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Carmen Johnson
Firm/Co ID # 24-02 Date 1/31/12 Doc ID# DIN

November 4, 2001

Mr. James C. Coffey, Acting Section Chief
Solid Waste Section, Division of Waste Management
North Carolina Department of Environment and Natural Resources
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

NOV 2001 Recommend Approval Decline

Re: Hydrogeologic Report Addendum
Sanitary (Captive Industrial) Landfill Siting Suitability
International Paper Riegelwood Pulp and Paper Mill
Columbus County, North Carolina
JEI Project No. 478.04/Task No. 01/File No. 10.1

Dear Mr. Coffey,

On behalf of International Paper, Joyce Engineering, Inc. is submitting the attached *Hydrogeologic Report Addendum* and for the proposed Sanitary (Captive Industrial) Landfill at the International Paper Riegelwood Pulp and Paper Mill located in Columbus County, North Carolina. This document is being submitted to address comments provided in your letter dated January 30, 2001, *RE: Site Suitability for a Sanitary Landfill, International Paper, Riegelwood Mill* (copy attached). Please note that additional groundwater modeling in support of an alternate landfill liner design will be submitted in conjunction with the *Construction Plan Application.* The *Water Quality Monitoring Plan* for the facility will also be submitted under separate cover.

Based on the information compiled during our hydrogeologic investigation, the site has been determined to be suitable for construction and long-term environmental monitoring of the proposed landfill. We would appreciate the opportunity to assist your staff with any questions or concerns that they may have during their review of this document. Additionally, on behalf of International Paper we would like to specifically thank Ellen Lorscheider for her assistance and guidance in preparation of this addendum report.

Sincerely,
JOYCE ENGINEERING, INC.

Daniel R. Moore, P.G.
Manager of Environmental Services

Michael G. Williams
Senior Project Hydrogeologist

Attachments: *January 30, 2001, Letter*
Hydrogeologic Report Addendum

C: Mr. Edward J. Kreul, International Paper
Mr. Paul Syslo, International Paper

NOV 2003
Received
Solid Waste
Section

ATTACHMENT 1

North Carolina
Department of Environment and Natural Resources

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary
William L. Meyer, Director

NCDENR

Fax: Don Huovinen + Pages

IP

To: Paul Syslo - Central File
xc: Don Huovinen
Rich Lowe - Technology
Tom Sauer - Corp. Env.
S. Moore
— Mgr. of Fiber Supply Planning — Fiber flow to mills in Miss AL and FL panhandle + 17 mills

January 30, 2001

Mr. Edward J. Kreul
Environmental Services Superintendent
International Paper- Riegelwood Mill
John L. Riegel Road
Riegelwood, NC 28456

RE: Site Suitability for a Sanitary Landfill, International Paper, Riegelwood Mill, Riegelwood, NC.

Dear Mr. Kreul;

The Solid Waste Section of the Division of Waste Management (Division), has completed its review of the site application and facility plan study for the proposed International Paper, Riegelwood Mill, Industrial Landfill. The proposed site is located on NCSR 1818 in Columbus County, near Riegelwood, North Carolina.

The application was prepared by your consultant Earth Tech of North Carolina, Inc., Raleigh, NC and is referenced as follows: *Site Application. Sanitary Landfill, International Paper Company, Riegelwood Mill, John L. Riegel Road, Riegelwood, NC 28456.* Your consultants response to comments, dated June 20, 2000 is referenced, as are the site application drawings (eleven pages) titled: *Site Application Conceptual Design, International Paper, Riegelwood, North Carolina.* December, 1999.

Pursuant to Rule .0504, the Division is notifying International Paper (IP) that the site is considered suitable, and you are authorized to prepare and submit an application for a permit to construct. Section .0201 of the Solid Waste Management Rules (15A NCAC 13B) requires the Division to issue a solid waste permit in two parts. The first part is a Permit to Construct and the second part is a Permit to Operate. The Division may only issue a Permit to Operate after it determines that the facility has been constructed in accordance with the construction permit and that all pre-operative conditions have been met. The final action the Division may take on a permit application is the issuance or denial of a permit.

APPROVED DISPOSAL AREA

Based upon information submitted and revised through June 20, 2000, the Division has determined that the approximately 450 acre site, as proposed in the conceptual design plan, is suitable for development of a solid waste management facility subject to the terms and conditions specified below. This statement of suitability does not predetermine that all portions of this property are deemed appropriate for landfilling activities. Each phase will be evaluated during the design process as to whether or not landfilling can be performed and what, if any, engineering is deemed appropriate to achieve that purpose.

Disposal of waste, or any portion of the waste disposal unit is not permitted in the 100-year flood plain. This includes the containment berm or any leachate storage or treatment facilities.

Disposal on western portions of the site may be restricted or prohibited because of the of the stream, possibly intermittent, which dissects the property. Appropriate wetlands approvals and/or mitigation may be necessary to utilize this area for waste cells, as presented in the conceptual design plan.

GENERAL CONDITIONS AND SITE-SPECIFIC DESIGN REQUIREMENTS

The Division requires the submittal of a construction plan application for the first five-year development phase, as identified in the conceptual design plan, which is consistent with the requirements of 15A NCAC 13B .0503, .0504, and .0505, including, but not limited to, the site specific criteria set forth in this letter. Development of subsequent phases of the landfill will be in accordance with rule .0201(e).

Buffers

Horizontal buffers shall be as described in the conceptual design and as designated in Rule .0503(2)(f), and shall also include the following buffer criteria:

a) A 100-foot minimum buffer shall be maintained between facility boundaries and borrow areas, unless otherwise approved by the Division.

b) A minimum 50-foot buffer shall be maintained between borrow areas and delineated wetlands.

c) A minimum 50-foot buffer shall be maintained between disposal areas and the delineated wetlands.

d) A minimum 200-foot buffer shall be established between the waste boundary and the property line, unless otherwise approved by the Division.

IP may utilize all remaining areas of the site, except buffer areas, for other solid waste management activities (such as composting or recycling) or for landfill support activities (such as leachate management and/or stockpiling of cover material) upon approval by the Division.

Design and Construction Standards

An engineering evaluation and design report shall be prepared. The division strongly encourages IP and their consultant to schedule a pre-design meeting with the division to discuss a strategy for preparing a permit to construct that will meet the goals and objectives of IP, be permittable, and be protective of public health and the environment. The permit to construct should consider the following:

1. Use of any composite liner system other than that specified in .0503(d)(2)(ii)(B) will require groundwater modeling to demonstrate compliance with ground water standards established under 15A NCAC 2L.
2. The proposed closure cap system is not adequate for a lined waste cell. At a minimum, current engineering practice requires a cap system that is equal to or less permeable than the bottom liner system. This should be addressed in the permit to construct.
3. Stability and settlement will need to be investigated during the design hydrogeologic phase of work. The presence of the loose saturated sands and compressible clays may present challenges to the engineering design.
4. Stone Columns surrounding the leachate collection lines must penetrate the protective cover and be in contact with the waste.
5. The use of concrete manholes for the leachate system can be problematic, particularly if multiple sections are needed. Consideration to using HDPE manholes should be given.

Additional Subsurface Investigation

A geologic and hydrogeologic report shall be submitted as a component of the construction plan application. The report shall present the results of additional subsurface investigations at the site and shall be consistent with the requirements of Section .0503(d)(ii) and .0504(1)(c) of the Solid Waste Management Rules.

6. Further characterization will be necessary concerning the underlying Pee Dee formation for the purpose of evaluating its settlement properties. Potential settlement must be designed for with the engineering design and evaluation.
7. The hydrogeologic study should be designed to evaluate the area's aquifer to determine whether it is discharging or recharging in the area of concern, and its potential variance

across the site.

8. The seasonal high groundwater surface must be determined for the site, particularly in the area of Phases 1 and 2. Installation of additional piezometers in this area may be required.
9. The groundwater monitoring system must be designed by giving consideration to the dispersive characteristics of the aquifer. This will determine the spacing and number of the monitoring wells.

The Permit to Construct and the Permit to Operate will be issued to International Paper Company, Inc., Riegelwood Mill. If you have any questions, or would like to schedule a meeting to discuss this letter, please contact our office at (919)733-0692. The staff engineer assigned this project is Ed Mussler.

Sincerely,

James C Coffey

James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

cc: Ellen Lorescheider, SWS
Mark Fry, SWS
Jim Barber, SWS
John Crowder, SWS

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INTERNATIONAL PAPER

HYDROGEOLOGIC REPORT ADDENDUM

INTERNATIONAL PAPER
RIEGELWOOD PULP AND PAPER MILL

NOVEMBER 2001

Prepared by: _____
Michael G. Williams

NORTH CAROLINA LICENSED SEAL 1306 GEOLOGIST DANIEL R. MOORE
11-01-01

Reviewed by: _____
Daniel R. Moore, P.G.

HYDROGEOLOGIC REPORT ADDENDUM
International Paper Riegelwood Pulp and Paper Mill
Columbus County, North Carolina

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Columbus County, North Carolina

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1.0 INTRODUCTION

This *Hydrogeologic Report Addendum* (Addendum) is being provided as a supplement to the *Site Application, Sanitary Landfill*, dated December 1999, and prepared by Earth Tech, Inc. for the Riegelwood Pulp and Paper Mill owned and operated by International Paper (hereafter referred to as IP Riegelwood), and located in Riegelwood, North Carolina. The Addendum, which was requested by the North Carolina Department of Environment and Natural Resources (DENR) in a letter dated January 30, 2001, incorporates new information obtained by Joyce Engineering, Inc. The Addendum also includes hydrogeologic information that was previously submitted to DENR on behalf of IP Riegelwood by Earth Tech, Inc. with their June 7, 2000, letter in response to the March 27, 2000, letter from DENR concerning the first review of the *Site Application.*

International Paper is proposing to construct a new sanitary landfill on property located east of the existing sanitary landfill at IP Riegelwood. The location of the IP Riegelwood Mill is shown on Drawing 1, Site Location Plan. The mill is located in the northeastern portion of Columbus County, North Carolina, approximately 20 miles northwest of Wilmington, North Carolina.

The proposed limits of the landfill are shown on Drawing 2, Existing Site Conditions Plan. The proposed landfill is approximately 6,000 feet east of the existing sanitary landfill on a small plateau covering approximately 70 acres. The plateau is bordered on the north by the Cape Fear River escarpment, and on the east and west by well-defined drainage channels. The proposed landfill, consisting of two phases, covers approximately 55 acres, and would be used for the disposal of International Paper generated industrial solid waste, asbestos, and construction and demolition debris. The southern half of the proposed landfill, Phase I contains two cells, Cells 1 and 2. The northern half (Phase II area) of the proposed landfill overlies several archeological sites that will be recovered in accordance with the *Data Recovery Plan – Neil's*

Eddy Tract, prepared by Coastal Carolina Research, Inc., and approved by the North Carolina State Historic Preservation Office.

2.0 ADDITIONAL INVESTIGATIVE ACTIVITIES

The January 30, 2001, letter from the DENR requested that additional subsurface investigations be performed. Specifically, the letter requested additional information with regard to the uppermost aquifer beneath the proposed landfill in order to determine the following:

- The hydrogeologic regime of the uppermost aquifer in the area of concern (i.e., recharging or discharging, and variability across the site);
- The seasonal high water table elevation;
- A proposed Groundwater Monitoring System based on site features and the aquifer characteristics; and
- The settlement properties of the confining Peedee Formation, which underlies the uppermost aquifer beneath the study area.

Based on the information requested in the DENR's January 30, 2001, letter and review of Section .0504(1)(c) of the North Carolina Solid Waste Management Rules, IP Riegelwood retained Joyce Engineering, Inc. to perform a variety of activities, including but not limited to:

- Reviewing existing geologic and hydrogeologic information available for the facility and nearby region;
- Drilling and logging nine investigative soil borings at eight locations;
- Constructing nine observation wells;
- Surveying the nine observation wells and 14 existing piezometers and monitoring wells in and around the study area to establish vertical control;
- Gauging static water level depths at relevant piezometers and observation and monitoring wells on a monthly basis;

- Testing the nine observation wells and selected piezometers and monitoring wells in and around the study area to estimate the hydraulic parameters of the uppermost aquifer;
- Mapping of accessible portions of the site to identify groundwater discharge locations; and
- Evaluating the structural stability of the Peedee Formation in the vicinity of the study area via geotechnical soil analyses.

The field investigation was initiated in June 2001 and was substantially completed in July 2001. Joyce Engineering, Inc. coordinated all aspects of the field investigation, including the drilling program; the surveying and mapping programs; and the well development, gauging, and aquifer testing programs. Information obtained during the additional investigation and research is presented herein in general accordance with the outline in Section .0504(1)(c) of the North Carolina Solid Waste Management Rules.

Drilling services were provided by Graham & Currie Well Drilling Co., Inc. (NC Well Contractor Certification #2573) of West End, North Carolina under contract to Joyce Engineering, Inc. Drilling was performed with a Century Mining Equipment CME-850 drill rig using 4 ¼-inch inside diameter hollow stem augers. All drilling activities performed during this field investigation were observed by a qualified geologist from Joyce Engineering, Inc. who logged all boreholes and directed well construction activities.

Surveying services were provided by Brunswick Survey, Inc., of Columbus County, North Carolina, under contract to Joyce Engineering, Inc. Geotechnical laboratory services were provided by Virginia Geotechnical Services, P.C., of Richmond, Virginia, also under contract to Joyce Engineering, Inc.

2.1 Subsurface Investigation

This section of the report presents a discussion of the investigative techniques used to characterize the surface and subsurface conditions present in the study area.

2.1.1 Soil Boring Number and Locations

As discussed previously, nine additional soil borings were advanced in the study area to gain additional information on the subsurface geology. The locations of the nine soil borings (JEP-1, JEP-2, JEP-3, JEP-4, JEP-5S, JEP-5D, JEP-6, JEP-7, and JEP-8) are shown on Drawing 2, Existing Site Conditions Plan. The nine soil borings were located based on existing site conditions (existing borings, wells, and topography) to obtain the maximum coverage for evaluating the hydrogeologic properties of the uppermost aquifer beneath the conceptual limits of the proposed landfill.

Boring logs from 29 previously advanced borings in the study area were used to supplement this subsurface investigation. A summary of the soil borings used to characterize the study area is provided in Table 1. The soil boring logs are included in Appendix I.

2.1.2 Drilling Methods

The soil borings were advanced in June and July 2001 with a CME-850 drill rig using 4 ¼-inch inside diameter hollow stem augers, which turn a borehole with an outside diameter of approximately 9 inches. Prior to use and between boreholes, the hollow stem augers were pressure washed to remove residual soil from the auger flights, the interior annular space of the augers, and the drill bit. After washing, the augers were allowed to air dry before use. Water used for pressure washing was obtained from the Cape Fear River.

Continuous soil samples were collected at each drilling location from 2 feet below grade until termination of the soil borings. The soil samples were collected by advancing split-spoon soil samplers or Shelby tubes ahead of the auger bit in accordance with American Society for Testing and Materials (ASTM) Method D-1586. The number of blow counts required to drive

the split-spoon soil sampler 6 inches with a 140-pound hammer falling 30 inches was recorded during the advancement of the split-spoon sampler. The blow counts, which were recorded on the boring logs, were used to calculate the standard penetration resistance of the soils being encountered.

The recovered split-spoon samples were logged for recovery, lithology, Unified Soil Classification System (USCS) soil classification, mineralogy, color, moisture content, odor, and other features as applicable. Table 1 provides a summary of the termination depths, and the depths to the different geologic strata encountered in each soil boring.

In addition to the split-spoon samples, six undisturbed soil samples were collected by advancing new Shelby tubes ahead of the hollow stem augers during the drilling process. These samples, which were collected from the 30- to 32-foot, 36- to 37.5-foot, and 52- to 54-foot depths in JEP-5D, and the 28- to 30-foot, 38- to 40-foot, and 50- to 52-foot depths in JEP-4, were submitted to Virginia Geotechnical Services of Richmond, Virginia, for soil classification. The 52- to 54-foot sample from JEP-5D and the 50- to 52-foot sample from JEP-4 were also submitted for vertical effective stress analysis via ASTM D-2435. The certificates-of-analysis for the geotechnical analyses are included in Appendix II, and the results are summarized in Table 2.

2.1.3 Sealing of Boreholes

In instances where observation wells were constructed at depths shallower than the boring depth, the boring holes were backfilled with sand and a 2-foot thick (minimum) seal of hydrated granular bentonite was placed at the total depth of the constructed well. The sand used for backfilling was a washed and graded No. 2 silica filter sand obtained from Driller Services, Inc.

2.1.4 Observation Wells

Observation wells were constructed at all eight drilling locations. Two observation wells were constructed as a nested pair (JEP-5S and JEP-5D), for a total of nine wells. The observation wells were constructed with 10 feet of 2-inch inside diameter schedule 40 PVC 0.010-inch factory slotted screen, which was placed in the saturated zone. The remaining well casing was constructed with 2-inch inside diameter schedule 40 PVC well casing. All casing sections were flush threaded together. The bottom of each well was equipped with a flush threaded schedule 40 PVC end cap. The well heads were completed with a locking expandable well cap, a locking 4-inch square steel standpipe, and a cement pad measuring approximately 3 feet by 3 feet that was sloped away from the well casing.

A filter pack, consisting of a washed and graded No. 2 silica filter sand obtained from Driller Services, Inc., was placed in the annular space surrounding the screened interval in each observation well to a depth of approximately 2 feet above the screened interval. A 2-foot thick (minimum) filter pack seal, consisting of a hydrated granular bentonite, was placed in the annular space of each borehole on top of the filter pack. The remaining annular space in each borehole was pressure grouted with a 5 to 10% BenSeal bentonite powder and 90 to 95% Portland cement grout mixture after allowing the filter pack seal to hydrate. The grout was pumped into the borehole at a slow rate of flow with a pneumatic Wilden Pump and associated tremie pipe. The grout was mixed on site to job specifications before pressure grouting each well. Well construction information is summarized in Table 3, and well construction logs for the nine observation wells constructed during this investigation, and the well logs for the existing piezometers and monitoring wells used to supplement this investigation are presented in Appendix I.

Following completion of well construction activities, Brunswick Survey, Inc. of Columbus County, North Carolina, surveyed all locations to obtain elevations and coordinates. Survey coordinates and elevations for all relevant borings used in this investigation are summarized in Table 1.

2.1.5 Well Development

Personnel from Joyce Engineering, Inc. developed the nine observations wells constructed as part of this investigation. Development was performed by surging each well with a QED pneumatic development pump and then purging the well with the pump to remove turbid water. Purging was continued until turbidity levels stabilized or until the well purged dry (i.e., JEP-5D) due to low yield.

2.1.6 Hydraulic Testing and Water Level Gauging

To obtain estimates of the saturated zone hydraulic conductivity, rising and falling head slug tests were performed on the nine observation wells constructed for this study and four of the existing piezometers and monitoring wells. The slug tests were performed with an inert 1 ½-inch outside diameter 3-foot long sand-filled PVC slug. The induced change in potentiometric head was measured with an In-Situ pressure transducer (model PXD-260) connected to a 2-channel data logger (Hermit 1000C), manufactured by In-Situ, Inc. of Laramie, Wyoming.

Data were downloaded from the data logger and evaluated using Bouwer and Rice's procedure for unconfined aquifers. The results of the analyses are summarized in Table 4 with pre-existing slug test data for the study area. Raw data, graphical analyses and results are presented in Appendix III.

To evaluate the potentiometric surface beneath the facility, Joyce Engineering, Inc. has obtained monthly depth-to-water measurements from relevant gauging stations in and around the study area since July 2001. Water level measurements were obtained to the nearest 0.01 foot using an electronic water level indicator manufactured by the Slope Indicator Company of Seattle, Washington. These static water level data are presented in Table 5 along with previously collected static water level data for the wells in the study area.

2.1.7 Field Mapping

Additional site characterization activities performed by Joyce Engineering, Inc. include field mapping of the study area to identify areas of groundwater discharge. Due to heavy ground cover and steep slopes, our mapping activities were restricted to the accessible portions of the two bordering drainage channels and the Cape Fear River escarpment. Delineation and confirmation of wetlands and waters of the United States was performed by personnel from CZR Incorporated of Wilmington, North Carolina, for the purpose of identifying jurisdictional wetlands, which might be impacted by the proposed landfill. The Army Corps of Engineers (COE) permitting process has been initiated and it is anticipated that an Individual Permit from the COE will be obtained for this project.

3.0 GEOLOGY

The study area lies within the Atlantic Coastal Plain physiographic province of North Carolina, which is characterized by Pleistocene and older offshore and marginal marine sediments. Transgressive-regressive sequences are evident within the Atlantic Coastal Plain, with older sequences lying inland and younger sequences present at lower elevations closer to the shoreline (Soller, 1988). Review of published literature indicates that there are no known Cretaceous or Cenozoic faults within the immediate vicinity of the study area (Prowell, 1983).

Although there have been several recent earthquakes east of Wilmington in the 20th Century, the most recent earthquake in the vicinity of the study area occurred northwest of Wilmington in 1884 (Reagor et al., 1987). The earthquake had an intensity of V on the Mercalli intensity scale, presumably occurred on a fault located in the basement bedrock, and did not produce a surface scar. United States Geological Survey (USGS) indicates that there is a 10% probability that the study area may experience an earthquake resulting in a peak ground acceleration of 0.16 to 0.18 g of acceleration within the next 50 years (USGS, 2001).

More specifically, the study area is located within the Cape Fear River Valley, which in turn, lies astride the Cape Fear Arch. Due to tectonic warping associated with the Cape Fear Arch, the basement bedrock surface in this region is not characterized by a seaward dipping platform as is the norm for most of the Atlantic Coastal Plain. The tectonic warping deformed the Cretaceous sediments and influenced the depositional patterns associated with the younger sediments of the Atlantic Coastal Plain, resulting in thinner deposits over the Cape Fear Arch and thicker deposits offshore, as compared to other locations in the Atlantic Coastal Plain (Owens, 1989).

Cenozoic sediments in the Cape Fear River Valley were deposited during transgressive-regressive sea level cycles. Each cycle generally resulted in the deposition of a thin basal marine unit as the ocean transgressed, and a thicker overlying series of deposits as the ocean regressed. The regressive sediments generally include beach or barrier sands, estuarine-backbarrier sands and clays, and sand and clay deposits associated with floodplains upriver from the backbarrier (Soller, 1988).

