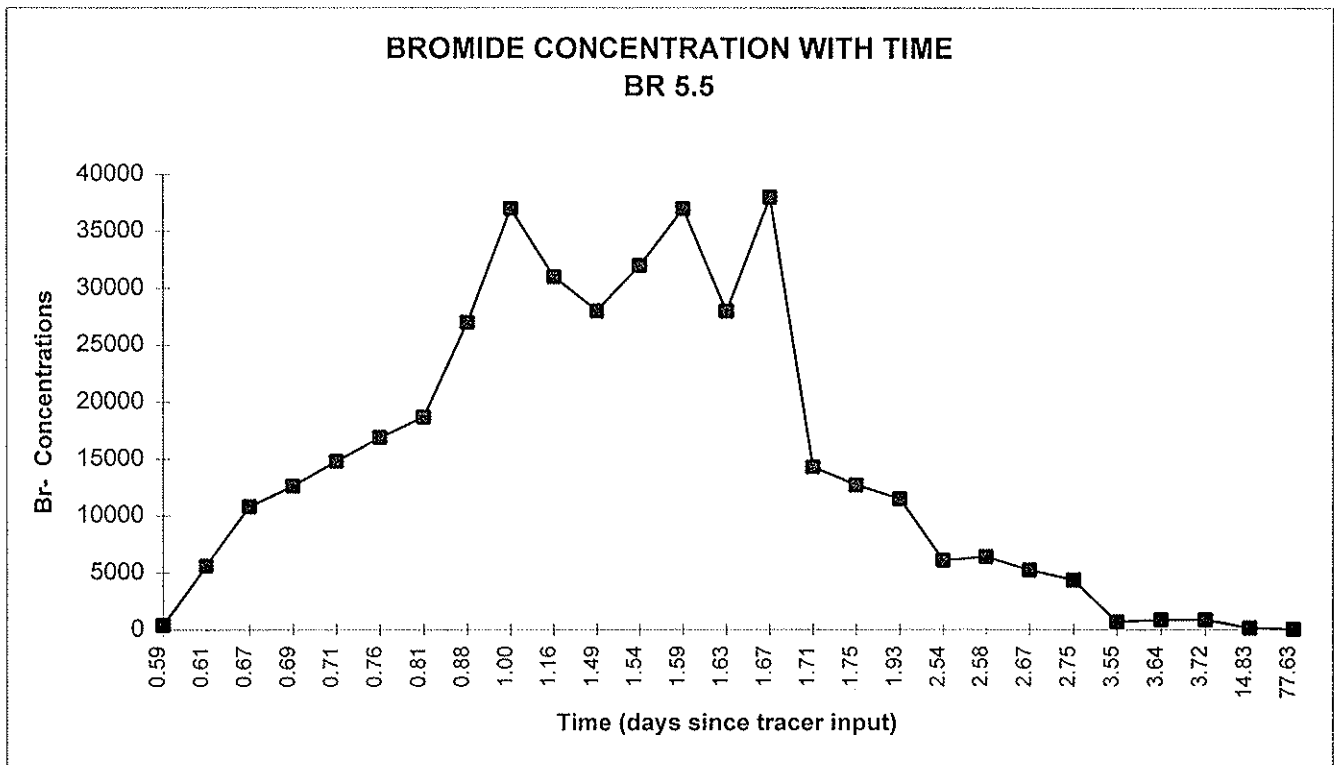
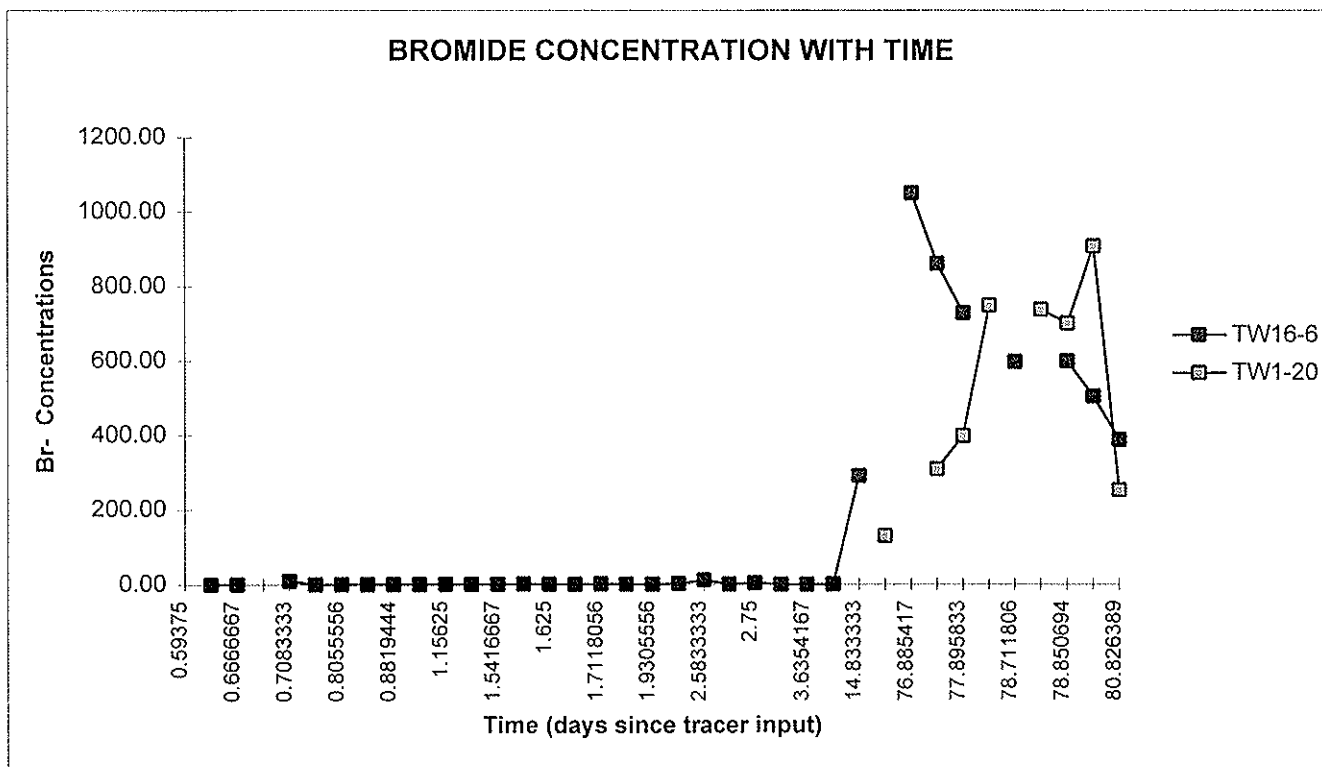


Figure G-2 Bromide Concentration Curves
 at TW16-6 and TW1-20
 Bromide Tracer Test #1



SOUTHERN ANALYTICAL LABORATORIES, INC.

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RSE Group
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Sabal Industrial Park - Suite 100
Tampa, Florida 33619

September 30, 1993
Project No. 06010
Page 1 of 2

LABORATORY REPORT

Project Description: Ayres Proj. SDA - Bromide Tracer

Sample Description: 01 - Bromide Tracer
02 - Bromide Tracer Duplicate

Date Received: 9/15/93

<u>Parameter</u>	<u>Units</u>	<u>(01) Bromide Tracer</u>	<u>(02) Bromide Tracer Dup.</u>	<u>Method Blank</u>
Bromide	mg/l	400,000	420,000	< 0.1



Francis I. Daniels
Laboratory Director

G2: Bromide Tracer Test #2 (May to October 1995)

STE and Initial Groundwater Bromide Data

SDA Florida OWTS Project
Table G-2 STE and Initial GW Bromide Data

Date/Time	Br Conc. (ppm)	Time(min)	STBr-	Conc (ppm)												
				TW19-6*	TW19-12*	TW19-20	TW20-6	TW20-12	TW20-20	TW21-6	TW21-12*	TW21-20	TW22-6	TW1-6	TW1-12	TW1-20
5/9/95 9:05	0.0	0:00	0													
5/9/95 9:30	617.0	0:25	617													
5/9/95 10:00	764.0	0:55	764													
5/9/95 10:30	811.0	1:25	811													
5/9/95 11:00	783.0	1:55	783													
5/9/95 11:30	779.0	2:25	779													
5/9/95 12:00	719.0	2:55	719													
5/9/95 12:30	719.0	3:25	719													
5/9/95 13:00	786.0	3:55	786													
5/9/95 13:40	1080.0	4:35	1080													
5/9/95 14:10	1160.0	5:05	1160													
5/9/95 14:50	1130.0	5:45	1130													
5/9/95 15:15	4.660	6:10		4.66												
5/9/95 15:15	0.896	6:10					0.896									
5/9/95 15:15	0.581	6:10								0.581						
5/9/95 15:25	1050.0	6:20	1050													
5/9/95 15:55	6.25 (<1)	6:50		6.25 (<1)												
5/9/95 16:05	1020.0 (800)	7:00	1020.0 (800)													
5/9/95 16:30	957.0	7:25	957													
5/9/95 16:30	7.480	7:25		7.48												
5/9/95 16:30	1.250	7:25					1.25									
5/9/95 16:30	0.845	7:25								0.845						
5/9/95 17:32	7.270	8:27		7.27												
5/9/95 17:40	7.960	8:35			7.96											
5/9/95 17:42	1.530	8:37					1.53									
5/9/95 17:46	0.823	8:41								0.823						
5/9/95 18:02	7.030	8:57			7.03											
5/9/95 18:05	1110.0	9:00	1110													
5/10/95 0:00	3.160	14:55		3.16												
5/10/95 4:00	5.230	18:55		5.23												
5/10/95 7:15	2.140	22:10		2.14												
5/10/95 7:18	3.080	22:13			3.08											
5/10/95 7:20	0.818	22:15					0.818									
5/10/95 7:24	0.584	22:19								0.584						
5/10/95 7:38	1160.0	22:33	1160													
5/10/95 8:15	5.460	23:10		5.46												
5/10/95 8:17	5.640	23:12			5.64											
5/10/95 8:20	1130.0	23:15	1130													
5/10/95 9:00	4.910	23:55		4.91												
5/10/95 9:05	1.810	24:00			1.81											
5/10/95 9:07	1170.0	24:02	1170													
5/10/95 9:30	2.150	24:25		2.15												

() Results of laboratory analyses for bromide

* Bromide data at TW19 indicated interferences from May 9-12, 1995

SDA Florida OWTS Project
Table G-2 STE and Initial GW Bromide Data

Date/Time	Br Conc. (ppm)	Time(min)	STBr-	Conc (ppm)												
				TW19-6*	TW19-12*	TW19-20	TW20-6	TW20-12	TW20-20	TW21-6	TW21-12*	TW21-20	TW22-6	TW1-6	TW1-12	TW1-20
5/10/95 9:34	1.710	24:29			1.71											
5/10/95 9:36	1220.0	24:31	1220													
5/10/95 10:02	3.530	24:57		3.53												
5/10/95 10:05	4.430	25:00			4.43											
5/10/95 10:07	1180.0	25:02	1180													
5/10/95 10:40	1.360	25:35		1.36												
5/10/95 10:42	1.130	25:37			1.13											
5/10/95 10:45	1140.0	25:40	1140													
5/10/95 11:20	1120.0	26:15	1120													
5/10/95 11:22	1.460	26:17		1.46												
5/10/95 11:24	1.290	26:19			1.29											
5/10/95 12:30	1.070	27:25		1.07												
5/10/95 12:31	1.020	27:26			1.02											
5/10/95 12:37	1160.0	27:32	1160													
5/10/95 13:55	0.674	28:50								0.674						
5/10/95 13:58	1.160	28:53					1.16									
5/10/95 14:02	0.879	28:57													0.879	
5/10/95 14:04	0.489	28:59											0.489			
5/10/95 15:17	1.460	30:12											1.46			
5/10/95 15:22	1.020	30:17								1.020						
5/10/95 15:24	1.200	30:19					1.2									
5/10/95 15:27	1.340	30:22		1.34												
5/10/95 15:30	1.460	30:25			1.46											
5/10/95 15:31	1.930	30:26													1.930	
5/10/95 15:50	1.040	30:45											1.04			
5/10/95 16:04	0.771	30:59								0.771						
5/10/95 16:18	0.996	31:13					0.996									
5/10/95 16:22	1.530	31:17		1.53												
5/10/95 16:25	1.530	31:20			1.53											
5/10/95 16:35	1.45 (<1)	31:30											1.45 (<1)			
5/10/95 16:39	1.150	31:34													1.150	
5/10/95 16:41	0.745	31:36								0.745						
5/10/95 16:43	0.967	31:38					0.967									
5/10/95 16:45	1.010	31:40		1.01												
5/10/95 16:48	1.520	31:43			1.52											
5/10/95 17:20	1560.0	32:15	1560													
5/11/95 0:00	1.780	38:55		1.78												
5/11/95 4:00	2.760	42:55		2.76												
5/11/95 7:02	1410.0	45:57	1410													
5/11/95 7:13	1.010	46:08					1.01									
5/11/95 7:16	0.661	46:11								0.661						
5/11/95 7:18	2.250	46:13		2.25												

() Results of laboratory analyses for bromide

* Bromide data at TW19 indicated interferences from May 9-12, 1995

SDA Florida OWTS Project
Table G-2 STE and Initial GW Bromide Data

Date/Time	Br Conc. (ppm)	Time(min)	Conc (ppm)													
			STBr-	TW19-6*	TW19-12*	TW19-20	TW20-6	TW20-12	TW20-20	TW21-6	TW21-12*	TW21-20	TW22-6	TW1-6	TW1-12	TW1-20
5/11/95 7:20	2.100	46:15			2.1											
5/11/95 7:22	0.826	46:17												0.826		
5/11/95 7:25	0.851	46:20											0.851			
5/11/95 7:50	0.646	46:45									0.646					
5/11/95 7:52	0.831	46:47					0.831									
5/11/95 7:56	0.609	46:51										0.609				
5/11/95 8:00	0.818	46:55											0.818			
5/11/95 8:03	0.756	46:58		0.756												
5/11/95 8:05	0.973	47:00			0.973											
5/11/95 8:07	1270.0	47:02	1270													
5/11/95 8:53	1.190	47:48		1.19												
5/11/95 8:55	1.080	47:50			1.08											
5/11/95 8:57	0.736	47:52										0.736				
5/11/95 9:00	1110.0	47:55	1110													
5/11/95 9:47	0.783	48:42					0.783									
5/11/95 9:50	0.000	48:45		0												
5/11/95 9:53	1390.0	48:48	1390													
5/11/95 10:32	0.145	49:27		0.145												
5/11/95 10:34	0.000	49:29			0											
5/11/95 10:36	1300.0	49:31	1300													
5/11/95 11:23	0.915	50:18		0.915												
5/11/95 11:25	0.291	50:20			0.291											
5/11/95 11:27	1280.0	50:22	1280													
5/11/95 12:42	1290.0	51:37	1290													
5/11/95 12:45	3.220	51:40		3.22												
5/11/95 12:47	1.640	51:42			1.64											
5/11/95 14:30	2.620	53:25		2.62												
5/11/95 14:32	9.480	53:27			9.48											
5/11/95 14:47	1980.0	53:42	1980													
5/11/95 15:26	18.100	54:21		18.1												
5/11/95 15:28	30.400	54:23			30.4											
5/11/95 16:12	24.000	55:07		24												
5/11/95 16:14	17.800	55:09			17.8											
5/11/95 16:16	2.040	55:11					2.04									
5/11/95 16:17	0.444	55:12							0.444							
5/11/95 16:20	3.250	55:15									3.25					
5/11/95 16:23	4.130	55:18										4.130				
5/11/95 16:25	1620.0	55:20	1620													
5/11/95 17:28	28.400	56:23		28.4												
5/11/95 17:31	31.600	56:26			31.6											
5/11/95 17:35	3.650	56:30					3.65									
5/11/95 17:38	3.590	56:33										3.59				

() Results of laboratory analyses for bromide

* Bromide data at TW19 indicated interferences from May 9-12, 1995

SDA Florida OWTS Project
Table G-2 STE and Initial GW Bromide Data

Date/Time	Br Conc. (ppm)	Time(min)	Conc (ppm)													
			STBr-	TW19-6*	TW19-12*	TW19-20	TW20-6	TW20-12	TW20-20	TW21-6	TW21-12*	TW21-20	TW22-6	TW1-6	TW1-12	TW1-20
5/11/95 17:40	1890.0	56:35	1890													
5/12/95 0:00	2.790	62:55		2.79												
5/12/95 4:00	3.080	66:55		3.08												
5/12/95 8:10	3.560	71:05			3.56											
5/12/95 8:14	5.650	71:09		5.65												
5/12/95 8:20	11.200	71:15											11.2			
5/12/95 8:27	1620.0	71:22	1620													
5/12/95 9:29	4.130	72:24											4.13			
5/12/95 9:32	1.130	72:27						1.13								
5/12/95 9:34	3.950	72:29			3.95											
5/12/95 9:36	3.730	72:31		3.73												
5/12/95 9:42	877.0	72:37	877													
5/12/95 10:44	1360.0	73:39	1360													
5/12/95 10:46	1.430	73:41		1.43												
5/12/95 10:48	24.900	73:43			24.9											
5/12/95 10:53	1.630	73:48						1.63								
5/12/95 11:00	12.600	73:55											12.6			
5/12/95 12:15	4.990	75:10											4.99			
5/12/95 12:27	2.230	75:22						2.23								
5/12/95 12:30	2.030	75:25													2.030	
5/12/95 12:34	15.900	75:29												15.900		
5/12/95 12:41	1680.0	75:36	1680													
5/12/95 13:38	575.0	76:33	575													
5/12/95 13:52	2.120	76:47		2.12												
5/12/95 13:59	1.790	76:54			1.79											
5/12/95 14:01	1.270	76:56						1.27								
5/12/95 14:04	1.480	76:59												1.480		
5/12/95 14:06	0.669	77:01													0.669	
5/12/95 14:12	1.150	77:07											1.15			
5/15/95 11:25	1.030	146:20		1.03												
5/15/95 11:27	0.945	146:22			0.945											
5/15/95 12:51	419.0	147:46	419													
5/15/95 13:34	0.414	148:29		0.414												
5/15/95 13:37	1.460	148:32			1.46											
5/15/95 13:41	1.070	148:36						1.07								
5/15/95 13:49	0.761	148:44								0.761						
5/15/95 13:53	3.270	148:48										3.270				
5/15/95 13:57	0.970	148:52											0.97			
5/15/95 14:55	439.0	149:50	439													
5/15/95 15:54	1.940	150:49		1.94												
5/15/95 15:57	0.440	150:52			0.44											
5/15/95 16:00	1.000	150:55						1.0								

() Results of laboratory analyses for bromide

* Bromide data at TW19 indicated interferences from May 9-12, 1995

SDA Florida OWTS Project
Table G-2 STE and Initial GW Bromide Data

Date/Time	Br Conc. (ppm)	Time(min)	STBr-	Conc (ppm)													
				TW19-6*	TW19-12*	TW19-20	TW20-6	TW20-12	TW20-20	TW21-6	TW21-12*	TW21-20	TW22-6	TW1-6	TW1-12	TW1-20	
5/15/95 16:07	1.400	151:02									1.400						
5/15/95 16:08	0.903	151:03										0.903					
5/15/95 16:11	0.819	151:06											0.819				
5/15/95 16:16	0.966	151:11												0.966			
5/15/95 16:31	0.828	151:26														0.828	
5/16/95 8:16	2.930	167:11														2.930	
5/16/95 8:33	0.322	167:28		0.322													
5/16/95 8:40	0.806	167:35					0.806										
5/16/95 9:37	0.541	168:32		0.541													
5/16/95 9:39	0.336	168:34			0.336												
5/16/95 9:53	1.010	168:48											1.010				
5/16/95 11:44	0.892	170:39														0.892	
5/16/95 12:09	0.977	171:04											0.977				
5/16/95 12:12	1.110	171:07												1.11			
5/16/95 13:28	0.266	172:23								0.266							
5/16/95 13:31	0.000	172:26									0.000						
5/16/95 13:33	2.100	172:28											2.100				
5/16/95 13:37	1.550	172:32												1.55			
5/16/95 16:05	2.260	175:00											2.260				
5/16/95 16:11	1.520	175:06												1.52			

() Results of laboratory analyses for bromide

* Bromide data at TW19 indicated interferences from May 9-12, 1995

G3: Bromide Tracer Test #2 (May to October 1995)

Groundwater Bromide Concentration Data with Time

SDA Florida OWTS Project

Table G-3 Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
PP1-6	146	6/29/95	1552
PP2-6	12.8	6/29/95	1609
PP3-6	43.1	6/29/95	1637
PP4-4	18	6/30/95	850
PP4-5	22.3	6/30/95	853
PP4-6	41.2	6/30/95	912
PP4-7	126	6/30/95	910
PP4-8	341	6/30/95	900
PP5-6	31.4	6/30/95	1004
PP6-6	19.1	6/30/95	1018
PP7-4	318	6/30/95	1225
PP7-5	205	6/30/95	1220
PP7-6	563	6/30/95	1213
PP7-7	315	6/30/95	1211
PP7-8	45	6/30/95	1207
PP7-9	0.502	6/30/95	1205
PP7-10	0.244	6/30/95	1203
PP7-11	0.25	6/30/95	1150
PP7-12	0.655	6/30/95	1148
PP8-6	151	6/30/95	1309
PP9-6	0.136	6/30/95	1345
PP10-6	239	6/30/95	1410
PP11-6	6.62	6/30/95	1428
PP12-6	3.29	7/26/95	933
PP13-6	3.97	7/26/95	952
PP14-6	173	7/26/95	1008
PP15-6	254	7/26/95	1022
PP16-6	406	7/26/95	1030
PP17-6	295	7/26/95	1038
PP18-6	145	7/26/95	1055
PP19-6	1.31	7/26/95	1117
PP20-6	382	7/26/95	1133
PP21-6	172	7/26/95	1153
PP22-6	447	7/26/95	1210
PP22-4	45.8	7/27/95	1140
PP22-5	291	7/27/95	1137
PP22-6	390	7/27/95	1135
PP22-7	365	7/27/95	1133
PP22-8	303	7/27/95	1131
PP22-9	211	7/27/95	1130
PP22-10	31.9	7/27/95	1127
PP22-11	0.718	7/27/95	1124
PP22-12	0.789	7/27/95	1122

SDA Florida OWTS Project

Table G-3 Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
PP23-6	210	7/26/95	1220
PP24-6	104	7/26/95	1235
PP25-6	248	7/26/95	1250
PP26-6	10.4	7/26/95	1303
PP27-6	292	7/26/95	1315
PP28-6	277	7/26/95	1410
PP29-6	175	7/26/95	1425
PP30-6	274	7/26/95	1442
PP31-6	457	7/26/95	1540
PP31-4	32.9	7/27/95	1107
PP31-5	350	7/27/95	1105
PP31-6	467	7/27/95	1102
PP31-7	1.06	7/27/95	1059
PP31-8	1.09	7/27/95	1057
PP31-9	0.705	7/27/95	1055
PP31-10	1.25	7/27/95	1054
PP31-11	1.31	7/27/95	1052
PP31-12	449	7/27/95	1050
PP32-6	92.8	7/26/95	1600
PP33-6	7.26	7/26/95	1618
PP34-6	264	7/26/95	1706
PP35-6	2.65	7/26/95	1725
PP36-6	1.39	7/27/95	830
PP37-6	327	7/27/95	838
PP38-6	271	7/27/95	915
PP39-6	217	7/27/95	925
PP40-6	3.63	7/27/95	940
PP41-6	149	7/27/95	1005
TW1-6	6.12	6/29/95	1431
TW1-6	22.91	6/30/95	1323
TW1-6	21.4	6/30/95	1523
TW1-6	206	7/25/95	1428
TW1-12	1.24	6/30/95	1325
TW1-12	0.973	7/25/95	1433
TW1-20	0.808	6/30/95	1327
TW1-20	1.24	7/25/95	1435
TW2-6	0.902	6/29/95	1436
TW2-6	1.11	7/25/95	1455
TW2-12	0.565	7/25/95	1456
TW2-20	0.812	7/25/95	1503
TW3-6	54.3	6/29/95	1358
TW3-6	70.8	6/30/95	947
TW3-6	63.6	6/30/95	1527

SDA Florida OWTS Project

Table G-3 Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
TW3-6	84.1	7/25/95	1418
TW3-12	0.67	6/30/95	1319
TW3-12	0.724	7/25/95	1421
TW3-20	0.535	6/30/95	1321
TW3-20	0.527	7/25/95	1422
TW4-6	0.81	6/29/95	1509
TW4-6	0.74	6/30/95	1519
TW4-6	0.49	7/25/95	1333
TW4-12	0.807	7/25/95	1335
TW4-20	0.427	7/25/95	1338
TW5-6	0.995	6/29/95	1511
TW5-6	1.14	6/30/95	1517
TW5-6	1.96	7/25/95	1356
TW5-12	0.801	7/25/95	1351
TW5-20	0.263	7/25/95	1358
TW6-6	1.13	6/29/95	1505
TW6-6	1.08	6/30/95	1520
TW6-6	0.724	7/25/95	1344
TW6-12	0.532	7/25/95	1343
TW6-20	0.479	7/25/95	1346
TW10-6	363	6/29/95	1400
TW10-6	329	6/30/95	945
TW10-6	314	6/30/95	1525
TW10-6	23.4	7/25/95	1416
TW11-6	1.47	6/29/95	1507
TW11-6	1.14	6/30/95	1515
TW11-6	4.91	7/25/95	1348
TW16-6	30.9	6/30/95	1047
TW17-6	0.578	6/30/95	1051
TW18-6	0.578	6/30/95	1054
TW19-6	127	6/29/95	1351
TW19-6	222	6/30/95	939
TW19-6	163	6/30/95	1533
TW19-6	74.8	7/25/95	1532
TW19-12	246	6/30/95	1026
TW19-12	65.8	7/25/95	1534
TW19-20	1.26	7/25/95	1536
TW20-6	122	6/29/95	1352
TW20-6	134	6/30/95	937
TW20-6	123	6/30/95	1531
TW20-6	145	7/25/95	1538
TW20-12	0.341	6/30/95	1029
TW20-12	0.339	7/25/95	1541