3.1 Regional Geology

The North Carolina Atlantic Coastal Plain consists of interlayered sedimentary units of sand, silt, clay, limestone, and marls overlying a basement rock of volcanic and plutonic origins. In Columbus County, the sedimentary units are approximately 1,000 feet thick, and range in age from late Cretaceous to Tertiary. A geologic column for the Mesozoic and Cenozoic formations in the mid-Atlantic Coastal Plain is presented as Table 6. Published literature indicates that the formations in the vicinity of the study area are, in ascending order, the Upper Cretaceous Cape Fear Formation, Black Creek Group, and Peedee Formation; Pleistocene Penholoway Formation; and various Holocene deposits (Owens, 1989; Brown, 1985). Both the Cretaceous Peedee Formation and the overlying Pleistocene Penholoway Formations were encountered in the study area.

In the vicinity of the study area, the Cape Fear Formation lies unconformably on the basement rock. This formation consists of interbedded clays and sands. The clay beds are usually pale to medium gray, although thin red zones within the clays are common, and they range in thickness from a few inches to approximately 8 feet. Most of the clay strata are laterally discontinuous and cannot be traced over distances. Generally, the clay beds have scattered, fine mica flakes and disseminated woody debris. The poorly sorted sands of the Cape Fear Formation are either massive or poorly cross-bedded with common reworked clay clasts (Owens, 1989).

The Black Creek Group overlies the Cape Fear Formation and is divided into three formations, the upper Donoho Creek Formation, the middle Bladen Formation, and the lower Tar Heel Formation (Owens, 1989). In general, the Black Creek Group thickens from northwest to southeast and may be between 300 and 400 feet thick in Columbus County. The Donoho Formation is a massive fossiliferous sand deposit, the base of which is marked by a thin zone of small, reworked quartz and pebbles. In the Cape Fear River Valley, the formation is largely characterized as dark gray medium-grained sands with a mottled appearance. The Donoho Formation is typically 55 feet thick.

The Bladen Formation is mostly intercalated thin dark clays and light sands, containing woody fragments and coarse mica flakes. The sands of the Bladen Formation range up to 130 feet thick and consist primarily of quartz, with less than 15 percent feldspars. The underlying Tar Heel Formation predominately consists of interbedded black clays and light colored sands. Carbonaceous matter in the Tar Heel Formation ranges from finely dispersed colloids to log-sized pieces. The sands of the Tar Heel Formation are generally described as being massive to cross-bedded and very micaceous. The Tar Heel Formation is approximately 145 to 180 feet thick and overlies the Cape Fear Formation with a sharp contact.

Overlying the Black Creek Group is the Peedee Formation (Owens, 1989). The lithology of this unit is complex, but is predominantly a massive to thick-bedded, dark green to gray,

slightly to very clayey sand with occasional mica and glauconite. The sand is generally massive with calcareous concretions appearing randomly or in a distinctive layer. The Peedee Formation is abundantly fossiliferous and contains large macrofossils. Dark marine clays with thicknesses up to 6 feet are present throughout the formation, but are a minor contribution to the lithology. In addition, marl layers appear inconsistently throughout the formation and are associated with sand beds containing high concentrations of glauconite. The Peedee Formation increases in thickness from the northern and western portions of Columbus County, where it is a few feet thick, to several hundred feet thick in the southern portion of Columbus County. It is separated from the underlying Donoho Formation by a reworked zone containing abundant pebbles and organic remains. The Peedee is believed to be approximately 100+ feet thick in the study area in northeastern Columbus County.

In the study area, a surficial sand deposit overlies the Peedee Formation. This sand deposit is the lower Pleistocene Penholoway Formation (Owens, 1989). This formation is largely a barrier and backbarrier system composed of interbedded sand and clayey sand that ranges in thickness from 25 to 60 feet. The barrier sands are thin and are comprised mainly of quartz with less than 10 percent feldspar. The top of the Penholoway Formation consists of backbarrier deposits up to 45 feet thick. The base of the formation consists of a thin zone of shells, wood, and various vertebrate remains.

Holocene deposits within the study area are alluvial facies that are confined to major drainageways and small valleys. These deposits overlap older sediments in the Cape Fear River Valley, varying in thickness from a feather's edge to approximately 45 feet. They are typically interbedded dark clays and light sands containing a thin gravel layer at the base. Woody materials are common throughout. The clay beds within these deposits are typically dark gray to dark green, peaty, and micaceous (Owens, 1989).

3.2 Site Geology

As presented on Drawings 1 and 2, topography in the region is generally characterized by gently rolling to flat upland surfaces (slopes of 1 to 3 percent) with steep slopes and erosional escarpments bordering major drainage pathways. The proposed facility, located in the Cape Fear River watershed, is bounded on the east and west by unnamed drainages and on the north by the Cape Fear River escarpment, which marks the boundary between the uplands and the Cape Fear River floodplain. Topographic elevations in the area of the proposed landfill range from more than 50 feet above mean sea level near the south central portion of the site to approximately 34 feet above mean sea level to the north along the edge of the Cape Fear River escarpment.

A geologic map for the study area is presented as Drawing 3 (Owens, 1989). The surficial sediments in the vicinity of the proposed landfill are part of the Penholoway Formation (map symbol Qph). To the north and west of the facility are mapped outcrops of the Peedee Formation (map symbol Kpd). Also to the north and west, within the Cape Fear River floodplain, are Holocene deposits (map symbol Qh).

3.2.1 Penholoway Formation

The on-site drilling program confirmed the regional geologic information. The uppermost stratum encountered beneath the study area consists mainly of fine- to coarse-grained, unconsolidated sands with varying amounts of silt and clay. Test pits advanced at other locations on the IP Riegelwood property (i.e., between the study area and the mill) indicate that there are thin surficial layers (up to 4 feet thick) of finer grained material consisting mainly of silty clay overlying the sandier Penholoway Formation. The surficial sands range in thickness from less than 10 feet near PZ-4S and PZ-3 to greater than 30 feet near B-3 and B-12 (see Drawing 2). A thin layer of shell hash (shells with greenish-gray fine sandy silt) was encountered in 18 of the 29 soil borings that penetrated the underlying Peedee Formation. The shell hash layer ranges in thickness from less than 1 foot in PZ-5 and JEP-8 to approximately 5 feet near MW-2 and JEP-4 (see Drawing 2). Scattered drill cuttings indicate that the shell hash was encountered in the boring identified as PZ-X; however, the overall thickness is unknown since no boring log is

available for this boring. The shell hash was not noted on the logs for 11 of 29 soil borings that encountered the Peedee Formation. The absence of the shell hash layer in these 11 borings is likely related to the 5-foot sampling interval used during the drilling of these borings, rather than the absence of the shell hash layer itself. These sediments (surficial sands and shell hash layer) are correlated with the Penholoway Formation. In the study area, the basal shell hash layer appears to serve as a definitive marker bed between the Peedee Formation and the overlying Penholoway Formation.

3.2.2 Peedee Formation

A greenish-gray, fine sandy silt to silty fine sand was encountered beneath the sediments of the Penholoway Formation. These sediments are correlated to the Peedee Formation. The thickness of the Peedee Formation beneath the study area is unknown, but exceeds 40 feet as logged in the vicinity of PZ-4D. A structural contour map for the top of the Peedee Formation in the vicinity of the study area is presented as Drawing 4. The available soil boring information indicates that the top of the Peedee Formation is a gently sloping surface that has been incised in areas by paleo-stream channels, which are now buried by the sediments of the Penholoway Formation.

To show the vertical relationship between the Penholoway and Peedee Formations, five geologic cross-sections have been prepared and are presented on Drawings 5, 6, and 7. The Penholoway Formation is continuous across the study area except in the vicinity of the north-south trending drainage that transects the study area west of the proposed landfill.

To evaluate the structural stability of the Peedee Formation sediments underlying the study area, two Shelby tube samples [JEP-4 (50-52 feet below existing grade) and JEP-5D (52-54 feet below existing grade)] were tested for vertical effective stress using a one dimensional consolidation test (ASTM D-2435). Based on the thickness of the existing overburden, it is estimated that the overburden pressure on the Peedee Formation currently exceeds 1,600 pounds per square foot (0.8 ton per square foot) in the study area. The two vertical stress tests yielded

preconsolidation pressures for the Peedee Formation of 15 tons per square foot to 19 tons per square foot. The results indicate that the Peedee Formation in the vicinity of the study area has already been consolidated under pressures approximately 20 times higher than the current load.

Based on the estimated average density of the waste to be disposed of in the landfill, it is expected that the vertical stress load induced by the landfill will be 5 tons per square foot for every 100 vertical feet of fill. Due to the flat recompression ratio, landfill loading is expected to produce an insignificant amount of settling in the Peedee Formation.

Based on the standard penetration values presented on boring logs, it is concluded that the geotechnical properties of the Peedee Formation are laterally similar. Therefore, based on the results of these analyses, it is concluded that Peedee Formation is structurally stable, and overall compression of the Peedee Formation should be minimal. Allowing for 1 percent settlement in the top 20 feet of the Peedee Formation would result in a total settlement of 0.2 foot or 2.5 inches. These analyses and conclusions do not preclude the possibility that the Peedee Formation may have significantly different geotechnical properties at locations not probed by soil borings. However, significant variation is unlikely based on the spatial distribution of the soil borings.

4.0 HYDROGEOLOGY

A summary of the regional hydrogeology, compiled from published literature is presented in the following section, followed by a summary of the local hydrogeology based on information obtained during the field investigations in the study area.

4.1 Regional Hydrogeology

Aquifers beneath the study area are part of the Northern Atlantic Coastal Plain regional aquifer system, which stretches from the South Carolina-North Carolina border to Long Island, New York. The regional system is a sedimentary wedge consisting of Early Cretaceous to Holocene formations that generally dip and thicken towards the east. The sedimentary wedge

overlays basement complex rock and ranges in thickness from a feather's edge along the Fall Line at the boundary between the Piedmont and Coastal Plain physiographic provinces to more than 10,000 feet along some portions of the Atlantic Coast (Winner and Coble, 1996).

The wedge, composed of aquifers made up of permeable sand, gravel, and limestone separated by confining units composed of less permeable sediments, was initially deposited under non-marine and marginal marine conditions. As the rift between the continents widened, the marine facies began to dominate the sequence (Rona, 1973).

Recharge to the aquifer system is generally by infiltration of precipitation at formation exposures in the Coastal Plain physiographic province, although saltwater intrusion occurs in some of the shallower aquifers along the Atlantic Coast. Infiltrating precipitation migrates down dip in the aquifers (Upper Cretaceous and younger), continually recharging the system, although over-pumping in some areas has resulted in the landward encroachment of the freshwater-saltwater interface (Winner and Coble, 1996; Hem, 1985; Winner 1978). However, such encroachment is not apparent in the area of investigation. The Lower Cretaceous and Jurassic aquifers are completely confined, with minor exceptions along some of the deeper river channels, and receive recharge via the vertical infiltration of water from the overlying aquifers. The regional aquifer system in North Carolina is summarized on Table 6 with correlating geologic units.

4.2 Site Hydrogeology

The uppermost aquifer beneath the proposed landfill is found in the residual overburden material consisting of the Penholoway Formation and more recent alluvium. The Penholoway is underlain by the Peedee Formation, which is considered to be an aquitard in the vicinity of the study area, retarding the downward flow of groundwater from the uppermost aquifer in the Penholoway Formation.

4.2.1 Aquifer Properties

Aquifer testing data from 14 wells screened in the saturated Penholoway Formation sediments indicate the hydraulic conductivity of the uppermost aquifer ranges from 1.5E-04 foot per second near PZ-11S to 1.5E-05 foot per second near PZ-7S (see Table 4 and Drawing 2). The geometric average hydraulic conductivity for the saturated sediments of the Penholoway Formation in the vicinity of the study area is 4.6E-05 foot per second. The effective porosity of the saturated section of the uppermost aquifer is estimated at 0.20 based on its sandy lithology (Barari and Hedges, 1985).

Vertical permeability analyses of Shelby tube samples collected in the upper, unsaturated portion of the Penholoway Formation indicate a vertical permeability of 1.1E-06 foot per second to 2.0E-07 foot per second. The lower permeability, as compared to that estimated for the saturated portion of the Penholoway Formation, is attributed to the fine-grained clayey material found in the upper portion of the Penholoway Formation.

Three groundwater surface contour maps were prepared for the uppermost aquifer as part of this investigation and are presented on Drawing 8. The groundwater surface contour maps were prepared from data obtained in July, August, and September 2001. Groundwater flow beneath the study area is generally from south to north with an average gradient of 8.7E-03 foot per foot. Using this average gradient, the groundwater flow velocity in the uppermost aquifer beneath the study area was calculated as shown below.

$$V_h = ik/\theta$$

Where: i = hydraulic gradient (unitless)
k = hydraulic conductivity (foot per second)
θ = assumed porosity (unitless)

V_h = [(8.7E-03)(4.6E-05 foot per second)]/0.20 = 2.0E-06 foot per second
V_h = 63.1 feet per year

Slug testing data from three wells screened in the lower Peedee Formation suggest the sediments of the Peedee Formation in the vicinity of the study area have an average hydraulic conductivity of 3.4E-08 foot per second. Based on lithology, the effective porosity of the Peedee Formation sediments is estimated at 0.15 (Barari and Hedges, 1985). The gradient between JEP-5D and PZ-4D averages 4.6E-03 foot per foot. Using this average gradient, the average groundwater flow velocity in the Peedee Formation beneath the study area was calculated as shown below.

$V_h = ik/\theta$

Where: i = hydraulic gradient (unitless)
k = hydraulic conductivity (foot per second)
θ = assumed porosity (unitless)

V_h = [(4.6E-03)(3.4E-08 foot per second)]/0.15 = 1.0E-09 foot per second
V_h = 3.3E-02 foot per year

Review of the static water level data in Table 5 for three pairs of nested wells in and around the study area (PZ-4S/PZ-4D, PZ-12S/PZ-12D, and JEP-5S/JEP-5D) indicates that a downward vertical gradient exists between the uppermost aquifer and the Peedee Formation in the study area. The September 2001 vertical gradient ranged from 2.4E-02 foot per foot in the vicinity of PZ-4S and PZ-4D to 1.9E-03 foot per foot as measured in the vicinity of PZ-12S and PZ-12D. The vertical gradient was calculated based on the difference in the head levels and the difference between the centers of the screened intervals in the two wells being compared. The geometric average vertical gradient as calculated at the three nested well pairs using September 2001 data was 7.9E-03 foot per foot. Useing the average gradient, the average vertical groundwater velocity was calculated as shown below.

$V_v = ik/\theta$

Where: i = hydraulic gradient (unitless)
k = hydraulic conductivity (foot per second)
θ = assumed porosity (unitless)

V_v = [(7.9E-03)(3.4E-08 foot per second)]/0.15 = 1.8E-09 foot per second
V_v = 5.6E-02 foot per year

The low infiltration velocity is consistent with the regional aquitard designation for the upper portion of the Peedee Formation. Based on the hydraulic properties of the Peedee Formation, the hydraulic gradient between the Peedee and overlying Penholoway Formations, and the area of interest (70 acres), it is estimated that approximately 3,500 gallons per day leave the uppermost aquifer beneath the study area via infiltration into the Peedee Formation. Groundwater in the Peedee Formation is likely to recharge the underlying formations and to discharge to the Cape Fear River.

4.2.2 Hydrogeologic Regime

Recharge to the uppermost aquifer beneath the study area is derived from the infiltration of precipitation that falls and surface water that collects within the watershed. After infiltrating, the groundwater generally flows laterally from the potentiometric high in the aquifer to potentiometric lows in the aquifer. Due to the underlying Peedee Formation, most of the groundwater in the uppermost aquifer is discharged along major drainages that are incised into the saturated section of the aquifer. In the vicinity of the study area, the major discharge routes are two drainages bordering the site on the east and west and the escarpment on the north.

One spring was identified during the field reconnaissance; however, the presence of thick brush and heavy ground cover is believed to have precluded the discovery of other springs. The location of the spring is shown on Drawing 2. The spring is located on the west-facing slope of the access road, which cuts across the drainage bordering the study area on the west side. When first observed in July 2001, the spring was estimated to be flowing at a rate of 2 gallons per minute. During the September 2001 field visit, the flow rate was estimated at approximately 10 gallons per minute. The variable flow rate suggests a strong hydrogeologic connection between the spring and the uppermost aquifer beneath the study area, with the flow rate being influenced by the head level in the uppermost aquifer.

While no other springs or seeps were specifically identified, the streams in each of the ravines appear to be perennial and are believed to be groundwater-fed. Because the headwaters of each stream are located in areas with intermittent surface drainage, the base flow of each stream must be from groundwater seepage into the stream (Earth Tech, Inc., 1999). Based on the estimated hydraulic properties of the uppermost aquifer beneath the study area, the combined groundwater discharge to the two drainages bordering the study area on the east and west and the escarpment on the north is estimated at 142,500 gallons per day or approximately 100 gallons per minute. This estimate is based on the assumption that the flux out of the system equals the flux into the system minus any change in storage. Neglecting changes in storage [reasonable assumption based on the lack of any long-term trends (increasing or decreasing) with respect to the water table elevation], the flux out of the system equals the flux into the system. The system flux was calculated as follows:

Flux Out = Flux In

Flux In = Precipitation (P) + Lateral Recharge (LR)

P = 4.67 feet per year over 70 acres
P = 1.07E08 gallons per year

LR = groundwater velocity * saturated area of the recharge boundary
LR = 63.1 feet per year * 1,100 feet * 9 feet
LR = 6.25E05 cubic feet per year = 4.67E06 gallons per year

Flux In = 4.67E06 gallons per year + 1.07E08 gallons per year
= 1.12E08 gallons per year

Flux Out = Infiltration to Peedee Formation (IPD)+ Discharge (D)+ precipitation runoff (PR) + evapotranspiration (E)

IPD = 1.28E06 gallons per year

PR = (assume 40% of P) = 1.87 feet per year over 70 acres
PR = 4.27E07 gallons per year

E = (assume 15% of P) = 0.70 feet per year over 70 acres
E = 1.60E07 gallons per year

Flux Out	= 1.28E06 gallons per year + 1.6E07 gallons per year + 4.27E07 gallons per year + D gallons per year
D	= Flux Out - 6.00E07 gallons per year
	Since Flux Out = Flux In
D	= 1.12E08 gallons per year – 6.00E07 gallons per year
D	= 5.20E07 gallons per year
D	= 1.43E05 gallons per day

Based on these observations, it is concluded that the study area is primarily located in a groundwater discharge area, with recharge being primarily derived from the infiltration of precipitation and lateral recharge from the south. The source of the lateral recharge is infiltrating precipitation that falls over the area south of the proposed landfill. With construction of the landfill, the recharge due to infiltrating precipitation that falls over the study area is expected to be sharply curtailed. However, the loss of this recharge is not expected to significantly impact the head levels in the uppermost aquifer or affect the ability to monitor groundwater, since lateral recharge from the south will continue.

4.2.3 Seasonal Water Table Fluctuation

The hydrogeologic analysis of the Penholoway Formation aquifer in the study area indicates that recharge to the uppermost aquifer beneath the study area is primarily from lateral recharge from the south fed by infiltrating precipitation and from the vertical infiltration of precipitation over the study area. Therefore, it is expected that the seasonal high in the water table beneath the study area will occur, with some lag-time, during the wet season.

A graph showing the average monthly precipitation between February 1992 and June 2001 is presented as Chart 1. Information presented on Chart 1 was compiled from data obtained from the National Oceanic and Atmospheric Administration Whiteville Station (COOP ID No. 319354). This station is located approximately 32 miles west of the study area. Review of Chart 1 indicates that the months of June, July, August, September, and January are the wettest

months of the year, averaging 5 to 6 inches of precipitation per month. The September average is significantly skewed due to the 22 inches of rainfall received as a result of Hurricane Floyd in September 1999.

Static water level measurements have been collected from the wells in the study area sporadically since June 1996. These measurements are summarized in Table 5 and presented graphically on Charts 2 through 4. Chart 2 shows the hydrographs for the observation wells constructed as part of this investigation. Since only a few measurements are available, the chart is of limited value. Chart 3 shows the hydrographs for the piezometers constructed in January 1999, and Chart 4 shows the hydrographs for the monitoring wells constructed in February 1994. All three charts show the monthly precipitation amounts recorded at the Whiteville Station. As presented on Charts 3 and 4, with the exception of a sharp spike in the fall of 1999, the groundwater surface in the uppermost aquifer beneath the study area has been fairly stable, fluctuating within a narrow range of approximately ±3 feet in response to various precipitation events, or lack thereof.

Review of Charts 2 and 3 indicates that there are generally insufficient data available to evaluate the correlation between precipitation and static water level elevation. The one exception is the January 1999 to June 2000 timeframe. However, these data are significantly skewed from the normal as a result of the 22 inches of rainfall dropped by Hurricane Floyd during September 1999. The precipitation spike and its effects on the static water level beneath the study area are clearly shown on Chart 3, which supports the theory that recharge to the uppermost aquifer is influenced by precipitation. The effect is not readily apparent on Chart 2 due to the timing of the static water level measurements.

Due to the limited amount of historical data available for the study area, static water level data from wells screened in the Penholoway Formation at the Wright Chemical Plant, located approximately 1.5 miles south of the study area, have been plotted on Chart 5. A spike in the water table in the vicinity of the Wright Chemical Plant is also seen in the September/October

1999 period. The data for MW-16, MW-27, and MW-28, which are screened in the Penholoway Formation (the remaining wells are believed to be screened in recent alluvial sediments associated with Livingston Creek), indicate a normal range of fluctuation in the neighborhood of ±2 feet. The data suggest a water table low during the March to June dry season followed by a water table rise during the late summer early fall wet season.

Based on these analyses, Joyce Engineering, Inc. believes that the seasonal high water table beneath the study area occurs in the July to October timeframe, lagging behind the peak of the precipitation curve during the wet season. Due to the limited amount of monthly data with which an average seasonal high elevation could be calculated, we have reviewed the data in Table 4 and selected an average seasonal high elevation for the water table in the Penholoway aquifer beneath the study area to be no more than 4 feet above the elevations observed during the July 2001 monitoring event. While the July 2001 levels are not the highest elevations recorded, they appear to represent the highest average seasonal level for the study area. We believe that this level sufficiently accounts for normal seasonal fluctuation, while acknowledging that the water table may achieve higher elevations during rare storm events, such as following Hurricane Floyd. The estimated seasonal high water table and the proposed base grade for the landfill are presented on Drawing 9.

5.0 WASTE CHARACTERIZATION

Waste characterization is discussed in the *Water Quality Monitoring Plan*, which is being submitted under separate cover.

6.0 PROPOSED GROUNDWATER MONITORING SYSTEM

Based on review of the hydrogeologic and waste characterization data compiled during this and previous investigations, a proposed Water Quality Monitoring Program was designed that will allow for the timely detection of a release from the proposed landfill to the uppermost aquifer. The Water Quality Monitoring Program has three major components. The first

component consists of surface water quality monitoring, the second component consists of groundwater quality monitoring, and the third component consists of potentiometric surface monitoring. Sampling locations for all three components are presented on Drawing 9, Proposed Monitoring Network Plan. Additional details pertaining to the three components of the Water Quality Monitoring Program proposed for this facility are presented in the *Water Quality Monitoring Plan*, which is being submitted as a separate document.