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Table G-3. Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
TW20-20	1.43	7/25/95	1544
TW21-6	83.3	6/29/95	1354
TW21-6	87.1	6/30/95	942
TW21-6	71.6	6/30/95	1529
TW21-6	10.3	7/25/95	1523
TW21-12	0.236	6/30/95	1024
TW21-12	0.247	7/25/95	1524
TW21-20	0.923	7/25/95	1526
TW22-6	0.693	6/29/95	1438
TW22-6	0.879	7/25/95	1441
TW22-12	0.422	7/25/95	1451
TW22-20	1.07	7/25/95	1453
TW23-6	1.44	6/29/95	1505
TW29-6	5.86	6/30/95	1454
TW29-6	194	7/25/95	1439
BRW1-5.5	134	6/30/95	1041
STE	11.4	6/30/95	1600
STE	8.93	7/27/95	1222
BW1-5	0.349	7/27/95	1209
BW1-10	0.557	7/27/95	1212
TW4-6	100	10/2/95	1612
TW5-20	<1	10/2/95	1631
TW6-6	79.8	10/2/95	1621
TW11-6	35.1	10/2/95	1610
TW5-6	14.1	10/2/95	1627
TW4-12	<1	10/2/95	1613
TW6-12	<1	10/2/95	1623
TW14-6	<1	10/2/95	1538
TW13-6	<1	10/2/95	1520
TW13-12	<1	10/2/95	1522
TW14-12	<1	10/2/95	1536
TW5-12	<1	10/2/95	1629
TW15-6	<1	10/2/95	1507
TW15-12	<1	10/2/95	1509
TW23-6	<1	10/2/95	1550
TW25-12	<1	10/2/95	1603
TW23-12	<1	10/2/95	1552
TW25-6	<1	10/2/95	1601
TW10-6	4.33	10/2/95	1633
TW29-6	8.8	10/2/95	1548
TW2-6	39.4	10/2/95	1543
TW22-12	<1	10/2/95	1556
TW2-20	<1	10/2/95	1551

SDA Florida OWTS Project

Table G-3 Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
TW3-12	1.10	10/2/95	1629
TW3-6	51.4	10/2/95	1626
TW2-12	1.42	10/2/95	1546
TW21-6	6.95	10/2/95	1513
BP2-12	15.2	10/2/95	1608
TW22-6	45.6	10/2/95	1553
TW19-6	14.9	10/2/95	1505
TW1-6	16.1	10/2/95	1602
TW1-12	1.25	10/2/95	1610
TW21-12	1.12	10/2/95	1517
BP1-12	1.85	10/2/95	1606
TW20-12	1.18	10/2/95	1528
TW19-12	12.2	10/2/95	1520
BP3-14	<1	10/2/95	1616
TW24-12	1.71	10/2/95	1557
TW24-6	<1	10/2/95	1555
TW20-6	18.4	10/2/95	1509
PP1A-6	19.6	10/3/95	904
PP2A-6	56.7	10/3/95	922
PP3A-6	54.1	10/3/95	937
TW4-6	89.0	10/3/95	945
PP4A-6	49.0	10/3/95	957
PP5A-6	55.8	10/3/95	1010
TW7-6	<1	10/3/95	1031
TW8-6	<1	10/3/95	1039
TW7-12	<1	10/3/95	1034
PP11A-6	47.3	10/3/95	1351
TW9-6	1.23	10/3/95	1045
TW12-6	<1	10/3/95	1051
PP10A-6	18.4	10/3/95	1348
PP7A-6	17.7	10/3/95	1110
PP9A-6	19.0	10/3/95	1150
PP8A-6	2.61	10/3/95	1151
PP6A-6	2.09	10/3/95	1057
PP12A-6	280	10/3/95	1412
PP13A-6	114	10/3/95	1425
PP14A-6	44.7	10/3/95	1442
PP15A-6	169	10/3/95	1521
PP16A-6	42.5	10/3/95	1530
PP17A-6	208	10/3/95	1545
PP18A-6	194	10/4/95	820
PP19A-6	25.2	10/4/95	832
PP20A-6	16.2	10/4/95	843

SDA Florida OWTS Project

Table G-3 Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
PP21A-6	330	10/4/95	916
PP22A-6	46.0	10/4/95	930
PP23A-6	31.6	10/4/95	955
PP24A-6	88.0	10/4/95	1005
PP25A-6	330	10/4/95	1015
PP26A-6	184	10/4/95	1030
PP27A-6	53.5	10/4/95	1040
PP28A-6	1.19	10/4/95	1110
PP29A-6	<1	10/4/95	1120
PP30A-6	20.1	10/4/95	1135
PP31A-6	80.3	10/4/95	1145
PP32A-6	73.4	10/4/95	1200
PP33A-6	5.06	10/4/95	1230
PP34A-6	255	10/4/95	1340
PP35A-6	2.27	10/4/95	1400
PP36A-6	2.61	10/4/95	1410
PP37A-6	3.73	10/4/95	1420
PP38A-6	3.82	10/4/95	1435
PP39A-6	1.93	10/4/95	1510
PP40A-6	1.66	10/4/95	1515
P21AP-3	17.4	10/4/95	1604
P21AP-4	68.6	10/4/95	1602
P21AP-5	91.3	10/4/95	1600
P21AP-6	396	10/4/95	1558
P21AP-7	89.1	10/4/95	1555
P21AP-8	96.5	10/4/95	1553
P21AP-9	251	10/4/95	1550
P21AP-10	235	10/4/95	1547
P21AP-11	170	10/4/95	1545
P21AP-12	89.1	10/4/95	1543
PP41A-6	11.2	10/4/95	1620
PP42A-6	15.0	10/5/95	915
PP43A-6	16.9	10/5/95	925
PP44A-6	38.8	10/5/95	935
PP45A-6	9.16	10/5/95	955
PP46A-6	106	10/5/95	1005
PP47A-6	26.9	10/5/95	1015
PP48A-6	75.2	10/5/95	1030
PP49A-6	77.6	10/5/95	1045
PP50A-6	101	10/5/95	1050
TW4-6	78.3	10/5/95	1100
PP51A-6	33.7	10/5/95	1115
PP52A-6	19.8	10/5/95	1125

SDA Florida OWTS Project

Table G-3 Bromide Concentration Data with Time, Test #2

LOCATION	CONCENTRATION	DATE	TIME
PP53A-6	21.6	10/5/95	1130
PP53AP-3	0.00	10/5/95	1355
PP53AP-4	2.91	10/5/95	1352
PP53AP-5	11.6	10/5/95	1347
PP53AP-6	16.0	10/5/95	1343
PP53AP-7	5.64	10/5/95	1540
PP53AP-8	6.92	10/5/95	1331
PP53AP-9	10.8	10/5/95	1325
PP53AP-10	24.6	10/5/95	1322
PP53AP-11	9.03	10/5/95	1318
PP53AP-12	0.694	10/5/95	1315
PP25AP-3	0.277	10/5/95	1447
PP25AP-4	45.0	10/5/95	1444
PP25AP-5	117	10/5/95	1439
PP25AP-6	187	10/5/95	1435
PP25AP-7	259	10/5/95	1432
PP25AP-8	142	10/5/95	1426
PP25AP-9	147	10/5/95	1423
PP25AP-10	41.1	10/5/95	1420
PP25AP-11	0.412	10/5/95	1413
PP25AP-12	0.00	10/5/95	1412
TW16-6	25.9	10/5/95	1537
TW16-12	0.00	10/5/95	1542
TW16-20	0.639	10/5/95	1544
TW17-6	1.62	10/5/95	1550
PP53A-6	16.3	10/5/95	1130
TW17-12	0.634	10/5/95	1552
TW17-20	1.11	10/5/95	1555
TW18-6	6.21	10/5/95	1557
BRW5.5	18.9	10/5/95	1547
STE	25.5	10/5/95	1600
TW4-12	1.79	10/5/95	1103

G4: Bromide Concentration Contours

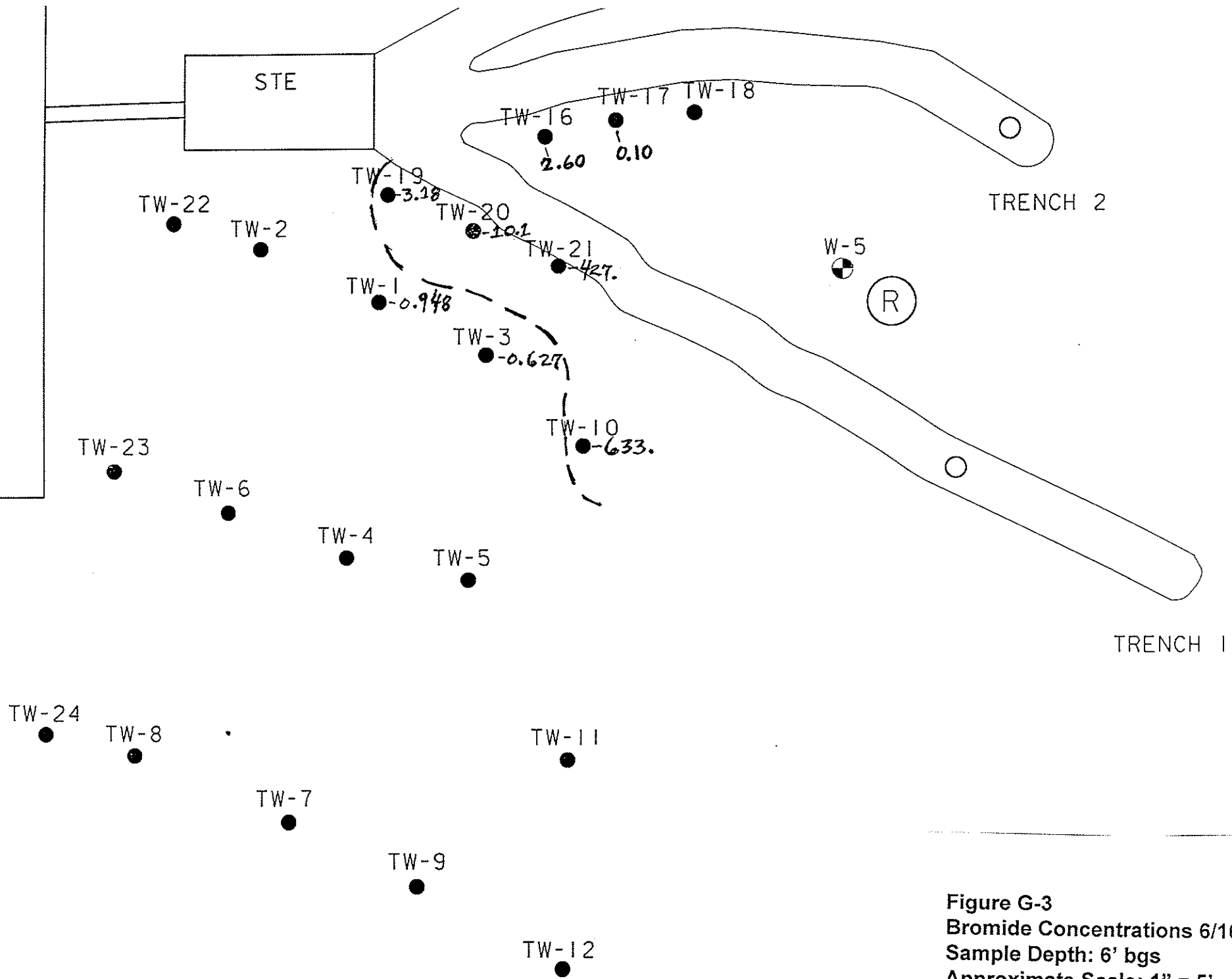


Figure G-3
Bromide Concentrations 6/16/95
Sample Depth: 6' bgs
Approximate Scale: 1" = 5'

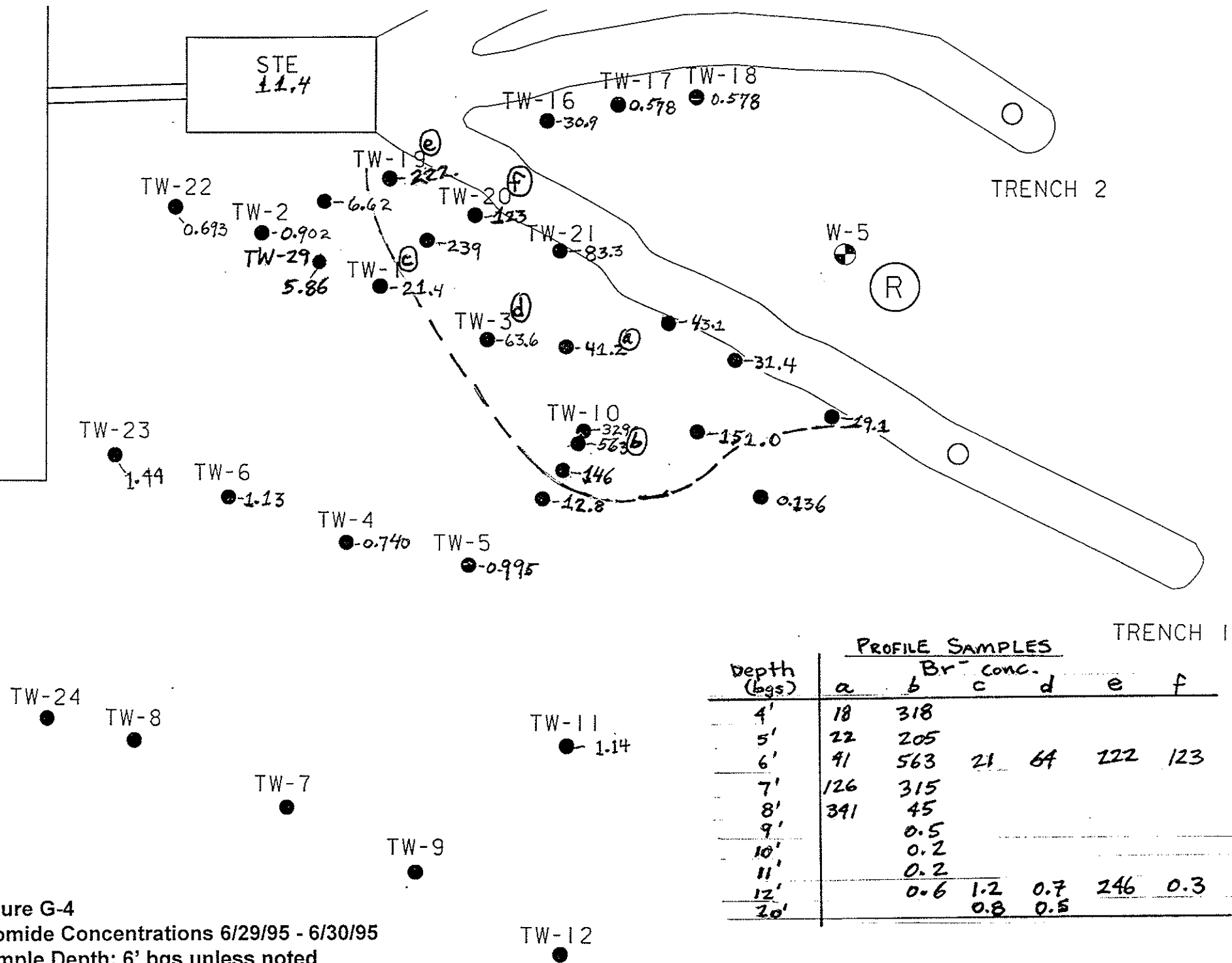


Figure G-4
 Bromide Concentrations 6/29/95 - 6/30/95
 Sample Depth: 6' bgs unless noted
 Approximate Scale: 1" = 5'

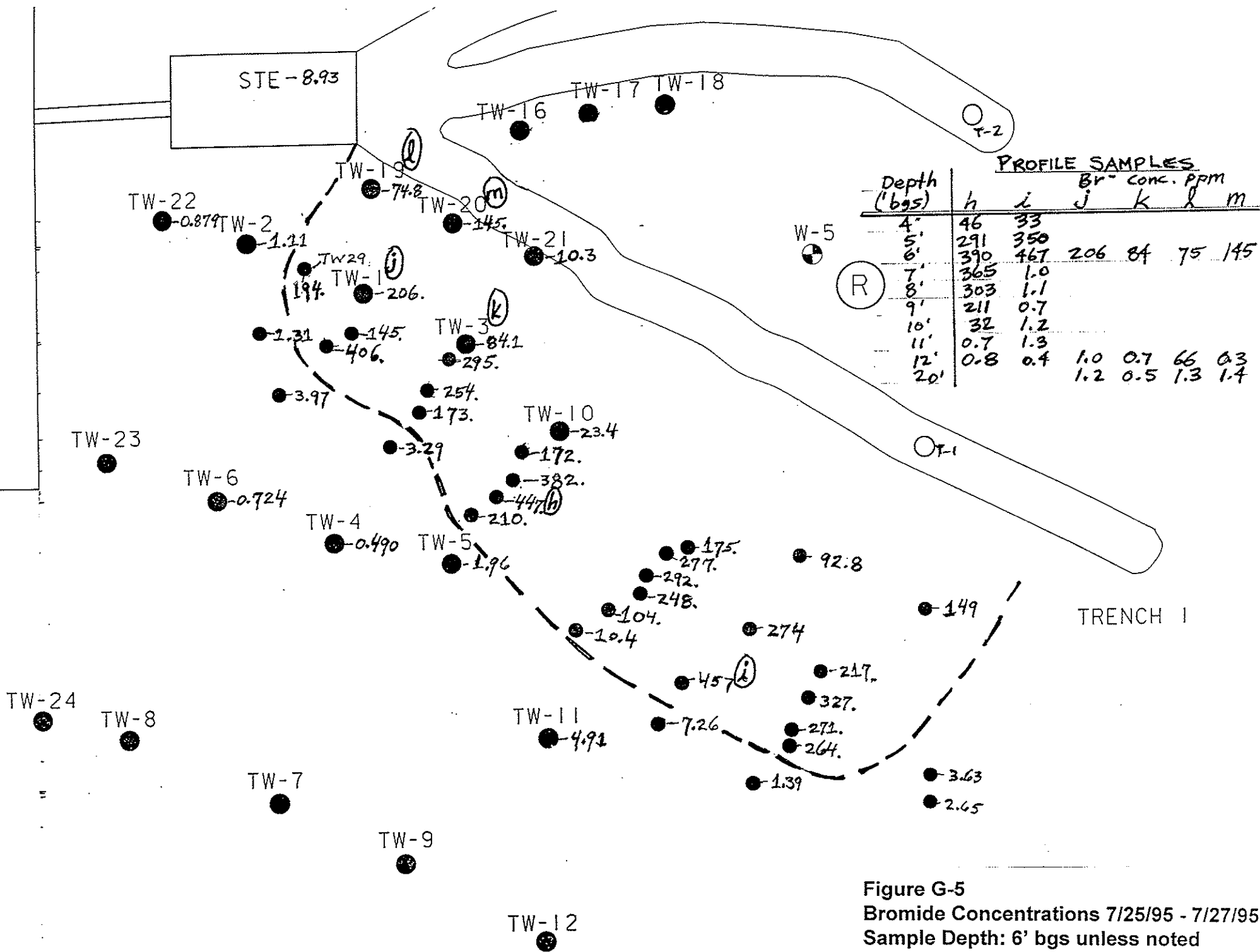


Figure G-5
 Bromide Concentrations 7/25/95 - 7/27/95
 Sample Depth: 6' bgs unless noted
 Approximate Scale: 1" = 5'

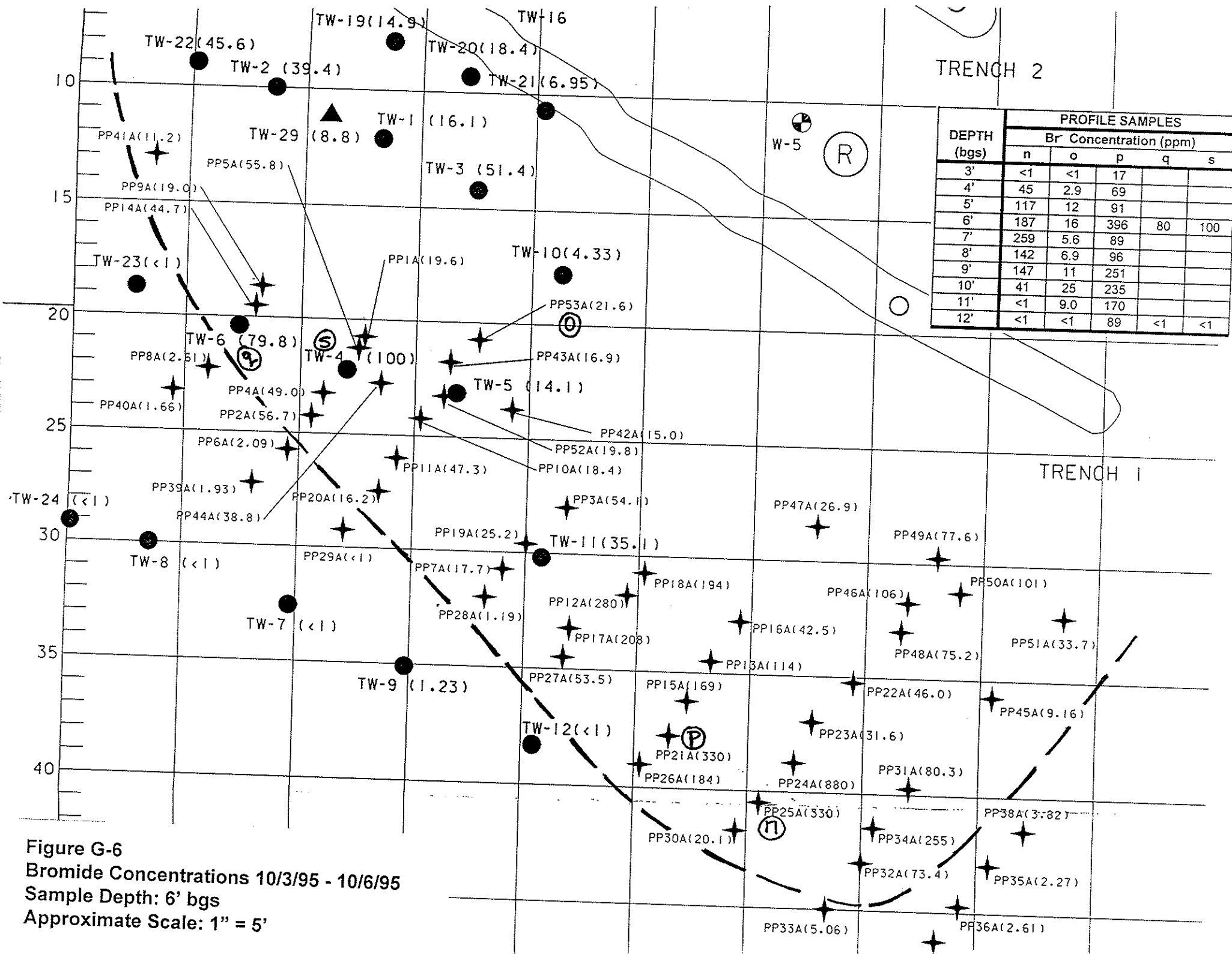


Figure G-6
 Bromide Concentrations 10/3/95 - 10/6/95
 Sample Depth: 6' bgs
 Approximate Scale: 1" = 5'

H1: Phase II Water Quality Data (January 1993)

Ayres Associates
RSE Group
3901 Coconut Palm Drive
Sabal Industrial Park - Suite 100
Tampa, Florida 33619

February 5, 1993
Project No. 05078
Page 2 of 13

LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
Sample Description: 02 - Water, TW1-6, sampled 1/7/93, 1000
03 - Water, TW1-12, sampled 1/7/93, 0950
04 - Water, TW1-20, sampled 1/7/93, 0940
Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(02)</u> <u>TW1-6</u>	<u>(03)</u> <u>TW1-12</u>	<u>(04)</u> <u>TW1-20</u>
Chloride	mg/l	61	13	44
Foaming Agents (MBAS)	mg/l	5.7	< 0.05	< 0.05
Total Dissolved Solids	mg/l	380	118	322
Ammonia Nitrogen	mg/l N	48	0.14	0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.1
Total Phosphorus	mg/l P	14	0.02	0.05
Total Organic Carbon	mg/l	26	4.5	1.5
Fecal Coliforms	Cts/100ml	200	< 10	< 2


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 05 - Water, TW2-6, sampled 1/7/93, 1030
06 - Water, TW2-12, sampled 1/7/93, 1020
07 - Water, TW2-20, sampled 1/7/93, 1010

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(05) TW2-6</u>	<u>(06) TW2-12</u>	<u>(07) TW2-20</u>
Chloride	mg/l	51	14	40
Foaming Agents (MBAS)	mg/l	0.40	< 0.05	< 0.05
Total Dissolved Solids	mg/l	330	124	320
Ammonia Nitrogen	mg/l N	19	0.08	< 0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.9
Total Phosphorus	mg/l P	13	0.02	0.15
Total Organic Carbon	mg/l	17	3.5	1.9
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 08 - Water, TW3-6, sampled 1/7/93, 0930
09 - Water, TW3-12, sampled 1/7/93, 0920
10 - Water, TW3-20, sampled 1/7/93, 0910