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Table 1

Summary of Soil Borings
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Boring Identification	Construction Date	NC State Plane 1983 Northing (Coordinates)	NC State Plane 1983 Easting (Coordinates)	Ground Surface Elevation (ft AMSL)	Boring Depth (ft bgs)	Top of the Shell Hash (ft bgs)	Top of the Peedee Formation (ft bgs)
PZ-1	01/05/99	218,738.2	2,247,946.1	48.3	15.0	>15	>15
PZ-2	01/05/99	219,678.3	2,247,981.8	47.9	18.0	>18	>18
PZ-3	01/06/99	219,023.4	2,246,543.1	38.5	10.0	>10	>10
PZ-4S	01/16/99	219,549.9	2,246,831.0	40.5	14.0	unknown	9.5
PZ-4D	01/06/99	219,538.6	2,246,828.7	40.5	50.0	unknown	9.5
PZ-5	01/06/99	218,807.4	2,246,039.4	40.7	20.0	18?	18
PZ-6	01/06/99	219,097.4	2,245,908.0	41.9	15.0	unknown	14.5
PZ-12S	01/11/99	217,709.7	2,245,863.8	52.7	18.0	24?	24
PZ-12D	01/11/99	217,705.2	2,245,859.3	52.7	50.0	24?	24
PZ-X	No Log	218,723.8	2,247,328.9	46.4	No Log	unknown	unknown
MW-1	02/17/94	218,023.1	2,247,437.0	54.6	23.0	>23	>23
MW-2	02/16/94	218,779.3	2,246,816.7	46.0	17.5	12?	>17.5
JEP-1	6/26/01	217,890.8	2,247,939.0	52.8	30.0	22.5	25.7
JEP-2	06/28/01	218,225.1	2,246,617.6	49.1	26.0	18.3	22.0
JEP-3	06/28/01	218,554.2	2,246,586.6	45.7	24.0	16.0	19.5
JEP-4	06/29/01	218,555.9	2,246,961.3	49.0	56.0	17.5	23.0
JEP-5D	06/26/01	218,358.1	2,247,385.6	51.0	56.0	25.0	26.8
JEP-5S	06/26/01	218,352.2	2,247,386.7	51.0	20.6	25.0	26.8
JEP-6	06/25/01	218,435.3	2,248,082.6	49.4	26.0	22.0	23.0
JEP-7	06/26/01	218,891.4	2,247,334.8	45.7	24.0	16.0	19.8
JEP-8	06/28/01	219,391.8	2,246,964.5	39.5	20.0	13.3	14.0
B-1	03/08/94	217,970.0	2,247,905.0	53.2	35.0	21.0	35.0
B-2	04/08/94	218,515.0	2,247,975.0	51.2	25.0	unknown	22.0
B-3	03/08/84	218,357.0	2,247,860.0	48.0	35.0	>35	>35
B-4	03/12/94	219,390.0	2,247,771.0	47.0	25.0	unknown	>25
B-6	03/12/94	219,445.0	2,248,171.0	48.2	25.0	unknown	22.0
B-8	03/12/94	219,338.0	2,247,263.0	45.2	35.0	unknown	21.0
B-9	04/08/94	218,115.0	2,246,892.0	53.5	25.0	22.0	25.0
B-12	03/08/94	219,279.0	2,246,757.0	40.2	35.0	31.0	>35
B-13	03/15/94	217,700.0	2,246,296.0	53.2	25.0	22.0	>25
B-15	04/08/94	218,740.0	2,246,340.0	37.2	25.0	unknown	12.0
B-19	03/16/94	217,975.0	2,245,821.0	51.1	10.0	>10	>10
B-21	03/12/94	219,170.0	2,245,810.0	35.0	25.0	unknown	14.5
B-38	04/18/94	218,318.0	2,247,378.0	51.0	10.0	>10	>10
B-42	03/12/94	219,417.0	2,247,260.0	44.0	25.0	>25	>25
B-55	03/12/94	219,245.0	2,245,800.0	42.2	25.0	unknown	11.0
B-56	03/15/94	219,360.0	2,246,230.0	33.2	35.0	unknown	17.0
B-57	03/08/94	219,381.0	2,246,756.0	40.1	25.0	>25	>25

Notes : ft AMSL = feet above mean sea level
ft bgs = feet below ground surface
? = Estimated Depth, interpreted from data on the boring log

TABLE 2

Summary of Geotechnical Analyses
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Sample ID	Sample Depth (fbs)	Sample Type	Vertical Permeability (cm/sec)	Remolded Permeability (cm/sec)	Maximum Density (lb/cf)	Optimum Moisture (percent)	Liquid Limit	Plasticity Index	Max. Dry Density (lb/cf)	Optimum Moisture (percent)	USCS Classification	Percent Passing a 200 Sieve	Formation Name
PZ-12D	2.5-4.5	Bulk	--	1.20E-04	124.0	10.2	24	9	124	10.2	SC	36.3	Penholoway
PZ-12S	3.0-5.0	Bulk	--	1.10E-04	119.4	12.7	30	15	119.4	12.7	SC	36	Penholoway
PZ-11D	23.0-41.0	Bulk	--	--	112.6	15.1	28	4	112.6	15.1	SM-SC	39.6	Peedee
PZ-12D	2.5-4.5	Shelby	3.50E-05	--	--	--	46	18	--	--	SC	34.4	Penholoway
PZ-11S	3.0-5.0	Shelby	8.60E-05	--	--	--	43	17	--	--	SC	29	Penholoway
PZ-7	14.0-16.0	Shelby	6.10E-06	--	--	--	28	8	--	--	SC	39.9	Penholoway
JEP-4	28.0-30.0	Shelby	--	--	--	--	NP	NP	--	--	SM	48	Peedee
JEP-4	38.0-40.0	Shelby	--	--	--	--	25	2	--	--	SM	46.1	Peedee
JEP-4	50.0-52.0	Shelby	--	--	--	--	38	20	--	--	CL	54.2	Peedee
JEP-5D	30.0-31.5	Shelby	--	--	--	--	26	7	--	--	SC-SM	45.2	Peedee
JEP-5D	36.0-38.0	Shelby	--	--	--	--	29	8	--	--	SC	46.2	Peedee
JEP-5D	52.0-54.0	Shelby	--	--	--	--	39	20	--	--	CL	52.1	Peedee

Notes: fbs = feet below ground surface
cm/sec = centimeter per second
lb/cf = pounds per cubic foot
USCS = Unified Soil Classification System
"--" = sample not tested
Formation names determined based on Joyce Engineering's evaluation of sample depth, description, and available boring log information.
NP = Non-plastic
SM = silt sand
SC = clayey sand
CL = lean clay

TABLE 3

Summary of Well Construction Information
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Well Identification	Date of Construction	NC State Plane 1983		Casing Diameter (inches)	Top of Casing Elevation (ft AMSL)	Ground Surface Elevation (ft AMSL)	Well Depth (ft bgs)	Screened Interval (ft bgs)
		Northing (Coordinates)	Easting (Coordinates)					
PZ-1	01/05/99	218,738.2	2,247,946.1	2.0	51.06	48.3	15.0	10-15
PZ-2	01/05/99	219,678.3	2,247,981.8	2.0	50.19	47.9	18.0	13-18
PZ-3	01/06/99	219,023.4	2,246,543.1	2.0	40.51	38.5	10.0	5-10
PZ-4S	01/16/99	219,549.9	2,246,831.0	2.0	42.37	40.5	14.0	9-14
PZ-4D	01/06/99	219,538.6	2,246,828.7	2.0	42.72	40.5	50.0	45-50
PZ-5	01/06/99	218,807.4	2,246,039.4	2.0	43.42	40.7	18.0	13-18
PZ-6	01/06/99	219,097.4	2,245,908.0	2.0	44.67	41.9	15.0	10-15
PZ-12S	01/11/99	217,709.7	2,245,863.8	2.0	54.17	52.7	18.0	13-18
PZ-12D	01/11/99	217,705.2	2,245,859.3	2.0	55.40	52.7	50.0	45-50
PZ-X	unknown	218,723.8	2,247,328.9	2.0	49.69	46.4	22.5	unknown
MW-1	02/17/94	218,023.1	2,247,437.0	2.0	56.51	54.6	23.0	13-23
MW-2	02/16/94	218,779.3	2,246,816.7	2.0	48.75	46.0	17.5	7.5-17.5
JEP-1	6/26/01	217,890.8	2,247,939.0	2.0	55.77	52.8	30.0	14.8-24.8
JEP-2	06/28/01	218,225.1	2,246,617.6	2.0	51.51	49.1	20.0	10-20
JEP-3	06/28/01	218,554.2	2,246,586.6	2.0	48.30	45.7	16.0	6-16
JEP-4	06/29/01	218,555.9	2,246,961.3	2.0	51.62	49.0	22.0	10-20
JEP-5D	06/26/01	218,358.1	2,247,385.6	2.0	54.19	51.0	54.0	44-54
JEP-5S	06/26/01	218,352.2	2,247,386.7	2.0	53.76	51.0	20.6	10.6-20.6
JEP-6	06/25/01	218,435.3	2,248,082.6	2.0	52.44	49.4	26.0	16-26
JEP-7	06/26/01	218,891.4	2,247,334.8	2.0	49.17	45.7	19.3	9.3-19.3
JEP-8	06/28/01	219,391.8	2,246,964.5	2.0	42.48	39.5	16.0	6-16

Notes : ft AMSL = feet above mean sea level
ft bgs = feet below ground surface
All wells constructed with PVC casing and screen

TABLE 4

Summary of Estimated Hydraulic Conductivity Values
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Well or Boring Identification	Rising Head K (ft/sec)	Falling Head K (ft/sec)	Average K (ft/sec)	Screen Fully Submerged?	Screened Formation
PZ-4D	NA	2.883E-08	2.883E-08	Yes	Peedee
PZ-11D	5.300E-08	NA	5.300E-08	Yes	Peedee
JEP-5D	NA	1.874E-08	1.874E-08	Yes	Peedee
Average K for Confining Peedee Formation :			3.352E-08		
PZ-3	1.780E-05	NA	1.780E-05	Yes	Penholoway
PZ-4S	2.435E-05	2.804E-05	2.620E-05	Yes	Penholoway
PZ-7S	1.550E-05	NA	1.550E-05	Yes	Penholoway
PZ-11S	1.490E-04	NA	1.490E-04	No	Penholoway
MW-1	1.459E-04	6.848E-05	1.072E-04	No	Penholoway
MW-2	6.126E-05	3.672E-05	4.899E-05	No	Penholoway
JEP-1	9.681E-05	5.539E-05	7.610E-05	Yes	Penholoway
JEP-2	3.306E-05	5.328E-06	1.919E-05	No	Penholoway
JEP-3	1.146E-04	3.440E-05	7.450E-05	No	Penholoway
JEP-4	2.580E-05	8.614E-06	1.721E-05	Yes	Penholoway
JEP-5S	6.294E-05	2.935E-05	4.615E-05	No	Penholoway
JEP-6	3.701E-05	6.481E-05	5.091E-05	Yes	Penholoway
JEP-7	1.401E-04	6.313E-05	1.016E-04	Yes	Penholoway
JEP-8	9.298E-05	5.104E-05	7.201E-05	Yes	Penholoway
Site Average K (geometric mean) for the Penholoway Formation:			4.586E-05		

Notes : Bouwer and Rice Slug Test Method used for calculating K
K = hydraulic conductivity
ft/sec = foot per second

TABLE 5

Summary of Static Water Level Measurements
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Monitoring Location ID	Date Constructed	NC State Plane 1983 Northing (coordinates)	NC State Plane 1983 Easting (coordinates)	Measuring Point Elev. (ft AMSL)	Ground Surface Elevation (ft AMSL)	Depth to Bottom (ft)	Date Measured	Depth to Water (ft)	Groundwater Elevation (ft AMSL)
PZ-1	01/05/99	218738.222997	2247946.128785	51.06	48.25	18.52	01/13/99	dry	
							01/20/99	dry	
							02/03/99	17.37	33.69
							05/21/99	16.84	34.22
							07/01/99	17.61	33.45
							10/04/99	14.28	36.78
							02/09/00	17.34	33.72
							03/28/00	18.53	32.53
							04/26/00	18.50	32.56
							05/24/00	18.38	32.68
							07/02/01	18.02	33.04
							07/03/01	18.04	33.02
							08/08/01	18.03	33.03
							09/11/01	18.02	33.04
							10/09/01	18.02	33.04
PZ-2	01/05/99	219678.305837	2247981.777337	50.19	47.92	21.10	01/13/99	dry	
							01/20/99	dry	
							02/03/99	19.91	30.28
							05/21/99	19.42	30.77
							07/01/99	20.64	29.55
							10/04/99	17.60	32.59
							12/03/99	18.88	31.31
							02/09/00	20.65	29.54
							03/28/00	20.64	29.55
							04/26/00	20.62	29.57
							05/24/00	20.63	29.56
							07/02/01	20.60	29.59
							07/03/01	20.63	29.56
							08/08/01	20.63	29.56
							09/11/01	20.63	29.56
							10/09/01	20.53	29.66
PZ-3	01/06/99	219023.422092	2246543.125545	40.51	38.49	12.58	01/13/99	5.42	35.09
							01/20/99	5.02	35.49
							02/03/99	3.96	36.55
							05/21/99	3.74	36.77
							07/01/99	3.93	36.58
							12/03/99	3.45	37.06
							02/09/00	4.46	36.05
							03/28/00	5.26	35.25
							04/26/00	5.63	34.88
							05/24/00	6.40	34.11
							07/02/01	5.88	34.63
							07/03/01	5.92	34.59
							08/08/01	6.92	33.59
							09/11/01	5.36	35.15
							10/09/01	6.52	33.99
PZ-4S	01/16/99	219549.910672	2246831.041802	42.37	40.50	16.09	01/13/99	9.12	33.25
							01/20/99	8.46	33.91
							02/03/99	7.84	34.53
							05/21/99	7.63	34.74
							07/01/99	8.54	33.83
							10/04/99	6.54	35.83
							12/03/99	7.34	35.03
							02/09/00	8.09	34.28
							03/28/00	8.82	33.55
							04/26/00	9.28	33.09
							05/24/00	9.80	32.57
							07/02/01	9.10	33.27
							07/03/01	9.13	33.24
							08/08/01	10.01	32.36
							09/11/01	8.64	33.73
							10/09/01	9.54	32.83
PZ-4D	01/06/99	219538.637786	2246828.722228	42.72	40.47	52.02	01/13/99	9.72	33.00
							01/20/99	9.75	32.97
							02/03/99	8.52	34.20
							05/21/99	8.22	34.50
							07/01/99	8.96	33.76
							10/04/99	7.04	35.68
							12/03/99	7.96	34.76
							02/09/00	8.57	34.15
							03/28/00	9.27	33.45
							04/26/00	9.64	33.08
							05/24/00	10.12	32.60
							07/02/01	9.68	33.04
							07/03/01	9.74	32.98
							08/08/01	10.42	32.30
							09/11/01	9.73	32.99
							10/09/01	9.94	32.78

TABLE 5

Summary of Static Water Level Measurements
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Monitoring Location ID	Date Constructed	NC State Plane 1983 Northing (coordinates)	NC State Plane 1983 Easting (coordinates)	Measuring Point Elev. (ft AMSL)	Ground Surface Elevation (ft AMSL)	Depth to Bottom (ft)	Date Measured	Depth to Water (ft)	Groundwater Elevation (ft AMSL)
PZ-5	01/06/99	218807.394102	2246039.361326	43.42	40.73	21.46	01/13/99	9.41	34.01
							01/20/99	10.50	32.92
							02/03/99	9.73	33.69
							05/21/99	9.26	34.16
							07/01/99	10.39	33.03
							12/03/99	8.89	34.53
							02/09/00	9.87	33.55
							03/28/00	10.88	32.54
							04/26/00	11.22	32.20
							05/24/00	11.48	31.94
							07/02/01	10.95	32.47
							07/03/01	10.96	32.46
							08/08/01	11.60	31.82
							09/11/01	10.77	32.65
							10/09/01	11.16	32.26
PZ-6	01/06/99	219097.377875	2245908.046836	44.67	41.90	18.25	01/13/99	13.52	31.15
							01/20/99	13.42	31.25
							02/03/99	12.84	31.83
							05/21/99	12.55	32.12
							07/01/99	13.42	31.25
							12/03/99	12.05	32.62
							02/09/00	13.08	31.59
							03/28/00	13.84	30.83
							04/26/00	14.06	30.61
							05/24/00	14.32	30.35
							07/02/01	13.80	30.87
							07/03/01	13.82	30.85
							08/08/01	14.38	30.29
							09/11/01	13.55	31.12
							10/09/01	13.97	30.70
PZ-7S	01/06/99	218896.807837	2245179.966389	41.34	40.12	15.18	01/13/99	7.77	33.57
							01/20/99	7.68	33.66
							02/03/99	7.19	34.15
							05/21/99	6.70	34.64
							07/01/99	7.14	34.20
							12/03/99	6.32	35.02
							02/09/00	7.78	33.56
							03/28/00	8.23	33.11
							04/26/00	8.60	32.74
							05/24/00	8.89	32.45
PZ-7D	01/06/99	218898.565893	2245185.217302	42.41	40.20	52.00	01/13/99	9.17	33.24
							01/20/99	12.12	30.29
							02/03/99	13.77	28.64
							05/21/99	8.86	33.55
							07/01/99	8.88	33.53
							12/03/99	8.46	33.95
							02/09/00	8.81	33.60
							03/28/00	9.10	33.31
							04/26/00	9.38	33.03
							05/24/00	9.68	32.73
PZ-8	01/06/99	NA	NA	47.03	45.62	15.20	01/13/99	11.62	35.41
							01/20/99	11.49	35.54
							02/03/99	10.76	36.27
							05/21/99	10.14	36.89
							07/01/99	11.06	35.97
							12/03/99	9.78	37.25
							02/09/00	10.88	36.15
							03/28/00	11.70	35.33
							04/26/00	12.02	35.01
							05/24/00	12.38	34.65
PZ-9	01/07/99	NA	NA	50.13	47.41	17.07	01/13/99	11.22	38.91
							01/20/99	10.89	39.24
							02/03/99	9.80	40.33
							05/21/99	8.53	41.60
							12/03/99	8.23	41.90
							02/09/00	9.48	40.65
							03/28/00	10.62	39.51
							04/26/00	11.35	38.78
							05/24/00	12.00	38.13

TABLE 5

Summary of Static Water Level Measurements
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Monitoring Location ID	Date Constructed	NC State Plane 1983 Northing (coordinates)	NC State Plane 1983 Easting (coordinates)	Measuring Point Elev. (ft AMSL)	Ground Surface Elevation (ft AMSL)	Depth to Bottom (ft)	Date Measured	Depth to Water (ft)	Groundwater Elevation (ft AMSL)
PZ-10	01/07/99	NA	NA	54.56	52.45	21.10	01/13/99	18.44	36.12
							01/20/99	17.07	37.49
							02/03/99	16.09	38.47
							05/21/99	15.23	39.33
							07/01/99	16.34	38.22
							12/03/99	15.74	38.82
							02/09/00	15.83	38.73
							03/28/00	21.30	33.26
							04/26/00	17.24	37.32
							05/24/00	18.00	36.56
PZ-11S	01/07/99	NA	NA	50.92	49.18	16.24	01/13/99	12.92	38.00
							01/20/99	11.13	39.79
							02/03/99	9.93	40.99
							05/21/99	8.40	42.52
							07/01/99	9.83	41.09
							12/03/99	7.96	42.96
							02/09/00	11.56	39.36
							04/26/00	11.90	39.02
PZ-11D	01/07/99	NA	NA	51.27	49.30	51.14	01/13/99	30.02	21.25
							01/20/99	11.90	39.37
							02/03/99	10.33	40.94
							05/21/99	8.78	42.49
							07/01/99	10.09	41.18
							12/03/99	8.32	42.95
							02/09/00	9.83	41.44
							03/28/00	11.40	39.87
							04/26/00	11.71	39.56
							05/24/00	12.31	38.96
PZ-12S	01/11/99	217709.712344	2245863.765345	54.17	52.70	20.06	01/13/99	13.18	40.99
							01/20/99	13.46	40.71
							02/03/99	12.34	41.83
							05/21/99	11.26	42.91
							07/01/99	12.52	41.65
							12/03/99	10.88	43.29
							02/09/00	13.47	40.70
							03/28/00	12.71	41.46
							04/26/00	13.20	40.97
							05/24/00	17.22	36.95
							07/02/01	14.41	39.76
							08/08/01	14.83	39.34
							09/11/01	14.83	39.34
							10/09/01	14.93	39.24
PZ-12D	01/11/99	217705.198676	2245859.262446	55.40	52.74	52.54	01/13/99	18.20	37.20
							01/20/99	15.70	39.70
							02/03/99	13.77	41.63
							05/21/99	12.43	42.97
							07/01/99	13.68	41.72
							12/03/99	12.10	43.30
							02/09/00	12.96	42.44
							03/28/00	13.92	41.48
							04/26/00	14.33	41.07
							05/24/00	14.89	40.51
							07/02/01	15.65	39.75
							08/08/01	16.01	39.39
							09/11/01	16.12	39.28
							10/09/01	16.12	39.28
PZ-13	NA	NA	NA	13.34	11.91	NA	01/13/99	0.31	13.03
							01/20/99	0.27	13.07
							02/03/99	1.52	11.82
PZ-14	NA	NA	NA	7.47	5.88	NA	01/13/99	1.44	6.03
							01/20/99	1.94	5.53
							02/03/99	0.75	6.72
PZ-15	NA	NA	NA	7.06	5.84	NA	01/13/99	1.21	5.85
							01/20/99	1.16	5.90
							02/03/99	0.00	7.06
PZ-16	NA	NA	NA	7.78	6.19	NA	01/13/99	1.63	6.15
							01/20/99	1.61	6.17
							02/03/99	0.50	7.28