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(08)</u> <u>TW3-6</u>	<u>(09)</u> <u>TW3-12</u>	<u>(10)</u> <u>TW3-20</u>
Chloride	mg/l	59	41	41
Foaming Agents (MBAS)	mg/l	0.37	0.06	0.07
Total Dissolved Solids	mg/l	440	126	304
Ammonia Nitrogen	mg/l N	14	0.04	0.02
Nitrate-Nitrite Nitrogen	mg/l N	23	< 0.01	2.4
Total Phosphorus	mg/l P	5.6	0.26	0.02
Total Organic Carbon	mg/l	5.6	4.0	1.7
Fecal Coliforms	Cts/100ml	< 2	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 11 - Water, TW4-6, sampled 1/7/93, 0820
12 - Water, TW4-12, sampled 1/7/93, 0810
13 - Water, TW4-20, sampled 1/7/93, 0800

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(11)</u> <u>TW4-6</u>	<u>(12)</u> <u>TW4-12</u>	<u>(13)</u> <u>TW4-20</u>
Chloride	mg/l	65	13	43
Foaming Agents (MBAS)	mg/l	5.5	< 0.05	< 0.05
Total Dissolved Solids	mg/l	420	124	316
Ammonia Nitrogen	mg/l N	26	0.03	0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.6
Total Phosphorus	mg/l P	5.2	0.10	0.02
Total Organic Carbon	mg/l	17	2.8	1.5
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
Sample Description: 14 - Water, TW5-6, sampled 1/7/93, 0850
15 - Water, TW5-12, sampled 1/7/93, 0840
16 - Water, TW5-20, sampled 1/7/93, 0830
Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(14)</u> <u>TW5-6</u>	<u>(15)</u> <u>TW5-12</u>	<u>(16)</u> <u>TW5-20</u>
Chloride	mg/l	55	16	35
Foaming Agents (MBAS)	mg/l	4.7	< 0.05	< 0.05
Total Dissolved Solids	mg/l	354	136	264
Ammonia Nitrogen	mg/l N	4.5	0.01	0.08
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01
Total Phosphorus	mg/l P	12	0.10	0.02
Total Organic Carbon	mg/l	15	3.5	3.2
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Aynes Project No. 4155.00 - SDA, St. Johns County

Sample Description: 17 - Water, TW6-6, sampled 1/7/93, 0750
18 - Water, TW6-12, sampled 1/7/93, 0740
19 - Water, TW6-20, sampled 1/7/93, 0730

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(17)</u> <u>TW6-6</u>	<u>(18)</u> <u>TW6-12</u>	<u>(19)</u> <u>TW6-20</u>
Chloride	mg/l	88	13	43
Foaming Agents (MBAS)	mg/l	0.83	< 0.05	< 0.05
Total Dissolved Solids	mg/l	324	134	332
Ammonia Nitrogen	mg/l N	37	0.04	< 0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.7
Total Phosphorus	mg/l P	8.4	0.08	0.03
Total Organic Carbon	mg/l	13	3.6	1.7
Fecal Coliforms	Cts/100ml	< 1	< 1	< 2


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 20 - Water, TW7-6, sampled 1/6/93, 1640
 21 - Water, TW7-20, sampled 1/6/93, 1630
 22 - Water, TW8-6, sampled 1/6/93, 1650
 23 - Water, TW8-20, sampled 1/6/93, 1700

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(20)</u> <u>TW7-6</u>	<u>(21)</u> <u>TW7-20</u>	<u>(22)</u> <u>TW8-6</u>	<u>(23)</u> <u>TW8-20</u>
Chloride	mg/l	83	43	24	42
Foaming Agents (MBAS)	mg/l	0.72	< 0.05	0.14	< 0.05
Total Dissolved Solids	mg/l	360	336	158	316
Ammonia Nitrogen	mg/l N	29	0.02	19	0.03
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	2.9	< 0.01	2.3
Total Phosphorus	mg/l P	5.2	0.02	3.5	0.02
Total Organic Carbon	mg/l	22	1.7	19	1.5
Fecal Coliforms	Cts/100ml	< 2	< 1	< 10	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 24 - Water, TW9-6, sampled 1/6/93, 1720
 25 - Water, TW9-20, sampled 1/6/93, 1710
 26 - Water, TW10-6, sampled 1/7/93, 0900
 27 - Water, TW11-6, sampled 1/7/93, 1045
 28 - Water, TW12-6, sampled 1/7/93, 1135

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(24) TW9-6</u>	<u>(25) TW9-20</u>	<u>(26) TW10-6</u>	<u>(27) TW11-6</u>	<u>(28) TW12-6</u>
Chloride	mg/l	76	43	53	13	69
Foaming Agents (MBAS)	mg/l	0.96	< 0.05	3.3	< 0.05	0.12
Total Dissolved Solids	mg/l	378	320	374	138	338
Ammonia Nitrogen	mg/l N	22	0.03	8.3	0.64	12
Nitrate-Nitrite Nitrogen	mg/l N	0.08	2.8	< 0.01	< 0.01	< 0.01
Total Phosphorus	mg/l P	12	0.06	9.6	0.82	0.33
Total Organic Carbon	mg/l	7.4	1.9	14	2.5	4.3
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 29 - Water, BW1-5, sampled 1/6/93, 1615
 30 - Water, BW1-10, sampled 1/6/93, 1600
 31 - Water, BW1-15, sampled 1/6/93, 1610
 32 - Water, SW7, sampled 1/6/93, 1545
 33 - Water, W5, sampled 1/7/93, 1210

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(29)</u> <u>BW1-5</u>	<u>(30)</u> <u>BW1-10</u>	<u>(31)</u> <u>BW1-15</u>	<u>(32)</u> <u>SW7</u>	<u>(33)</u> <u>W5</u>
Chloride	mg/l	13	31	27	15	49
Foaming Agents (MBAS)	mg/l	< 0.05	< 0.05	< 0.05	0.05	0.31
Total Dissolved Solids	mg/l	56	66	190	248	362
Ammonia Nitrogen	mg/l N	0.15	0.10	0.10	0.79	3.0
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01	19
Total Phosphorus	mg/l P	0.02	0.02	0.01	0.04	5.2
Total Organic Carbon	mg/l	4.3	3.8	1.3	32	7.7
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1	< 10	6


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Specific Conductance	EPA 120.1	0.1 umhos/cm	1/26/93
Chloride	EPA 325.2	1 mg/l	1/20/93
Sulfate	EPA 375.4	2 mg/l	1/28/93
Foaming Agents (MBAS)	SM 512 B	0.05 mg/l	1/8/93
Total Dissolved Solids	EPA 160.1	10 mg/l	1/12/93
Total Suspended Solids	EPA 160.2	1 mg/l	1/12/93
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	2/3/93
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	1/14/93
Total Phosphorus	EPA 365.2	0.01 mg/l P	1/19/93
Total Organic Carbon	EPA 415.1	1 mg/l	1/28/93
Fecal Coliforms	SM 909 C	1 Ct/100mls	1/7/93
Fecal Streptococci	SM 910 B	1 Ct/100mls	1/7/93
BOD	SM 507	1 mg/l	1/8/93
Oil and Grease	EPA 413.1	2 mg/l	2/2/93
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	1/14/93 (01-20,M/B) 1/20/93 (21-33)
Total Nitrogen	Calc.	0.05 mg/l N	2/3/93


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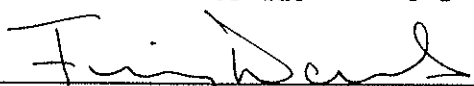
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Specific Conductance Chloride	IS01474(1/26)	102	0	90-118	0-1
	05078-02	89	1	92-109	0-3
	05078-16	100	2	92-109	0-3
	05078-30	99	1	92-109	0-3
Sulfate	05091-11	103	1	78-127	0-7
Foaming Agents (MBAS)	05078-03	97	6	74-132	0-22
	05078-15	99	6	74-132	0-22
	05078-23	101	18	74-132	0-22
Total Dissolved Solids	05078-03	99	3	81-116	0-11
	05078-19	101	3	81-116	0-11
	05078-28	94	3	81-116	0-11
Total Suspended Solids	05070-01	91	1	87-104	0-12
Nitrate-Nitrite Nitrogen	05078-02	100	2	81-132	0-14
	05078-11	99	1	81-132	0-14
	05078-24	97	0	81-132	0-14
Total Kjeldahl Nitrogen	05065-10	83	1	79-119	0-18
Total Phosphorus	05078-10	94	0	81-122	0-14
	05078-19	98	8	81-122	0-14
	05078-31	87	2	81-122	0-14
Total Organic Carbon	05078-10	97	2	82-117	0-7
	05078-20	90	1	82-117	0-7
	05078-30	94	1	82-117	0-7
Fecal Coliforms	05078-01	--	33	--	0-82
	Pos.Control(1/7)	--	29	--	0-82
Fecal Streptococci	05078-01	--	43	--	0-60
BOD	05078-01	--	5	--	0-21
	IS01820(1/8)	90	15	70-113	0-21
Oil and Grease	RS/RSD(2/2)	100	3	79-114	0-21
Ammonia Nitrogen	05078-06	103	1	83-123	0-3
	05078-16	100	1	83-123	0-3
	05078-25	117	2	83-123	0-3


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Note: Matrix Spike/Matrix Spike Duplicates are routinely analyzed concurrently with samples, in all methods, to assess the accuracy and precision of the techniques being carried out. Two of three aliquots of at least one sample in the set being processed are spiked with known equal concentrations of actual method analytes. These duplicate spiked aliquots are subjected to the analytical method in the same manner as the samples themselves.

Recovery of the spikes is determined by comparison of analyte concentrations in the two spiked aliquots to the analyte concentration in the unspiked sample aliquot. Accuracy is reported as percent of the analyte recovered versus the original concentration spiked (Percent Recovery), averaged for the duplicate spikes. Precision is reported as Relative Percent Difference between the duplicate spike measurements.

Quality Control results published for each method are representative of the sample set in which these project samples were included. The actual sample spiked is indicated. Each matrix type (water and/or soil) in a set is spiked at least once. A minimum of 10% of all samples are routinely spiked.



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H2: Phase III Water Quality Data (November 1993)

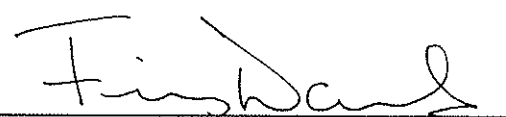
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 01 - Water, STE-9, sampled 11/3/93, 1245
 02 - Water, Tap/SDA, sampled 11/3/93, 1630
 03 - Water, TW13-20, sampled 11/3/93, 1700
 04 - Water, TW14-6, sampled 11/3/93, 1630
Date Received: 11/4/93, 1035

Parameter	Units	(01) STE-9	(02) Tap/SDA	(03) TW13-20	(04) TW14-6	Method Blank
Chloride	mg/l	64	9.5	10	12	< 1
Sulfate	mg/l	4	< 2	38	4	< 2
Foaming Agents (MBAS)	mg/l	28	< 0.05	< 0.05	0.12	< 0.05
Total Suspended Solids	mg/l	32	--	--	--	< 1
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	75	0.10	0.16	1.1	< 0.05
Total Phosphorus	mg/l P	8.7	0.05	< 0.01	0.43	< 0.01
Total Organic Carbon	mg/l	82	< 1	1.5	6.1	< 1
BOD (5 Day @ 20°C)	mg/l	199	--	--	--	< 1
Ammonia Nitrogen	mg/l N	69	0.09	0.12	0.67	< 0.01
Organic Nitrogen	mg/l N	6	< 0.05	< 0.05	0.43	< 0.05
Total Hardness	mg/l CaCO ₃	160	160	99	35	< 2



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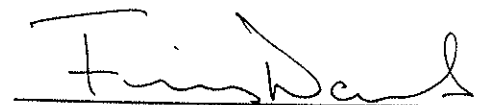
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 05 - Water, TW14-12, sampled 11/3/93, 1600
 06 - Water, TW14-20, sampled 11/3/93, 1545
 07 - Water, TW15-6, sampled 11/3/93, 1515
 08 - Water, TW15-12, sampled 11/3/93, 1445
Date Received: 11/4/93, 1035

<u>Parameter</u>	<u>Units</u>	<u>(05)</u> <u>TW14-12</u>	<u>(06)</u> <u>TW14-20</u>	<u>(07)</u> <u>TW15-6</u>	<u>(08)</u> <u>TW15-12</u>
Chloride	mg/l	16	11	13	43
Sulfate	mg/l	< 2	29	25	17
Foaming Agents (MBAS)	mg/l	0.44	< 0.05	0.10	0.99
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	7.4	0.13	3.6	0.83
Total Phosphorus	mg/l P	0.01	0.01	0.32	< 0.01
Total Organic Carbon	mg/l	6.2	1.6	11	10
Ammonia Nitrogen	mg/l N	6.7	0.08	3.0	0.70
Organic Nitrogen	mg/l N	0.7	0.05	0.60	0.13
Total Hardness	mg/l CaCO ₃	89	93	69	200



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 09 - Water, TW15-20, sampled 11/3/93, 1345
 10 - Water, TW6-6, sampled 11/4/93, 1630
 11 - Water, TW6-12, sampled 11/4/93, 1600
 12 - Water, TW6-20, sampled 11/4/93, 1530
Date Received: 11/4, 1035 (09), 11/5/93, 1015 (10-12)

<u>Parameter</u>	<u>Units</u>	<u>(09)</u> <u>TW15-20</u>	<u>(10)</u> <u>TW6-6</u>	<u>(11)</u> <u>TW6-12</u>	<u>(12)</u> <u>TW6-20</u>
Chloride	mg/l	13	52	36	26
Sulfate	mg/l	23	84	< 2	60
Foaming Agents (MBAS)	mg/l	< 0.05	1.5	0.20	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	19	1.2	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	0.21	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.12	45	0.39	0.19
Total Phosphorus	mg/l P	< 0.01	4.7	0.06	< 0.01
Total Organic Carbon	mg/l	1.3	12	5.8	1.2
Ammonia Nitrogen	mg/l N	0.08	44	0.07	0.11
Organic Nitrogen	mg/l N	< 0.05	1.0	0.32	0.08
Total Hardness	mg/l CaCO ₃	99	120	130	75


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 13 - Water, TW7-6, sampled 11/4/93, 1500
14 - Water, TW7-12, sampled 11/4/93, 1430
15 - Water, TW7-20, sampled 11/4/93, 1400
16 - Water, TW11-6, sampled 11/4/93, 1700

Date Received: 11/5/93, 1015

<u>Parameter</u>	<u>Units</u>	<u>(13)</u> <u>TW7-6</u>	<u>(14)</u> <u>TW7-12</u>	<u>(15)</u> <u>TW7-20</u>	<u>(16)</u> <u>TW11-6</u>
Chloride	mg/l	62	20	16	100
Sulfate	mg/l	83	< 2	57	140
Foaming Agents (MBAS)	mg/l	0.66	0.09	< 0.05	0.93
Nitrate Nitrogen	mg/l N	1.8	< 0.01	< 0.01	13
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	0.01
Total Kjeldahl Nitrogen	mg/l N	27	0.24	0.14	17
Total Phosphorus	mg/l P	4.1	< 0.01	0.03	0.32
Total Organic Carbon	mg/l	9.8	5.1	< 1	7.9
Ammonia Nitrogen	mg/l N	27	0.12	0.07	15
Organic Nitrogen	mg/l N	< 0.05	0.12	0.07	2.0
Total Hardness	mg/l CaCO ₃	80	100	59	310


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 17 - Water, TW8-6, sampled 11/4/93, 1330
18 - Water, TW8-12, sampled 11/4/93, 1300
19 - Water, TW8-20, sampled 11/4/93, 1145
20 - Water, TW9-6, sampled 11/4/93, 1115

Date Received: 11/5/93, 1050

<u>Parameter</u>	<u>Units</u>	<u>(17)</u> <u>TW8-6</u>	<u>(18)</u> <u>TW8-12</u>	<u>(19)</u> <u>TW8-20</u>	<u>(20)</u> <u>TW9-6</u>
Chloride	mg/l	49	9.8	24	45
Sulfate	mg/l	50	< 2	66	19
Foaming Agents (MBAS)	mg/l	1.3	< 0.05	< 0.05	1.2
Nitrate Nitrogen	mg/l N	1.3	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	11	0.14	0.30	29
Total Phosphorus	mg/l P	2.5	0.01	0.01	2.5
Total Organic Carbon	mg/l	12	2.9	1.2	11
Ammonia Nitrogen	mg/l N	11	0.05	0.10	29
Organic Nitrogen	mg/l N	< 0.05	0.09	0.20	< 0.05
Total Hardness	mg/l CaCO ₃	110	75	83	120



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 21 - Water, TW9-12, sampled 11/4/93, 1050
 22 - Water, TW9-20, sampled 11/4/93, 1020
 23 - Water, TW12-6, sampled 11/4/93, 0950
 24 - Water, TW13-6, sampled 11/4/93, 0900
Date Received: 11/5/93, 1050

<u>Parameter</u>	<u>Units</u>	<u>(21)</u> <u>TW9-12</u>	<u>(22)</u> <u>TW9-20</u>	<u>(23)</u> <u>TW12-6</u>	<u>(24)</u> <u>TW13-6</u>
Chloride	mg/l	16	18	52	2.1
Sulfate	mg/l	< 2	22	< 2	4
Foaming Agents (MBAS)	mg/l	0.21	< 0.05	0.54	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	0.25
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.16	0.16	2.5	0.86
Total Phosphorus	mg/l P	< 0.01	< 0.01	0.39	0.85
Total Organic Carbon	mg/l	5.2	1.3	9.9	4.6
Ammonia Nitrogen	mg/l N	< 0.01	0.07	2.5	0.03
Organic Nitrogen	mg/l N	0.16	0.09	< 0.05	0.83
Total Hardness	mg/l CaCO ₃	100	47	240	45



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 25 - Water, TW13-12, sampled 11/4/93, 0825
 26 - Water, WP6-6, sampled 11/4/93, 1145
 27 - Water, TW1-6, sampled 11/5/93, 1400
 28 - Water, TW1-12, sampled 11/5/93, 1330

Date Received: 11/5, 1050 (25,26), 11/6/93, 0915 (27,28)

Parameter	Units	(25)	(26)*	(27)	(28)
		TW13-12	WP6-6	TW1-6	TW1-12
Chloride	mg/l	37	49	51	250
Sulfate	mg/l	10	20	54	36
Foaming Agents (MBAS)	mg/l	1.2	1.3	0.44	0.54
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	43	14
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	0.01	0.29
Total Kjeldahl Nitrogen	mg/l N	15	31	2.6	0.36
Total Phosphorus	mg/l P	0.09	2.3	6.8	< 0.01
Total Organic Carbon	mg/l	11	9.9	5.7	6.1
BOD (5 Day @ 20°C)	mg/l	--	--	< 1	--
Ammonia Nitrogen	mg/l N	16	30	3.2	0.12
Organic Nitrogen	mg/l N	< 0.05	1.0	< 0.05	0.24
Total Hardness	mg/l CaCO ₃	100	93	210	260

(TW9-6) Dup

* Duplicate of TW9-6


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 29 - Water, TW1-20, sampled 11/5/93, 1330
 30 - Water, TW2-6, sampled 11/5/93, 1245
 31 - Water, TW2-12, sampled 11/5/93, 1315
 32 - Water, TW2-20, sampled 11/5/93, 1340

Date Received: 11/6/93 , 0915

<u>Parameter</u>	<u>Units</u>	<u>(29)</u> <u>TW1-20</u>	<u>(30)</u> <u>TW2-6</u>	<u>(31)</u> <u>TW2-12</u>	<u>(32)</u> <u>TW2-20</u>
Chloride	mg/l	230	52	40	21
Sulfate	mg/l	91	110	36	100
Foaming Agents (MBAS)	mg/l	< 0.05	1.8	0.32	< 0.05
Nitrate Nitrogen	mg/l N	3.1	37	17	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.4	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.32	36	0.61	0.21
Total Phosphorus	mg/l P	< 0.01	4.6	< 0.01	0.02
Total Organic Carbon	mg/l	2.1	11	4.7	2.3
BOD (5 Day @ 20°C)	mg/l	--	6.2	--	--
Ammonia Nitrogen	mg/l N	0.22	36	< 0.01	0.14
Organic Nitrogen	mg/l N	0.10	< 0.05	0.61	0.07
Total Hardness	mg/l CaCO ₃	130	220	210	85


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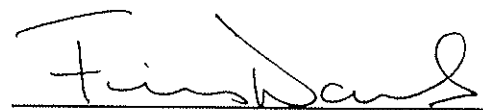
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 33 - Water, TW3-6, sampled 11/5/93, 1300
 34 - Water, TW3-12, sampled 11/5/93, 1200
 35 - Water, TW3-20, sampled 11/5/93, 1130
 36 - Water, TW4-6, sampled 11/5/93, 1030
Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(33)</u> <u>TW3-6</u>	<u>(34)</u> <u>TW3-12</u>	<u>(35)</u> <u>TW3-20</u>	<u>(36)</u> <u>TW4-6</u>
Chloride	mg/l	46	44	24	49
Sulfate	mg/l	38	52	100	95
Foaming Agents (MBAS)	mg/l	0.14	0.75	< 0.05	0.65
Nitrate Nitrogen	mg/l N	43	19	< 0.01	39
Nitrite Nitrogen	mg/l N	0.13	0.49	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.59	0.76	0.25	29
Total Phosphorus	mg/l P	7.9	0.22	< 0.01	6.9
Total Organic Carbon	mg/l	4.6	8.0	2.5	6.0
BOD (5 Day @ 20°C)	mg/l	< 1	--	--	--
Ammonia Nitrogen	mg/l N	0.07	0.03	0.13	30
Organic Nitrogen	mg/l N	0.52	0.73	0.12	< 0.05
Total Hardness	mg/l CaCO ₃	180	130	83	160



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 37 - Water, TW4-12, sampled 11/5/93, 1000
38 - Water, TW4-20, sampled 11/5/93, 0930
39 - Water, TW5-6, sampled 11/5/93, 0900
40 - Water, TW5-12 sampled 11/5/93, 0830

Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(37)</u> <u>TW4-12</u>	<u>(38)</u> <u>TW4-20</u>	<u>(39)</u> <u>TW5-6</u>	<u>(40)</u> <u>TW5-12</u>
Chloride	mg/l	46	23	41	46
Sulfate	mg/l	15	66	56	25
Foaming Agents (MBAS)	mg/l	1.9	< 0.05	0.26	2.6
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	46	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.35	0.21	24	0.35
Total Phosphorus	mg/l P	0.10	< 0.01	6.1	0.18
Total Organic Carbon	mg/l	13	1.6	4.8	14
Ammonia Nitrogen	mg/l N	0.07	0.11	24	0.04
Organic Nitrogen	mg/l N	0.28	0.10	< 0.05	0.31
Total Hardness	mg/l CaCO ₃	180	43	140	170



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 41 - Water, TW5-20, sampled 11/5/93, 0800
 42 - Water, TW10-6, sampled 11/5/93, 1100
 43 - Water, TW16-6, sampled 11/5/93, 1210
 44 - Water, TW16-12, sampled 11/5/93, 1200

Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(41)</u> <u>TW5-20</u>	<u>(42)</u> <u>TW10-6</u>	<u>(43)</u> <u>TW16-6</u>	<u>(44)</u> <u>TW16-12</u>
Chloride	mg/l	11	48	300	41
Sulfate	mg/l	2	45	47	44
Foaming Agents (MBAS)	mg/l	< 0.05	0.25	0.15	0.54
Nitrate Nitrogen	mg/l N	< 0.01	33	59	7.1
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	0.15	2.7
Total Kjeldahl Nitrogen	mg/l N	0.11	22	1.0	0.52
Total Phosphorus	mg/l P	0.05	4.6	16	0.29
Total Organic Carbon	mg/l	1.9	4.7	8.9	6.8
BOD (5 Day @ 20°C)	mg/l	--	--	< 1	--
Ammonia Nitrogen	mg/l N	0.04	21	0.08	0.03
Organic Nitrogen	mg/l N	0.07	1.0	0.92	0.49
Total Hardness	mg/l CaCO ₃	22	120	120	100



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 45 - Water, TW16-20, sampled 11/5/93, 1125
 46 - Water, TW17-6, sampled 11/5/93, 1055
 47 - Water, TW17-12, sampled 11/5/93, 1025
 48 - Water, TW17-20, sampled 11/5/93, 1005

Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(45)</u> <u>TW16-20</u>	<u>(46)</u> <u>TW17-6</u>	<u>(47)</u> <u>TW17-12</u>	<u>(48)</u> <u>TW17-20</u>
Chloride	mg/l	28	46	38	29
Sulfate	mg/l	120	49	39	130
Foaming Agents (MBAS)	mg/l	< 0.05	0.10	0.63	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	52	8.9	0.02
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.1	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.14	7.1	0.56	0.11
Total Phosphorus	mg/l P	< 0.01	5.3	< 0.01	< 0.01
Total Organic Carbon	mg/l	1.6	4.4	6.4	1.4
BOD (5 Day @ 20°C)	mg/l	--	< 1	--	--
Ammonia Nitrogen	mg/l N	0.04	8.4	0.02	0.02
Organic Nitrogen	mg/l N	0.10	< 0.05	0.54	0.09
Total Hardness	mg/l CaCO ₃	110	180	67	110


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County


Sample Description: 49 - Water, TW18-6, sampled 11/5/93, 0935
 50 - Water, TW18-12, sampled 11/5/93, 0910
 51 - Water, TW18-20, sampled 11/5/93, 0845
 52 - Water, WP10-6, sampled 11/5/93, 1100

Date Received: 11/6/93, 0915

(TW4-6) Dup
 *

Parameter	Units	(49) TW18-6	(50) TW18-12	(51) TW18-20	(52) WP10-6
Chloride	mg/l	50	40	28	50
Sulfate	mg/l	36	44	130	90
Foaming Agents (MBAS)	mg/l	0.15	0.81	< 0.05	0.52
Nitrate Nitrogen	mg/l N	50	8.7	< 0.01	37
Nitrite Nitrogen	mg/l N	< 0.01	0.64	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	7.3	0.54	0.11	28
Total Phosphorus	mg/l P	2.2	0.02	< 0.01	6.3
Total Organic Carbon	mg/l	4.0	7.1	1.5	5.9
BOD (5 Day @ 20°C)	mg/l	< 1	--	--	--
Ammonia Nitrogen	mg/l N	9.1	0.03	0.04	30
Organic Nitrogen	mg/l N	< 0.05	0.51	0.07	< 0.05
Total Hardness	mg/l CaCO ₃	190	91	110	160

* Duplicate of TW4-6


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LABORATORY REPORT

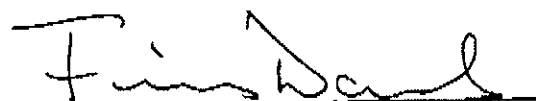
Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 53 - Water, WP7-12, sampled 11/5/93, 1230
 54 - Water, WP8-12, sampled 11/5/93, 1400
 55 - Water, WP9-12, sampled 11/5/93, 1400
 56 - Water, BW1-5, sampled 11/5/93, 1455
Date Received: 11/6/93, 0915

Parameter	Units	(TW17-12 dup)	(TW2-12 Dup)	(TW1-12 dup)	(56)
		(53)* WP7-12	(54)** WP8-12	(55)*** WP9-12	BW1-5
Chloride	mg/l	38	40	250	12
Sulfate	mg/l	38	35	38	12
Foaming Agents (MBAS)	mg/l	0.57	0.27	0.46	< 0.05
Nitrate Nitrogen	mg/l N	8.9	18	15	0.17
Nitrite Nitrogen	mg/l N	2.1	2.4	0.03	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.59	0.49	0.37	0.16
Total Phosphorus	mg/l P	0.17	< 0.01	< 0.01	< 0.01
Total Organic Carbon	mg/l	6.3	4.6	7.0	3.1
Ammonia Nitrogen	mg/l N	0.02	0.03	0.12	0.03
Organic Nitrogen	mg/l N	0.57	0.46	0.25	0.13
Total Hardness	mg/l CaCO ₃	73	210	260	22

* Duplicate of TW17-12.

** Duplicate of TW2-12

*** Duplicate of TW1-12



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 57 - Water, BW1-10, sampled 11/5/93, 1440
 58 - Water, BW1-15, sampled 11/5/93, 1425
 59 - Water, BW1-20, sampled 11/5/93, 1415
 60 - Equipment Blank, sampled 11/5/93, 0730

Date Received: 11/6/93, 0915

Parameter	Units	(57) BW1-10	(58) BW1-15	(59) BW1-20	(60) Equip. Blank 11/5, 0730
Chloride	mg/l	3	29	32	< 1
Sulfate	mg/l	16	56	120	< 2
Foaming Agents (MBAS)	mg/l	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	0.33	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.29	0.18	0.10	< 0.05
Total Phosphorus	mg/l P	< 0.01	< 0.01	< 0.01	< 0.01
Total Organic Carbon	mg/l	5.9	1.6	1.4	< 1
Ammonia Nitrogen	mg/l N	0.10	0.04	0.06	0.02
Organic Nitrogen	mg/l N	0.19	0.14	0.04	< 0.05
Total Hardness	mg/l CaCO ₃	35	65	110	< 2


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 61 - Equipment Blank, sampled 11/5/93, 1600
 62 - Equipment Blank A, sampled 11/5/93, 1615
 63 - Spiked Blank, sampled 11/5/93, 1500

Date Received: 11/6/93, 0915

Parameter	Units	(61) Equip. Blank 11/5, 1600	(62) Equip. Blank A	(63) Spiked Blank	Method Blank
Chloride	mg/l	< 1	< 1	--	< 1
Sulfate	mg/l	< 2	< 2	--	< 2
Foaming Agents (MBAS)	mg/l	< 0.05	< 0.05	0.28	< 0.05
Total Suspended Solids	mg/l	--	--	--	< 1
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	--	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	--	< 0.01
Total Kjeldahl Nitrogen	mg/l N	< 0.05	< 0.05	--	< 0.05
Total Phosphorus	mg/l P	< 0.01	< 0.01	--	< 0.01
Total Organic Carbon	mg/l	< 1	< 1	--	< 1
BOD (5 Day @ 20°C)	mg/l	--	--	--	< 1
Ammonia Nitrogen	mg/l N	0.02	0.01	--	< 0.01
Organic Nitrogen	mg/l N	< 0.05	< 0.05	--	< 0.05
Total Hardness	mg/l CaCO ₃	< 2	< 2	--	< 2



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Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Chloride	EPA 325.2	1 mg/l	11/8/93 (01-09,M/B) 11/11/93 (10-26) 11/12/93 (27-49) 11/17/93 (50-62)
Sulfate	EPA 375.4	2 mg/l	11/9/93 (01-09,M/B) 11/10/93 (10-32) 11/11/93 (33-62)
Foaming Agents (MBAS)	SM 5540 C	0.05 mg/l	11/5/93 (01-26,M/B) 11/6/93 (27-63)
Total Suspended Solids	EPA 160.2	1 mg/l	11/9/93
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	11/5/93 (01-26,M/B) 11/10/93 (27-62)
Nitrite Nitrogen	EPA 354.1	0.01 mg/l N	11/5/93 (01-16,M/B) 11/6/93 (17-62)
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	11/9/93 (01-14,M/B) 11/16/93 (15-29) 11/23/93 (30-62)
Total Phosphorus	EPA 365.2	0.01 mg/l P	11/10/93 (01-14,M/B) 11/18/93 (15-29) 11/23/93 (30-62)


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Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Total Organic Carbon	EPA 415.1	1 mg/l	11/9/93 (01-54,M/B) 11/10/93 (55-62)
BOD	SM 5210	1 mg/l	11/4/93 (01,M/B) 11/6/93 (27,30,33,43, 46,49)
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	11/18/93 (01-24,M/B) 11/22/93 (25-62)
Organic Nitrogen	Calc.	0.05 mg/l N	11/18/93 (01-24,M/B) 11/22/93 (25-29) 11/23/93 (30-62)
Total Hardness	SM 2340 C	2 mg/l CaCO ₃	11/16/93 (01-26,M/B) 11/18/93 (27-42) 11/19/93 (43-60) 11/22/93 (61,62)


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Chloride	06174-02	100	1	82-116	0-5
	06174-12	94	0	82-116	0-5
	06174-21	90	0	82-116	0-5
	06174-32	91	1	82-116	0-5
	06174-38	96	2	82-116	0-5
	06174-53	101	1	82-116	0-5
Sulfate	06174-02	110	2	78-131	0-9
	06174-11	117	4	78-131	0-9
	06174-18	118	6	78-131	0-9
	06174-34	103	3	78-131	0-9
	06174-42	116	3	78-131	0-9
	06174-58	79	2	78-131	0-9
Foaming Agents (MBAS)	06174-03	98	1	77-121	0-16
	06174-12	97	1	77-121	0-16
	06174-22	100	1	77-121	0-16
	06174-34	101	2	77-121	0-16
	06174-44	105	5	77-121	0-16
	06174-54	99	2	77-121	0-16
	06174-59	101	1	77-121	0-16
Total Suspended Solids	06174-01	94	3	76-113	0-8
Nitrate Nitrogen	06174-08	105	0	72-128	0-14
	06174-11	105	0	72-128	0-14
	06174-12	95	0	72-128	0-14
	06174-32	104	1	72-128	0-14
	06174-48	101	0	72-128	0-14
	06174-56	105	0	72-128	0-14



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Nitrite Nitrogen	06174-03	98	0	78-114	0-6
	06174-12	98	1	78-114	0-6
	06174-22	98	0	78-114	0-6
	06174-35	98	0	78-114	0-6
	06174-45	100	0	78-114	0-6
	06174-59	96	0	78-114	0-6
	06174-56	95	2	78-114	0-6
Total Kjeldahl Nitrogen	06174-03	92	4	76-114	0-16
	06174-26	98	3	76-114	0-16
	06174-45	101	1	76-114	0-16
	06174-48	98	4	76-114	0-16
	06174-58	95	0	76-114	0-16
Total Phosphorus	06174-03	83	3	77-118	0-17
	06174-26	100	5	77-118	0-17
	06174-45	95	0	77-118	0-17
	06174-48	93	4	77-118	0-17
	06174-58	91	0	77-118	0-17
Total Organic Carbon	06174-09	95	2	83-109	0-4
	06174-19	96	1	83-109	0-4
	06174-29	92	3	83-109	0-4
	06174-39	95	4	83-109	0-4
	06174-48	99	1	83-109	0-4
	06174-59	98	2	83-109	0-4
BOD (5 Day @ 20°C)	ISO2359(11/4)	87	11	63-111	0-41
	06170-03	--	12	63-111	0-41
	ISO2370(11/6)	89	1	63-111	0-41
	06177-01	--	6	63-111	0-41



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Ammonia Nitrogen	06174-06	97	0	78-125	0-4
	06174-15	98	0	78-125	0-4
	06174-24	98	1	78-125	0-4
	06174-28	94	1	78-125	0-4
	06174-37	91	0	78-125	0-4
	06174-47	94	1	78-125	0-4
	06174-58	95	2	78-125	0-4
Total Hardness	06174-05	96	1	87-115	0-4
	06174-12	95	0	87-115	0-4
	06174-25	93	2	87-115	0-4
	06174-31	99	1	87-115	0-4
	06174-38	110	0	87-115	0-4
	06174-47	97	0	87-115	0-4
	06174-57	100	2	87-115	0-4


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H3: Phase IIIA Water Quality Data (May 1995, January 1996)

SOUTHERN ANALYTICAL LABORATORIES, INC.

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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County


Sample Description:
01 - Water, STE, sampled 5/8/95, 1445
02 - Water, TW19-6, sampled 5/8/95, 1605
03 - Water, TW19-12, sampled 5/8/95, 1645
04 - Water, TW19-20, sampled 5/8/95, 1715

Date Received: 5/9/95, 1330

Parameter	Units	(01)	(02)	(03)	(04)
		STE	TW19-6	TW19-12	TW19-20
Ammonia Nitrogen	mg/l N	48	61	60	0.06
Nitrate Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	5.0	0.67	0.59	0.05 U
Total Kjeldahl Nitrogen	mg/l N	53	62	61	0.06
Total Phosphorus	mg/l P	7.8	11	11	0.04
Chloride	mg/l	45	46	46	23
Foaming Agents (MBAS)	mg/l	31	1.7	1.4	0.05 U
Sulfate	mg/l	5	2 U	2	20
Total Hardness	mg/l CaCO ₃	140	140	150	31
Total Organic Carbon	mg/l	42	12	13	1 U
BOD (5 Day @ 20°C)	mg/l	187	--	--	--
Total Suspended Solids	mg/l	50	--	--	--

U - Analyte was not detected; indicated concentration is method detection limit.

FHRS Environmental Lab No. E84129
FHRS Drinking Water Lab No. 84269
Comprehensive QA Plan No. 870317G


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LABORATORY REPORT


Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 05 - Water, TW20-6, sampled 5/8/95, 1630
06 - Water, TW20-12, sampled 5/8/95, 1705
07 - Water, TW20-20, sampled 5/8/95, 1730
08 - Water, BW1-5, sampled 5/9/95, 1010

Date Received: 5/9, 1330 (05-07); 5/10/95, 1330 (08)

<u>Parameter</u>	<u>Units</u>	<u>(05) TW20-6</u>	<u>(06) TW20-12</u>	<u>(07) TW20-20</u>	<u>(08) BW1-5</u>
Ammonia Nitrogen	mg/l N	34	0.04	0.02	0.01 U
Nitrate Nitrogen	mg/l N	0.03	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.55	0.15	0.05 U	0.13
Total Kjeldahl Nitrogen	mg/l N	35	0.19	0.05 U	0.13
Total Phosphorus	mg/l P	12	0.08	0.15	0.03
Chloride	mg/l	46	19	12	6.2
Foaming Agents (MBAS)	mg/l	0.52	0.11	0.08	0.05 U
Sulfate	mg/l	40	15	42	5
Total Hardness	mg/l CaCO ₃	150	160	33	8.9
Total Organic Carbon	mg/l	7.6	4.6	1.1	3.4

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
09 - Water, BW1-10, sampled 5/9/95, 1040
10 - Water, TW2-6, sampled 5/9/95, 1300
11 - Water, TW4-6, sampled 5/9/95, 1635
12 - Water, TW5-6, sampled 5/9/95, 1900

Date Received: 5/10/95, 1330

Parameter	Units	(09)	(10)	(11)	(12)
		BW1-10	TW2-6	TW4-6	TW5-6
Ammonia Nitrogen	mg/l N	0.06	1.2	47	4.1
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	15
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.15	0.48	0.53	0.64
Total Kjeldahl Nitrogen	mg/l N	0.21	1.7	48	4.7
Total Phosphorus	mg/l P	0.02	6.7	13	5.1
Chloride	mg/l	10	18	46	48
Foaming Agents (MBAS)	mg/l	0.05 U	0.10	0.67	0.27
Sulfate	mg/l	35	9	24	23
Total Hardness	mg/l CaCO ₃	130	130	130	180
Total Organic Carbon	mg/l	4.9	12	9.4	4.3

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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
13 - Water, TW6-6, sampled 5/9/95, 1155
14 - Water, TW6-12, sampled 5/9/95, 1520
15 - Water, TW8-6, sampled 5/9/95, 1230
16 - Water, TW16-6, sampled 5/9/95, 1120

Date Received: 5/10/95, 1330

Parameter	Units	(13)	(14)	(15)	(16)
		TW6-6	TW6-12	TW8-6	TW16-6
Ammonia Nitrogen	mg/l N	8.5	0.05	0.37	1.5
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.02	2.7
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.45	0.12	0.25	0.88
Total Kjeldahl Nitrogen	mg/l N	9.0	0.17	0.62	2.4
Total Phosphorus	mg/l P	5.2	0.01	1.1	6.3
Chloride	mg/l	39	35	3.6	23
Foaming Agents (MBAS)	mg/l	0.25	0.05U	0.05 U	0.05 U
Sulfate	mg/l	17	33	14	32
Total Hardness	mg/l CaCO ₃	220	160	67	110
Total Organic Carbon	mg/l	9.6	3.8	4.1	9.3

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 17 - Water, TW21-6, sampled 5/8/95, 1835
 18 - Water, TW21-12, sampled 5/8/95, 1915
 19 - Water, TW21-20, sampled 5/8/95, 1925
 20 - Water, STBr-, sampled 5/9/95, 1605

Date Received: 5/10/95, 1330

Parameter	Units	(17) TW21-6	(18) TW21-12	(19) TW21-20	(20) STBr-
Ammonia Nitrogen	mg/l N	0.33	0.01	0.01 U	--
Nitrate Nitrogen	mg/l N	9.4	0.01 U	0.01 U	--
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	--
Organic Nitrogen	mg/l N	0.81	0.15	0.05 U	--
Total Kjeldahl Nitrogen	mg/l N	1.1	0.16	0.05 U	--
Total Phosphorus	mg/l P	3.3	0.16	0.03	--
Chloride	mg/l	28	13	9.8	--
Foaming Agents (MBAS)	mg/l	0.06	0.05 U	0.05 U	--
Sulfate	mg/l	36	14	48	--
Total Hardness	mg/l CaCO ₃	94	140	51	--
Total Organic Carbon	mg/l	7.5	5.4	1 U	--
Bromide	mg/l	--	--	--	800

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 21 - Water, TW19-6, sampled 5/9/95, 1555
 22 - Water, TW4-12, sampled 5/10/95, 0830
 23 - Water, TW5-12, sampled 5/10/95, 0845
 24 - Water, TW7-6, sampled 5/10/95, 0930
Date Received: 5/10, 1330 (21); 5/11/95, 0935 (22-24)

Parameter	Units	(21) TW19-6	(22) TW4-12	(23) TW5-12	(24) TW7-6
Ammonia Nitrogen	mg/l N	--	0.03	0.18	2.1
Nitrate Nitrogen	mg/l N	--	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	--	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	--	0.13	0.13	0.34
Total Kjeldahl Nitrogen	mg/l N	--	0.16	0.31	2.4
Total Phosphorus	mg/l P	--	0.07	0.28	4.8
Chloride	mg/l	--	20	22	20
Foaming Agents (MBAS)	mg/l	--	0.05 U	0.05 U	0.07
Sulfate	mg/l	--	15	13	9
Total Hardness	mg/l CaCO ₃	--	150	160	130
Total Organic Carbon	mg/l	--	4.9	5.0	7.0
Bromide	mg/l	1 K ¹	--	--	--

U - Analyte was not detected; indicated concentration is method detection limit.

K - Analyte was less than indicated concentration; indicated concentration is method detection limit multiplied by sample dilution factor.

¹ Sample required dilution due to matrix interferences.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
25 - Water, TW7-12, sampled 5/10/95, 0935
26 - Water, TW7-24, sampled 5/10/95, 1000
27 - Water, TW9-6, sampled 5/10/95, 1030
28 - Water, TW9-12, sampled 5/10/95, 1030

Date Received: 5/11/95, 0935

<u>Parameter</u>	<u>Units</u>	<u>(25) TW7-12</u>	<u>(26) TW7-24</u>	<u>(27) TW9-6</u>	<u>(28) TW9-12</u>
Ammonia Nitrogen	mg/l N	0.07	2.1	2.5	0.25
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.13	0.37	0.44	0.11
Total Kjeldahl Nitrogen	mg/l N	0.20	2.5	2.9	0.36
Total Phosphorus	mg/l P	0.02	4.6	6.6	0.01 U
Chloride	mg/l	29	20	31	20
Foaming Agents (MBAS)	mg/l	0.05 U	0.12	0.08	0.05 U
Sulfate	mg/l	22	9	11	11
Total Hardness	mg/l CaCO ₃	140	130	130	140
Total Organic Carbon	mg/l	3.6	7.1	8.4	4.5

U - Analyte was not detected; indicated concentration is method detection limit.



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
29 - Water, TW11-6, sampled 5/10/95, 1250
30 - Water, TW12-6, sampled 5/10/95, 1110
31 - Water, TW13-6, sampled 5/10/95, 1340
32 - Water, TW13-12, sampled 5/10/95, 1335

Date Received: 5/11/95, 0935

<u>Parameter</u>	<u>Units</u>	<u>(29) TW11-6</u>	<u>(30) TW12-6</u>	<u>(31) TW13-6</u>	<u>(32) TW13-12</u>
Ammonia Nitrogen	mg/l N	29	3.1	0.02	0.01
Nitrate Nitrogen	mg/l N	0.01 U	0.01	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.52	0.41	0.14	0.11
Total Kjeldahl Nitrogen	mg/l N	30	3.5	0.16	0.12
Total Phosphorus	mg/l P	2.0	0.44	0.16	0.01 U
Chloride	mg/l	42	45	4.7	36
Foaming Agents (MBAS)	mg/l	0.28	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	44	13	4	36
Total Hardness	mg/l CaCO ₃	140	190	24	28
Total Organic Carbon	mg/l	9.0	10	1.8	4.3

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 33 - Water, TW13-20, sampled 5/10/95, 1445
 34 - Water, TW14-6, sampled 5/10/95, 1440
 35 - Water, TW14-12, sampled 5/10/95, 1520
 36 - Water, TW14-20, sampled 5/10/95, 1535

Date Received: 5/11/95, 0935

Parameter	Units	(33)	(34)	(35)	(36)
		TW13-20	TW14-6	TW14-12	TW14-20
Ammonia Nitrogen	mg/l N	0.01 U	0.15	0.24	0.01 U
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.05 U	0.26	0.12	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.05 U	0.41	0.36	0.05 U
Total Phosphorus	mg/l P	0.01 U	0.18	0.01 U	0.01
Chloride	mg/l	37	3.1	32	57
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	33	3	14	20
Total Hardness	mg/l CaCO ₃	52	24	140	98
Total Organic Carbon	mg/l	1 U	4.3	4.1	1 U

U - Analyte was not detected; indicated concentration is method detection limit.



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 37 - Water, TW15-6, sampled 5/10/95, 1640
 38 - Water, TW15-12, sampled 5/10/95, 1605
 39 - Water, TW15-20, sampled 5/10/95, 1655
 40 - Water, TW22-6, sampled 5/10/95, 1635

Date Received: 5/11/95, 0935

Parameter	Units	(37) TW15-6	(38) TW15-12	(39) TW15-20	(40) TW22-6
Ammonia Nitrogen	mg/l N	0.09	1.9	0.01 U	--
Nitrate Nitrogen	mg/l N	0.01 U	0.01	0.01 U	--
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	--
Organic Nitrogen	mg/l N	0.31	0.14	0.05 U	--
Total Kjeldahl Nitrogen	mg/l N	0.40	2.0	0.05 U	--
Total Phosphorus	mg/l P	0.31	0.01 U	0.01	--
Chloride	mg/l	4.5	28	67	--
Foaming Agents (MBAS)	mg/l	0.05 U	0.05	0.05 U	--
Sulfate	mg/l	2 U	10	31	--
Total Hardness	mg/l CaCO ₃	42	120	110	--
Total Organic Carbon	mg/l	7.8	4.2	1 U	--
Bromide	mg/l	--	--	--	1 K ¹

U - Analyte was not detected; indicated concentration is method detection limit.

K - Analyte was less than indicated concentration; indicated concentration is method detection limit multiplied by sample dilution factor.

¹ Sample required dilution due to matrix interferences.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 41 - Water, TW1-6, sampled 5/11/95, 0915
 42 - Water, TW22-6, sampled 5/11/95, 0810
 43 - Water, TW22-12, sampled 5/11/95, 0930
 44 - Water, TW22-20, sampled 5/11/95, 0855

Date Received: 5/12/95, 1005

Parameter	Units	(41) TW1-6	(42) TW22-6	(43) TW22-12	(44) TW22-20
Ammonia Nitrogen	mg/l N	46	0.01 U	0.05	0.01 U
Nitrate Nitrogen	mg/l N	1.2	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.63	0.47	0.05 U	0.05 U
Total Kjeldahl Nitrogen	mg/l N	47	0.47	0.05	0.05 U
Total Phosphorus	mg/l P	8.8	1.2	0.01 U	0.02
Chloride	mg/l	42	12	16	20
Foaming Agents (MBAS)	mg/l	0.54	0.05	0.05 U	0.05 U
Sulfate	mg/l	11	2 U	59	18
Total Hardness	mg/l CaCO ₃	130	110	130	26
Total Organic Carbon	mg/l	7.7	15	2.9	1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT


Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 45 - Water, TW23-6, sampled 5/11/95, 0955
46 - Water, TW23-12, sampled 5/11/95, 1005
47 - Water, TW23-20, sampled 5/11/95, 1030
48 - Water, TW23-24, sampled 5/11/95, 1100

Date Received: 5/12/95, 1005

Parameter	Units	(45)	(46)	(47)	(48)
		TW23-6	TW23-12	TW23-20	TW23-24
Ammonia Nitrogen	mg/l N	0.15	0.10	0.01 U	0.01 U
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.31	0.08	0.05 U	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.46	0.18	0.05 U	0.05 U
Total Phosphorus	mg/l P	1.4	0.02	0.03	0.02
Chloride	mg/l	5.9	14	23	23
Foaming Agents (MBAS)	mg/l	0.07	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	4	72	21	29
Total Hardness	mg/l CaCO ₃	73	150	27	28
Total Organic Carbon	mg/l	10	2.5	1 U	1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 49 - Water, TW24-6, sampled 5/11/95, 1040
 50 - Water, TW24-12, sampled 5/11/95, 1115
 51 - Water, TW24-20, sampled 5/11/95, 1125
 52 - Water, TW25-6, sampled 5/11/95, 1305
Date Received: 5/12/95, 1005

Parameter	Units	(49)	(50)	(51)	(52)
		TW24-6	TW24-12	TW24-20	TW25-6
Ammonia Nitrogen	mg/l N	0.01 U	0.07	0.01 U	0.01 U
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.05
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	1.2	0.10	0.05 U	0.23
Total Kjeldahl Nitrogen	mg/l N	1.2	0.17	0.05 U	0.23
Total Phosphorus	mg/l P	2.0	0.03	0.05	0.22
Chloride	mg/l	0.70	14	25	1.4
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	3	71	24	3
Total Hardness	mg/l CaCO ₃	9.9	150	30	7.9
Total Organic Carbon	mg/l	4.4	3.7	1 U	2.4

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LABORATORY REPORT


Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 53 - Water, TW25-12, sampled 5/11/95, 1310
 54 - Water, TW25-20, sampled 5/11/95, 0735
 55 - Water, TW26-6, sampled 5/11/95, 1430
 56 - Water, TW26-12, sampled 5/11/95, 1445

Date Received: 5/12/95, 1005

Parameter	Units	(53)	(54)	(55)	(56)
		TW25-12	TW25-20	TW26-6	TW26-12
Ammonia Nitrogen	mg/l N	0.05	0.02	0.03	0.38
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.14	0.05 U	0.16	0.11
Total Kjeldahl Nitrogen	mg/l N	0.19	0.05 U	0.19	0.49
Total Phosphorus	mg/l P	0.05	0.03	0.19	0.02
Chloride	mg/l	30	30	3.9	25
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	21	24	6	45
Total Hardness	mg/l CaCO ₃	120	36	40	120
Total Organic Carbon	mg/l	5.3	1 U	2.6	3.9

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 57 - Water, TW26-20, sampled 5/11/95, 1530
 58 - Water, TW26-30, sampled 5/11/95, 1515
 59 - Water, TAP, sampled 5/11/95, 1610
 60 - Water, STE, sampled 5/11/95, 1635
Date Received: 5/12/95, 1005