TABLE 5

Summary of Static Water Level Measurements
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Monitoring Location ID	Date Constructed	NC State Plane 1983 Northing (coordinates)	NC State Plane 1983 Easting (coordinates)	Measuring Point Elev. (ft AMSL)	Ground Surface Elevation (ft AMSL)	Depth to Bottom (ft)	Date Measured	Depth to Water (ft)	Groundwater Elevation (ft AMSL)
PZ-100	NA	NA	NA	55.37	53.06	25.50	02/03/99	12.50	42.87
							05/21/99	10.84	44.53
							10/04/99	4.80	50.57
							12/03/99	10.31	45.06
							02/09/00	11.82	43.55
							03/28/00	12.92	42.45
							04/26/00	13.48	41.89
							05/24/00	14.06	41.31
PZ-X	NA	218723.842732	2247328.883842	49.69	46.39	22.50	07/02/01	11.19	38.50
							07/03/01	11.22	38.47
							08/08/01	12.22	37.47
							09/11/01	11.65	38.04
							10/09/01	12.05	37.64
MW-1	02/17/94	218023.126666	2247437.023950	56.51	54.57	27.50	06/24/96	14.77	41.74
							12/09/96	14.23	42.28
							06/18/97	16.10	40.41
							06/30/98	14.49	42.02
							02/03/99	14.03	42.48
							05/21/99	12.55	43.96
							10/04/99	6.90	49.61
							12/03/99	12.07	44.44
							02/09/00	13.51	43.00
							03/28/00	14.69	41.82
							04/26/00	15.22	41.29
							05/24/00	15.73	40.78
							07/02/01	15.99	40.52
							07/03/01	16.02	40.49
							08/08/01	16.60	39.91
							09/11/01	17.68	38.83
							10/09/01	16.74	39.77
MW-2	02/16/94	218779.280591	2246816.719877	48.75	46.00	19.25	06/24/96	17.08	31.67
							12/09/96	16.64	32.11
							06/18/97	18.35	30.40
							06/30/98	16.85	31.90
							02/03/99	9.38	39.37
							05/21/99	8.49	40.26
							10/04/99	6.02	42.73
							12/03/99	8.10	40.65
							02/09/00	9.22	39.53
							03/28/00	10.48	38.27
							04/26/00	11.04	37.71
							05/24/00	11.74	37.01
							07/02/01	11.36	37.39
							07/03/01	11.40	37.35
							08/08/01	12.52	36.23
							09/11/01	11.41	37.34
							10/09/01	12.09	36.66
MW-3	02/16/94	NA	NA	48.02	46.15	18.75	06/24/96	20.67	27.35
							12/09/96	19.79	28.23
							06/18/97	21.98	26.04
							06/30/98	20.70	27.32
							02/03/99	7.50	40.52
							12/03/99	7.12	40.90
							02/09/00	10.10	37.92
							03/28/00	18.72	29.30
							04/26/00	18.62	29.40
MW-5	02/16/94	NA	NA	58.45	57.05	26.00	02/03/99	16.92	41.53
							05/21/99	19.63	38.82
							12/03/99	19.22	39.23
							02/09/00	15.50	42.95
							03/28/00	16.28	42.17
							04/26/00	16.80	41.65
							05/24/00	17.34	41.11
MW-6	02/17/94	NA	NA	55.14	53.23	27.45	02/03/99	20.39	34.75
							12/03/99	19.89	35.25
JEP-1	6/26/01	217890.780684	2247938.998388	55.77	52.80	27.85	07/02/01	17.69	38.08
							07/03/01	17.71	38.06
							08/08/01	18.17	37.60
							09/11/01	16.53	39.24
							10/09/01	18.14	37.63

TABLE 5

Summary of Static Water Level Measurements
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Monitoring Location ID	Date Constructed	NC State Plane 1983 Northing (coordinates)	NC State Plane 1983 Easting (coordinates)	Measuring Point Elev. (ft AMSL)	Ground Surface Elevation (ft AMSL)	Depth to Bottom (ft)	Date Measured	Depth to Water (ft)	Groundwater Elevation (ft AMSL)
JEP-2	06/28/01	218225.095896	2246617.552339	51.51	49.10	22.00	07/02/01	14.73	36.78
							07/03/01	14.71	36.80
							08/08/01	15.07	36.44
							09/11/01	14.89	36.62
							10/09/01	15.00	36.51
JEP-3	06/28/01	218554.155405	2246586.606746	48.30	45.73	18.20	07/02/01	11.41	36.89
							07/03/01	11.42	36.88
							08/08/01	11.99	36.31
							09/11/01	11.50	36.80
							10/09/01	11.76	36.54
JEP-4	06/29/01	218555.880941	2246961.287868	51.62	49.00	21.45	07/02/01	12.06	39.56
							07/03/01	12.09	39.53
							08/08/01	13.01	38.61
							09/11/01	12.48	39.14
							10/09/01	12.73	38.89
JEP-5D	06/26/01	218358.136125	2247385.555867	54.19	50.99	56.60	07/02/01	14.45	39.74
							07/03/01	14.55	39.64
							08/08/01	15.02	39.17
							09/11/01	15.17	39.02
							10/09/01	15.07	39.12
JEP-5S	06/26/01	218352.174660	2247386.744352	53.76	50.99	22.60	07/02/01	13.69	40.07
							07/03/01	13.71	40.05
							08/08/01	14.44	39.32
							09/11/01	14.39	39.37
							10/09/01	14.46	39.30
JEP-6	06/25/01	218435.342213	2248082.602800	52.44	49.44	28.90	07/02/01	18.21	34.23
							07/03/01	18.22	34.22
							08/08/01	18.54	33.90
							09/11/01	18.44	34.00
							10/09/01	18.40	34.04
JEP-7	06/26/01	218891.367532	2247334.818608	49.17	45.67	22.90	07/02/01	11.74	37.43
							07/03/01	11.76	37.41
							08/08/01	12.72	36.45
							09/11/01	12.12	37.05
							10/09/01	12.52	36.65
JEP-8	06/28/01	219391.823009	2246964.524434	42.48	39.51	18.50	07/02/01	8.32	34.16
							07/03/01	8.34	34.14
							08/08/01	9.14	33.34
							09/11/01	7.97	34.51
							10/09/01	8.71	33.77

NOTES:
The measuring point for each well is the top of the PVC well casing.
ID = identification
ft AMSL = feet above mean sea level
ft = feet
NA = Not available

TABLE 6

Geologic Column and Regional Aquifer System
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Series	Geologic Unit	North Carolina Aquifers and Confining Units
Holocene	Holocene Deposits	Surficial aquifer
Pleistocene	Wando Formation	
	Socastee Formation	
	Canepatch Formation	
	Penholoway Formation	
	Waccamaw Formation	
Pliocene	Yorktown Formation	Yorktown confining unit Yorktown aquifer
Upper Miocene	Eastover Formation	Pungo River confining unit Pungo River aquifer
Middle Miocene	Pungo River Formation	
Lower Miocene	Belgrade Formation	Castle Hayne confining unit Castle Hayne aquifer
Oligocene	Oligocene Limestone	
	River Bend Formation	
Middle Eocene	Castle Hayne Limestone	
Lower Eocene	Unnamed Unit	Beaufort confining unit Beaufort aquifer
Paleocene	Beaufort Formation	
Upper Cretaceous	Peedee Formation	Peedee confining unit Peedee aquifer
	Black Creek Group	Black Creek confining unit Black Creek aquifer
	Middendorf Formation	
	Cape Fear Formation	Upper Cape Fear confining unit Upper Cape Fear aquifer Lower Cape Fear confining unit Lower Cape Fear aquifer
Lower Cretaceous	Unnamed Units	Lower Cretaceous confining unit Lower Cretaceous aquifer
Jurrasic	Unnamed Units	Unnamed Units

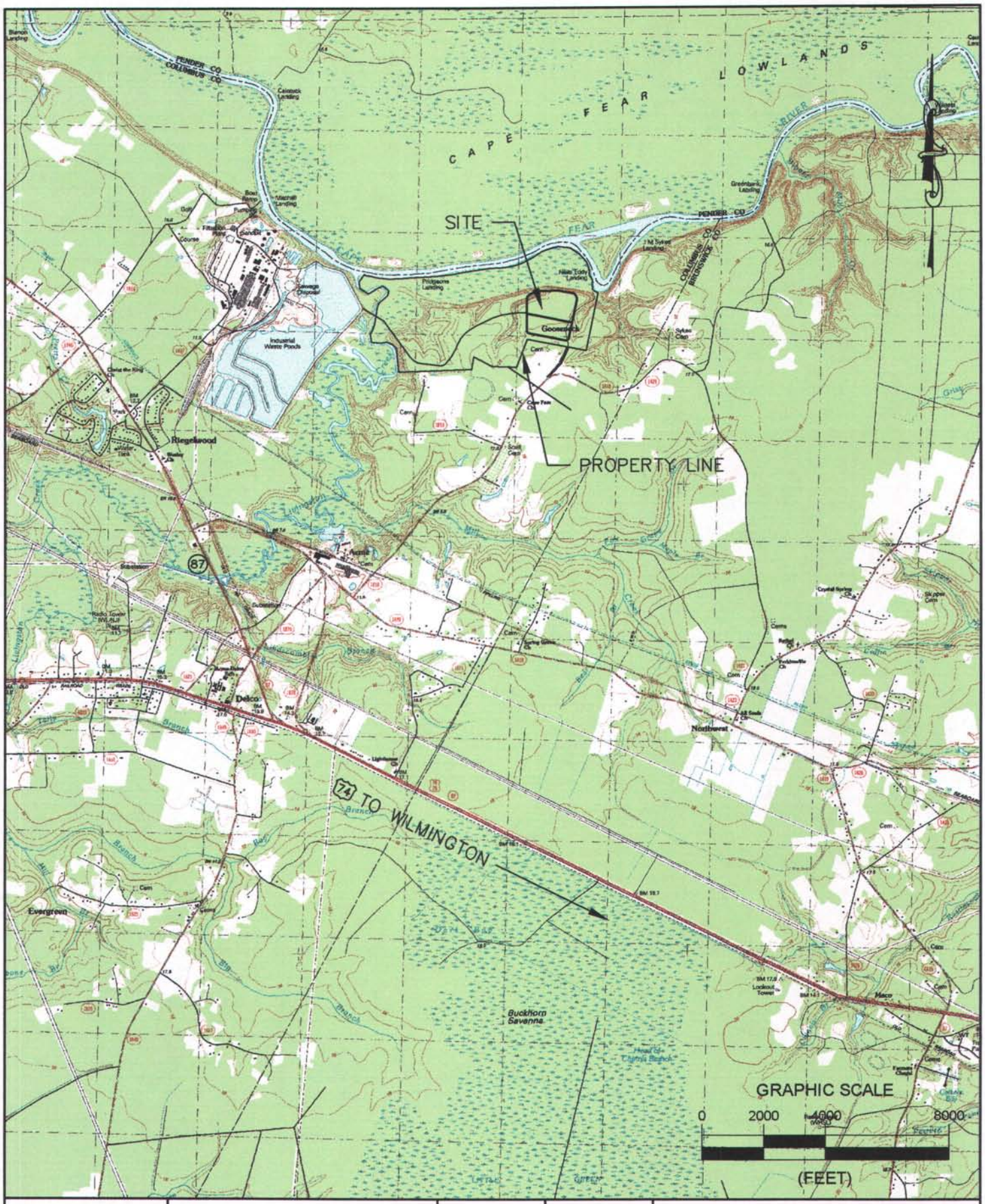
Source: Winner, 1996; and Owen, 1989.

TABLE 7

Summary of Waste Characterization Results
International Paper Riegelwood Pulp and Paper Mill
Riegelwood, North Carolina

Analyte	Sample Date	Quantitation Limit	Reporting Units	Pond C Sludge	Pond A Sludge
Alkalinity	8/7/01	--	mg/kg	14,900.00	20,700.00
Antimony	8/7/01	25	mg/kg	BQL	BQL
Arsenic	8/7/01	15	mg/kg	BQL	BQL
Barium	8/7/01	1	mg/kg	89.00	140.00
Beryllium	8/7/01	0.15	mg/kg	BQL	BQL
Cadmium	8/7/01	1	mg/kg	2.20	BQL
Calcium	8/7/01	25	mg/kg	24,000.00	62,000.00
Chloride	8/7/01	--	mg/kg	0.08	0.06
Chromium	8/7/01	1	mg/kg	18.00	15.00
Cobalt	8/7/01	2.5	mg/kg	7.50	16.00
Copper	8/7/01	1	mg/kg	26.00	19.00
Cyanide	8/7/01	--	mg/kg	BQL	BQL
Iron	8/7/01	1	mg/kg	1,100.00	4,000.00
Lead	8/7/01	10	mg/kg	BQL	BQL
Magnesium	8/7/01	10	mg/kg	940.00	1,500.00
Mercury	8/7/01	0.5	mg/kg	BQL	0.50
Nickel	8/7/01	2.5	mg/kg	26.00	52.00
pH	8/7/01	0.8	Standard Units	7.00	6.30
Potassium	8/7/01	50	mg/kg	590.00	790.00
Selenium	8/7/01	15	mg/kg	BQL	BQL
Silver	8/7/01	5	mg/kg	BQL	BQL
Sulfate	8/7/01	0.8	mg/kg	0.23	0.24
Sulfide	8/7/01	--	mg/kg	BQL	BQL
Thallium	8/7/01	10	mg/kg	BQL	BQL
Tin	8/7/01	25	mg/kg	BQL	BQL
Vanadium	8/7/01	2.5	mg/kg	54.00	140.00
Zinc	8/7/01	0.5	mg/kg	290.00	160.00

Notes: BQL = below quantitation limit
mg/kg = milligrams per kilogram



TOPO SOURCE: USGS o34078c2 1984 ACME QUADRANGLE.

8/22/01

JOYCE ENGINEERING, INC.

2301 West Meadowview Road
Greensboro, NC 27407
PHONE: (336) 323-0092

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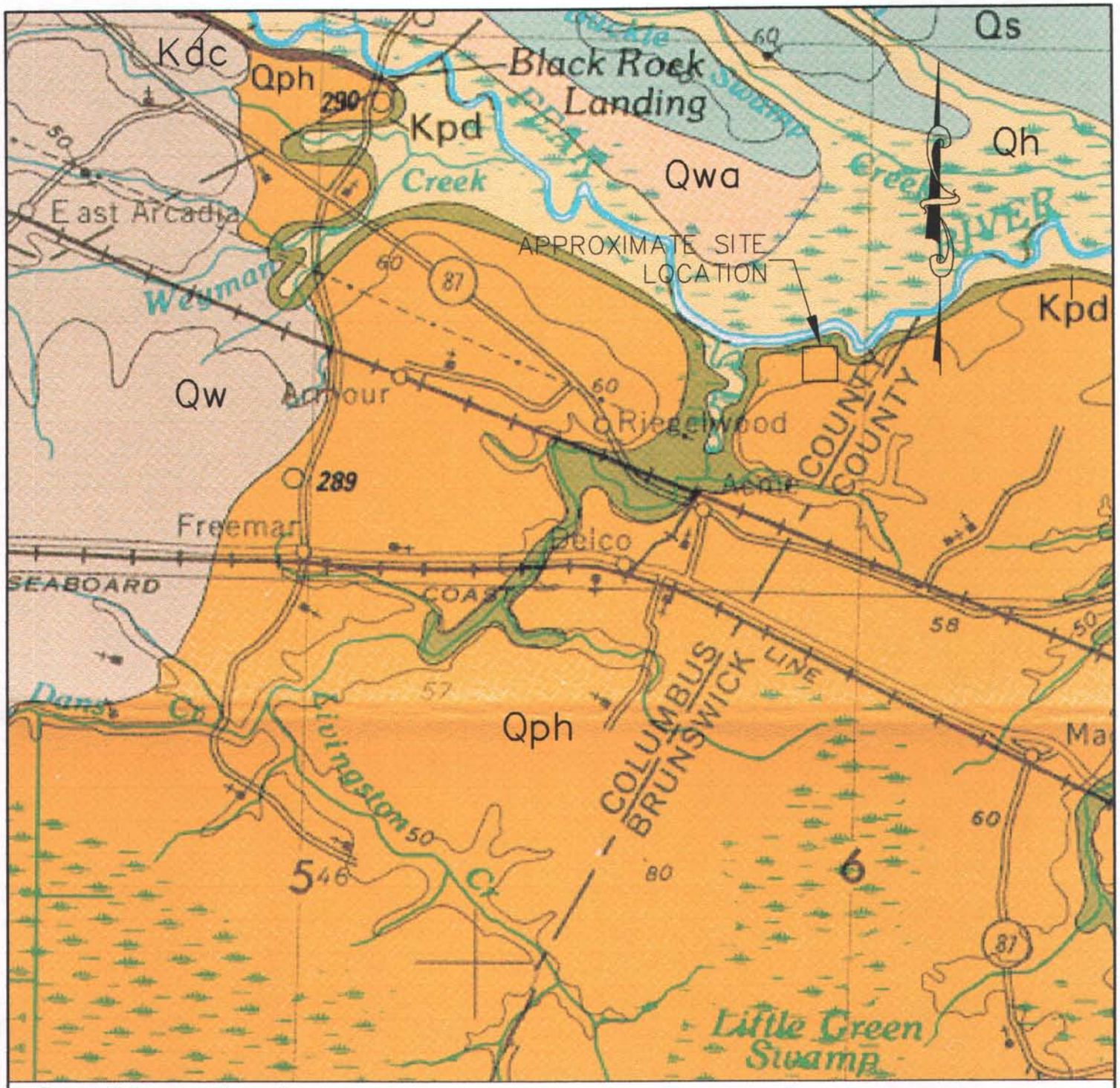
SCALE	PROJECT NO.	
1"=4000'	478.04.01	INTERNATIONAL PAPER RIEGELWOOD MILL LANDFILL SITE LOCATION PLAN DRAWING 1

L:\IP-RGLWD\dwg\Environ\HYDRO PLOTS\SITE LOCATION MAP.dwgLayout1



Qh – Holocene deposits
Qph – Penholoway Formation (lower Pleistocene)
Qs – Socastee Formation (upper Pleistocene)
Qwa – Wando Formation (upper Pleistocene)
Kpd – Peedee Formation (upper Cretaceous)
Kdc – Donoho Creek Formation (upper Cretaceous)
Qw – Wacamaw Formation

Base info from –Geologic map of the Cape Fear region, Florence 1° x 2° quadrangle and north–half of the Georgetown 1° x 2° quadrangle, North Carolina and South Carolina. Dated 1989.

JOYCE ENGINEERING, INC.	2301 West Meadowview Road Greensboro, NC 27407 PHONE: (336) 323-0092 © 2001 Joyce Engineering, Inc. All rights reserved.	SCALE 1 : 100,000	PROJECT NO. 478.04.01	INTERNATIONAL PAPER RIEGELWOOD MILL LANDFILL GEOLOGIC MAP DRAWING 3

L:\IP–RGLWD\dwg\Environ\HYDRO PLOTS\GEOLOGICMAP.dwgLayout1

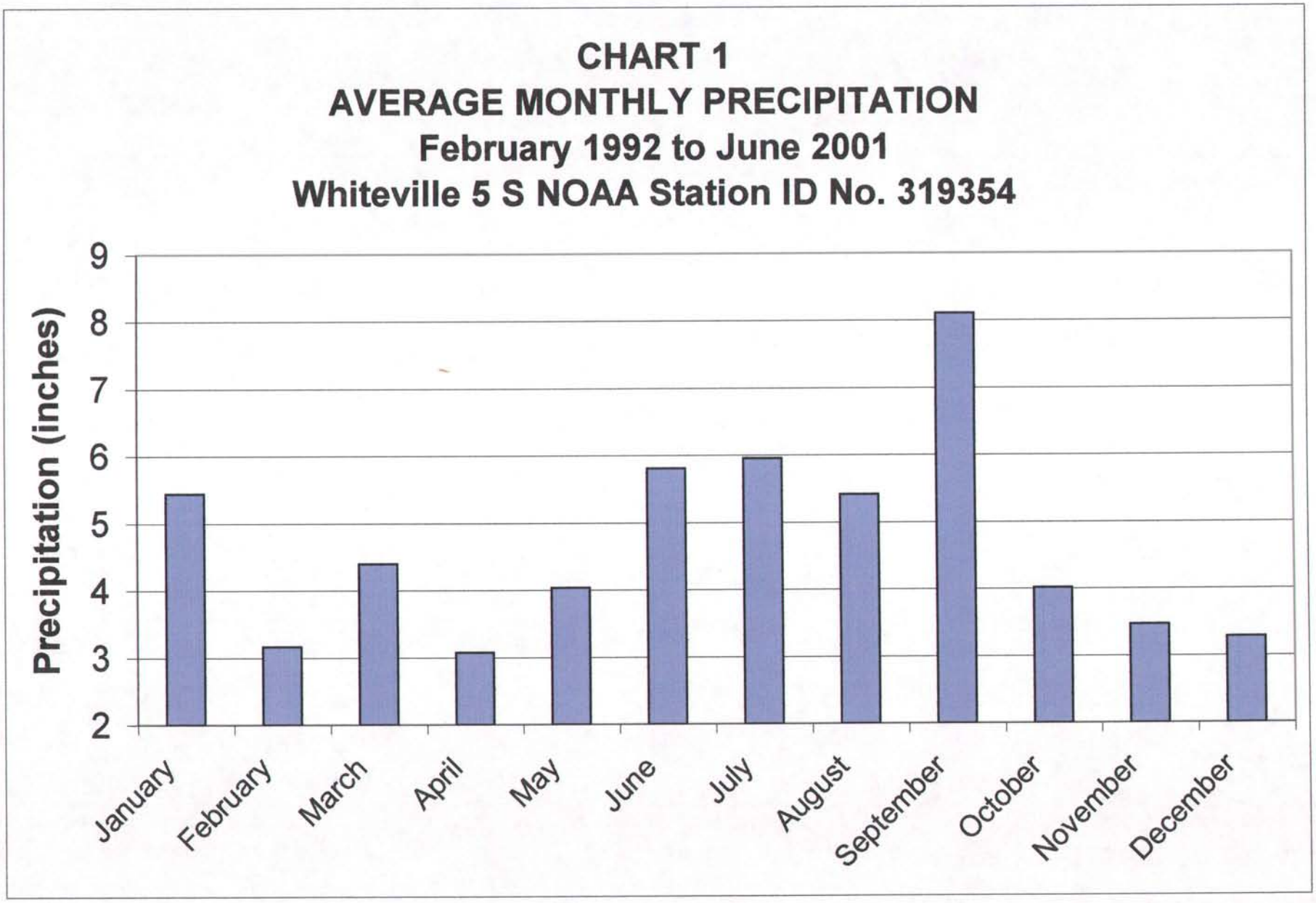


CHART 1
AVERAGE MONTHLY PRECIPITATION
February 1992 to June 2001
Whiteville 5 S NOAA Station ID No. 319354
Precipitation (inches)
9
8
7
6
5
4
3
2
January
February
March
April
May
June
July
August
September
October
November
December

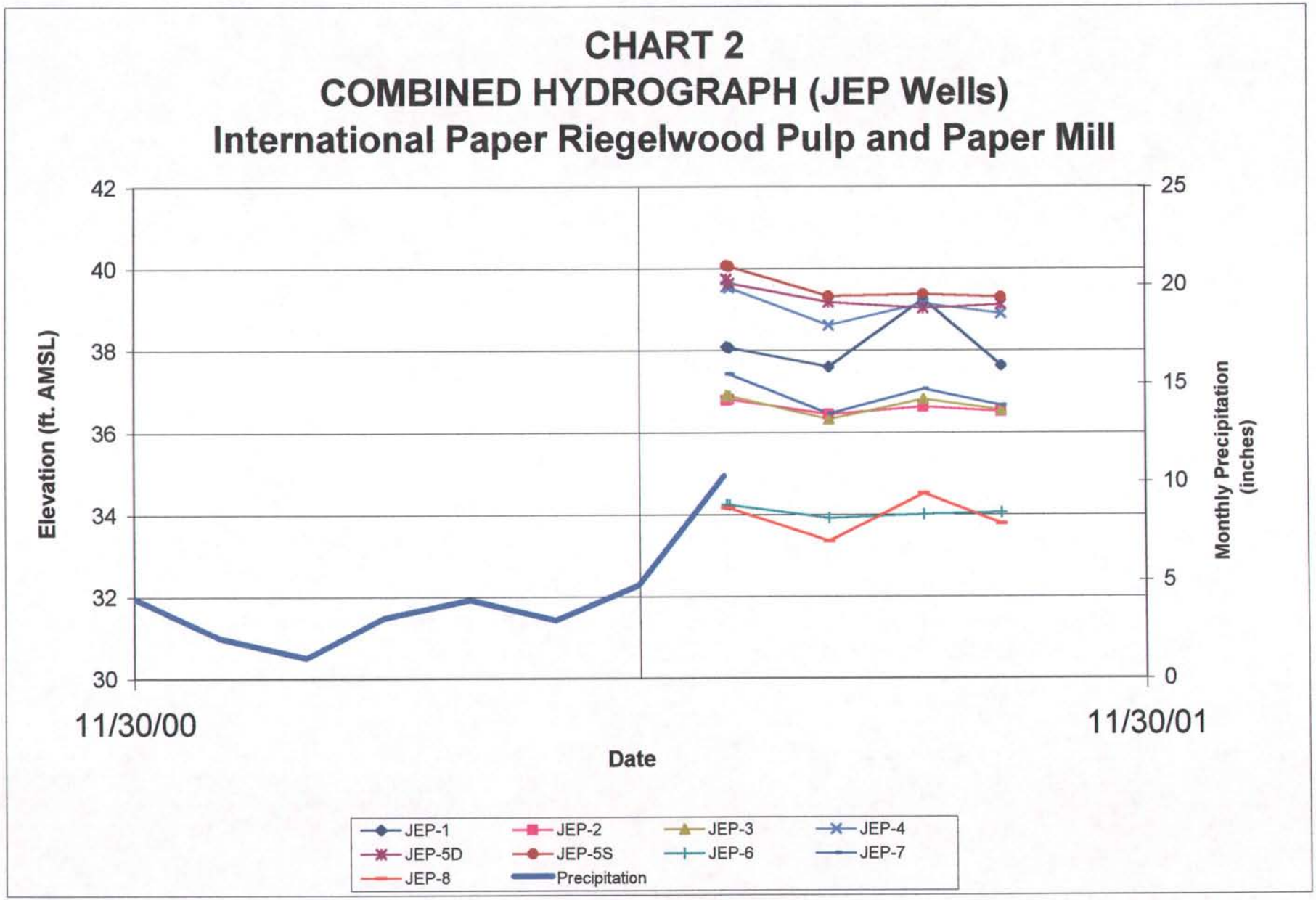


CHART 2
COMBINED HYDROGRAPH (JEP Wells)
International Paper Riegelwood Pulp and Paper Mill
Elevation (ft. AMSL)
42
40
38
36
34
32
30
Monthly Precipitation (inches)
25
20
15
10
5
0
11/30/00
11/30/01
Date
JEP-1
JEP-2
JEP-3
JEP-4
JEP-5D
JEP-5S
JEP-6
JEP-7
JEP-8
Precipitation

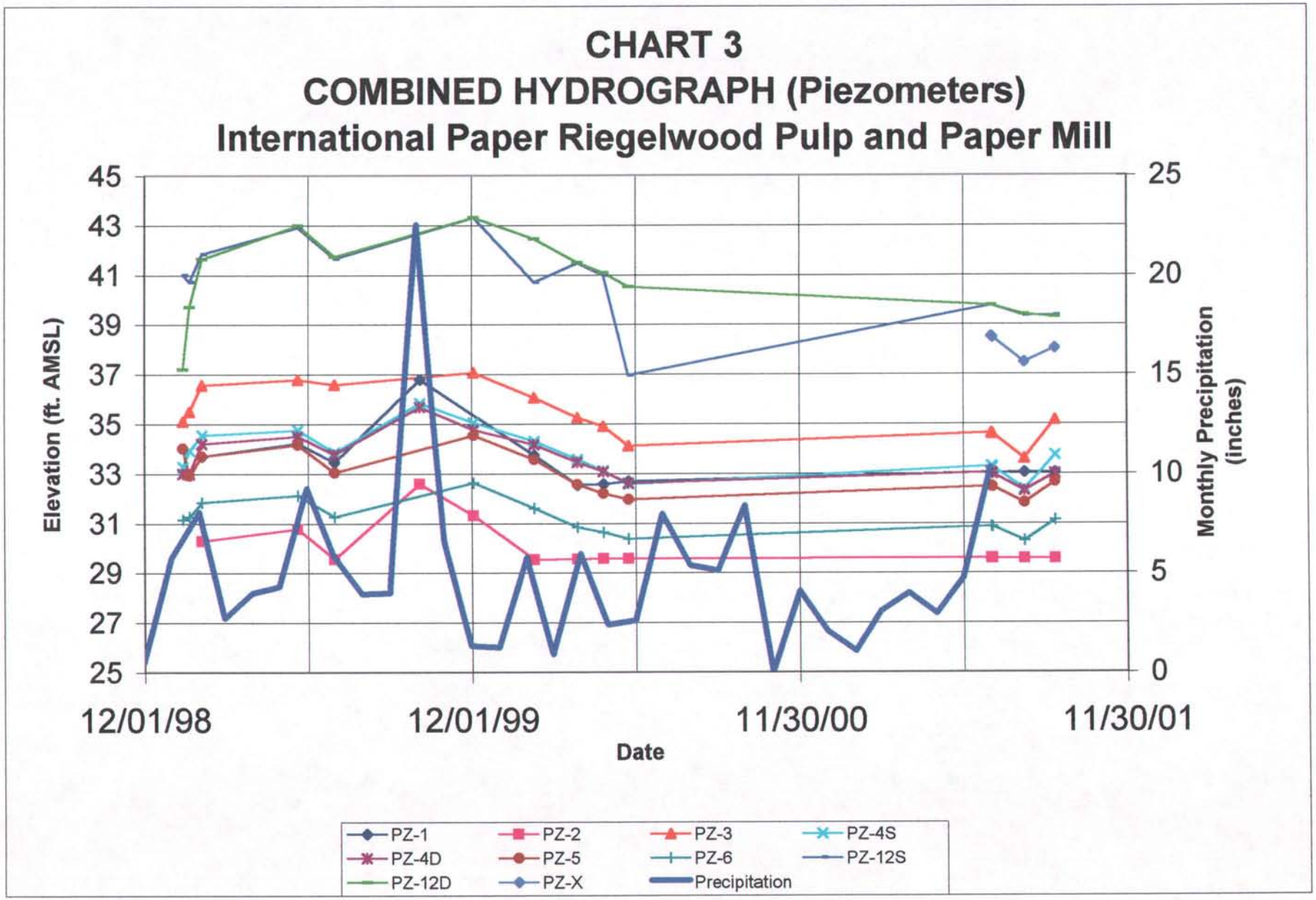


CHART 3
COMBINED HYDROGRAPH (Piezometers)
International Paper Riegelwood Pulp and Paper Mill
Elevation (ft. AMSL)
45
43
41
39
37
35
33
31
29
27
25
Monthly Precipitation (inches)
25
20
15
10
5
0
12/01/98
12/01/99
11/30/00
11/30/01
Date
PZ-1
PZ-2
PZ-3
PZ-4S
PZ-4D
PZ-5
PZ-6
PZ-12S
PZ-12D
PZ-X
Precipitation

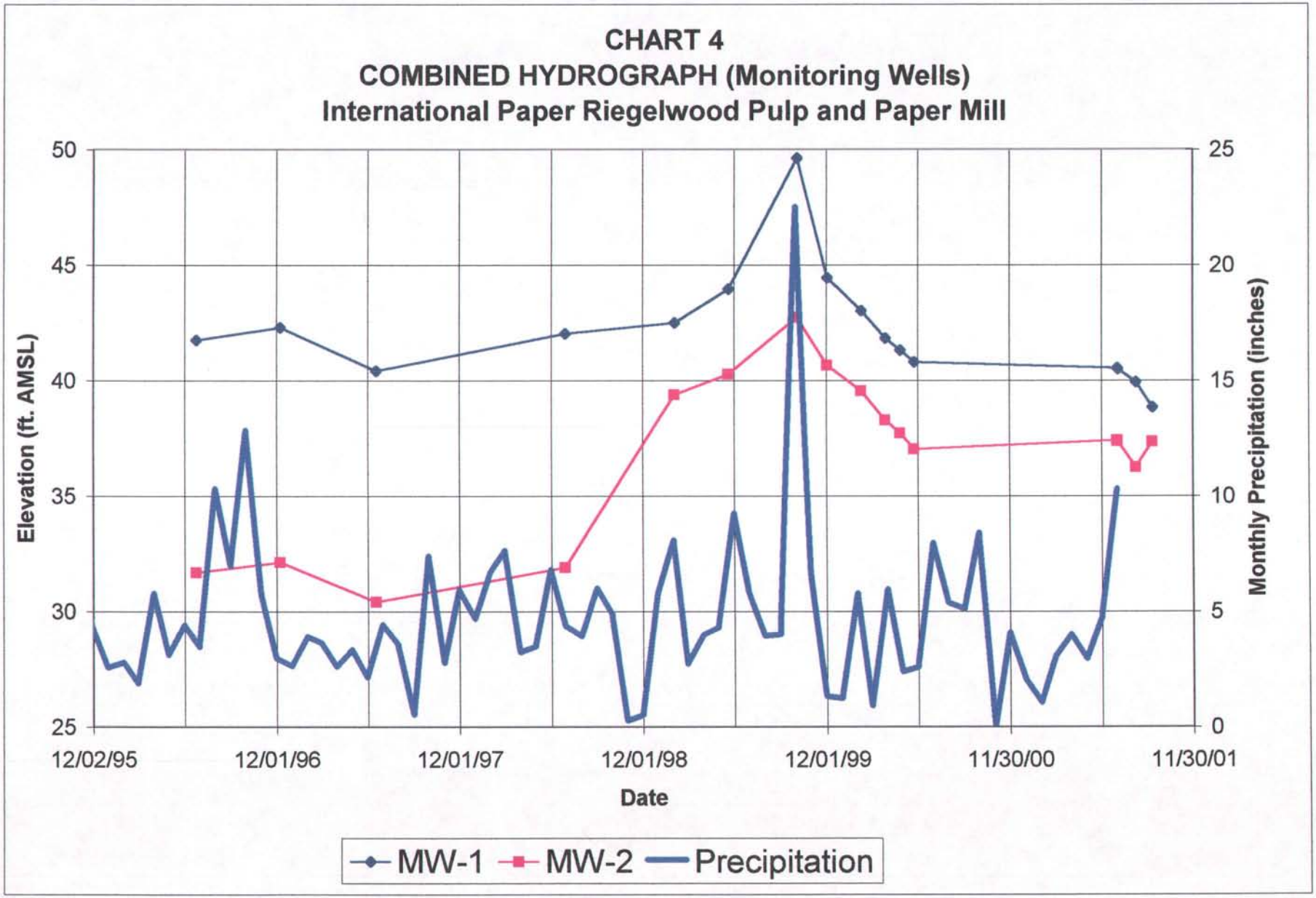


CHART 4
COMBINED HYDROGRAPH (Monitoring Wells)
International Paper Riegelwood Pulp and Paper Mill
Elevation (ft. AMSL)
50
45
40
35
30
25
Monthly Precipitation (inches)
25
20
15
10
5
0
12/02/95
12/01/96
12/01/97
12/01/98
12/01/99
11/30/00
11/30/01
Date
MW-1
MW-2
Precipitation

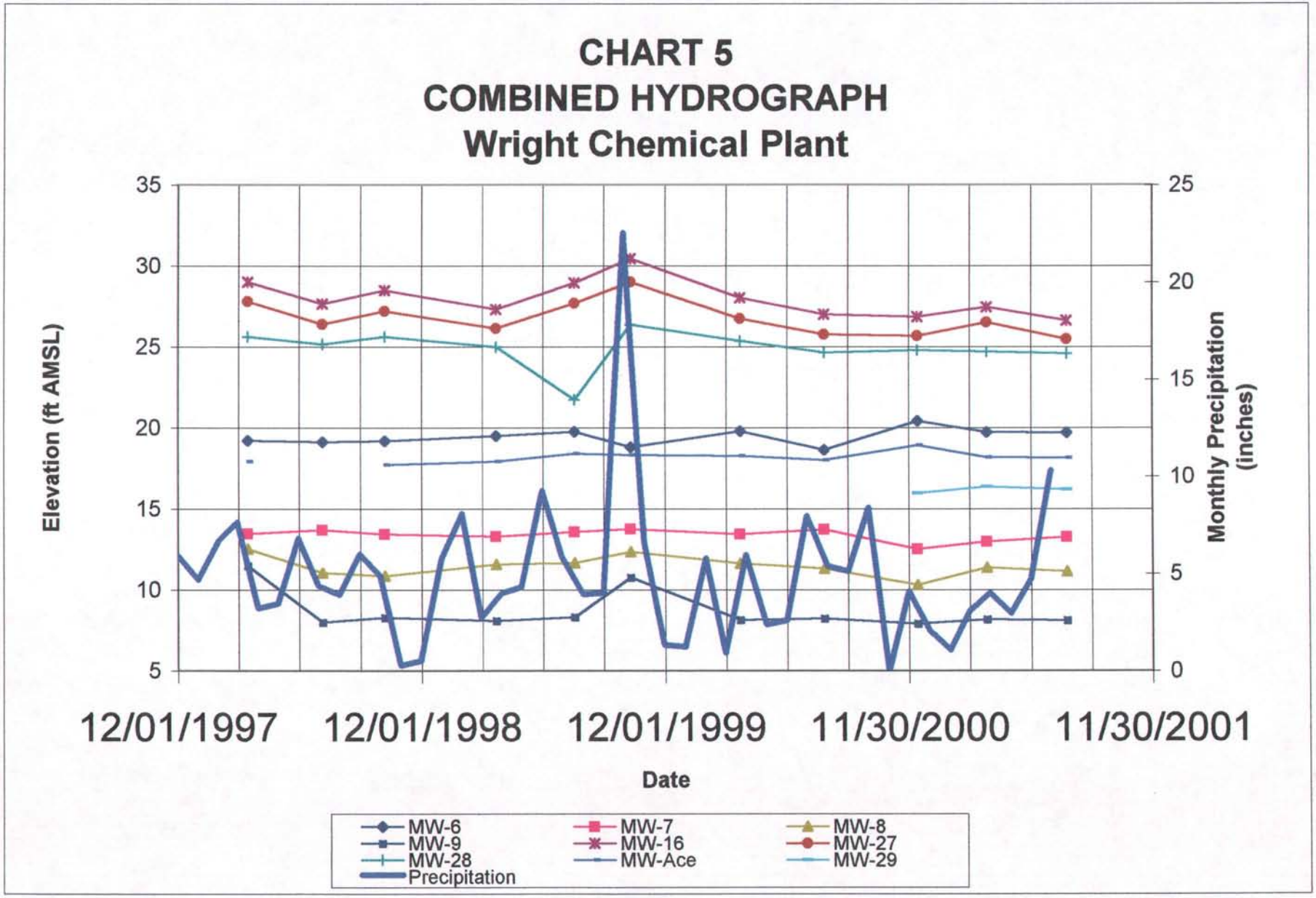


CHART 5
COMBINED HYDROGRAPH
Wright Chemical Plant
Elevation (ft AMSL)
35
30
25
20
15
10
5
Monthly Precipitation (inches)
25
20
15
10
5
0
12/01/1997
12/01/1998
12/01/1999
11/30/2000
11/30/2001
Date
MW-6
MW-7
MW-8
MW-9
MW-16
MW-27
MW-28
MW-Ace
MW-29
Precipitation

APPENDIX I

SOIL BORING AND WELL CONSTRUCTION LOGS

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-1
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/26/01	NORTHING:	217890.7807
DRILLER:	Tony	GROUND ELEV.:	52.8 AMSL	EASTING:	2247938.998
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	30.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1 2	-	-	-	-			SW	Not Sampled. Augered to 2.0 feet below grade. Light gray medium-grained sand cuttings.	Sand
3 4	1 1 1 1	SS-1	24"	2			SW	7.5YR 7/2 pinkish-gray medium-grained sand.	
							SC	Abrupt transition to 7.5YR 6/8 reddish-yellow clayey sand.	Clayey Sand
							SP	Grades to medium-grained sand with trace of clay.	Sand
5 6	2 2 4 6	SS-2	19"	6			SP	7.5YR 6/8 reddish-yellow medium-grained sand with trace of clay.	
							SC	Grades to 7.5YR 5/8 strong brown clayey sand.	Clayey Sand
7 8	2 6 10 13	SS-3	16"	16			SC	7.5YR 5/8 strong brown clayey sand.	
							SW	Abrupt transition to 7.5YR 8/2 to 7/2 pinkish-white to pinkish-gray well sorted medium-grained sand.	Sand
9 10	3 6 7 11	SS-4	17"	13			SW	7.5YR 7/2 pinkish-gray medium-grained sand.	
							SP	Grades to 7.5YR 4/3 dark brown medium-grained sand with trace of clay.	
11 12	3 7 11 21	SS-5	20"	18			SP	7.5YR 4/3 dark brown medium-grained sand with trace of clay. Color grades to 7.5YR 7/2 pinkish-white.	
13 14	4 7 10 9	SS-6	20"	17			SP	7.5YR 7/2 pinkish-white sand with bands of 4/3 dark brown medium-grained sand with trace of clay. Water Table encountered at approximately 13 feet below grade.	Water Table
15	3 3	SS-7	20"	12			SP	7.5YR 7/2 medium-grained sand with 1-inch thick 7.5YR 7/3 clay interbeds.	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-1
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/26/01	NORTHING:	217890.7807
DRILLER:	Tony	GROUND ELEV.:	52.8 AMSL	EASTING:	2247938.998
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	30.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	9 19	SS-7	18"	1			SP	7.5YR 7/2 medium-grained sand with 1-inch thick 7.5 YR 7/3 clay interbeds.	Sand
17 18	4 7 7 7	SS-8	20"	14			SP	7.5YR 7/3 pink medium to coarse-grained sand.	
19 20	3 5 5 6	SS-9	22"	10			SP	7.5YR 6/3 light brown medium-grained sand with 2-inch lens of 8/0 white clayey sand in the bottom of the spoon.	
21 22	1 2 3 4	SS-10	24"	5			SP	7.5YR 6/4 light brown medium to coarse-grained sand grading to 7/4 pink medium-grained sand with laminations of black organic mud.	
23 24	3 3 3 4	SS-11	24"	-			-	Heaving sand in the auger, recovery is all heaving sand.	Shell Hash
25 26	4 4 3 2	SS-12	18"	7			GC	7.5YR 7/4 pink sandy shell hash. Broken shell fragments with sandy clay matrix.	
							SM	Abrupt transition to dark brown silty fine sand.	Silty Fine Sand (Peedee Form.)
27 28	5 16 24 42	SS-13	21"	40			SM	7.5YR 2/0 black fine sandy silt with trace of clay.	
29 30	3 7 8 7	SS-14	8"	15			SM	7.5YR 2/0 black fine sandy silt with trace of clay. Soil boring terminated at 30 feet below grade.	