Parameter	Units	(57) TW26-20	(58) TW26-30	(59) TAP	(60) STE
Ammonia Nitrogen	mg/l N	0.01 U	0.05	0.06	50
Nitrate Nitrogen	mg/l N	1.5	0.01 U	0.01 U	0.05
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.02
Organic Nitrogen	mg/l N	0.06	0.05 U	0.05 U	4.8
Total Kjeldahl Nitrogen	mg/l N	0.06	0.05	0.06	55
Total Phosphorus	mg/l P	0.03	0.01 U	0.07	8.8
Chloride	mg/l	19	30	11	600
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	32
Sulfate	mg/l	22	140	2 U	19
Total Hardness	mg/l CaCO ₃	55	110	150	140
Total Organic Carbon	mg/l	1 U	1 U	1 U	47
BOD (5 Day @ 20°C)	mg/l	--	--	--	196
Total Suspended Solids	mg/l	--	--	--	58

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT


Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 61 - Water, TW10-6, sampled 5/12/95, 0920
 62 - Water, TW27-6, sampled 5/12/95, 1020
 63 - Water, TW27-12, sampled 5/12/95, 0950
 64 - Water, TW27-20, sampled 5/12/95, 1035

Date Received: 5/13/95, 0900

Parameter	Units	(61) TW10-6	(62) TW27-6	(63) TW27-12	(64) TW27-20
Ammonia Nitrogen	mg/l N	9.9	0.01	0.36	0.05
Nitrate Nitrogen	mg/l N	14	0.01 U	0.01 U	0.01
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.47	0.11	0.12	0.05 U
Total Kjeldahl Nitrogen	mg/l N	10	0.12	0.48	0.05
Total Phosphorus	mg/l P	4.8	0.13	0.02	0.02
Chloride	mg/l	48	1.8	22	28
Foaming Agents (MBAS)	mg/l	0.07	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	45	16	29	47
Total Hardness	mg/l CaCO ₃	180	20	100	71
Total Organic Carbon	mg/l	5.1	1.7	3.9	1 U

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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 65 - Water, TW27-24, sampled 5/12/95, 1015
66 - Water, TW27-30, sampled 5/12/95, 1050
67 - Water, TW28-6, sampled 5/12/95, 1125
68 - Water, TW28-12, sampled 5/12/95, 1155

Date Received: 5/13/95, 0900

<u>Parameter</u>	<u>Units</u>	<u>(65)</u> <u>TW27-24</u>	<u>(66)</u> <u>TW27-30</u>	<u>(67)</u> <u>TW28-6</u>	<u>(68)</u> <u>TW28-12</u>
Ammonia Nitrogen	mg/l N	0.36	0.07	0.08	2.9
Nitrate Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.13	0.05 U	0.17	0.10
Total Kjeldahl Nitrogen	mg/l N	0.49	0.07	0.25	3.0
Total Phosphorus	mg/l P	0.03	0.02	0.07	0.03
Chloride	mg/l	22	28	2.8	30
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	25	160	5	10
Total Hardness	mg/l CaCO ₃	100	110	40	110
Total Organic Carbon	mg/l	3.5	1 U	4.5	2.7

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County


Sample Description: 69 - Water, TW28-20, sampled 5/12/95, 1235

70 - Water, TW28-30, sampled 5/12/95, 1255

Date Received: 5/13/95, 0900

<u>Parameter</u>	<u>Units</u>	<u>(69) TW28-20</u>	<u>(70) TW28-30</u>	<u>Method Blank</u>
Ammonia Nitrogen	mg/l N	0.05	0.04	0.01 U
Nitrate Nitrogen	mg/l N	0.01	0.01	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.05 U	0.05 U	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.05	0.05 U	0.05 U
Total Phosphorus	mg/l P	0.03	0.02	0.01 U
Chloride	mg/l	30	28	1 U
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	61	30	2 U
Total Hardness	mg/l CaCO ₃	82	110	2 U
Total Organic Carbon	mg/l	1.3	1 U	1 U
BOD (5 Day @ 20°C)	mg/l	--	--	1 U
Total Suspended Solids	mg/l	--	--	1 U
Bromide	mg/l	--	--	0.1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	5/25/95
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	5/10/95 (01-19,M/B) 5/17/95 (22-50) 5/18/95 (51-70)
Nitrite Nitrogen	EPA 354.1	0.01 mg/l N	5/9/95,1413 (01-07,M/B) 5/10/95,1530 (08-19) 5/11/95,1400 (22-39) 5/12/95,1500 (41-60) 5/13/95,1000 (61-70)
Organic Nitrogen	Calc.	0.05 mg/l N	5/22/95
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	5/26/95
Total Phosphorus	EPA 365.2	0.01 mg/l P	5/18/95
Chloride	EPA 325.2	1 mg/l	5/18/95 (01-19,M/B) 5/23/95 (22-70)
Foaming Agents (MBAS)	SM 5540 C	0.05 mg/l	5/9/95,1330 (01-07,M/B) 5/10/95,1500 (08-19) 5/12/95,0815 (22-60) 5/13/95,1010 (61-70)
Sulfate	EPA 375.4	2 mg/l	5/19/95 (01-19,M/B) 5/23/95 (22-29) 5/25/95 (30-62) 5/26/95 (63-70)
Total Hardness	SM 2340 C	2 mg/l CaCO ₃	5/19/95 (01-19,M/B) 5/25/95 (22-70)
Total Organic Carbon	EPA 415.1	1 mg/l	5/15/95 (01-07,M/B) 5/17/95 (08-52) 5/18/95 (53-70)
BOD	SM 5210	1 mg/l	5/10/95,1030 (01,M/B) 5/12/95,1330 (60)
Total Suspended Solids	EPA 160.2	1 mg/l	5/15/95
Bromide	SM 4500-Br B	0.1 mg/l	5/30/95


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Ammonia Nitrogen	07824-07	102	0	87-117	4
	07824-19	102	0	87-117	4
	07824-25	101	0	87-117	4
	07824-39	90	2	87-117	4
	07824-48	92	0	87-117	4
	07824-58	105	0	87-117	4
	07824-66	105	0	87-117	4
Nitrate-Nitrite Nitrogen	07824-01	85	6	90-113	2
	07824-08	102	0	90-113	2
	07824-14	105	2	90-113	2
	07824-26	90	0	90-113	2
	07824-36	99	2	90-113	2
	07824-42	103	2	90-113	2
	07824-50	101	6	90-113	2
	07824-58	99	2	90-113	2
	07824-60	75	10	90-113	2
	07824-68	100	0	90-113	2
Nitrite Nitrogen	07824-02	87	2	78-115	6
	07824-14	100	2	78-115	6
	07824-28	98	2	78-115	6
	07824-33	96	4	78-115	6
	07824-47	97	0	78-115	6
	07824-57	105	3	78-115	6
	07824-63	92	4	78-115	6


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Total Kjeldahl Nitrogen	07824-02	96	1	76-115	14
	07824-11	98	0	76-115	14
	07824-25	95	7	76-115	14
	07824-35	100	0	76-115	14
	07824-45	93	0	76-115	14
	07824-55	99	0	76-115	14
	07824-65	99	2	76-115	14
Total Phosphorus	07824-11	114	1	76-119	18
	07824-25	97	6	76-119	18
	07824-35	107	2	76-119	18
	07824-55	110	3	76-119	18
	07824-65	106	5	76-119	18
Chloride	07824-08	101	0	81-121	7
	07824-19	103	0	81-121	7
	07824-23	90	0	81-121	7
	07824-30	90	2	81-121	7
	07824-43	88	0	81-121	7
	07824-52	99	0	81-121	7
	07824-62	103	2	81-121	7
Foaming Agents (MBAS)	07817-05	98	6	79-118	12
	07824-08	99	1	79-118	12
	07824-25	102	1	79-118	12
	07824-32	106	1	79-118	12
	07824-44	110	4	79-118	12
	07824-51	110	1	79-118	12
	07824-61	94	2	79-118	12


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Sulfate	07824-04	97	3	74-133	9
	07824-15	96	2	74-133	9
	07824-31	98	0	74-133	9
	07824-42	106	0	74-133	9
	07824-53	100	1	74-133	9
	07824-62	95	0	74-133	9
Total Hardness	07824-04	100	1	86-115	4
	07824-15	98	1	86-115	4
	07824-31	102	1	86-115	4
	07824-33	100	1	86-115	4
	07824-44	100	1	86-115	4
	07824-54	100	1	86-115	4
	07824-67	102	1	86-115	4
Total Organic Carbon	07824-06	88	3	79-108	5
	07824-12	100	1	79-108	5
	07824-26	102	2	79-108	5
	07824-32	103	2	79-108	5
	07824-43	93	1	79-108	5
	07824-53	95	3	79-108	5
	07824-63	97	1	79-108	5
BOD (5 Day @ 20°C)	ISO3088(5/10)	92	2	39-138	36
	ISO3088(5/12)	95	5	39-138	36
Total Suspended Solids	07817-01	90	3	77-113	12
Bromide	07824-20	110	7	88-127	24


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.40 - SDA, St. Johns County

Sample Description: 01 - Water, BW1-5', sampled 1/16/96, 0853
02 - Water, TW21-6', sampled 1/16/96, 1355

Date Received: 1/18/96, 1005

<u>Parameter</u>	<u>Units</u>	<u>(01) BW1-5'</u>	<u>(02) TW21-6'</u>	<u>Method Blank</u>
Ammonia Nitrogen	mg/l N	0.02	46	0.01 U
Nitrate Nitrogen	mg/l N	0.01	7.7	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01	0.01 U
Organic Nitrogen	mg/l N	0.18	0.97	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.20	47	0.05 U
Total Phosphorus	mg/l P	0.04	5.6	0.02
Chloride	mg/l	17	40	1 U
Foaming Agents (MBAS)	mg/l	0.05 U	2.6	0.05 U
Sulfate	mg/l	12	30	2 U
Total Hardness	mg/l CaCO ₃	16	130	2 U
Total Organic Carbon	mg/l	6.0	16	1 U
BOD (5 Day @ 20°C)	mg/l	1 U	6.7	1 U
Total Suspended Solids	mg/l	11	25	1 U

U - Analyte was not detected; indicated concentration is method detection limit.

FHRS Environmental Lab No. E84129
FHRS Drinking Water Lab No. 84269
Comprehensive QA Plan No. 870317G


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.40 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	1/19/96
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	1/24/96
Nitrite Nitrogen	EPA 354.1	0.01 mg/l N	1/17/96, 1040
Organic Nitrogen	Calc.	0.05 mg/l N	1/26/96
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	1/26/96
Total Phosphorus	EPA 365.2	0.01 mg/l P	1/25/96
Chloride	EPA 325.2	1 mg/l	1/26/96
Foaming Agents (MBAS)	SM 5540 C	0.05 mg/l	1/18/96, 0845
Sulfate	EPA 375.4	2 mg/l	1/29/96
Total Hardness	SM 2340 C	2 mg/l CaCO ₃	1/29/96
Total Organic Carbon	EPA 415.1	1 mg/l	1/23/96
BOD	SM 5210	1 mg/l	1/17/96, 0830
Total Suspended Solids	EPA 160.2	1 mg/l	1/23/96


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LABORATORY REPORT

Project Description: Aynes Project No. 4155.40 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

<u>Parameter</u>	<u>Sample No. Spiked</u>	<u>Accuracy Mean % R</u>	<u>Precision RPD</u>	<u>QC Control Limits</u>	
				<u>Accuracy</u>	<u>Precision</u>
Ammonia Nitrogen	08655-17	97	2	78-121	4
Nitrate-Nitrite Nitrogen	08694-01	99	2	83-114	4
Nitrite Nitrogen	08654-03	92	0	85-110	6
Total Kjeldahl Nitrogen	08694-01	97	4	69-126	22
Total Phosphorus	08694-01	100	2	72-124	15
Chloride	08703-02	103	1	74-122	6
Foaming Agents (MBAS)	08694-01	109	4	80-121	14
Sulfate	08707-11	101	2	71-127	10
Total Hardness	08707-11	97	0	86-114	4
Total Organic Carbon	08688-01	104	4	81-111	7
BOD (5 Day @ 20°C)	IS03512(1/17)	92	2	54-127	28
Total Suspended Solids	08706-01	91	5	61-133	9


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H4: Groundwater Dissolved Oxygen and Oxidation-Reduction
Potential (ORP) Data

SDA Florida OWTS Project

Table H-1 Groundwater Dissolved Oxygen and ORP Measurements

Date	Well Point I.D.	Time of Reading	Time Elapsed (min.)	DO (ppm)	ORP (mv)	Temperature (C°)	pH
8/31/93	DI H2O	5:30PM		4.6	326.6	N/A	N/A
	BW1-10	5:30 PM	0	N/A	N/A	23	6.2
		5:35 PM	5	0.5	205.0		
		5:37 PM	7	0.3	190.4		
		5:40 PM	10	0.15	186.5		
8/31/93	TW16-6	6:04PM	0	1.5	268.0	27	6.3
		6:07PM	3	0.4	261.8		
		6:09PM	5	0.25	253.4		
		6:11 PM	7	0.2	248.0		
		6:14 PM	10	0.18	244.6	25.5	
8/31/93	TW16-12	6:20 PM	0	N/A	N/A	23	6.6
		6:22 PM	2	0.25	146.5		
		6:27PM	5	0.2	145.2		
		6:29 PM	7	0.15	145.2		
		6:32PM	10	N/A	N/A	23	
8/31/93	TW17-6	6:40 PM	0	0.75	52.0	26	6.9
		6:44PM	4	0.35	136.9		
		6:46 PM	6	0.25	149.7		
		6:47 PM	7	N/A	N/A		
		6:50 PM	10	0.15	159.0	25.5	
8/31/93	TW1-6	7:00PM	0	5	241.0	25.5	6.9
		7:04PM	4	4	240.0		
		7:06 PM	6	3.8	231.0		
		7:10 PM	10	3.4	229.0		
		7:13 PM	13	3.3	228.0	25	
8/31/93	TW1-12	7:20 PM	0	N/A	N/A	23	6.8
		7:24PM	4	0.25	174.0		
		7:26PM	6	0.2	169.0		
		7:30PM	10	0.15	163.6		
		7:33PM	13	0.15	162.0	23	
8/31/93	TW7-6	7:46PM	0	0.6	-108.0	24	7
		7:50PM	4	0.35	-125.0		
		7:52PM	6	0.3	-138.0		
		7:56PM	10	0.2	-155.0	25	
8/31/93	TW7-12	8:05PM	0	0.5	72.8	23	6.9
		8:09PM	4	0.15	81.2		
		8:11 PM	6	0.15	82.6		
		8:13 PM	9	0.15	84.7	23	
1/15/96	TW19-6	4:32 PM	0	1	-60.0	19.5	7.2
		4:34 PM	02:00	0.9	-81.0		
		4:36 PM	04:00	0.6	-60.0		

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Table H-1 Groundwater Dissolved Oxygen and ORP Measurements

Date	Well Point I.D.	Time of Reading	Time Elapsed (min.)	DO (ppm)	ORP (mv)	Temperature (C°)	pH
		4:49 PM	17:00	0.5	-55.0		
		4:56 PM	24:00	0.4	-52.0		
1/15/96	TW20-6	5:04 PM	0	0.4	76.0	19.1	7.4
		5:07 PM	03:50	0.25	38.0		
		5:11 PM	07:00	0.25	8.0		
		5:16 PM	12:00	0.2	-55.0		
1/15/96	TW21-6	5:19 PM	0			19	6.5
		5:20 PM	01:39	0.5	-187.0		
		5:24 PM	05:50	0.15	-220.0		
		5:28 PM	09:00	0.15	-238.0		
1/16/96	BW1-5	9:14 AM	0	0.5	55.0	17.5	7.5
		9:17 AM	03:25	0.3	29.2		
		9:19 AM	05:40	0.3	20.9		
		9:21 AM	07:00	0.25	14.1		
1/16/96	BW1-5	1:22 PM	0	0.1	-210.0	NA	NA
		1:24 PM	02:00	0.1	-201.3		
		1:25 PM	03:00	0.1	-203.0		
1/16/96	TW21-6	1:59 PM	0	0.1	-295.0	19	7
		2:03 PM	04:00	0.1	-338.5		
		2:08 PM	09:00	0.1	-360.0		
		2:13 PM	14:00	0.1	-371.0		

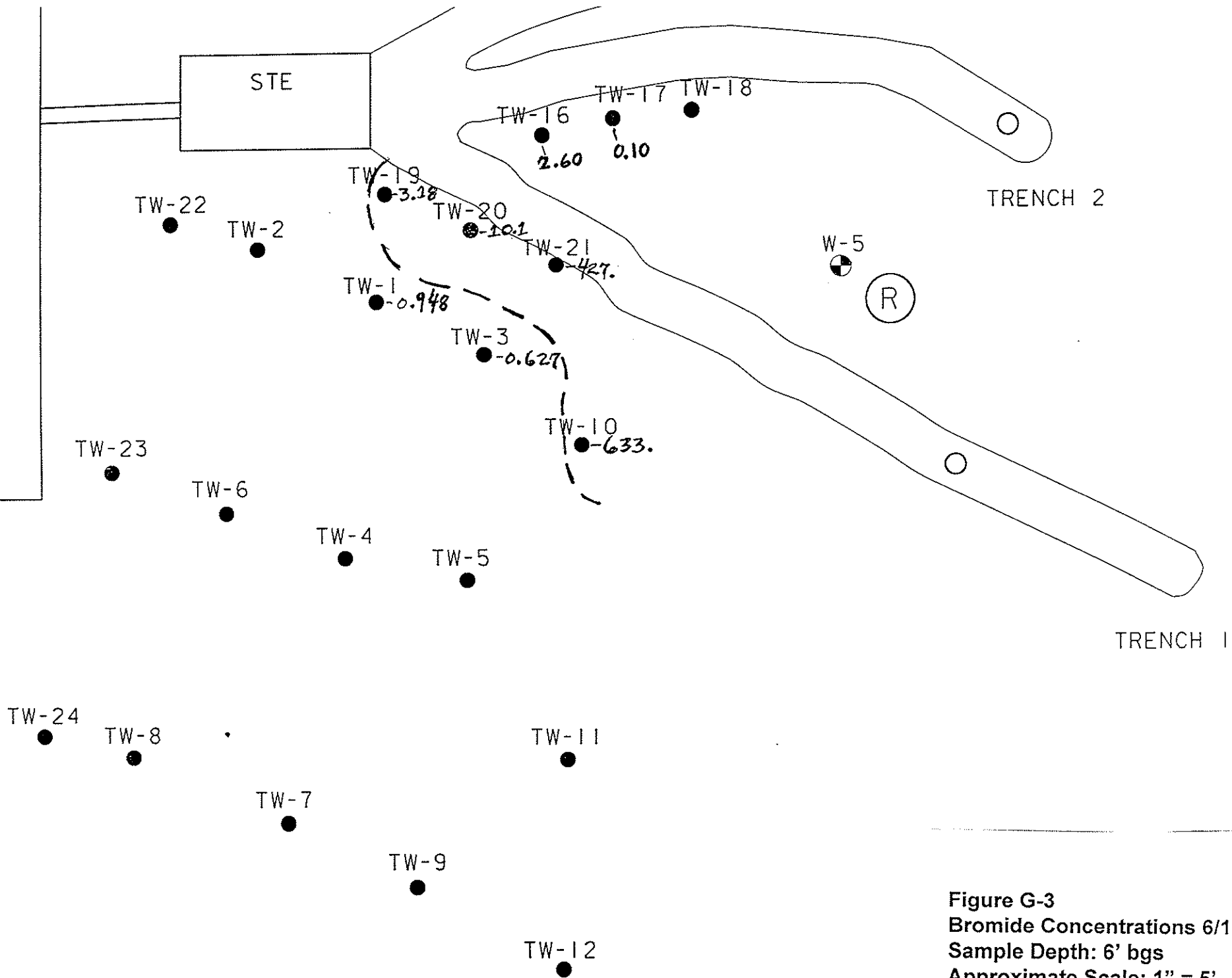


Figure G-3
 Bromide Concentrations 6/16/95
 Sample Depth: 6' bgs
 Approximate Scale: 1" = 5'

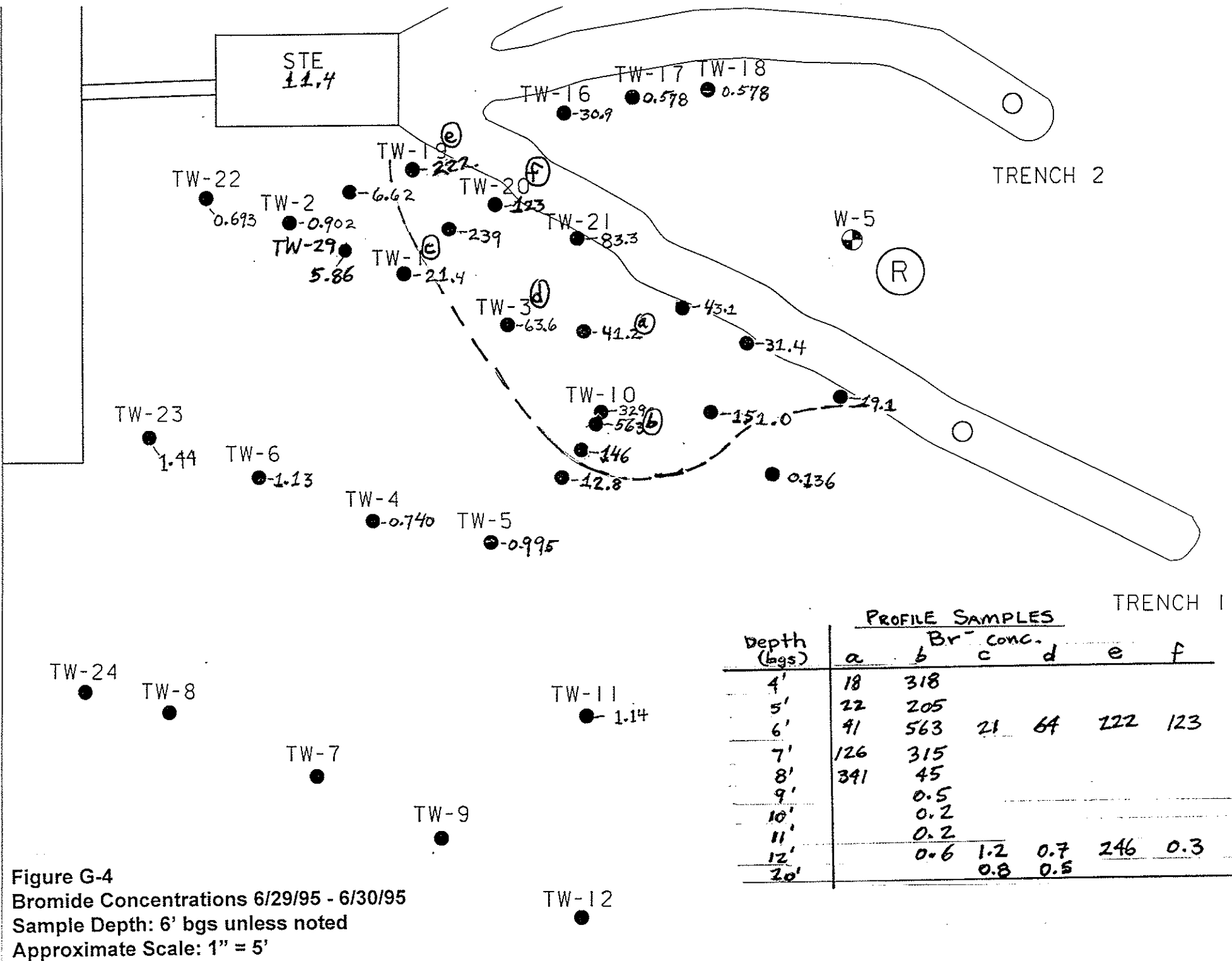


Figure G-4
 Bromide Concentrations 6/29/95 - 6/30/95
 Sample Depth: 6' bgs unless noted
 Approximate Scale: 1" = 5'

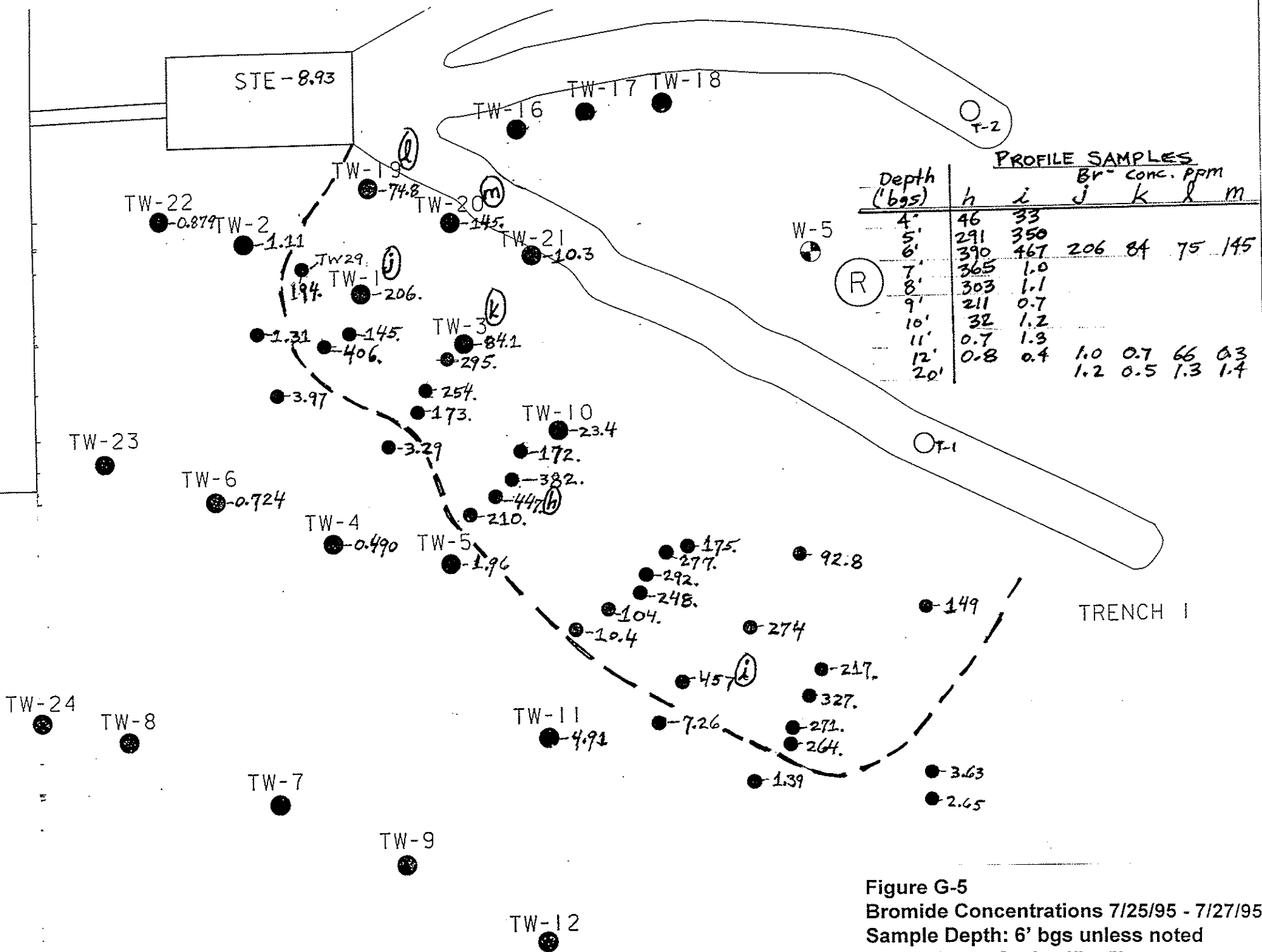


Figure G-5
 Bromide Concentrations 7/25/95 - 7/27/95
 Sample Depth: 6' bgs unless noted
 Approximate Scale: 1" = 5'