OBSERVATION WELL

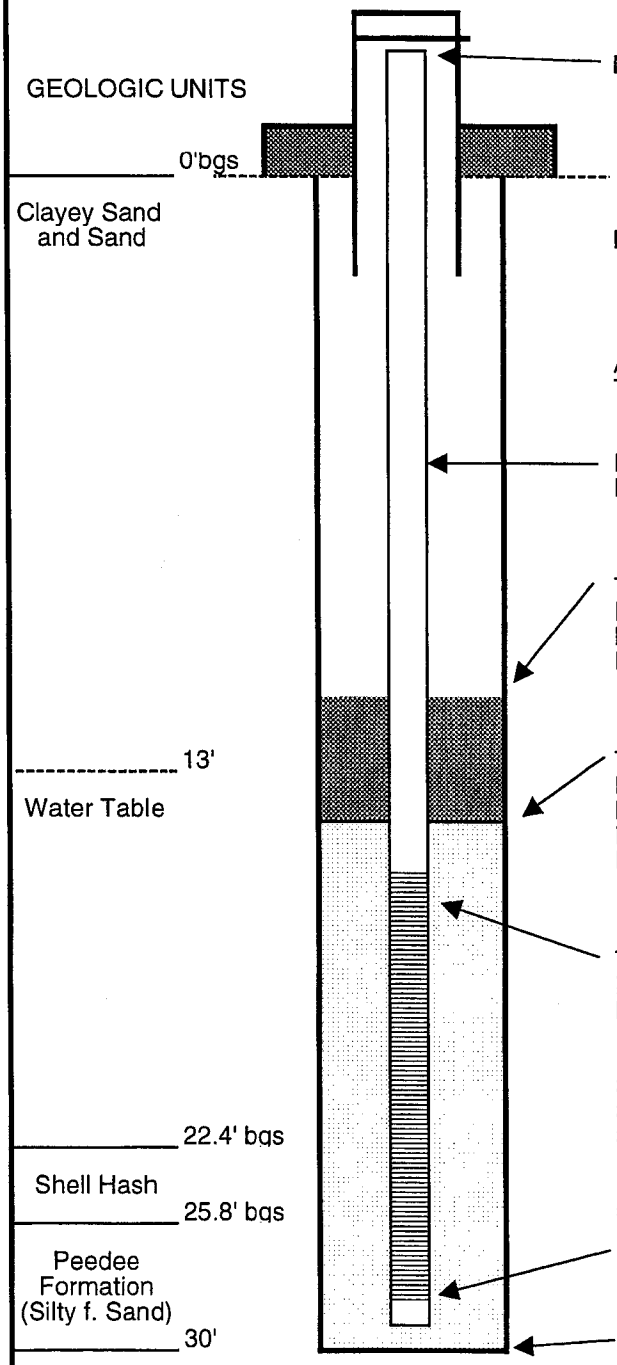
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

OBSERVATION WELL ID: JEP-1
CONSTRUCTION DATE: 6/26/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 55.7 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 52.8 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 42.0 feet AMSL
DEPTH 10.8 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 40.0 feet AMSL
DEPTH 12.8 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 38.0 feet AMSL
DEPTH 14.8 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inches
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 28.0 feet AMSL
DEPTH 24.8 feet

BOTTOM OF BOREHOLE
ELEVATION 22.8 feet AMSL
DEPTH 30'

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-2
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/28/01	NORTHING:	218225.0959
DRILLER:	Tony	GROUND ELEV.:	49.10 feet AMSL	EASTING:	2246617.552
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	26.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1, 2	-	-	-	-			SW	Not Sampled. Augered to 2.0 feet below grade. Light gray medium-grained sand cuttings.	Sand
3, 4	2, 2, 2, 2	SS-1	22"	4			SP	7.5YR 6/6 reddish-yellow medium-grained sand.	
							SC	Grades to 7.5YR 5/6 strong brown clayey sand.	Clayey Sand
5, 6	2, 3, 3, 6	SS-2	21"	6			SC	7.5YR 5/6 strong brown clayey sand.	
							SP	Grades to 2/0 and 3/3 black medium-grained sand with trace of clay.	Sand
7, 8	3, 4, 5, 5	SS-3	22"	9			SP	7.5YR 2/0 to 3/3 grading to 5/2 sand with clay.	
							SC	Abrupt transition to 7.5YR 7/4 pink clayey medium-grained sand.	Clayey Sand
9, 10	2, 4, 4, 10	SS-4	14"	8			SC	7.5YR 7/4 pink dense clayey sand.	
11, 12	2, 4, 7, 7	SS-5	18"	11			SC	7.5YR 7/4 pink dense clayey sand.	
							SP	Abrupt transition to 7.5YR 7/2 medium-grained clean sand. Color grades to 5/8 medium sand with trace of clay.	Sand
13, 14	3, 2, 3, 3	SS-6	14"	5			SP	7.5YR 6/6 reddish-yellow medium to coarse-grained sand with trace of clay. Saturated.	Water Table
15	2, 2	SS-7	17"	4			SP	7.5YR 7/6 medium to coarse-grained clean sand.	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-2
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/28/01	NORTHING:	218225.0959
DRILLER:	Tony	GROUND ELEV.:	49.10 fet AMSL	EASTING:	2246617.552
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	26.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	2 2	SS-7	17"	4			SP	7.5YR 7/6 medium to coarse-grained clean sand.	Sand
17	4 3 1	SS-8	20"	4			SP	7.5YR 7/6 medium to coarse-grained clean sand.	
18	2						SC	7.5YR 5/6 clayey sand.	Clayey Sand
19	WR WR WH	SS-9	0"	WH			--	No recovery. Suspected to be soft shell hash.	Shell Hash
20	1								
21	1 3	SS-10	17"	7			GC	7.5YR 7/0 light gray clayey sand shell hash. Clast supported.	
22	4 5								
23	41 19	SS-11	6"	28			SC	7.5YR 4/0 dark gray clayey fine sand. Indurated at top, plugged the tip of the spoon.	Clayey Fine Sand (Peedee Form.)
24	9 7								
25	3 5	SS-12	24"	14			SC	7.5YR 4/0 dark gray clayey fine sand.	
26	9 8								
27								Soil boring terminated at 26 feet below grade.	
28									
29									
30									

s:\jei-templates\jei boring log

OBSERVATION WELL

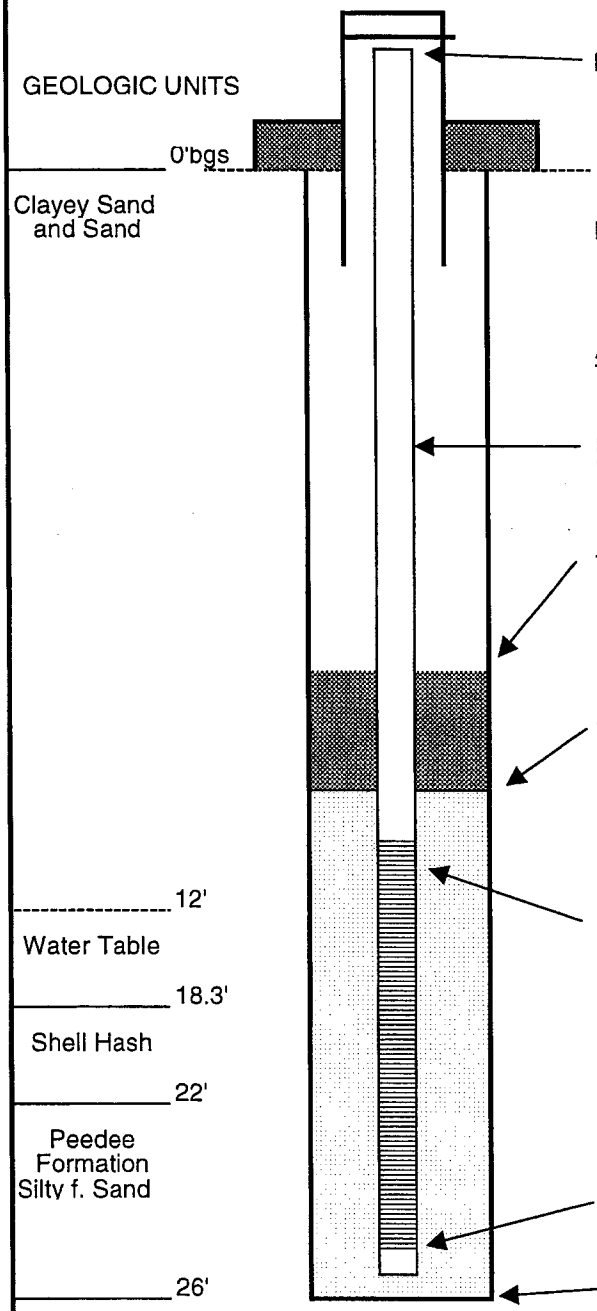
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

MONITORING WELL ID: JEP-2
CONSTRUCTION DATE: 6/28/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 51.51 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 49.10 feet AMSL

BOREHOLE DIAMETER 8.25 inch

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 43.1 feet AMSL
DEPTH 6 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 41.1 feet AMSL
DEPTH 8 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 39.1 feet AMSL
DEPTH 10 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inch
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 29.1 feet AMSL
DEPTH 20 feet

BOTTOM OF BOREHOLE
ELEVATION 23.10 feet AMSL
DEPTH 26 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-3
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/28/01	NORTHING:	218554.1554
DRILLER:	Tony	GROUND ELEV.:	45.74 feet AMSL	EASTING:	2246586.607
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1, 2	-	-	-	-			SC	Not Sampled. Augered to 2.0 feet below grade. Light gray clayey sand cuttings.	Clayey Sand
3	2 3 5	SS-1	23"	8			SC	7.5YR 6/4 light brown clayey sand.	
4	5						SP	Grades to 7.5YR 6/6 medium-grained sand with trace of clay.	Sand
5, 6	2 2 4 5	SS-2	20"	6			SP	10YR 6/8 brownish-yellow medium-grained sand with trace of clay.	
7, 8	2 3 4 6	SS-3	20"	7			SW	7.5YR 7/3 pink well sorted medium-grained sand. Color grades to 7.5YR 8/0 with depth. Water table encountered at approximately 8.0 feet.	Water Table
9, 10	2 4 6 7	SS-4	20.5"	10			SW	7.5YR 8/3 pink clean medium to coarse sand, saturated.	
11, 12	4 6 8 9	SS-5	20"	14			SW	7.5YR 7/2 pinkish-gray medium to coarse-grained sand with trace of clay in tip of spoon.	
13, 14	2 2 3 2	SS-6	21"	5			SP	7.5YR 7/2 pinkish-gray to 7/4 pink medium to coarse sand with trace of clay.	
15	1 1	SS-7	14"	2			SW	7.5YR 7/4 grading to 6/8 reddish-yellow clayey sand.	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-3
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/28/01	NORTHING:	218554.1554
DRILLER:	Tony	GROUND ELEV.:	45.74 feet AMSL	EASTING:	2246586.607
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	1 WH	SS-7	14"	2			SW	7.5YR 7/4 grading to 6/8 reddish-yellow clayey sand.	Sand
17 18	1 2 2 3	SS-8	22"	4			GC	7.5YR 6/4 clayey sand shell hash.	Shell Hash
19 20	1 2 2 2	SS-9	20"	4			GC	7.5YR 6/4 to 7/0 clayey sand shell hash.	
							SC	7.5YR 4/0 dark gray clayey fine sand.	Clayey Sand (Peedee Form.)
21 22	3 4 7 9	SS-10	21"	11			SC	7.5YR 3/0 very dark gray clayey fine sand.	
23 24	2 6 5 6	SS-11	24"	11			SC	7.5YR 3/0 very dark gray clayey fine sand.	
25 26 27 28 29 30								Boring terminated at 24.0 feet below grade.	TD @24.0 feet

OBSERVATION WELL

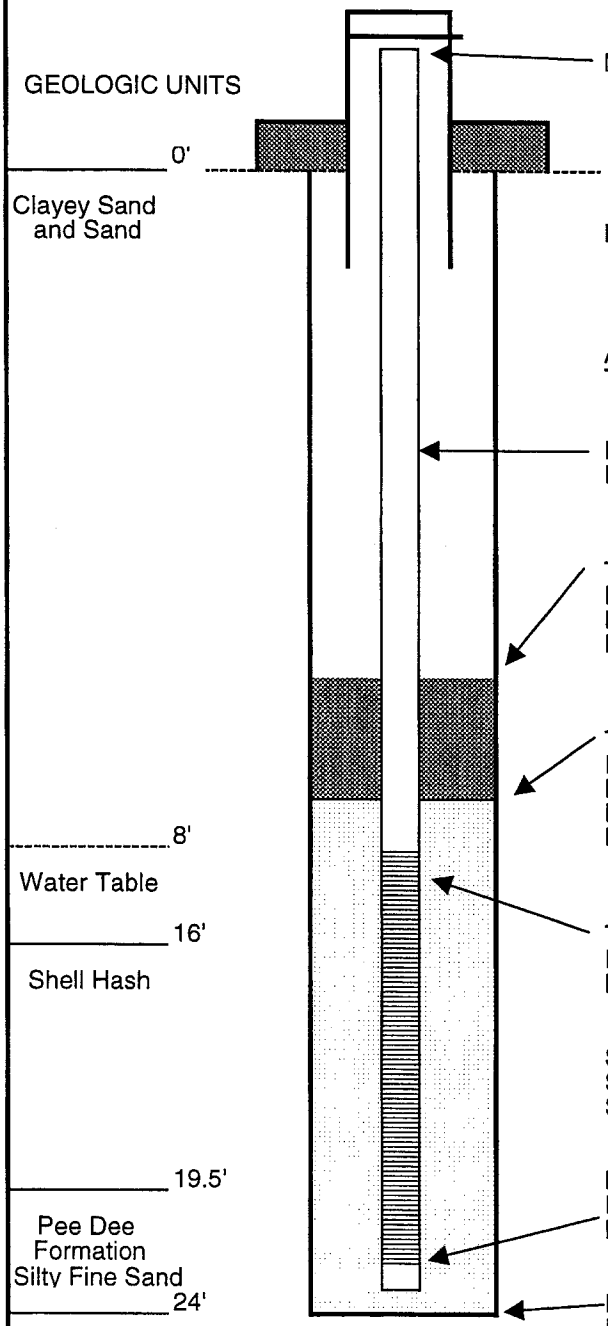
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

OBSERVATION WELL ID: JEP-3
CONSTRUCTION DATE: 6/28/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 48.31 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 45.74 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 43.7 feet AMSL
DEPTH 2 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 41.7 feet AMSL
DEPTH 4 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 39.7 feet AMSL
DEPTH 6 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inches
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 29.7 feet AMSL
DEPTH 16 feet

BOTTOM OF BOREHOLE
ELEVATION 21.7 feet AMSL
DEPTH 24 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-4
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC Sate Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/29/01	NORTHING:	218555.8809
DRILLER:	Tony	GROUND ELEV.:	49.01 feet AMSL	EASTING:	2246961.288
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1	-	-	-	-			-	Not sampled	
2									
3	1	SS-1	17"	2			SW /SP	7.5 YR 6/4, light brown medium-grained loose sand	Sand
4	1								
	1								
	2								
5	1	SS-2	13"	4			SP	7.5 YR 6/3, light brown loose medium-grained sand,trace clay	
	2								
	2								
6	4								
7	1	SS-3	18"	7			SP	7.5 YR 5/3, brown loose medium-grained sand, trace clay	
	3								
	4								
8	6								
9	2	SS-4	17"	5			SP	7.5 YR 5/3, brown loose medium-grained sand, trace clay	
	3								
							SC	7.5 YR 7/2, pinkish-gray stiff clayey sand	Clayey sand
10	2								
	4								
11	2	SS-5	14"	7			SC	7.5 YR 7/2, pinkish-gray stiff clayey sand bottom 4" are 7.5 YR 7/8, reddish clayey sand	
	3								
							SP	Yellow loose medium to coarse-grained sand, wet	Sand
	4								
12	7							water table @ 12'	Water Table
	2	SS-6	19"	6			CL	4" of dense sandy clay 7.5 YR 8/0, white	Clay
							SP	7/6 Reddish yellow loose medium sand with trace clay	Sand
13	3								
	3								
14	3								
	2	SS-7	16"	4			SP	8/2 to 7/4 medium to coarse sand, trace clay	
15	2								

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-4
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC Sate Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/29/01	NORTHING:	218555.8809
DRILLER:	Tony	GROUND ELEV.:	49.01 feet AMSL	EASTING:	2246961.288
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	2 3	SS-7	16"	4			SP	8/2 to 7/4 medium to coarse sand, trace clay	Sand
17	3 1	SS-8	14"	2			SP	8/2 to 7/4 medium to coarse sand, trace clay	
18	1 2						GC	shell hash, clayey sand 6/6	Shell hash
19 20	3 5 7 8	SS-9	15"	12			GC	7.5 YR 5/0, gray clayey sand, shell hash	
21 22	4 4 4 6	SS-10	14"	8			GC	7.5 YR 5/0, gray clayey sand, shell hash	
23	2 1	SS-11	22"	2			GC	7.5 YR 5/0, gray clayey sand, shell hash	
24	1 5						PD	7.5 YR 3/0, silty fine sand with clay, moist	Silty sand (Peedee Form.)
25 26	2 3 7 7	SS-12	20"	10			SM	7.5 YR 3/0, silty fine sand with clay, moist	
27 28	5 14 20 50+	SS-13	19"	34				7.5 YR 3/0, silty fine sand with clay, moist	
29 30	22 50+	Shelby#1						six inch recovery	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-4
LOCATION:	Riegelwood, North Carolina			SHEET:	3 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC Sate Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/29/01	NORTHING:	218555.8809
DRILLER:	Tony	GROUND ELEV.:	49.01 feet AMSL	EASTING:	2246961.288
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
31	5 5 7 7	SS-14	24"	12			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	Silty sand (Peedee Form.)
33	3 6 7 14	SS-15	24"	13			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	
35	2 4 5 9	SS-16	24"	9			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	
37	3 6 6 10	SS-17	24"	12			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	
39	2 9 10	Shelby#2						19 inch recovery	
41	3 4 6 10	SS-18	24"	10			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	
43	4 5 8 12	SS-19	24"	13			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	
45	3 5	SS-20	24"	12			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-4
LOCATION:	Riegelwood, North Carolina			SHEET:	4of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC Sate Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/29/01	NORTHING:	218555.8809
DRILLER:	Tony	GROUND ELEV.:	49.01 feet AMSL	EASTING:	2246961.288
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
46	7 8	SS-20	24"	12			SM /SC	7.5 YR 3/0, very dark gray silty fine sand with clay	Silty sand (Peedee Form.)
47 48	3 6 6 7	SS-21	24"	12			SM /SC	7.5 YR 3/0 very dark gray silty fine sand with clay	
49 50	3 5 7 10	SS-22	24"	12			SM /SC	7.5 YR 3/0 very dark gray silty fine sand with clay	
51 52	10 9 15	Shelby#3	22"	NA				22" recovery	
53 54	4 7 18 37	SS-23	24"	25			SM /SC	7.5 YR 3/0 very dark gray silty fine sand with clay	
55 56	3 6 8 11	SS-24	24"	14			SM /SC	7.5 YR 3/0 very dark gray silty fine sand with clay TD boring @ 56'	
57 58 59 60									

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OBSERVATION WELL

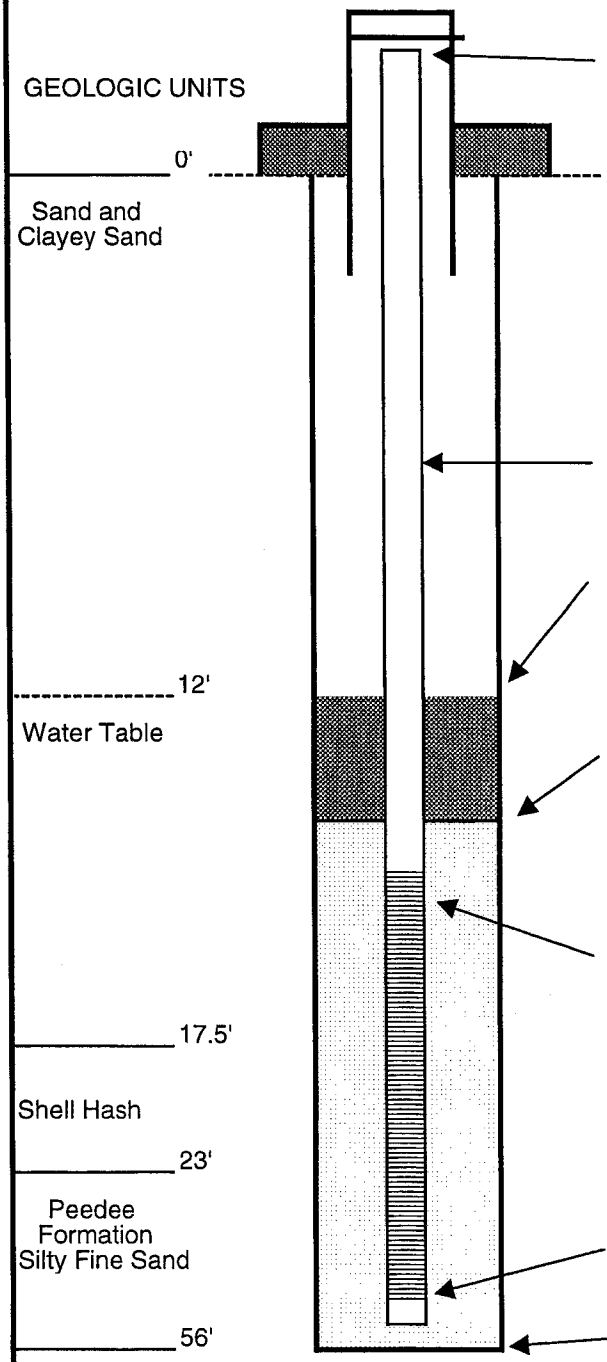
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

OBSERVATION WELL ID: JEP-4
CONSTRUCTION DATE: 6/29/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 51.63 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 49.01 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 47.0 feet AMSL
DEPTH 2 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 39.0 feet AMSL
DEPTH 8 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 37.0 feet AMSL
DEPTH 10 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inch
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 27.0 feet AMSL
DEPTH 20 feet

BOTTOM OF BOREHOLE
ELEVATION 7 feet BMSL
DEPTH 56 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-5S
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/27/01	NORTHING:	218352.1747
DRILLER:	Tony	GROUND ELEV.:	50.99 feet AMSL	EASTING:	2247386.744
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1 2	-	-	-	-			-	Not Sampled. Augered to 2.0 feet below grade. Description herein derived from the sampling of soil boring JEP-5D, which was drilled adjacent to JEP-5S.	
3 4	1 1 3 3	SS-1	22"	4			SC	7.5YR 5/8 strong brown clayey sand.	Clayey Sand
5 6	2 2 4 6	SS-2	21"	6			SC	7.5YR 5/8 strong brown clayey sand.	
7 8	5 8 7 7	SS-3	24"	15			SP	Transitional to 7.5YR 6/6 reddish-yellow medium to fine-grained sand with trace of clay.	Sand
9 10	4 8 12 14	SS-4	23"	20			SP SW	7.5YR 6/6 reddish-yellow medium to fine-grained sand. 7.5YR 8/2 pinkish-white well sorted medium sand.	
11 12	5 9 9 11	SS-5	18"	18			SW	7.5YR 8/2 pinkish-white well sorted clean medium-grained sand. Saturated.	
13 14	4 7 7 10	SS-6	20"	14			SP	7.5YR 7/3 to 6/3 pink to light brown medium-grained sand with trace of clay. Saturated.	
15	4 6	SS-7	24"	12			-	No sample recovery.	No Recovery

SOIL BORING LOG

JOYCE ENGINEERING, INC

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-5S
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/27/01	NORTHING:	218352.1747
DRILLER:	Tony	GROUND ELEV.:	50.99 feet AMSL	EASTING:	2247386.744
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	6 6	SS-7	24"	12			-	No sample recovery.	No Recovery
17	1 0.5 0.5	SS-8	17"	1				Slumping sand from up the borehole.	
18	1						SC	7.5YR 3/3 dark brown clayey silt.	Clayey Silt
19	2 4	SS-9	17"	11			SP	7.5YR 6/3 light brown clean medium-grained sand. half inch thick lens of 7.5YR 3/3 dark brown clayey silt.	Sand
20	7 10						SM	7.5YR 8/0 white sand.	
								No Sample	
21								Soil Boring terminated at 20.6 feet below grade.	
22									
23									
24									
25									
26									
27									
28									
29									
30									