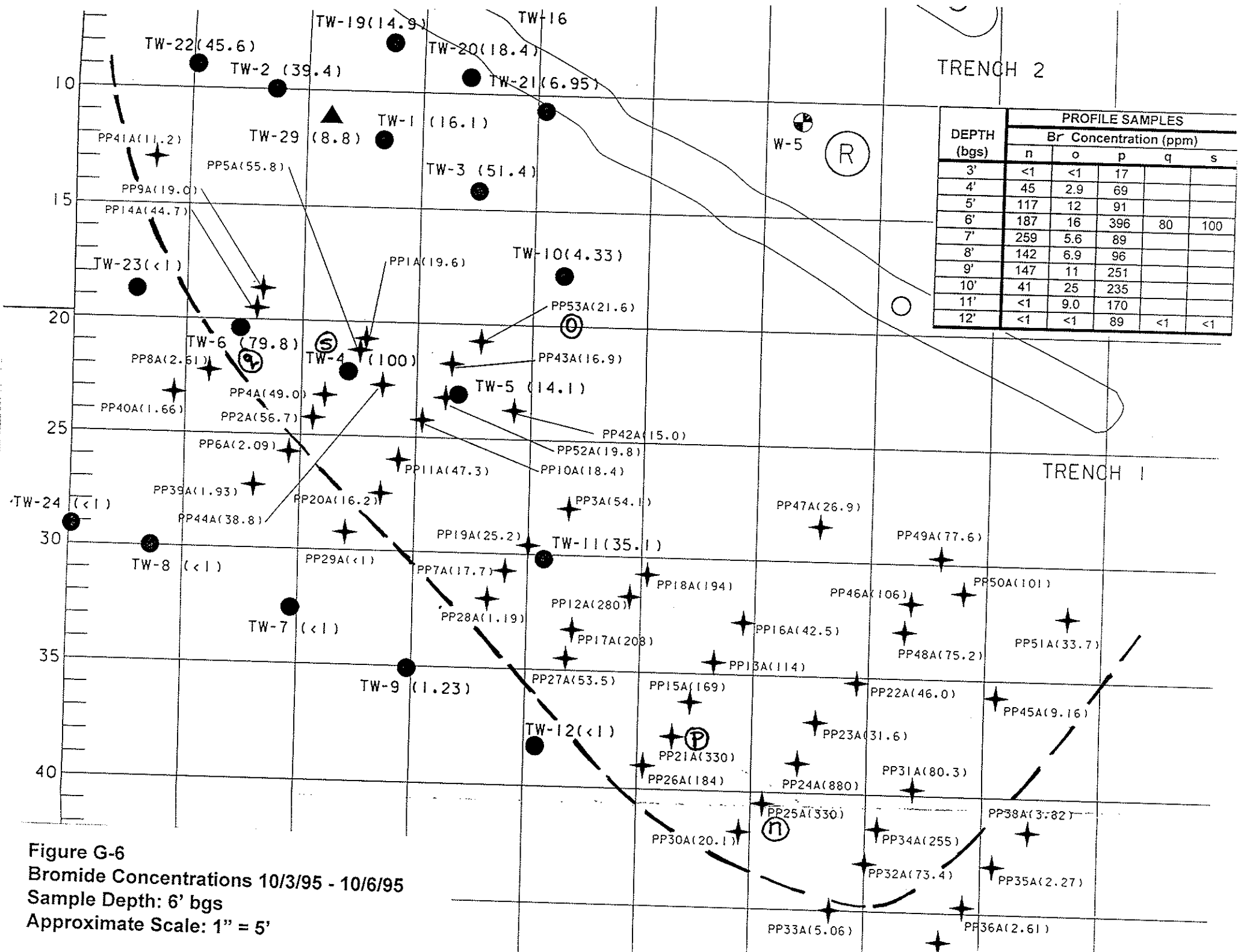


Figure G-6
Bromide Concentrations 10/3/95 - 10/6/95
Sample Depth: 6' bgs
Approximate Scale: 1" = 5'

H1: Phase II Water Quality Data (January 1993)

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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
Sample Description: 02 - Water, TW1-6, sampled 1/7/93, 1000
03 - Water, TW1-12, sampled 1/7/93, 0950
04 - Water, TW1-20, sampled 1/7/93, 0940
Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(02)</u> <u>TW1-6</u>	<u>(03)</u> <u>TW1-12</u>	<u>(04)</u> <u>TW1-20</u>
Chloride	mg/l	61	13	44
Foaming Agents (MBAS)	mg/l	5.7	< 0.05	< 0.05
Total Dissolved Solids	mg/l	380	118	322
Ammonia Nitrogen	mg/l N	48	0.14	0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.1
Total Phosphorus	mg/l P	14	0.02	0.05
Total Organic Carbon	mg/l	26	4.5	1.5
Fecal Coliforms	Cts/100ml	200	< 10	< 2


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 05 - Water, TW2-6, sampled 1/7/93, 1030
06 - Water, TW2-12, sampled 1/7/93, 1020
07 - Water, TW2-20, sampled 1/7/93, 1010

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(05) TW2-6</u>	<u>(06) TW2-12</u>	<u>(07) TW2-20</u>
Chloride	mg/l	51	14	40
Foaming Agents (MBAS)	mg/l	0.40	< 0.05	< 0.05
Total Dissolved Solids	mg/l	330	124	320
Ammonia Nitrogen	mg/l N	19	0.08	< 0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.9
Total Phosphorus	mg/l P	13	0.02	0.15
Total Organic Carbon	mg/l	17	3.5	1.9
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 08 - Water, TW3-6, sampled 1/7/93, 0930
09 - Water, TW3-12, sampled 1/7/93, 0920
10 - Water, TW3-20, sampled 1/7/93, 0910

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(08) TW3-6</u>	<u>(09) TW3-12</u>	<u>(10) TW3-20</u>
Chloride	mg/l	59	41	41
Foaming Agents (MBAS)	mg/l	0.37	0.06	0.07
Total Dissolved Solids	mg/l	440	126	304
Ammonia Nitrogen	mg/l N	14	0.04	0.02
Nitrate-Nitrite Nitrogen	mg/l N	23	< 0.01	2.4
Total Phosphorus	mg/l P	5.6	0.26	0.02
Total Organic Carbon	mg/l	5.6	4.0	1.7
Fecal Coliforms	Cts/100ml	< 2	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 11 - Water, TW4-6, sampled 1/7/93, 0820
12 - Water, TW4-12, sampled 1/7/93, 0810
13 - Water, TW4-20, sampled 1/7/93, 0800

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(11)</u> <u>TW4-6</u>	<u>(12)</u> <u>TW4-12</u>	<u>(13)</u> <u>TW4-20</u>
Chloride	mg/l	65	13	43
Foaming Agents (MBAS)	mg/l	5.5	< 0.05	< 0.05
Total Dissolved Solids	mg/l	420	124	316
Ammonia Nitrogen	mg/l N	26	0.03	0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.6
Total Phosphorus	mg/l P	5.2	0.10	0.02
Total Organic Carbon	mg/l	17	2.8	1.5
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 14 - Water, TW5-6, sampled 1/7/93, 0850
15 - Water, TW5-12, sampled 1/7/93, 0840
16 - Water, TW5-20, sampled 1/7/93, 0830

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(14)</u> <u>TW5-6</u>	<u>(15)</u> <u>TW5-12</u>	<u>(16)</u> <u>TW5-20</u>
Chloride	mg/l	55	16	35
Foaming Agents (MBAS)	mg/l	4.7	< 0.05	< 0.05
Total Dissolved Solids	mg/l	354	136	264
Ammonia Nitrogen	mg/l N	4.5	0.01	0.08
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01
Total Phosphorus	mg/l P	12	0.10	0.02
Total Organic Carbon	mg/l	15	3.5	3.2
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 17 - Water, TW6-6, sampled 1/7/93, 0750
18 - Water, TW6-12, sampled 1/7/93, 0740
19 - Water, TW6-20, sampled 1/7/93, 0730

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(17) TW6-6</u>	<u>(18) TW6-12</u>	<u>(19) TW6-20</u>
Chloride	mg/l	88	13	43
Foaming Agents (MBAS)	mg/l	0.83	< 0.05	< 0.05
Total Dissolved Solids	mg/l	324	134	332
Ammonia Nitrogen	mg/l N	37	0.04	< 0.01
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.7
Total Phosphorus	mg/l P	8.4	0.08	0.03
Total Organic Carbon	mg/l	13	3.6	1.7
Fecal Coliforms	Cts/100ml	< 1	< 1	< 2


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 20 - Water, TW7-6, sampled 1/6/93, 1640
21 - Water, TW7-20, sampled 1/6/93, 1630
22 - Water, TW8-6, sampled 1/6/93, 1650
23 - Water, TW8-20, sampled 1/6/93, 1700

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(20)</u> <u>TW7-6</u>	<u>(21)</u> <u>TW7-20</u>	<u>(22)</u> <u>TW8-6</u>	<u>(23)</u> <u>TW8-20</u>
Chloride	mg/l	83	43	24	42
Foaming Agents (MBAS)	mg/l	0.72	< 0.05	0.14	< 0.05
Total Dissolved Solids	mg/l	360	336	158	316
Ammonia Nitrogen	mg/l N	29	0.02	19	0.03
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	2.9	< 0.01	2.3
Total Phosphorus	mg/l P	5.2	0.02	3.5	0.02
Total Organic Carbon	mg/l	22	1.7	19	1.5
Fecal Coliforms	Cts/100ml	< 2	< 1	< 10	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 24 - Water, TW9-6, sampled 1/6/93, 1720
 25 - Water, TW9-20, sampled 1/6/93, 1710
 26 - Water, TW10-6, sampled 1/7/93, 0900
 27 - Water, TW11-6, sampled 1/7/93, 1045
 28 - Water, TW12-6, sampled 1/7/93, 1135

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(24)</u> <u>TW9-6</u>	<u>(25)</u> <u>TW9-20</u>	<u>(26)</u> <u>TW10-6</u>	<u>(27)</u> <u>TW11-6</u>	<u>(28)</u> <u>TW12-6</u>
Chloride	mg/l	76	43	53	13	69
Foaming Agents (MBAS)	mg/l	0.96	< 0.05	3.3	< 0.05	0.12
Total Dissolved Solids	mg/l	378	320	374	138	338
Ammonia Nitrogen	mg/l N	22	0.03	8.3	0.64	12
Nitrate-Nitrite Nitrogen	mg/l N	0.08	2.8	< 0.01	< 0.01	< 0.01
Total Phosphorus	mg/l P	12	0.06	9.6	0.82	0.33
Total Organic Carbon	mg/l	7.4	1.9	14	2.5	4.3
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1	< 1	< 1


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

Sample Description: 29 - Water, BW1-5, sampled 1/6/93, 1615
30 - Water, BW1-10, sampled 1/6/93, 1600
31 - Water, BW1-15, sampled 1/6/93, 1610
32 - Water, SW7, sampled 1/6/93, 1545
33 - Water, W5, sampled 1/7/93, 1210

Date Received: 1/7/93

<u>Parameter</u>	<u>Units</u>	<u>(29)</u> <u>BW1-5</u>	<u>(30)</u> <u>BW1-10</u>	<u>(31)</u> <u>BW1-15</u>	<u>(32)</u> <u>SW7</u>	<u>(33)</u> <u>W5</u>
Chloride	mg/l	13	31	27	15	49
Foaming Agents (MBAS)	mg/l	< 0.05	< 0.05	< 0.05	0.05	0.31
Total Dissolved Solids	mg/l	56	66	190	248	362
Ammonia Nitrogen	mg/l N	0.15	0.10	0.10	0.79	3.0
Nitrate-Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01	19
Total Phosphorus	mg/l P	0.02	0.02	0.01	0.04	5.2
Total Organic Carbon	mg/l	4.3	3.8	1.3	32	7.7
Fecal Coliforms	Cts/100ml	< 1	< 1	< 1	< 10	6


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Specific Conductance	EPA 120.1	0.1 umhos/cm	1/26/93
Chloride	EPA 325.2	1 mg/l	1/20/93
Sulfate	EPA 375.4	2 mg/l	1/28/93
Foaming Agents (MBAS)	SM 512 B	0.05 mg/l	1/8/93
Total Dissolved Solids	EPA 160.1	10 mg/l	1/12/93
Total Suspended Solids	EPA 160.2	1 mg/l	1/12/93
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	2/3/93
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	1/14/93
Total Phosphorus	EPA 365.2	0.01 mg/l P	1/19/93
Total Organic Carbon	EPA 415.1	1 mg/l	1/28/93
Fecal Coliforms	SM 909 C	1 Ct/100mls	1/7/93
Fecal Streptococci	SM 910 B	1 Ct/100mls	1/7/93
BOD	SM 507	1 mg/l	1/8/93
Oil and Grease	EPA 413.1	2 mg/l	2/2/93
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	1/14/93 (01-20,M/B) 1/20/93 (21-33)
Total Nitrogen	Calc.	0.05 mg/l N	2/3/93


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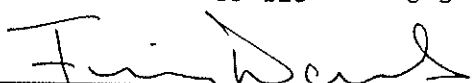
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Specific Conductance Chloride	IS01474(1/26)	102	0	90-118	0-1
	05078-02	89	1	92-109	0-3
	05078-16	100	2	92-109	0-3
	05078-30	99	1	92-109	0-3
Sulfate	05091-11	103	1	78-127	0-7
Foaming Agents (MBAS)	05078-03	97	6	74-132	0-22
	05078-15	99	6	74-132	0-22
	05078-23	101	18	74-132	0-22
Total Dissolved Solids	05078-03	99	3	81-116	0-11
	05078-19	101	3	81-116	0-11
	05078-28	94	3	81-116	0-11
Total Suspended Solids	05070-01	91	1	87-104	0-12
Nitrate-Nitrite Nitrogen	05078-02	100	2	81-132	0-14
	05078-11	99	1	81-132	0-14
	05078-24	97	0	81-132	0-14
Total Kjeldahl Nitrogen	05065-10	83	1	79-119	0-18
Total Phosphorus	05078-10	94	0	81-122	0-14
	05078-19	98	8	81-122	0-14
	05078-31	87	2	81-122	0-14
Total Organic Carbon	05078-10	97	2	82-117	0-7
	05078-20	90	1	82-117	0-7
	05078-30	94	1	82-117	0-7
Fecal Coliforms	05078-01	--	33	--	0-82
	Pos.Control(1/7)	--	29	--	0-82
Fecal Streptococci	05078-01	--	43	--	0-60
BOD	05078-01	--	5	--	0-21
	IS01820(1/8)	90	15	70-113	0-21
Oil and Grease	RS/RSD(2/2)	100	3	79-114	0-21
Ammonia Nitrogen	05078-06	103	1	83-123	0-3
	05078-16	100	1	83-123	0-3
	05078-25	117	2	83-123	0-3


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.00 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Note: Matrix Spike/Matrix Spike Duplicates are routinely analyzed concurrently with samples, in all methods, to assess the accuracy and precision of the techniques being carried out. Two of three aliquots of at least one sample in the set being processed are spiked with known equal concentrations of actual method analytes. These duplicate spiked aliquots are subjected to the analytical method in the same manner as the samples themselves.

Recovery of the spikes is determined by comparison of analyte concentrations in the two spiked aliquots to the analyte concentration in the unspiked sample aliquot. Accuracy is reported as percent of the analyte recovered versus the original concentration spiked (Percent Recovery), averaged for the duplicate spikes. Precision is reported as Relative Percent Difference between the duplicate spike measurements.

Quality Control results published for each method are representative of the sample set in which these project samples were included. The actual sample spiked is indicated. Each matrix type (water and/or soil) in a set is spiked at least once. A minimum of 10% of all samples are routinely spiked.



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H2: Phase III Water Quality Data (November 1993)

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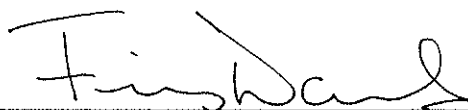
LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 01 - Water, STE-9, sampled 11/3/93, 1245
 02 - Water, Tap/SDA, sampled 11/3/93, 1630
 03 - Water, TW13-20, sampled 11/3/93, 1700
 04 - Water, TW14-6, sampled 11/3/93, 1630

Date Received: 11/4/93, 1035

Parameter	Units	(01) STE-9	(02) Tap/SDA	(03) TW13-20	(04) TW14-6	Method Blank
Chloride	mg/l	64	9.5	10	12	< 1
Sulfate	mg/l	4	< 2	38	4	< 2
Foaming Agents (MBAS)	mg/l	28	< 0.05	< 0.05	0.12	< 0.05
Total Suspended Solids	mg/l	32	--	--	--	< 1
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	75	0.10	0.16	1.1	< 0.05
Total Phosphorus	mg/l P	8.7	0.05	< 0.01	0.43	< 0.01
Total Organic Carbon	mg/l	82	< 1	1.5	6.1	< 1
BOD (5 Day @ 20°C)	mg/l	199	--	--	--	< 1
Ammonia Nitrogen	mg/l N	69	0.09	0.12	0.67	< 0.01
Organic Nitrogen	mg/l N	6	< 0.05	< 0.05	0.43	< 0.05
Total Hardness	mg/l CaCO ₃	160	160	99	35	< 2



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 05 - Water, TW14-12, sampled 11/3/93, 1600
06 - Water, TW14-20, sampled 11/3/93, 1545
07 - Water, TW15-6, sampled 11/3/93, 1515
08 - Water, TW15-12, sampled 11/3/93, 1445
Date Received: 11/4/93, 1035

Parameter	Units	(05) TW14-12	(06) TW14-20	(07) TW15-6	(08) TW15-12
Chloride	mg/l	16	11	13	43
Sulfate	mg/l	< 2	29	25	17
Foaming Agents (MBAS)	mg/l	0.44	< 0.05	0.10	0.99
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	7.4	0.13	3.6	0.83
Total Phosphorus	mg/l P	0.01	0.01	0.32	< 0.01
Total Organic Carbon	mg/l	6.2	1.6	11	10
Ammonia Nitrogen	mg/l N	6.7	0.08	3.0	0.70
Organic Nitrogen	mg/l N	0.7	0.05	0.60	0.13
Total Hardness	mg/l CaCO ₃	89	93	69	200



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 09 - Water, TW15-20, sampled 11/3/93, 1345
 10 - Water, TW6-6, sampled 11/4/93, 1630
 11 - Water, TW6-12, sampled 11/4/93, 1600
 12 - Water, TW6-20, sampled 11/4/93, 1530
Date Received: 11/4, 1035 (09), 11/5/93, 1015 (10-12)

<u>Parameter</u>	<u>Units</u>	<u>(09)</u> <u>TW15-20</u>	<u>(10)</u> <u>TW6-6</u>	<u>(11)</u> <u>TW6-12</u>	<u>(12)</u> <u>TW6-20</u>
Chloride	mg/l	13	52	36	26
Sulfate	mg/l	23	84	< 2	60
Foaming Agents (MBAS)	mg/l	< 0.05	1.5	0.20	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	19	1.2	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	0.21	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.12	45	0.39	0.19
Total Phosphorus	mg/l P	< 0.01	4.7	0.06	< 0.01
Total Organic Carbon	mg/l	1.3	12	5.8	1.2
Ammonia Nitrogen	mg/l N	0.08	44	0.07	0.11
Organic Nitrogen	mg/l N	< 0.05	1.0	0.32	0.08
Total Hardness	mg/l CaCO ₃	99	120	130	75


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 13 - Water, TW7-6, sampled 11/4/93, 1500
14 - Water, TW7-12, sampled 11/4/93, 1430
15 - Water, TW7-20, sampled 11/4/93, 1400
16 - Water, TW11-6, sampled 11/4/93, 1700
Date Received: 11/5/93, 1015

<u>Parameter</u>	<u>Units</u>	<u>(13)</u> <u>TW7-6</u>	<u>(14)</u> <u>TW7-12</u>	<u>(15)</u> <u>TW7-20</u>	<u>(16)</u> <u>TW11-6</u>
Chloride	mg/l	62	20	16	100
Sulfate	mg/l	83	< 2	57	140
Foaming Agents (MBAS)	mg/l	0.66	0.09	< 0.05	0.93
Nitrate Nitrogen	mg/l N	1.8	< 0.01	< 0.01	13
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	0.01
Total Kjeldahl Nitrogen	mg/l N	27	0.24	0.14	17
Total Phosphorus	mg/l P	4.1	< 0.01	0.03	0.32
Total Organic Carbon	mg/l	9.8	5.1	< 1	7.9
Ammonia Nitrogen	mg/l N	27	0.12	0.07	15
Organic Nitrogen	mg/l N	< 0.05	0.12	0.07	2.0
Total Hardness	mg/l CaCO ₃	80	100	59	310


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 17 - Water, TW8-6, sampled 11/4/93, 1330
 18 - Water, TW8-12, sampled 11/4/93, 1300
 19 - Water, TW8-20, sampled 11/4/93, 1145
 20 - Water, TW9-6, sampled 11/4/93, 1115

Date Received: 11/5/93, 1050

<u>Parameter</u>	<u>Units</u>	<u>(17)</u> <u>TW8-6</u>	<u>(18)</u> <u>TW8-12</u>	<u>(19)</u> <u>TW8-20</u>	<u>(20)</u> <u>TW9-6</u>
Chloride	mg/l	49	9.8	24	45
Sulfate	mg/l	50	< 2	66	19
Foaming Agents (MBAS)	mg/l	1.3	< 0.05	< 0.05	1.2
Nitrate Nitrogen	mg/l N	1.3	< 0.01	< 0.01	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	11	0.14	0.30	29
Total Phosphorus	mg/l P	2.5	0.01	0.01	2.5
Total Organic Carbon	mg/l	12	2.9	1.2	11
Ammonia Nitrogen	mg/l N	11	0.05	0.10	29
Organic Nitrogen	mg/l N	< 0.05	0.09	0.20	< 0.05
Total Hardness	mg/l CaCO ₃	110	75	83	120



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 21 - Water, TW9-12, sampled 11/4/93, 1050
 22 - Water, TW9-20, sampled 11/4/93, 1020
 23 - Water, TW12-6, sampled 11/4/93, 0950
 24 - Water, TW13-6, sampled 11/4/93, 0900
Date Received: 11/5/93, 1050

<u>Parameter</u>	<u>Units</u>	<u>(21)</u> <u>TW9-12</u>	<u>(22)</u> <u>TW9-20</u>	<u>(23)</u> <u>TW12-6</u>	<u>(24)</u> <u>TW13-6</u>
Chloride	mg/l	16	18	52	2.1
Sulfate	mg/l	< 2	22	< 2	4
Foaming Agents (MBAS)	mg/l	0.21	< 0.05	0.54	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	0.25
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.16	0.16	2.5	0.86
Total Phosphorus	mg/l P	< 0.01	< 0.01	0.39	0.85
Total Organic Carbon	mg/l	5.2	1.3	9.9	4.6
Ammonia Nitrogen	mg/l N	< 0.01	0.07	2.5	0.03
Organic Nitrogen	mg/l N	0.16	0.09	< 0.05	0.83
Total Hardness	mg/l CaCO ₃	100	47	240	45


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 25 - Water, TW13-12, sampled 11/4/93, 0825
 26 - Water, WP6-6, sampled 11/4/93, 1145
 27 - Water, TW1-6, sampled 11/5/93, 1400
 28 - Water, TW1-12, sampled 11/5/93, 1330

Date Received: 11/5, 1050 (25,26), 11/6/93, 0915 (27,28)

Parameter	Units	(25)	(26)*	(27)	(28)
		TW13-12	WP6-6	TW1-6	TW1-12
Chloride	mg/l	37	49	51	250
Sulfate	mg/l	10	20	54	36
Foaming Agents (MBAS)	mg/l	1.2	1.3	0.44	0.54
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	43	14
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	0.01	0.29
Total Kjeldahl Nitrogen	mg/l N	15	31	2.6	0.36
Total Phosphorus	mg/l P	0.09	2.3	6.8	< 0.01
Total Organic Carbon	mg/l	11	9.9	5.7	6.1
BOD (5 Day @ 20°C)	mg/l	--	--	< 1	--
Ammonia Nitrogen	mg/l N	16	30	3.2	0.12
Organic Nitrogen	mg/l N	< 0.05	1.0	< 0.05	0.24
Total Hardness	mg/l CaCO ₃	100	93	210	260

(TW9-6) Dup

* Duplicate of TW9-6


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 29 - Water, TW1-20, sampled 11/5/93, 1330
 30 - Water, TW2-6, sampled 11/5/93, 1245
 31 - Water, TW2-12, sampled 11/5/93, 1315
 32 - Water, TW2-20, sampled 11/5/93, 1340
Date Received: 11/6/93 , 0915

<u>Parameter</u>	<u>Units</u>	<u>(29)</u> <u>TW1-20</u>	<u>(30)</u> <u>TW2-6</u>	<u>(31)</u> <u>TW2-12</u>	<u>(32)</u> <u>TW2-20</u>
Chloride	mg/l	230	52	40	21
Sulfate	mg/l	91	110	36	100
Foaming Agents (MBAS)	mg/l	< 0.05	1.8	0.32	< 0.05
Nitrate Nitrogen	mg/l N	3.1	37	17	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.4	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.32	36	0.61	0.21
Total Phosphorus	mg/l P	< 0.01	4.6	< 0.01	0.02
Total Organic Carbon	mg/l	2.1	11	4.7	2.3
BOD (5 Day @ 20°C)	mg/l	--	6.2	--	--
Ammonia Nitrogen	mg/l N	0.22	36	< 0.01	0.14
Organic Nitrogen	mg/l N	0.10	< 0.05	0.61	0.07
Total Hardness	mg/l CaCO ₃	130	220	210	85


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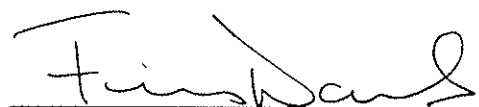
LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 33 - Water, TW3-6, sampled 11/5/93, 1300
34 - Water, TW3-12, sampled 11/5/93, 1200
35 - Water, TW3-20, sampled 11/5/93, 1130
36 - Water, TW4-6, sampled 11/5/93, 1030

Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(33)</u> <u>TW3-6</u>	<u>(34)</u> <u>TW3-12</u>	<u>(35)</u> <u>TW3-20</u>	<u>(36)</u> <u>TW4-6</u>
Chloride	mg/l	46	44	24	49
Sulfate	mg/l	38	52	100	95
Foaming Agents (MBAS)	mg/l	0.14	0.75	< 0.05	0.65
Nitrate Nitrogen	mg/l N	43	19	< 0.01	39
Nitrite Nitrogen	mg/l N	0.13	0.49	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.59	0.76	0.25	29
Total Phosphorus	mg/l P	7.9	0.22	< 0.01	6.9
Total Organic Carbon	mg/l	4.6	8.0	2.5	6.0
BOD (5 Day @ 20°C)	mg/l	< 1	--	--	--
Ammonia Nitrogen	mg/l N	0.07	0.03	0.13	30
Organic Nitrogen	mg/l N	0.52	0.73	0.12	< 0.05
Total Hardness	mg/l CaCO ₃	180	130	83	160



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 37 - Water, TW4-12, sampled 11/5/93, 1000
 38 - Water, TW4-20, sampled 11/5/93, 0930
 39 - Water, TW5-6, sampled 11/5/93, 0900
 40 - Water, TW5-12 sampled 11/5/93, 0830
Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(37)</u> <u>TW4-12</u>	<u>(38)</u> <u>TW4-20</u>	<u>(39)</u> <u>TW5-6</u>	<u>(40)</u> <u>TW5-12</u>
Chloride	mg/l	46	23	41	46
Sulfate	mg/l	15	66	56	25
Foaming Agents (MBAS)	mg/l	1.9	< 0.05	0.26	2.6
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	46	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.35	0.21	24	0.35
Total Phosphorus	mg/l P	0.10	< 0.01	6.1	0.18
Total Organic Carbon	mg/l	13	1.6	4.8	14
Ammonia Nitrogen	mg/l N	0.07	0.11	24	0.04
Organic Nitrogen	mg/l N	0.28	0.10	< 0.05	0.31
Total Hardness	mg/l CaCO ₃	180	43	140	170


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 41 - Water, TW5-20, sampled 11/5/93, 0800
 42 - Water, TW10-6, sampled 11/5/93, 1100
 43 - Water, TW16-6, sampled 11/5/93, 1210
 44 - Water, TW16-12, sampled 11/5/93, 1200
Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(41)</u> <u>TW5-20</u>	<u>(42)</u> <u>TW10-6</u>	<u>(43)</u> <u>TW16-6</u>	<u>(44)</u> <u>TW16-12</u>
Chloride	mg/l	11	48	300	41
Sulfate	mg/l	2	45	47	44
Foaming Agents (MBAS)	mg/l	< 0.05	0.25	0.15	0.54
Nitrate Nitrogen	mg/l N	< 0.01	33	59	7.1
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	0.15	2.7
Total Kjeldahl Nitrogen	mg/l N	0.11	22	1.0	0.52
Total Phosphorus	mg/l P	0.05	4.6	16	0.29
Total Organic Carbon	mg/l	1.9	4.7	8.9	6.8
BOD (5 Day @ 20°C)	mg/l	--	--	< 1	--
Ammonia Nitrogen	mg/l N	0.04	21	0.08	0.03
Organic Nitrogen	mg/l N	0.07	1.0	0.92	0.49
Total Hardness	mg/l CaCO ₃	22	120	120	100


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 45 - Water, TW16-20, sampled 11/5/93, 1125
 46 - Water, TW17-6, sampled 11/5/93, 1055
 47 - Water, TW17-12, sampled 11/5/93, 1025
 48 - Water, TW17-20, sampled 11/5/93, 1005

Date Received: 11/6/93, 0915

Parameter	Units	(45) TW16-20	(46) TW17-6	(47) TW17-12	(48) TW17-20
Chloride	mg/l	28	46	38	29
Sulfate	mg/l	120	49	39	130
Foaming Agents (MBAS)	mg/l	< 0.05	0.10	0.63	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	52	8.9	0.02
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	2.1	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.14	7.1	0.56	0.11
Total Phosphorus	mg/l P	< 0.01	5.3	< 0.01	< 0.01
Total Organic Carbon	mg/l	1.6	4.4	6.4	1.4
BOD (5 Day @ 20°C)	mg/l	--	< 1	--	--
Ammonia Nitrogen	mg/l N	0.04	8.4	0.02	0.02
Organic Nitrogen	mg/l N	0.10	< 0.05	0.54	0.09
Total Hardness	mg/l CaCO ₃	110	180	67	110


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 49 - Water, TW18-6, sampled 11/5/93, 0935
 50 - Water, TW18-12, sampled 11/5/93, 0910
 51 - Water, TW18-20, sampled 11/5/93, 0845
 52 - Water, WP10-6, sampled 11/5/93, 1100

Date Received: 11/6/93, 0915

(TW4-6) Dup
 *

<u>Parameter</u>	<u>Units</u>	<u>(49) TW18-6</u>	<u>(50) TW18-12</u>	<u>(51) TW18-20</u>	<u>(52) WP10-6</u>
Chloride	mg/l	50	40	28	50
Sulfate	mg/l	36	44	130	90
Foaming Agents (MBAS)	mg/l	0.15	0.81	< 0.05	0.52
Nitrate Nitrogen	mg/l N	50	8.7	< 0.01	37
Nitrite Nitrogen	mg/l N	< 0.01	0.64	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	7.3	0.54	0.11	28
Total Phosphorus	mg/l P	2.2	0.02	< 0.01	6.3
Total Organic Carbon	mg/l	4.0	7.1	1.5	5.9
BOD (5 Day @ 20°C)	mg/l	< 1	--	--	--
Ammonia Nitrogen	mg/l N	9.1	0.03	0.04	30
Organic Nitrogen	mg/l N	< 0.05	0.51	0.07	< 0.05
Total Hardness	mg/l CaCO ₃	190	91	110	160

* Duplicate of TW4-6


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 53 - Water, WP7-12, sampled 11/5/93, 1230
 54 - Water, WP8-12, sampled 11/5/93, 1400
 55 - Water, WP9-12, sampled 11/5/93, 1400
 56 - Water, BW1-5, sampled 11/5/93, 1455
Date Received: 11/6/93, 0915

Parameter	Units	(TW17-12 dup)	(TW2-12 Dup)	(TW1-12 dup)	(56)
		(53)* WP7-12	(54)** WP8-12	(55)*** WP9-12	BW1-5
Chloride	mg/l	38	40	250	12
Sulfate	mg/l	38	35	38	12
Foaming Agents (MBAS)	mg/l	0.57	0.27	0.46	< 0.05
Nitrate Nitrogen	mg/l N	8.9	18	15	0.17
Nitrite Nitrogen	mg/l N	2.1	2.4	0.03	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.59	0.49	0.37	0.16
Total Phosphorus	mg/l P	0.17	< 0.01	< 0.01	< 0.01
Total Organic Carbon	mg/l	6.3	4.6	7.0	3.1
Ammonia Nitrogen	mg/l N	0.02	0.03	0.12	0.03
Organic Nitrogen	mg/l N	0.57	0.46	0.25	0.13
Total Hardness	mg/l CaCO ₃	73	210	260	22

* Duplicate of TW17-12

** Duplicate of TW2-12

*** Duplicate of TW1-12



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 57 - Water, BW1-10, sampled 11/5/93, 1440
 58 - Water, BW1-15, sampled 11/5/93, 1425
 59 - Water, BW1-20, sampled 11/5/93, 1415
 60 - Equipment Blank, sampled 11/5/93, 0730

Date Received: 11/6/93, 0915

<u>Parameter</u>	<u>Units</u>	<u>(57)</u> <u>BW1-10</u>	<u>(58)</u> <u>BW1-15</u>	<u>(59)</u> <u>BW1-20</u>	<u>(60)</u> <u>Equip.</u> <u>Blank</u> <u>11/5, 0730</u>
Chloride	mg/l	3	29	32	< 1
Sulfate	mg/l	16	56	120	< 2
Foaming Agents (MBAS)	mg/l	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	0.33	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/l N	0.29	0.18	0.10	< 0.05
Total Phosphorus	mg/l P	< 0.01	< 0.01	< 0.01	< 0.01
Total Organic Carbon	mg/l	5.9	1.6	1.4	< 1
Ammonia Nitrogen	mg/l N	0.10	0.04	0.06	0.02
Organic Nitrogen	mg/l N	0.19	0.14	0.04	< 0.05
Total Hardness	mg/l CaCO ₃	35	65	110	< 2


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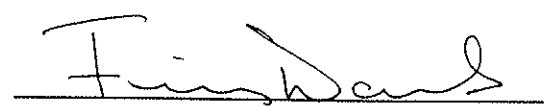
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 61 - Equipment Blank, sampled 11/5/93, 1600
 62 - Equipment Blank A, sampled 11/5/93, 1615
 63 - Spiked Blank, sampled 11/5/93, 1500
Date Received: 11/6/93, 0915

Parameter	Units	(61) Equip. Blank 11/5, 1600	(62) Equip. Blank A	(63) Spiked Blank	Method Blank
Chloride	mg/l	< 1	< 1	--	< 1
Sulfate	mg/l	< 2	< 2	--	< 2
Foaming Agents (MBAS)	mg/l	< 0.05	< 0.05	0.28	< 0.05
Total Suspended Solids	mg/l	--	--	--	< 1
Nitrate Nitrogen	mg/l N	< 0.01	< 0.01	--	< 0.01
Nitrite Nitrogen	mg/l N	< 0.01	< 0.01	--	< 0.01
Total Kjeldahl Nitrogen	mg/l N	< 0.05	< 0.05	--	< 0.05
Total Phosphorus	mg/l P	< 0.01	< 0.01	--	< 0.01
Total Organic Carbon	mg/l	< 1	< 1	--	< 1
BOD (5 Day @ 20°C)	mg/l	--	--	--	< 1
Ammonia Nitrogen	mg/l N	0.02	0.01	--	< 0.01
Organic Nitrogen	mg/l N	< 0.05	< 0.05	--	< 0.05
Total Hardness	mg/l CaCO ₃	< 2	< 2	--	< 2


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>		<u>Analysis Date</u>
Chloride	EPA 325.2	1	mg/l	11/8/93 (01-09,M/B) 11/11/93 (10-26) 11/12/93 (27-49) 11/17/93 (50-62)
Sulfate	EPA 375.4	2	mg/l	11/9/93 (01-09,M/B) 11/10/93 (10-32) 11/11/93 (33-62)
Foaming Agents (MBAS)	SM 5540 C	0.05	mg/l	11/5/93 (01-26,M/B) 11/6/93 (27-63)
Total Suspended Solids	EPA 160.2	1	mg/l	11/9/93
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01	mg/l N	11/5/93 (01-26,M/B) 11/10/93 (27-62)
Nitrite Nitrogen	EPA 354.1	0.01	mg/l N	11/5/93 (01-16,M/B) 11/6/93 (17-62)
Total Kjeldahl Nitrogen	EPA 351.2	0.05	mg/l N	11/9/93 (01-14,M/B) 11/16/93 (15-29) 11/23/93 (30-62)
Total Phosphorus	EPA 365.2	0.01	mg/l P	11/10/93 (01-14,M/B) 11/18/93 (15-29) 11/23/93 (30-62)


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>		<u>Analysis Date</u>
Total Organic Carbon	EPA 415.1	1	mg/l	11/9/93 (01-54,M/B) 11/10/93 (55-62)
BOD	SM 5210	1	mg/l	11/4/93 (01,M/B) 11/6/93 (27,30,33,43, 46,49)
Ammonia Nitrogen	EPA 350.1	0.01	mg/l N	11/18/93 (01-24,M/B) 11/22/93 (25-62)
Organic Nitrogen	Calc.	0.05	mg/l N	11/18/93 (01-24,M/B) 11/22/93 (25-29) 11/23/93 (30-62)
Total Hardness	SM 2340 C	2	mg/l CaCO ₃	11/16/93 (01-26,M/B) 11/18/93 (27-42) 11/19/93 (43-60) 11/22/93 (61,62)


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Chloride	06174-02	100	1	82-116	0-5
	06174-12	94	0	82-116	0-5
	06174-21	90	0	82-116	0-5
	06174-32	91	1	82-116	0-5
	06174-38	96	2	82-116	0-5
	06174-53	101	1	82-116	0-5
Sulfate	06174-02	110	2	78-131	0-9
	06174-11	117	4	78-131	0-9
	06174-18	118	6	78-131	0-9
	06174-34	103	3	78-131	0-9
	06174-42	116	3	78-131	0-9
	06174-58	79	2	78-131	0-9
Foaming Agents (MBAS)	06174-03	98	1	77-121	0-16
	06174-12	97	1	77-121	0-16
	06174-22	100	1	77-121	0-16
	06174-34	101	2	77-121	0-16
	06174-44	105	5	77-121	0-16
	06174-54	99	2	77-121	0-16
	06174-59	101	1	77-121	0-16
Total Suspended Solids	06174-01	94	3	76-113	0-8
Nitrate Nitrogen	06174-08	105	0	72-128	0-14
	06174-11	105	0	72-128	0-14
	06174-12	95	0	72-128	0-14
	06174-32	104	1	72-128	0-14
	06174-48	101	0	72-128	0-14
	06174-56	105	0	72-128	0-14


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Nitrite Nitrogen	06174-03	98	0	78-114	0-6
	06174-12	98	1	78-114	0-6
	06174-22	98	0	78-114	0-6
	06174-35	98	0	78-114	0-6
	06174-45	100	0	78-114	0-6
	06174-59	96	0	78-114	0-6
	06174-56	95	2	78-114	0-6
Total Kjeldahl Nitrogen	06174-03	92	4	76-114	0-16
	06174-26	98	3	76-114	0-16
	06174-45	101	1	76-114	0-16
	06174-48	98	4	76-114	0-16
	06174-58	95	0	76-114	0-16
Total Phosphorus	06174-03	83	3	77-118	0-17
	06174-26	100	5	77-118	0-17
	06174-45	95	0	77-118	0-17
	06174-48	93	4	77-118	0-17
	06174-58	91	0	77-118	0-17
Total Organic Carbon	06174-09	95	2	83-109	0-4
	06174-19	96	1	83-109	0-4
	06174-29	92	3	83-109	0-4
	06174-39	95	4	83-109	0-4
	06174-48	99	1	83-109	0-4
	06174-59	98	2	83-109	0-4
BOD (5 Day @ 20°C)	ISO2359(11/4)	87	11	63-111	0-41
	06170-03	--	12	63-111	0-41
	ISO2370(11/6)	89	1	63-111	0-41
	06177-01	--	6	63-111	0-41


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

<u>Parameter</u>	<u>Sample No. Spiked</u>	<u>Accuracy Mean % R</u>	<u>Precision RPD</u>	<u>QC Control Limits Accuracy</u>	<u>Limits Precision</u>
Ammonia Nitrogen	06174-06	97	0	78-125	0-4
	06174-15	98	0	78-125	0-4
	06174-24	98	1	78-125	0-4
	06174-28	94	1	78-125	0-4
	06174-37	91	0	78-125	0-4
	06174-47	94	1	78-125	0-4
	06174-58	95	2	78-125	0-4
Total Hardness	06174-05	96	1	87-115	0-4
	06174-12	95	0	87-115	0-4
	06174-25	93	2	87-115	0-4
	06174-31	99	1	87-115	0-4
	06174-38	110	0	87-115	0-4
	06174-47	97	0	87-115	0-4
	06174-57	100	2	87-115	0-4


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H3: Phase IIIA Water Quality Data (May 1995, January 1996)

SOUTHERN ANALYTICAL LABORATORIES, INC.

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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County


Sample Description:
01 - Water, STE, sampled 5/8/95, 1445
02 - Water, TW19-6, sampled 5/8/95, 1605
03 - Water, TW19-12, sampled 5/8/95, 1645
04 - Water, TW19-20, sampled 5/8/95, 1715

Date Received: 5/9/95, 1330

<u>Parameter</u>	<u>Units</u>	<u>(01)</u> <u>STE</u>	<u>(02)</u> <u>TW19-6</u>	<u>(03)</u> <u>TW19-12</u>	<u>(04)</u> <u>TW19-20</u>
Ammonia Nitrogen	mg/l N	48	61	60	0.06
Nitrate Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	5.0	0.67	0.59	0.05 U
Total Kjeldahl Nitrogen	mg/l N	53	62	61	0.06
Total Phosphorus	mg/l P	7.8	11	11	0.04
Chloride	mg/l	45	46	46	23
Foaming Agents (MBAS)	mg/l	31	1.7	1.4	0.05 U
Sulfate	mg/l	5	2 U	2	20
Total Hardness	mg/l CaCO ₃	140	140	150	31
Total Organic Carbon	mg/l	42	12	13	1 U
BOD (5 Day @ 20°C)	mg/l	187	--	--	--
Total Suspended Solids	mg/l	50	--	--	--

U - Analyte was not detected; indicated concentration is method detection limit.

FHRS Environmental Lab No. E84129
FHRS Drinking Water Lab No. 84269
Comprehensive QA Plan No. 870317G


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 05 - Water, TW20-6, sampled 5/8/95, 1630
06 - Water, TW20-12, sampled 5/8/95, 1705
07 - Water, TW20-20, sampled 5/8/95, 1730
08 - Water, BW1-5, sampled 5/9/95, 1010
Date Received: 5/9, 1330 (05-07); 5/10/95, 1330 (08)

Parameter	Units	(05)	(06)	(07)	(08)
		TW20-6	TW20-12	TW20-20	BW1-5
Ammonia Nitrogen	mg/l N	34	0.04	0.02	0.01 U
Nitrate Nitrogen	mg/l N	0.03	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.55	0.15	0.05 U	0.13
Total Kjeldahl Nitrogen	mg/l N	35	0.19	0.05 U	0.13
Total Phosphorus	mg/l P	12	0.08	0.15	0.03
Chloride	mg/l	46	19	12	6.2
Foaming Agents (MBAS)	mg/l	0.52	0.11	0.08	0.05 U
Sulfate	mg/l	40	15	42	5
Total Hardness	mg/l CaCO ₃	150	160	33	8.9
Total Organic Carbon	mg/l	7.6	4.6	1.1	3.4

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
09 - Water, BW1-10, sampled 5/9/95, 1040
10 - Water, TW2-6, sampled 5/9/95, 1300
11 - Water, TW4-6, sampled 5/9/95, 1635
12 - Water, TW5-6, sampled 5/9/95, 1900
Date Received: 5/10/95, 1330

Parameter	Units	(09)	(10)	(11)	(12)
		BW1-10	TW2-6	TW4-6	TW5-6
Ammonia Nitrogen	mg/l N	0.06	1.2	47	4.1
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	15
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.15	0.48	0.53	0.64
Total Kjeldahl Nitrogen	mg/l N	0.21	1.7	48	4.7
Total Phosphorus	mg/l P	0.02	6.7	13	5.1
Chloride	mg/l	10	18	46	48
Foaming Agents (MBAS)	mg/l	0.05 U	0.10	0.67	0.27
Sulfate	mg/l	35	9	24	23
Total Hardness	mg/l CaCO ₃	130	130	130	180
Total Organic Carbon	mg/l	4.9	12	9.4	4.3

U - Analyte was not detected; indicated concentration is method detection limit.



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
13 - Water, TW6-6, sampled 5/9/95, 1155
14 - Water, TW6-12, sampled 5/9/95, 1520
15 - Water, TW8-6, sampled 5/9/95, 1230
16 - Water, TW16-6, sampled 5/9/95, 1120

Date Received: 5/10/95, 1330

Parameter	Units	(13)	(14)	(15)	(16)
		TW6-6	TW6-12	TW8-6	TW16-6
Ammonia Nitrogen	mg/l N	8.5	0.05	0.37	1.5
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.02	2.7
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.45	0.12	0.25	0.88
Total Kjeldahl Nitrogen	mg/l N	9.0	0.17	0.62	2.4
Total Phosphorus	mg/l P	5.2	0.01	1.1	6.3
Chloride	mg/l	39	35	3.6	23
Foaming Agents (MBAS)	mg/l	0.25	0.05U	0.05 U	0.05 U
Sulfate	mg/l	17	33	14	32
Total Hardness	mg/l CaCO ₃	220	160	67	110
Total Organic Carbon	mg/l	9.6	3.8	4.1	9.3

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 17 - Water, TW21-6, sampled 5/8/95, 1835
 18 - Water, TW21-12, sampled 5/8/95, 1915
 19 - Water, TW21-20, sampled 5/8/95, 1925
 20 - Water, STBr-, sampled 5/9/95, 1605

Date Received: 5/10/95, 1330

Parameter	Units	(17) TW21-6	(18) TW21-12	(19) TW21-20	(20) STBr-
Ammonia Nitrogen	mg/l N	0.33	0.01	0.01 U	--
Nitrate Nitrogen	mg/l N	9.4	0.01 U	0.01 U	--
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	--
Organic Nitrogen	mg/l N	0.81	0.15	0.05 U	--
Total Kjeldahl Nitrogen	mg/l N	1.1	0.16	0.05 U	--
Total Phosphorus	mg/l P	3.3	0.16	0.03	--
Chloride	mg/l	28	13	9.8	--
Foaming Agents (MBAS)	mg/l	0.06	0.05 U	0.05 U	--
Sulfate	mg/l	36	14	48	--
Total Hardness	mg/l CaCO ₃	94	140	51	--
Total Organic Carbon	mg/l	7.5	5.4	1 U	--
Bromide	mg/l	--	--	--	800

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 21 - Water, TW19-6, sampled 5/9/95, 1555
 22 - Water, TW4-12, sampled 5/10/95, 0830
 23 - Water, TW5-12, sampled 5/10/95, 0845
 24 - Water, TW7-6, sampled 5/10/95, 0930
Date Received: 5/10, 1330 (21); 5/11/95, 0935 (22-24)

Parameter	Units	(21) TW19-6	(22) TW4-12	(23) TW5-12	(24) TW7-6
Ammonia Nitrogen	mg/l N	--	0.03	0.18	2.1
Nitrate Nitrogen	mg/l N	--	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	--	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	--	0.13	0.13	0.34
Total Kjeldahl Nitrogen	mg/l N	--	0.16	0.31	2.4
Total Phosphorus	mg/l P	--	0.07	0.28	4.8
Chloride	mg/l	--	20	22	20
Foaming Agents (MBAS)	mg/l	--	0.05 U	0.05 U	0.07
Sulfate	mg/l	--	15	13	9
Total Hardness	mg/l CaCO ₃	--	150	160	130
Total Organic Carbon	mg/l	--	4.9	5.0	7.0
Bromide	mg/l	1 K ¹	--	--	--

U - Analyte was not detected; indicated concentration is method detection limit.

K - Analyte was less than indicated concentration; indicated concentration is method detection limit multiplied by sample dilution factor.