OBSERVATION WELL

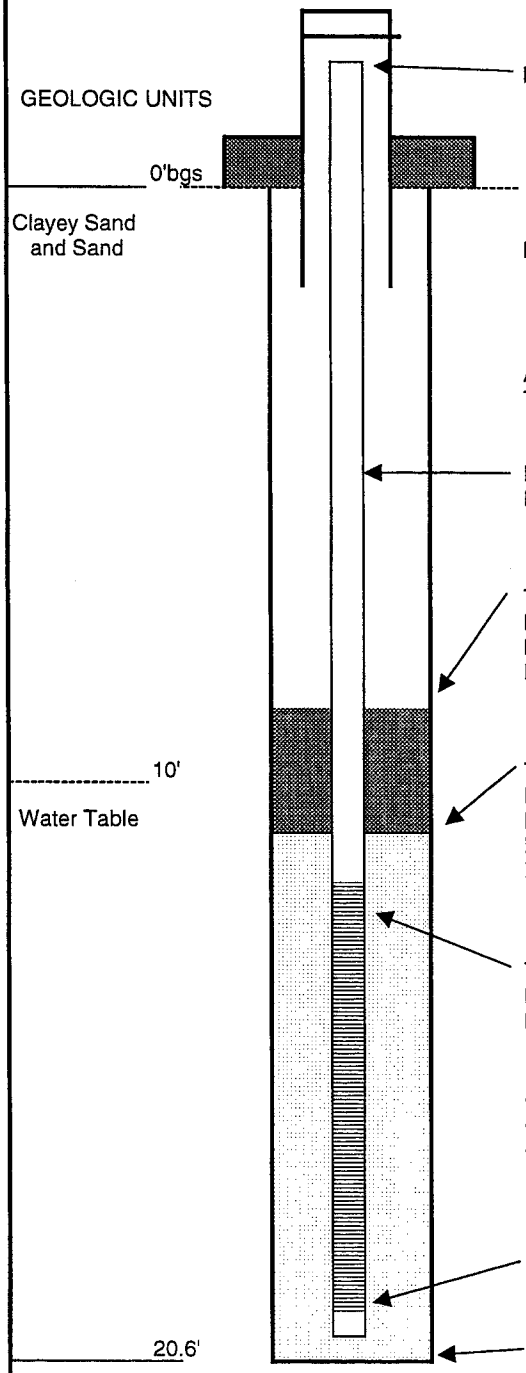
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

OBSERVATION WELL ID: JEP-5S
CONSTRUCTION DATE: 6/27/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 53.76 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 50.99 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 48.0 feet AMSL
DEPTH 3'
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 43.3 feet AMSL
DEPTH 7.7 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 40.4 feet AMSL
DEPTH 10.6 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inch
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 30.4 feet AMSL
DEPTH 20.6 feet

BOTTOM OF BOREHOLE
ELEVATION 30.4 feet AMSL
DEPTH 20.6 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-5D
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/27/01	NORTHING:	218358.1361
DRILLER:	Tony	GROUND ELEV.:	50.99 feet AMSL	EASTING:	2247385.556
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1, 2	-	-	-	-			-	Not Sampled. Augered to 2.0 feet below grade.	
3, 4	1, 1, 3, 3	SS-1	22"	4			SC	7.5YR 5/8 strong brown clayey sand.	Clayey Sand
5, 6	2, 2, 4, 6	SS-2	21"	6			SC	7.5YR 5/8 strong brown clayey sand.	
7, 8	5, 8, 7, 7	SS-3	24"	15			SP	Transitional to 7.5YR 6/6 reddish-yellow medium to fine-grained sand with trace of clay.	Sand
9, 10	4, 8, 12, 14	SS-4	23"	20			SP SW	7.5YR 6/6 reddish-yellow medium to fine-grained sand. 7.5YR 8/2 pinkish-white well sorted medium sand.	
11, 12	5, 9, 9, 11	SS-5	18"	18			SW	7.5YR 8/2 pinkish-white well sorted clean medium-grained sand. Saturated.	
13, 14	4, 7, 7, 10	SS-6	20"	14			SP	7.5YR 7/3 to 6/3 pink to light brown medium-grained sand with trace of clay. Saturated.	
15	4, 6	SS-7	24"	12			-	No sample recovery.	No Recovery

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-5D
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/27/01	NORTHING:	218358.1361
DRILLER:	Tony	GROUND ELEV.:	50.99 feet AMSL	EASTING:	2247385.556
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	6 6	SS-7	24"	12			-	No sample recovery.	No Recovery
17	1 0.5 0.5 1	SS-8	17"	1				Slumping sand from up the borehole.	
18							SC	7.5YR 3/3 dark brown clayey silt.	Clayey Silt
19	2 4 7 10	SS-9	17"	11			SP SM	7.5YR 6/3 light brown clean medium-grained sand. half inch thick lens of 7.5YR 3/3 dark brown clayey silt. 7.5YR 8/0 white sand.	Sand
20									
21	2 2 2 3	SS-10	24"	4			SM SP	7.5YR 8/0 white sand to 20 feet 4 inches; abrupt transition to 7.5YR 3/3 dark brown clayey silt to 20 feet 6 inches. Abrupt transition to 7.5YR 6/6 reddish-yellow medium-grained sand.	
22									
23	1 0.5 0.5 1	SS-11	24"	1			SP	7.5YR 6/6 reddish-yellow sand, grading to 7.5YR 5/8 strong brown at 23 feet to 7.5YR 3/0 dark gray at 23.5 feet.	
24									
25	3 1 1 2	SS-12	12"	2			SP GC	7.5YR 3/0 dark gray medium-grained sand. 7.5YR 5/0 gray clayey sand shell hash.	Shell Hash
26									
27	6 11 13 50+	SS-13	24"	24			GC SC	7.5YR 5/0 gray clayey sand shell hash. 7.5YR 4/0 to 3/0 dark to very dark gray clayey fine sand.	Clayey Sand (Peedee Form.)
28									
29	9 11 10 25	SS-14	24"	21			SC	7.5YR 3/0 very dark gray clayey fine sand.	
30									

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-5D
LOCATION:	Riegelwood, North Carolina			SHEET:	3 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/27/01	NORTHING:	218358.1361
DRILLER:	Tony	GROUND ELEV.:	50.99 feet AMSL	EASTING:	2247385.556
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
	7	SH-1	5"				SC	Drive Shelby tube 6 inches with hammer. 5 inch recovery, tube end is bent. 7.5YR 3/0 very dark gray clayey fine sand. Moist.	Clayey Sand (Peedee Form.)
31	9								
	7	SS-15	18"	14			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
32	7								
	5	SS-16	24"	30			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
33	14								
	16								
34	12								
	1	SS-17	24"	10			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
35	3								
	7								
36	9								
	6	SH-2	20"	-			SC	7.5YR 3/0 very dark gray clayey fine sand, moist. 20 inch recovery, used hammer to advance tube.	
37	13								
	19								
38									
	3	SS-18	24"	13			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
39	6								
	7								
40	8								
	6	SS-19	24"	13			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
41	6								
	7								
42	11								
	4	SS-20	24"	12			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
43	6								
	6								
44	9								
	3	SS-21	24"	14			SC	7.5YR 3/0 very dark gray clayey fine sand, moist. Broken shell fragment at 44.5 feet.	
45	6								

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-5D
LOCATION:	Riegelwood, North Carolina			SHEET:	4 of 4
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/27/01	NORTHING:	218358.1361
DRILLER:	Tony	GROUND ELEV.:	50.99 feet AMSL	EASTING:	2247385.556
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	56.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
46	8 11	SS-21	24"	14			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	Clayey Sand (Peedee Form.)
47 48	11 11 9 12	SS-22	24"	20			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
49 50	WH 6 6 8	SS-23	24"	12			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
51 52	1 4 6 9	SS-24	24"	10			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
53 54	8 14 18	SH-3	18"	-			SC	7.5YR 3/0 very dark gray clayey fine sand, moist. Advanced shelby tube with hammer.	
55 56	3 15 21 16	SS-25	24"	36			SC	7.5YR 3/0 very dark gray clayey fine sand, moist.	
57 58 59 60								Soil boring terminated at 56.0 feet below grade.	TD @56.0 feet

OBSERVATION WELL

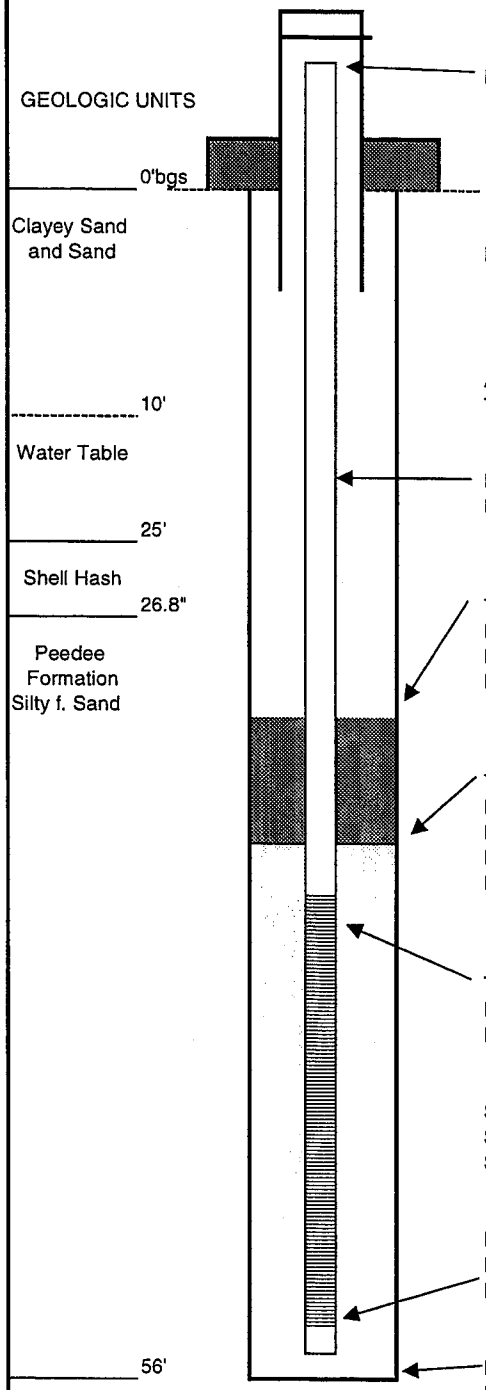
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

OBSERVATION WELL ID: JEP-5D
CONSTRUCTION DATE: 6/27/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION: 54.19 feet AMSL

PAD DIMENSIONS: 3'x3'x6"

GROUND SURFACE ELEVATION: 50.99 feet AMSL

BOREHOLE DIAMETER: 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL: Cement/Bentonite

RISER TYPE: PVC
RISER DIAMETER: 2 inch

TOP OF FILTER PACK SEAL
ELEVATION: 11.0 feet AMSL
DEPTH: 40.0 feet
FILTER PACK SEAL TYPE: Bentonite

TOP OF FILTER PACK
ELEVATION: 9.0 feet AMSL
DEPTH: 42.0 feet
FILTER PACK TYPE: Sand
FILTER PACK SOURCE:

TOP OF SCREEN
ELEVATION: 7.0 feet AMSL
DEPTH: 44.0 feet

SCREEN TYPE: PVC
SCREEN DIAMETER: 2 inch
SLOT SIZE: 0.010 inch

BOTTOM OF SCREEN
ELEVATION: (3.0) feet MSL
DEPTH: 54.0 feet

BOTTOM OF BOREHOLE
ELEVATION: (5.0) feet MSL
DEPTH: 56 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-6
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/25/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/25/01	NORTHING:	218435.3422
DRILLER:	Tony	GROUND ELEV.:	49.45 feet AMSL	EASTING:	2248082.603
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	26.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1, 2	-	-	-	-			SC	Not Sampled. Augered to 2.0 feet below grade. Brown sand, moist.	Sand
3, 4	1 1 2 3	SS-1	18"	3			SP	7.5 YR 6/6 Reddish-yellow medium to fine sand with trace of clay, moist	
5, 6	4 6 7 6	SS-2	24"	13			SP	7.5 YR 6/8 Reddish-yellow, medium to fine sand with trace of clay. Well graded white sand in tip of spoon	
7, 8	2 5 6 7	SS-3	18"	11			SP /SW	7.5 TR 7/3 Pink, medium grained, well sorted sand, moist	
9, 10	4 7 6 8	SS-4	18"	13			SP /SW	Thinly bedded 7.5 YR 7/3, Pink with 7.5 YR 6/8 Reddish-yellow interbeds of medium sand	
11, 12	3 4 4 7	SS-5	18"	8			SP /SW	Thinly bedded 7.5 YR 7/3, Pink with 7.5 YR 6/8 Reddish-yellow interbeds of medium sand grading coarser	
13, 14	2 5 5 5	SS-6	19"	10			SP /SW	Thinly bedded 7.5 YR 7/3, Pink with 7.5 YR 6/8 Reddish-yellow interbeds of medium sand grading coarser	
15	3 4	SS-7	22"	7			SP /SW	Thinly bedded 7.5 YR 7/3, Pink with 7.5 YR 6/8 Reddish-yellow interbeds of medium sand grading coarser	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-6
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/25/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/25/01	NORTHING:	218435.3422
DRILLER:	Tony	GROUND ELEV.:	49.45 feet AMSL	EASTING:	2248082.603
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	26.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	3 3	SS-7	22"	7			SP /SW	Encountered water table at 15.75	Sand
17	2 1	SS-8	24"	1			SW	7.5 YR 5/8, light gray, coarse sand	
							SC	7.5 YR 5/8, strong brown, clayey fine sand	Clayey fine sand
18	WH WH								
19	WH WH 1	SS-9	24"	1			SC	7.5 YR 5/8, strong brown, clayey fine sand	
20	WH						SM	7.5 YR 2/0, black, silty fine sand	Slity fine sand
21	WH WH WH	SS-10	17"	WH			SM /SW	7.5 YR 2/0, black, silty fine sand grading to clayey fine sand	
22	1							white marl layer l" thick at 22' with bivalve shell fragments	Clayey fine sand
23	2 2	SS-11	24"	9			GC	7.5 YR, 5/0 gray shell hash with sand and trace clay	Clayey shell hash
24	7 5						SC	10 YR 3/1, very dark gray clayey silt	Peedee Formation Clayey sand
25	4 37	SS-12	19"	61			SC	10 YR 3/1, very dark gray clayey silt	
26	24 24								
27								Boring terminated at 26.0 feet below grade.	TD@26.0 feet
28									
29									
30									

s:\jei-templates\jei boring log

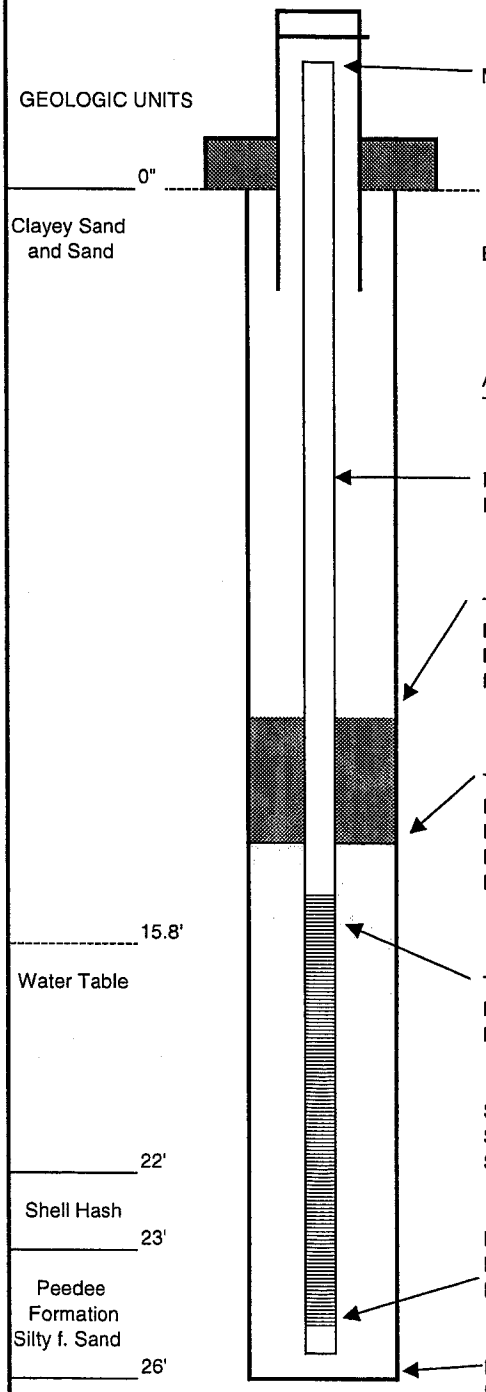
OBSERVATION WELL CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

OBSERVATION WELL ID: JEP-6
CONSTRUCTION DATE: 6/25/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 52.45 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 49.45 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 39.0 feet AMSL
DEPTH 10.5 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 35.6 feet AMSL
DEPTH 13.9 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 33.5 feet AMSL
DEPTH 16 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inch
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 23.5 feet AMSL
DEPTH 26 feet

BOTTOM OF BOREHOLE
ELEVATION 23.5 feet AMSL
DEPTH 26 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-7
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/26/01	NORTHING:	218891.3675
DRILLER:	Tony	GROUND ELEV.:	45.67 feet AMSL	EASTING:	2247334.819
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
1 2	-	-	-	-			-	Not Sampled. Augered to 2.0 feet below grade.	Clayey Sand
3 4	1 2 2 3	SS-1	20"	4			SC	7.5YR 5/4 brown clayey sand, moist. grades to :	
5 6	4 4 5 7	SS-2	19"	9			SW	7.5YR 7/6 reddish-yellow well sorted medium sand.	Sand
7 8	3 4 6 6	SS-3	19"	10			SW	7.5YR 8/2 pinkish-white well sorted sand. grades to:	
9 10	2 4 5 7	SS-4	20"	9			SP	7.5YR 6/6 reddish-yellow coarse sand with trace of clay. Saturated.	Water Table
11 12	3 4 5 5	SS-5	22"	9			SP	7.5YR 6/6 reddish-yellow coarse sand with trace of clay.	
13 14	4 6 4 4	SS-6	24"	10			SP	7.5YR 6/6 reddish-yellow coarse sand with trace of clay. 7.5YR 8/0 white coarse sand with trace of clay and small pebbles.	
15	1 0.5	SS-7	18"	1			SP	Grades to a 5YR 5/8 yellowish-red medium sand with trace of clay.	

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-7
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/26/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/26/01	NORTHING:	218891.3675
DRILLER:	Tony	GROUND ELEV.:	45.67 feet AMSL	EASTING:	2247334.819
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
	0.5	SS-7	18"	1			SP	5YR 5/8 yellowish-red medium sand with trace of clay.	Sand
16	2							Tip of spoon has a gray shell hash in it.	
	3	SS-8	20"	8			GC	7.5YR 4/0 dark gray clayey sand shell hash.	Shell Hash
17	4								
	4								
18	3								
	3	SS-9	16"	5			GC	7.5YR 4/0 dark gray clayey sand shell hash.	
19	3								
	2								
20	2						SM	5Y 2.5/1 black silty fine sand.	
	2	SS-10	22"	11			SM	5Y2.5/1 black silty fine sand.	Silty Sand (Peedee Form.)
21	3								
	8								
22	10						SC	Grades to a 5Y2.5/1 black clayey fine sand.	Clayey Sand (Peedee Form.)
	3	SS-11	24"	16			SC	5Y2.5/1 black clayey fine sand.	
23	8								
	8								
24	35							Color grades to 7.5YR 3/0 very dark gray.	
								Soil boring terminated at 24.0 feet below grade.	TD @ 24.0 feet
25									
26									
27									
28									
29									
30									

OBSERVATION WELL

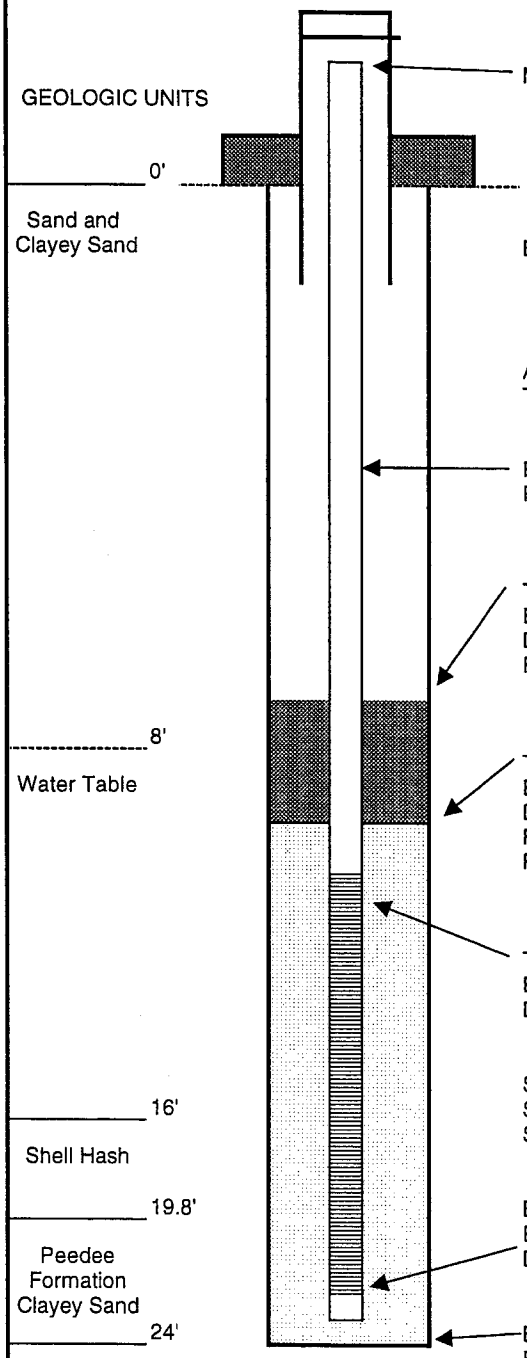
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Caarolina

OBSERVATION WELL ID: JEP-7
CONSTRUCTION DATE: 6/26/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 49.17 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 45.67 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 39.1 feet AMSL
DEPTH 6.6 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 37.4 feet AMSL
DEPTH 8.3 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 36.4 feet AMSL
DEPTH 9.3 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inch
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 26.4 feet AMSL
DEPTH 19.3 feet

BOTTOM OF BOREHOLE
ELEVATION 21.7 feet AMSL
DEPTH 24 feet

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-8
LOCATION:	Riegelwood, North Carolina			SHEET:	1 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/28/01	NORTHING:	219391.823
DRILLER:	Tony	GROUND ELEV.:	39.51 feet AMSL	EASTING:	2246964.524
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
	-	-	-	-			-	Not Sampled. Augered to 2.0 feet below grade.	Sand
1									
2									
	1	SS-1	20"	3			SW	7.5 YR 8/4, pink medium sand, well sorted, clean moist	
3	1								
	2								
4	3								
	2	SS-2	19"	5			SW	7.5 YR 8/3, pink medium to coarse sand tip of spoon is saturated	
5	2								
	3								
6	3							water table @ 6'	Water Table
	1	SS-3	22"	5			SW	7.5 YR 7/4, pink coarse sand with trace clay and 1-2 cm thick seams of clayey sand	
7	2								
	3								
8	5								
	2	SS-4	18"				SP	7.5 YR 5/4, brown coarse sand with trace clay Saturated.	
9	2								
	3								
10	4								
	1	SS-5	23"				SP	7.5 YR 5/4, brown changing to 8/2 pinkish white coarse sand with trace clay	
11	1								
	WH						SC	5/8 strong brown clayey medium grained sand grading to black clayey sand	Clayey sand
12	WH								
	1	SS-6	6"				GC	sand	
13	WH								
	WH						GC	with bottom six inches 7.5 YR 6/2, pinkish gray shell hash	Shell Hash
14	WH								
	4	SS-7	22"	13			SC	7.5 YR 2/0, clayey fine sand	Clayey Sand (Peedee Form.)
15	5								

SOIL BORING LOG

JOYCE ENGINEERING, INC.