¹ Sample required dilution due to matrix interferences.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
25 - Water, TW7-12, sampled 5/10/95, 0935
26 - Water, TW7-24, sampled 5/10/95, 1000
27 - Water, TW9-6, sampled 5/10/95, 1030
28 - Water, TW9-12, sampled 5/10/95, 1030

Date Received: 5/11/95, 0935

<u>Parameter</u>	<u>Units</u>	<u>(25) TW7-12</u>	<u>(26) TW7-24</u>	<u>(27) TW9-6</u>	<u>(28) TW9-12</u>
Ammonia Nitrogen	mg/l N	0.07	2.1	2.5	0.25
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.13	0.37	0.44	0.11
Total Kjeldahl Nitrogen	mg/l N	0.20	2.5	2.9	0.36
Total Phosphorus	mg/l P	0.02	4.6	6.6	0.01 U
Chloride	mg/l	29	20	31	20
Foaming Agents (MBAS)	mg/l	0.05 U	0.12	0.08	0.05 U
Sulfate	mg/l	22	9	11	11
Total Hardness	mg/l CaCO ₃	140	130	130	140
Total Organic Carbon	mg/l	3.6	7.1	8.4	4.5

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
29 - Water, TW11-6, sampled 5/10/95, 1250
30 - Water, TW12-6, sampled 5/10/95, 1110
31 - Water, TW13-6, sampled 5/10/95, 1340
32 - Water, TW13-12, sampled 5/10/95, 1335

Date Received: 5/11/95, 0935

<u>Parameter</u>	<u>Units</u>	<u>(29)</u> <u>TW11-6</u>	<u>(30)</u> <u>TW12-6</u>	<u>(31)</u> <u>TW13-6</u>	<u>(32)</u> <u>TW13-12</u>
Ammonia Nitrogen	mg/l N	29	3.1	0.02	0.01
Nitrate Nitrogen	mg/l N	0.01 U	0.01	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.52	0.41	0.14	0.11
Total Kjeldahl Nitrogen	mg/l N	30	3.5	0.16	0.12
Total Phosphorus	mg/l P	2.0	0.44	0.16	0.01 U
Chloride	mg/l	42	45	4.7	36
Foaming Agents (MBAS)	mg/l	0.28	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	44	13	4	36
Total Hardness	mg/l CaCO ₃	140	190	24	28
Total Organic Carbon	mg/l	9.0	10	1.8	4.3

U - Analyte was not detected; indicated concentration is method detection limit.



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
33 - Water, TW13-20, sampled 5/10/95, 1445
34 - Water, TW14-6, sampled 5/10/95, 1440
35 - Water, TW14-12, sampled 5/10/95, 1520
36 - Water, TW14-20, sampled 5/10/95, 1535

Date Received: 5/11/95, 0935

<u>Parameter</u>	<u>Units</u>	<u>(33)</u> <u>TW13-20</u>	<u>(34)</u> <u>TW14-6</u>	<u>(35)</u> <u>TW14-12</u>	<u>(36)</u> <u>TW14-20</u>
Ammonia Nitrogen	mg/l N	0.01 U	0.15	0.24	0.01 U
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.05 U	0.26	0.12	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.05 U	0.41	0.36	0.05 U
Total Phosphorus	mg/l P	0.01 U	0.18	0.01 U	0.01
Chloride	mg/l	37	3.1	32	57
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	33	3	14	20
Total Hardness	mg/l CaCO ₃	52	24	140	98
Total Organic Carbon	mg/l	1 U	4.3	4.1	1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
 37 - Water, TW15-6, sampled 5/10/95, 1640
 38 - Water, TW15-12, sampled 5/10/95, 1605
 39 - Water, TW15-20, sampled 5/10/95, 1655
 40 - Water, TW22-6, sampled 5/10/95, 1635

Date Received: 5/11/95, 0935

Parameter	Units	(37) TW15-6	(38) TW15-12	(39) TW15-20	(40) TW22-6
Ammonia Nitrogen	mg/l N	0.09	1.9	0.01 U	--
Nitrate Nitrogen	mg/l N	0.01 U	0.01	0.01 U	--
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	--
Organic Nitrogen	mg/l N	0.31	0.14	0.05 U	--
Total Kjeldahl Nitrogen	mg/l N	0.40	2.0	0.05 U	--
Total Phosphorus	mg/l P	0.31	0.01 U	0.01	--
Chloride	mg/l	4.5	28	67	--
Foaming Agents (MBAS)	mg/l	0.05 U	0.05	0.05 U	--
Sulfate	mg/l	2 U	10	31	--
Total Hardness	mg/l CaCO ₃	42	120	110	--
Total Organic Carbon	mg/l	7.8	4.2	1 U	--
Bromide	mg/l	--	--	--	1 K ¹

U - Analyte was not detected; indicated concentration is method detection limit.

K - Analyte was less than indicated concentration; indicated concentration is method detection limit multiplied by sample dilution factor.

¹ Sample required dilution due to matrix interferences.



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LABORATORY REPORT


Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 41 - Water, TW1-6, sampled 5/11/95, 0915
 42 - Water, TW22-6, sampled 5/11/95, 0810
 43 - Water, TW22-12, sampled 5/11/95, 0930
 44 - Water, TW22-20, sampled 5/11/95, 0855

Date Received: 5/12/95, 1005

Parameter	Units	(41)	(42)	(43)	(44)
		TW1-6	TW22-6	TW22-12	TW22-20
Ammonia Nitrogen	mg/l N	46	0.01 U	0.05	0.01 U
Nitrate Nitrogen	mg/l N	1.2	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.63	0.47	0.05 U	0.05 U
Total Kjeldahl Nitrogen	mg/l N	47	0.47	0.05	0.05 U
Total Phosphorus	mg/l P	8.8	1.2	0.01 U	0.02
Chloride	mg/l	42	12	16	20
Foaming Agents (MBAS)	mg/l	0.54	0.05	0.05 U	0.05 U
Sulfate	mg/l	11	2 U	59	18
Total Hardness	mg/l CaCO ₃	130	110	130	26
Total Organic Carbon	mg/l	7.7	15	2.9	1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 45 - Water, TW23-6, sampled 5/11/95, 0955
46 - Water, TW23-12, sampled 5/11/95, 1005
47 - Water, TW23-20, sampled 5/11/95, 1030
48 - Water, TW23-24, sampled 5/11/95, 1100

Date Received: 5/12/95, 1005

<u>Parameter</u>	<u>Units</u>	<u>(45)</u> <u>TW23-6</u>	<u>(46)</u> <u>TW23-12</u>	<u>(47)</u> <u>TW23-20</u>	<u>(48)</u> <u>TW23-24</u>
Ammonia Nitrogen	mg/l N	0.15	0.10	0.01 U	0.01 U
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.31	0.08	0.05 U	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.46	0.18	0.05 U	0.05 U
Total Phosphorus	mg/l P	1.4	0.02	0.03	0.02
Chloride	mg/l	5.9	14	23	23
Foaming Agents (MBAS)	mg/l	0.07	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	4	72	21	29
Total Hardness	mg/l CaCO ₃	73	150	27	28
Total Organic Carbon	mg/l	10	2.5	1 U	1 U

U - Analyte was not detected; indicated concentration is method detection limit.



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 49 - Water, TW24-6, sampled 5/11/95, 1040
 50 - Water, TW24-12, sampled 5/11/95, 1115
 51 - Water, TW24-20, sampled 5/11/95, 1125
 52 - Water, TW25-6, sampled 5/11/95, 1305
Date Received: 5/12/95, 1005

Parameter	Units	(49)	(50)	(51)	(52)
		TW24-6	TW24-12	TW24-20	TW25-6
Ammonia Nitrogen	mg/l N	0.01 U	0.07	0.01 U	0.01 U
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.05
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	1.2	0.10	0.05 U	0.23
Total Kjeldahl Nitrogen	mg/l N	1.2	0.17	0.05 U	0.23
Total Phosphorus	mg/l P	2.0	0.03	0.05	0.22
Chloride	mg/l	0.70	14	25	1.4
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	3	71	24	3
Total Hardness	mg/l CaCO ₃	9.9	150	30	7.9
Total Organic Carbon	mg/l	4.4	3.7	1 U	2.4

U - Analyte was not detected; indicated concentration is method detection limit.



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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 53 - Water, TW25-12, sampled 5/11/95, 1310
 54 - Water, TW25-20, sampled 5/11/95, 0735
 55 - Water, TW26-6, sampled 5/11/95, 1430
 56 - Water, TW26-12, sampled 5/11/95, 1445

Date Received: 5/12/95, 1005

Parameter	Units	(53)	(54)	(55)	(56)
		TW25-12	TW25-20	TW26-6	TW26-12
Ammonia Nitrogen	mg/l N	0.05	0.02	0.03	0.38
Nitrate Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.14	0.05 U	0.16	0.11
Total Kjeldahl Nitrogen	mg/l N	0.19	0.05 U	0.19	0.49
Total Phosphorus	mg/l P	0.05	0.03	0.19	0.02
Chloride	mg/l	30	30	3.9	25
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	21	24	6	45
Total Hardness	mg/l CaCO ₃	120	36	40	120
Total Organic Carbon	mg/l	5.3	1 U	2.6	3.9

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 57 - Water, TW26-20, sampled 5/11/95, 1530
 58 - Water, TW26-30, sampled 5/11/95, 1515
 59 - Water, TAP, sampled 5/11/95, 1610
 60 - Water, STE, sampled 5/11/95, 1635
Date Received: 5/12/95, 1005

Parameter	Units	(57) TW26-20	(58) TW26-30	(59) TAP	(60) STE
Ammonia Nitrogen	mg/l N	0.01 U	0.05	0.06	50
Nitrate Nitrogen	mg/l N	1.5	0.01 U	0.01 U	0.05
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.02
Organic Nitrogen	mg/l N	0.06	0.05 U	0.05 U	4.8
Total Kjeldahl Nitrogen	mg/l N	0.06	0.05	0.06	55
Total Phosphorus	mg/l P	0.03	0.01 U	0.07	8.8
Chloride	mg/l	19	30	11	600
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	32
Sulfate	mg/l	22	140	2 U	19
Total Hardness	mg/l CaCO ₃	55	110	150	140
Total Organic Carbon	mg/l	1 U	1 U	1 U	47
BOD (5 Day @ 20°C)	mg/l	--	--	--	196
Total Suspended Solids	mg/l	--	--	--	58

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

Sample Description: 61 - Water, TW10-6, sampled 5/12/95, 0920
62 - Water, TW27-6, sampled 5/12/95, 1020
63 - Water, TW27-12, sampled 5/12/95, 0950
64 - Water, TW27-20, sampled 5/12/95, 1035

Date Received: 5/13/95, 0900

<u>Parameter</u>	<u>Units</u>	<u>(61)</u> <u>TW10-6</u>	<u>(62)</u> <u>TW27-6</u>	<u>(63)</u> <u>TW27-12</u>	<u>(64)</u> <u>TW27-20</u>
Ammonia Nitrogen	mg/l N	9.9	0.01	0.36	0.05
Nitrate Nitrogen	mg/l N	14	0.01 U	0.01 U	0.01
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.47	0.11	0.12	0.05 U
Total Kjeldahl Nitrogen	mg/l N	10	0.12	0.48	0.05
Total Phosphorus	mg/l P	4.8	0.13	0.02	0.02
Chloride	mg/l	48	1.8	22	28
Foaming Agents (MBAS)	mg/l	0.07	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	45	16	29	47
Total Hardness	mg/l CaCO ₃	180	20	100	71
Total Organic Carbon	mg/l	5.1	1.7	3.9	1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
Sample Description: 65 - Water, TW27-24, sampled 5/12/95, 1015
 66 - Water, TW27-30, sampled 5/12/95, 1050
 67 - Water, TW28-6, sampled 5/12/95, 1125
 68 - Water, TW28-12, sampled 5/12/95, 1155
Date Received: 5/13/95, 0900

Parameter	Units	(65) TW27-24	(66) TW27-30	(67) TW28-6	(68) TW28-12
Ammonia Nitrogen	mg/l N	0.36	0.07	0.08	2.9
Nitrate Nitrogen	mg/l N	0.01	0.01 U	0.01 U	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.13	0.05 U	0.17	0.10
Total Kjeldahl Nitrogen	mg/l N	0.49	0.07	0.25	3.0
Total Phosphorus	mg/l P	0.03	0.02	0.07	0.03
Chloride	mg/l	22	28	2.8	30
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	25	160	5	10
Total Hardness	mg/l CaCO ₃	100	110	40	110
Total Organic Carbon	mg/l	3.5	1 U	4.5	2.7

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County


Sample Description: 69 - Water, TW28-20, sampled 5/12/95, 1235

70 - Water, TW28-30, sampled 5/12/95, 1255

Date Received: 5/13/95, 0900

<u>Parameter</u>	<u>Units</u>	<u>(69) TW28-20</u>	<u>(70) TW28-30</u>	<u>Method Blank</u>
Ammonia Nitrogen	mg/l N	0.05	0.04	0.01 U
Nitrate Nitrogen	mg/l N	0.01	0.01	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01 U	0.01 U
Organic Nitrogen	mg/l N	0.05 U	0.05 U	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.05	0.05 U	0.05 U
Total Phosphorus	mg/l P	0.03	0.02	0.01 U
Chloride	mg/l	30	28	1 U
Foaming Agents (MBAS)	mg/l	0.05 U	0.05 U	0.05 U
Sulfate	mg/l	61	30	2 U
Total Hardness	mg/l CaCO ₃	82	110	2 U
Total Organic Carbon	mg/l	1.3	1 U	1 U
BOD (5 Day @ 20°C)	mg/l	--	--	1 U
Total Suspended Solids	mg/l	--	--	1 U
Bromide	mg/l	--	--	0.1 U

U - Analyte was not detected; indicated concentration is method detection limit.


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	5/25/95
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	5/10/95 (01-19,M/B) 5/17/95 (22-50) 5/18/95 (51-70)
Nitrite Nitrogen	EPA 354.1	0.01 mg/l N	5/9/95,1413 (01-07,M/B) 5/10/95,1530 (08-19) 5/11/95,1400 (22-39) 5/12/95,1500 (41-60) 5/13/95,1000 (61-70)
Organic Nitrogen	Calc.	0.05 mg/l N	5/22/95
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	5/26/95
Total Phosphorus	EPA 365.2	0.01 mg/l P	5/18/95
Chloride	EPA 325.2	1 mg/l	5/18/95 (01-19,M/B) 5/23/95 (22-70)
Foaming Agents (MBAS)	SM 5540 C	0.05 mg/l	5/9/95,1330 (01-07,M/B) 5/10/95,1500 (08-19) 5/12/95,0815 (22-60) 5/13/95,1010 (61-70)
Sulfate	EPA 375.4	2 mg/l	5/19/95 (01-19,M/B) 5/23/95 (22-29) 5/25/95 (30-62) 5/26/95 (63-70)
Total Hardness	SM 2340 C	2 mg/l CaCO ₃	5/19/95 (01-19,M/B) 5/25/95 (22-70)
Total Organic Carbon	EPA 415.1	1 mg/l	5/15/95 (01-07,M/B) 5/17/95 (08-52) 5/18/95 (53-70)
BOD	SM 5210	1 mg/l	5/10/95,1030 (01,M/B) 5/12/95,1330 (60)
Total Suspended Solids	EPA 160.2	1 mg/l	5/15/95
Bromide	SM 4500-Br B	0.1 mg/l	5/30/95


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Ammonia Nitrogen	07824-07	102	0	87-117	4
	07824-19	102	0	87-117	4
	07824-25	101	0	87-117	4
	07824-39	90	2	87-117	4
	07824-48	92	0	87-117	4
	07824-58	105	0	87-117	4
	07824-66	105	0	87-117	4
Nitrate-Nitrite Nitrogen	07824-01	85	6	90-113	2
	07824-08	102	0	90-113	2
	07824-14	105	2	90-113	2
	07824-26	90	0	90-113	2
	07824-36	99	2	90-113	2
	07824-42	103	2	90-113	2
	07824-50	101	6	90-113	2
	07824-58	99	2	90-113	2
	07824-60	75	10	90-113	2
07824-68	100	0	90-113	2	
Nitrite Nitrogen	07824-02	87	2	78-115	6
	07824-14	100	2	78-115	6
	07824-28	98	2	78-115	6
	07824-33	96	4	78-115	6
	07824-47	97	0	78-115	6
	07824-57	105	3	78-115	6
	07824-63	92	4	78-115	6


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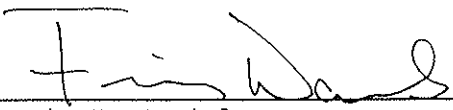
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Total Kjeldahl Nitrogen	07824-02	96	1	76-115	14
	07824-11	98	0	76-115	14
	07824-25	95	7	76-115	14
	07824-35	100	0	76-115	14
	07824-45	93	0	76-115	14
	07824-55	99	0	76-115	14
	07824-65	99	2	76-115	14
Total Phosphorus	07824-11	114	1	76-119	18
	07824-25	97	6	76-119	18
	07824-35	107	2	76-119	18
	07824-55	110	3	76-119	18
	07824-65	106	5	76-119	18
Chloride	07824-08	101	0	81-121	7
	07824-19	103	0	81-121	7
	07824-23	90	0	81-121	7
	07824-30	90	2	81-121	7
	07824-43	88	0	81-121	7
	07824-52	99	0	81-121	7
	07824-62	103	2	81-121	7
Foaming Agents (MBAS)	07817-05	98	6	79-118	12
	07824-08	99	1	79-118	12
	07824-25	102	1	79-118	12
	07824-32	106	1	79-118	12
	07824-44	110	4	79-118	12
	07824-51	110	1	79-118	12
	07824-61	94	2	79-118	12


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.10 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

Parameter	Sample No. Spiked	Accuracy	Precision	QC Control Limits	
		Mean % R	RPD	Accuracy	Precision
Sulfate	07824-04	97	3	74-133	9
	07824-15	96	2	74-133	9
	07824-31	98	0	74-133	9
	07824-42	106	0	74-133	9
	07824-53	100	1	74-133	9
	07824-62	95	0	74-133	9
Total Hardness	07824-04	100	1	86-115	4
	07824-15	98	1	86-115	4
	07824-31	102	1	86-115	4
	07824-33	100	1	86-115	4
	07824-44	100	1	86-115	4
	07824-54	100	1	86-115	4
	07824-67	102	1	86-115	4
Total Organic Carbon	07824-06	88	3	79-108	5
	07824-12	100	1	79-108	5
	07824-26	102	2	79-108	5
	07824-32	103	2	79-108	5
	07824-43	93	1	79-108	5
	07824-53	95	3	79-108	5
	07824-63	97	1	79-108	5
BOD (5 Day @ 20°C)	ISO3088(5/10)	92	2	39-138	36
	ISO3088(5/12)	95	5	39-138	36
Total Suspended Solids	07817-01	90	3	77-113	12
Bromide	07824-20	110	7	88-127	24


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LABORATORY REPORT

Project Description: Ayres Project No. 4155.40 - SDA, St. Johns County


Sample Description: 01 - Water, BW1-5', sampled 1/16/96, 0853
02 - Water, TW21-6', sampled 1/16/96, 1355

Date Received: 1/18/96, 1005

<u>Parameter</u>	<u>Units</u>	<u>(01) BW1-5'</u>	<u>(02) TW21-6'</u>	<u>Method Blank</u>
Ammonia Nitrogen	mg/l N	0.02	46	0.01 U
Nitrate Nitrogen	mg/l N	0.01	7.7	0.01 U
Nitrite Nitrogen	mg/l N	0.01 U	0.01	0.01 U
Organic Nitrogen	mg/l N	0.18	0.97	0.05 U
Total Kjeldahl Nitrogen	mg/l N	0.20	47	0.05 U
Total Phosphorus	mg/l P	0.04	5.6	0.02
Chloride	mg/l	17	40	1 U
Foaming Agents (MBAS)	mg/l	0.05 U	2.6	0.05 U
Sulfate	mg/l	12	30	2 U
Total Hardness	mg/l CaCO ₃	16	130	2 U
Total Organic Carbon	mg/l	6.0	16	1 U
BOD (5 Day @ 20°C)	mg/l	1 U	6.7	1 U
Total Suspended Solids	mg/l	11	25	1 U

U - Analyte was not detected; indicated concentration is method detection limit.

FHRS Environmental Lab No. E84129
FHRS Drinking Water Lab No. 84269
Comprehensive QA Plan No. 870317G


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January 31, 1996
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.40 - SDA, St. Johns County

<u>Parameter</u>	<u>Method</u>	<u>Detection Limit</u>	<u>Analysis Date</u>
Ammonia Nitrogen	EPA 350.1	0.01 mg/l N	1/19/96
Nitrate-Nitrite Nitrogen	EPA 353.2	0.01 mg/l N	1/24/96
Nitrite Nitrogen	EPA 354.1	0.01 mg/l N	1/17/96, 1040
Organic Nitrogen	Calc.	0.05 mg/l N	1/26/96
Total Kjeldahl Nitrogen	EPA 351.2	0.05 mg/l N	1/26/96
Total Phosphorus	EPA 365.2	0.01 mg/l P	1/25/96
Chloride	EPA 325.2	1 mg/l	1/26/96
Foaming Agents (MBAS)	SM 5540 C	0.05 mg/l	1/18/96, 0845
Sulfate	EPA 375.4	2 mg/l	1/29/96
Total Hardness	SM 2340 C	2 mg/l CaCO ₃	1/29/96
Total Organic Carbon	EPA 415.1	1 mg/l	1/23/96
BOD	SM 5210	1 mg/l	1/17/96, 0830
Total Suspended Solids	EPA 160.2	1 mg/l	1/23/96


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January 31, 1996
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LABORATORY REPORT

Project Description: Ayres Project No. 4155.40 - SDA, St. Johns County
QC Description: Matrix Spike/Matrix Spike Duplicate Recoveries

<u>Parameter</u>	<u>Sample No. Spiked</u>	<u>Accuracy Mean % R</u>	<u>Precision RPD</u>	<u>QC Control Limits Accuracy</u>	<u>Limits Precision</u>
Ammonia Nitrogen	08655-17	97	2	78-121	4
Nitrate-Nitrite Nitrogen	08694-01	99	2	83-114	4
Nitrite Nitrogen	08654-03	92	0	85-110	6
Total Kjeldahl Nitrogen	08694-01	97	4	69-126	22
Total Phosphorus	08694-01	100	2	72-124	15
Chloride	08703-02	103	1	74-122	6
Foaming Agents (MBAS)	08694-01	109	4	80-121	14
Sulfate	08707-11	101	2	71-127	10
Total Hardness	08707-11	97	0	86-114	4
Total Organic Carbon	08688-01	104	4	81-111	7
BOD (5 Day @ 20°C)	IS03512(1/17)	92	2	54-127	28
Total Suspended Solids	08706-01	91	5	61-133	9


Francis I. Daniels
Laboratory Director

H4: Groundwater Dissolved Oxygen and Oxidation-Reduction
Potential (ORP) Data

SDA Florida OWTS Project

Table H-1 Groundwater Dissolved Oxygen and ORP Measurements

Date	Well Point I.D.	Time of Reading	Time Elapsed (min.)	DO (ppm)	ORP (mv)	Temperature (C°)	pH
8/31/93	DI H2O	5:30PM		4.6	326.6	N/A	N/A
	BW1-10	5:30 PM	0	N/A	N/A	23	6.2
		5:35 PM	5	0.5	205.0		
		5:37 PM	7	0.3	190.4		
		5:40 PM	10	0.15	186.5		
8/31/93	TW16-6	6:04PM	0	1.5	268.0	27	6.3
		6:07PM	3	0.4	261.8		
		6:09PM	5	0.25	253.4		
		6:11 PM	7	0.2	248.0		
		6:14 PM	10	0.18	244.6	25.5	
8/31/93	TW16-12	6:20 PM	0	N/A	N/A	23	6.6
		6:22 PM	2	0.25	146.5		
		6:27PM	5	0.2	145.2		
		6:29 PM	7	0.15	145.2		
		6:32PM	10	N/A	N/A	23	
8/31/93	TW17-6	6:40 PM	0	0.75	52.0	26	6.9
		6:44PM	4	0.35	136.9		
		6:46 PM	6	0.25	149.7		
		6:47 PM	7	N/A	N/A		
		6:50 PM	10	0.15	159.0	25.5	
8/31/93	TW1-6	7:00PM	0	5	241.0	25.5	6.9
		7:04PM	4	4	240.0		
		7:06 PM	6	3.8	231.0		
		7:10 PM	10	3.4	229.0		
		7:13 PM	13	3.3	228.0	25	
8/31/93	TW1-12	7:20 PM	0	N/A	N/A	23	6.8
		7:24PM	4	0.25	174.0		
		7:26PM	6	0.2	169.0		
		7:30PM	10	0.15	163.6		
		7:33PM	13	0.15	162.0	23	
8/31/93	TW7-6	7:46PM	0	0.6	-108.0	24	7
		7:50PM	4	0.35	-125.0		
		7:52PM	6	0.3	-138.0		
		7:56PM	10	0.2	-155.0	25	
8/31/93	TW7-12	8:05PM	0	0.5	72.8	23	6.9
		8:09PM	4	0.15	81.2		
		8:11 PM	6	0.15	82.6		
		8:13 PM	9	0.15	84.7	23	
1/15/96	TW19-6	4:32 PM	0	1	-60.0	19.5	7.2
		4:34 PM	02:00	0.9	-81.0		
		4:36 PM	04:00	0.6	-60.0		

SDA Florida OWTS Project

Table H-1 Groundwater Dissolved Oxygen and ORP Measurements

Date	Well Point I.D.	Time of Reading	Time Elapsed (min.)	DO (ppm)	ORP (mv)	Temperature (C°)	pH
		4:49 PM	17:00	0.5	-55.0		
		4:56 PM	24:00	0.4	-52.0		
1/15/96	TW20-6	5:04 PM	0	0.4	76.0	19.1	7.4
		5:07 PM	03:50	0.25	38.0		
		5:11 PM	07:00	0.25	8.0		
		5:16 PM	12:00	0.2	-55.0		
1/15/96	TW21-6	5:19 PM	0			19	6.5
		5:20 PM	01:39	0.5	-187.0		
		5:24 PM	05:50	0.15	-220.0		
		5:28 PM	09:00	0.15	-238.0		
1/16/96	BW1-5	9:14 AM	0	0.5	55.0	17.5	7.5
		9:17 AM	03:25	0.3	29.2		
		9:19 AM	05:40	0.3	20.9		
		9:21 AM	07:00	0.25	14.1		
1/16/96	BW1-5	1:22 PM	0	0.1	-210.0	NA	NA
		1:24 PM	02:00	0.1	-201.3		
		1:25 PM	03:00	0.1	-203.0		
1/16/96	TW21-6	1:59 PM	0	0.1	-295.0	19	7
		2:03 PM	04:00	0.1	-338.5		
		2:08 PM	09:00	0.1	-360.0		
		2:13 PM	14:00	0.1	-371.0		