PROJECT:	International Paper - 478.04.01			BORING NO.:	JEP-8
LOCATION:	Riegelwood, North Carolina			SHEET:	2 of 2
BORING TYPE:	4 1/4 inch ID Hollowstem Auger	DATE STARTED:	6/28/01	COORDINATES:	NC State Plane
DRILLING FIRM:	Graham and Currie Well Drilling	DATE FINISHED:	6/28/01	NORTHING:	219391.823
DRILLER:	Tony	GROUND ELEV.:	39.51 feet AMSL	EASTING:	2246964.524
DRILL RIG:	CME - 850	LOGGED BY:	MGW	TOTAL DEPTH:	24.0 feet

DEPTH (FT)	BLOWS / 6"	SAMPLE NO. AND TYPE	RECOVERY	N-VALUE	LEL (%)		CLASSIF-ICATION	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	GEOLOGIC UNIT
16	8 8	SS-7	22"	13			SC	7.5 YR 2/0, clayey fine sand	Clayey Sand (Peedee Form.)
17 18	3 1 2 5	SS-8	20"	3			SC	7.5 YR 2/0 black clayey fine sand	
19 20	3 4 5 7	SS-9	24"	9			SC	7.5 YR 2/0 black clayey fine sand	
21 22 23 24 25 26 27 28 29 30								Soil Boring terminated at 20 feet below grade.	

OBSERVATION WELL

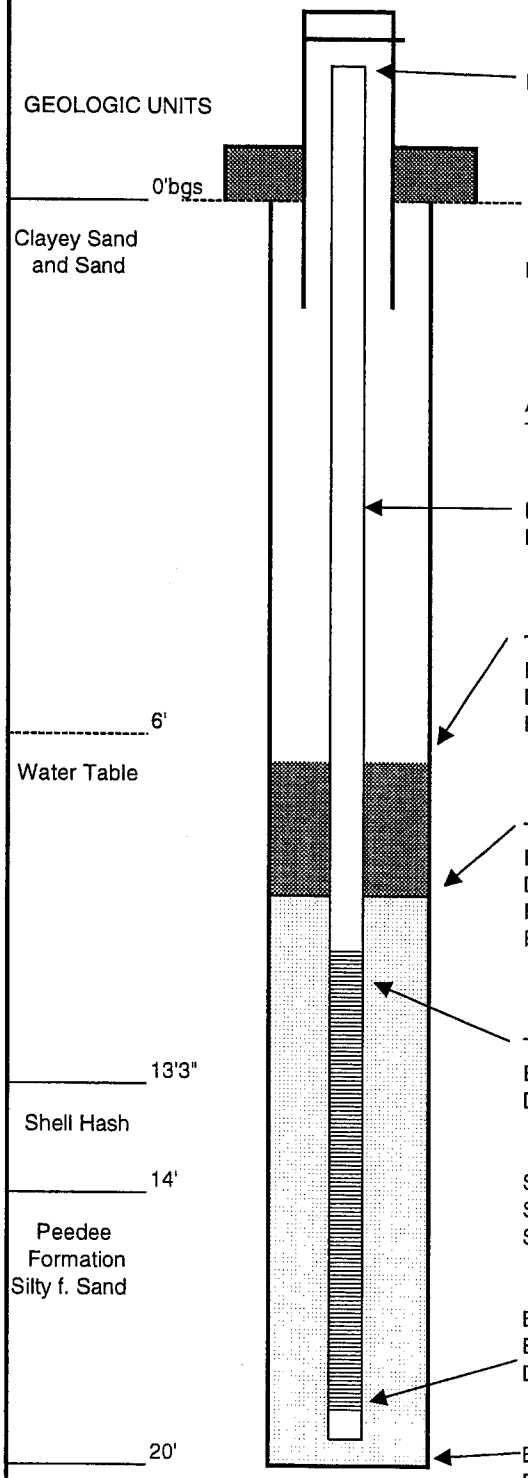
CONSTRUCTION LOG

JOYCE ENGINEERING, INC.

PROJECT: International Paper - 478.04.01
LOCATION: Rieglewood, North Carolina

MONITORING WELL ID: JEP-8
CONSTRUCTION DATE: 6/28/01

STAND PIPE CONSTRUCTION



MEASURING POINT ELEVATION 42.48 feet AMSL

PAD DIMENSIONS 3'x3'x6"

GROUND SURFACE ELEVATION 39.51 feet AMSL

BOREHOLE DIAMETER 8.25 inches

ANNULAR SPACE SEAL
TYPE OF SEAL Cement/Bentonite

RISER TYPE PVC
RISER DIAMETER 2 inch

TOP OF FILTER PACK SEAL
ELEVATION 37.5 feet AMSL
DEPTH 2 feet
FILTER PACK SEAL TYPE Bentonite

TOP OF FILTER PACK
ELEVATION 35.5 feet AMSL
DEPTH 4 feet
FILTER PACK TYPE Sand
FILTER PACK SOURCE

TOP OF SCREEN
ELEVATION 33.5 feet AMSL
DEPTH 6 feet

SCREEN TYPE PVC
SCREEN DIAMETER 2 inch
SLOT SIZE 0.010 inch

BOTTOM OF SCREEN
ELEVATION 23.5 feet AMSL
DEPTH 16 feet

BOTTOM OF BOREHOLE
ELEVATION 19.5 feet AMSL
DEPTH 20 feet

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-1
PAGE 1
ELEVATION
DATE 1/5/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
		3			(SW) Tan and gray medium organic sand. Moist.
		4			
		3			
		2			
		3			(SW) Tan to light gray medium-fine sand. Moist.
		4			
		2			
		3			
		5			(SW) Tan to gray medium-fine sand. Moist.
5.0		8			
		8			
		5			
		6			(SW) Tan to light gray medium-fine sand. Moist.
		8			
		5			
		6			
		2			(SW) Tan to light gray medium-fine sand. Moist.
		10			
		10			
10.0		12			
		7			(SW) Tan to light gray medium-fine sand. Very moist.
		5			
		5			
		7			
		6			(SW) Tan to gray medium sand. Wet at 13'.
		5			
		3			
		3			
		5			(SW) Tan to gray medium sand. Saturated. Terminated boring at 15'.
15.0		7			
20.0					

PZ-1

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent _____ GW-1 Ent _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS
JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD (City or Town) NC (State) 28456 (Zip Code)

3. DATE DRILLED 1/5/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 15'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 17.37 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 17.37'
11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	10		2"	SCH 40	PVC

13. GROUT:

	Depth From	To	Ft.	Material	Method
	GS	6		PORTLAND	POUR
	6	8		BENTONITE	POUR

14. SCREEN:

	Depth From	To	Ft	Diameter	in.	Slot Size	in.	Material
	10	15		2"		0.01		PVC

15. SAND/GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	8	15		MED	SAND

16. REMARKS:

DEPTH From	To	DRILLING LOG Formation Description
0	2	SW
2	4	SW
4	6	SW
6	8	SW
8	10	SW
10	12	SW
12	15	SW

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to owner

GW-1 REV. 9/91

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-2
PAGE 1
ELEVATION
DATE 1/5/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(SP-SM) Dark brown organic sandy topsoil.
					(SW) Gray mottled with orange medium-fine sand. Moist.
		2			
		3			
		3			
5.0		3			
		5			(SW) Light gray medium-fine sand. Moist.
		7			
		8			
10.0		8			
					(SW) 13'-14.5' light gray medium-fine sand. Moist. From 14.5'-15' orange medium sand. Moist
		4			
		4			
		3			
15.0		4			
		1			(SP-SM) Orange poorly sorted silty sand. Wet. Terminated boring at 18'.
		1			
		1			
20.0		1			

EARTH TECH
A TYCO INTERNATIONAL LTD. COMPANY

PZ-2

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO: _____
Lat. _____ Long. _____ RO: _____
Minor Basin _____
Basin Code: _____
Header Ent: _____ GW-1 Ent: _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS
JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD (City or Town) NC (State) 28456 (Zip Code)

3. DATE DRILLED 1/5/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 18'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 19.91 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 19.91

DEPTH From	To	DRILLING LOG Formation Description
0	2	SP - SM
3	5	SW
8	10	SW
13	15	SW
18	20	SP - SM

If additional space is needed use back of form

11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	13		2"	SCH 40	PVC

13. GROUT:

	Depth From	To	Ft.	Material	Method
	GS	9		PORTLAND	POUR
	9	11		BENTONITE	POUR

14. SCREEN:

	Depth From	To	Ft	Diameter	in.	Slot Size	in.	Material
	13	18		2"		0.01		PVC

15. SAND/GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	11	18		MED	SAND

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
SEE MAP

16. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Environmental Management and copy to well owner

GW-1 REV. 9/91

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-3
PAGE 1
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(SP) Gray poorly sorted medium and coarse sand. Wet at 4'.
		3			
		3			
		3			
5.0		3			
		1			(SP-SC) Gray poorly sorted medium and coarse sand. Little orange clay. Non-cohesive. Wet. Terminated boring at 10'.
		1			
		1			
10.0		1			
15.0					
20.0					

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Division of Environmental Management - Groundwater Section
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QUAD. NO. _____ SERIAL NO: _____
Lat _____ Long. _____ RO: _____
Minor Basin _____
Basin Code: _____
Header Ent: _____ GW-1 Ent: _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: RIEGELWOOD County: COLUMBUS
   JOHN L. RIEGEL ROAD
   (Road, Community, or Subdivision and Lot No.)
2. OWNER INTERNATIONAL PAPER
   ADDRESS JOHN L. RIEGEL ROAD
   (Street or Route No.)
   RIEGELWOOD (City or Town) NC (State) 28456 (Zip Code)
3. DATE DRILLED 1/6/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 10'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 3.96 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 3.96
11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	5		2"	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	GS	2		PORTLAND	POUR
	2	3		BENTONITE	POUR

14. SCREEN:

	Depth From	Depth To	Ft	Diameter	in.	Slot Size	in.	Material
	5	10		2"		0.01		PVC

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	3	10		MED	SAND

16. REMARKS:

Depth From	Depth To	Drilling Log Formation Description
3	5	SP
8	10	SP-SC

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-4s
PAGE 1
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(SP) Dark gray poorly sorted sandy topsoil. Moist.
					(SW) Tan to orange well sorted medium-fine sand. Trace of orange clay. Non-cohesive. Moist.
		2			
		3			
		4			
5.0		3			
					(SP) From 8'-9.5 tan, poorly sorted medium-coarse sand. Wet. From 9.5'-10' (CH) greenish gray fat clay with sand. Pee Dee formation. Terminated boring at 14'.
		2			
		3			
		2			
10.0		1			
15.0					
20.0					

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PZ - 4s

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QUAD. NO. _____ SERIAL NO: _____
Lat. _____ Long. _____ RO: _____
Minor Basin _____
Basin Code _____
Header Ent _____ GW-1 Ent _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS
JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD NC 28456
City or Town State Zip Code

3. DATE DRILLED 1/16/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 14'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 7.84 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 7.84

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	2	SP
3	5	SW
8	10	SP-CH

If additional space is needed use back of form

11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	9		2"	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	GS	5		PORTLAND	POUR
	5	7		BENTONITE	POUR

14. SCREEN:

	Depth From	Depth To	Ft	Diameter	in.	Slot Size	in.	Material
	9	14		2"		0.01		PVC

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	7	14		MED	SAND

16. REMARKS:

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
SEE MAP

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Environmental Management and copy to well owner

GW-1 REV. 9/91

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-4d
PAGE 1
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(SP) Dark gray poorly sorted sandy topsoil. Moist.
					(SW) Tan to orange well sorted medium-fine sand. Trace of orange clay. Non-cohesive. Moist.
		2			
		3			
		4			
5.0		3			
		2			(SP) From 8'-9.5 tan, poorly sorted medium-coarse sand. Wet. From 9.5'-10' (CH) greenish gray fat clay with sand. Pee Dee formation.
		3			
		2			
10.0		1			
15.0					
20.0					

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TEST BORING REPORT

PROJECT LANDFILL SITE
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PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ - 4d
PAGE 2
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
		3			(CH) Pee Dee formation to 40'.
		5			
		6			
		11			
		4			
		4			
		7			
		12			
		2			
25.		2			
		4			
		9			
		11			
		7			
		6			
		7			
		2			
		3			
		5			
30.0		8			
		4			
		6			
		9			
		15			
		4			
		5			
		6			
		10			
		2			
35.0		2			
		6			
		8			
		2			
		3			
		6			
		10			
		7			
		11			
		15			
40.0		17			

TEST BORING REPORT

OJECT LANDFILL SITE
NT INTERNATIONAL PAPER
ECT NUMBER 33004.10200
ONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ - 4d
PAGE 3
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(CH) Pee Dee formation.
		3			
		4			
		7			
45		11			
		5			
		7			
		9			
50		15			
55					
60					

EARTH TECH
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PZ - 4d

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QUAD. NO. _____ SERIAL NO: _____
Lat. _____ Long. _____ RO: _____
Minor Basin _____
Basin Code _____
Header Ent _____ GW-1 Ent _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS

JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD NC 28456
City or Town State Zip Code

3. DATE DRILLED 1/6/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 50'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 8.52 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 8.52
11. CHLORINATION: Type NA Amount NA

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See boring log		

If additional space is needed use back of form

12. CASING:

From	To	Diameter	Wall Thickness or Weight/Ft.	Material
+2.5	45	2"	SCH 40	PVC

13. GROUT:

From	To	Material	Method
GS	41	PORTLAND	POUR
41	43	BENTONITE	POUR

14. SCREEN:

From	To	Diameter	Slot Size	Material
45	50	2"	0.01	PVC

15. SAND/GRAVEL PACK:

From	To	Size	Material
43	50	MED	SAND

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

16. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 REV. 9/91

Submit original to Division of Environmental Management and copy to well owner

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-5
PAGE 1
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(SP) Light gray to white poorly sorted sandy topsoil. Moist.
					(CH) Tan fat clay with sand. Stiff, cohesive. Moist.
		3			
		4			
		6			
5.0		11			
		2			(SW) Light gray well sorted medium-fine sand. Thin layers (<.5") of coarser sand. Moist.
		3			
		3			
10.0		4			
					(CH) Greenish gray fat clay with sand. Pee Dee formation. Moist, somewhat cohesive. Few shells.
		2			
		3			
		5			
15.0		7			
		3			(CH) Greenish gray fat clay with sand. Peedee formation. Moist, somewhat cohesive.
		4			
		8			
20.0		40			

EARTH TECH
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Lat. _____ Long. _____ RO. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: RIEGELWOOD County: COLUMBUS
   JOHN L. RIEGEL ROAD
   (Road, Community, or Subdivision and Lot No.)
2. OWNER INTERNATIONAL PAPER
   ADDRESS JOHN L. RIEGEL ROAD
   (Street or Route No.)
   RIEGELWOOD NC 28456
   City or Town State Zip Code
3. DATE DRILLED 1/6/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 18'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 9.73 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
   * Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 9.73
11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	13		2"	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	GS	9		PORTLAND	POUR
	9	11		BENTONITE	POUR

14. SCREEN:

	Depth From	Depth To	Ft	Diameter	in.	Slot Size	in.	Material
	13	18		2"		0.01		PVC

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	11	18		MED	SAND

16. REMARKS:

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	2	SP
3	5	CH
8	10	SW
13	15	CH
18	20	CH

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-6
PAGE 1
ELEVATION
DATE 1/6/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					(SP) Gray poorly sorted sandy topsoil. Moist.
					(SC-CH) Tan and orange clayey sand. Moist. Non-cohesive. Clayey sand approximately 2' thick.
		2			
		3			
		3			
5.0		5			
					(SW) Tan mottled with orange well sorted medium-fine sand. Trace of clay. Wet.
		2			
		3			
		3			
10.0		2			
					(SP) Tan and gray medium and coarse sand. Wet. From 14.5' to 15" (CH-SC) greenish gray fat clay with sand. Pee Dee formation. Terminated boring at 15'.
		1			
		2			
15.0					
20.0					

EARTH TECH
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PZ-6

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Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS

JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD (City or Town) NC (State) 28456 (Zip Code)

3. DATE DRILLED 1/6/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 15'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 12.84 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 12.84

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	2	SP
3	5	SC - CH
8	10	SW
13	15	SP

If additional space is needed use back of form

11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	10		2"	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	GS	6		PORTLAND	POUR
	6	8		BENTONITE	POUR

14. SCREEN:

	Depth From	Depth To	Ft	Diameter	Slot Size	Material
	10	15		2" in.	0.01 in.	PVC
				in.	in.	
				in.	in.	

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	8	15		MED	SAND

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

16. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

GW-1 REV. 9/91

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-12s
PAGE 1
ELEVATION
DATE 1/11/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
		3			(SP) Poorly sorted organic sandy topsoil. From 1.5' to 2' (SC-CH) gray sandy clay.
		2			
		1			
		1			
					Collected shelby tube of sandy clay.
					(SC) Tan and orange clayey sand. Non-cohesive. Moist.
5.0					
		3			
		6			
		9			
		11			
		4			(SP) Tan medium-fine sand.
		4			
		5			
		7			
10.0					
		4			(SW) Light gray well sorted silty sand. Trace limestone. Very moist.
		7			
		7			
		7			
					(SW) Gray and orange medium-coarse sand. Saturated, flowing sand.
15.0					
		5			
		9			
		10			
		10			
		4			(SW) From 18' to 19.5' gray and orange medium-coarse sand. Saturated, flowing sand. From 19.5' to 20' (SP) poorly sorted orange medium sand. Some clay. Wet.
		11			
		8			
		6			
20.0					

PZ - 12s

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO: _____
Lat _____ Long. _____ RO: _____
Minor Basin _____
Basin Code _____
Header Ent _____ GW-1 Ent _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

DRILLER REGISTRATION NUMBER: # 537

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS
JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD (City or Town) NC (State) 28456 (Zip Code)

3. DATE DRILLED 1/11/99 USE OF WELL PIEZOMETER
4. TOTAL DEPTH 18'
5. CUTTINGS COLLECTED YES [ ] NO [X]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 12.34 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 12.34

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	2	SP
5	7	SC
8	10	SP
10	12	SW
15	17	SW
18	20	SW-SP

If additional space is needed use back of form

11. CHLORINATION: Type NA Amount NA
12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	13		2"	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	GS	9		PORTLAND	POUR
	9	11		BENTONITE	POUR

14. SCREEN:

Depth From	Depth To	Ft	Diameter	in.	Slot Size	in.	Material
13	18		2"		0.01		PVC

15. SAND/GRAVEL PACK:

Depth From	Depth To	Ft.	Size	Material
11	18		MED	SAND

16. REMARKS:

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

GW-1 REV. 9/91

TEST BORING REPORT

PROJECT LANDFILL SITE
CLIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ-12d
PAGE 1
ELEVATION
DATE 1/11/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
		3			(SP) Poorly sorted organic sandy topsoil. From 1.5' to 2' (SC-CH) gray sandy clay.
		2			
		1			
		1			
					Collected shelby tube of sandy clay.
					(SC) Tan and orange clayey sand. Non-cohesive. Moist.
5.0					
		3			
		6			
		9			
		11			
		4			(SP) Tan medium-fine sand.
		4			
		5			
		7			
10.0					
		4			(SW) Light gray well sorted silty sand. Trace limestone. Very moist.
		7			
		7			
		7			
					(SW) Gray and orange medium-coarse sand. Saturated, flowing sand.
15.0					
		5			
		9			
		10			
		10			
		4			(SW) From 18' to 19.5' gray and orange medium-coarse sand. Saturated, flowing sand. From 19.5' to 20' (SP) poorly sorted orange medium sand. Some clay. Wet.
		11			
		8			
		6			
20.0					

TEST BORING REPORT

PROJECT LANDFILL SITE
LIENT INTERNATIONAL PAPER
PROJECT NUMBER 33004.10200
CONTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ - 12d
PAGE 2
ELEVATION
DATE 1/11/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
					Heaving sand. Drilled to clay layer at 23.5'
		5			
		7			(CL) Lean green marine clay, many shells. Pee Dee formation wet
		7			
25.		5			
		2			
		5			(CL) Lean green sandy marine clay. Moist
		7			
30.0		5			
35.0					
		3			(CL) Lean green sandy marine clay. Moist.
		5			
		7			
40.0		11			

TEST BORING REPORT

OJECT LANDFILL SITE
'T INTERNATIONAL PAPER
ECT NUMBER 33004.10200
NTRACTOR GRAHAM & CURRIE
EQUIPMENT CME 55

BORING NUMBER PZ - 12d
PAGE 3
ELEVATION
DATE 1/11/99
DRILLER SNOW
PREPARED BY HOLLAND

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
45					
		9			(CL) Dark green,lean sandy marine clay. Moist. Terminated boring
		6			
		8			
50		10			
55					
60					

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO: _____
Lat. _____ Long. _____ RO. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GRAHAM & CURRIE

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

DRILLER REGISTRATION NUMBER: # 537

WELL LOCATION: (Show sketch of the location below)
Nearest Town: RIEGELWOOD County: COLUMBUS

JOHN L. RIEGEL ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER INTERNATIONAL PAPER
ADDRESS JOHN L. RIEGEL ROAD
(Street or Route No.)
RIEGELWOOD NC 28456
City or Town State Zip Code

DATE DRILLED 1/11/99 USE OF WELL PIEZOMETER
7. TOTAL DEPTH 50'
5. CUTTINGS COLLECTED YES [ ] NO [X]
. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
. STATIC WATER LEVEL Below Top of Casing: 13.77 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +-2.5 FT. Above Land Surface*
Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): 13.77

11. CHLORINATION: Type NA Amount NA

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	2	SP
5	7	SC
10	12	SW
15	17	SW
18	20	SW
23	25	CL
28	30	CL
38	40	CL
48	50	CL

If additional space is needed use back of form

12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.5	45		2"	SCH 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	GS	41		PORTLAND	POUR
	41	43		BENTONITE	POUR

14. SCREEN:

	Depth From	Depth To	Ft	Diameter	in.	Slot Size	in.	Material
	45	50		2"		0.01		PVC

15. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	43	50		MED	SAND

16. REMARKS:

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE MAP

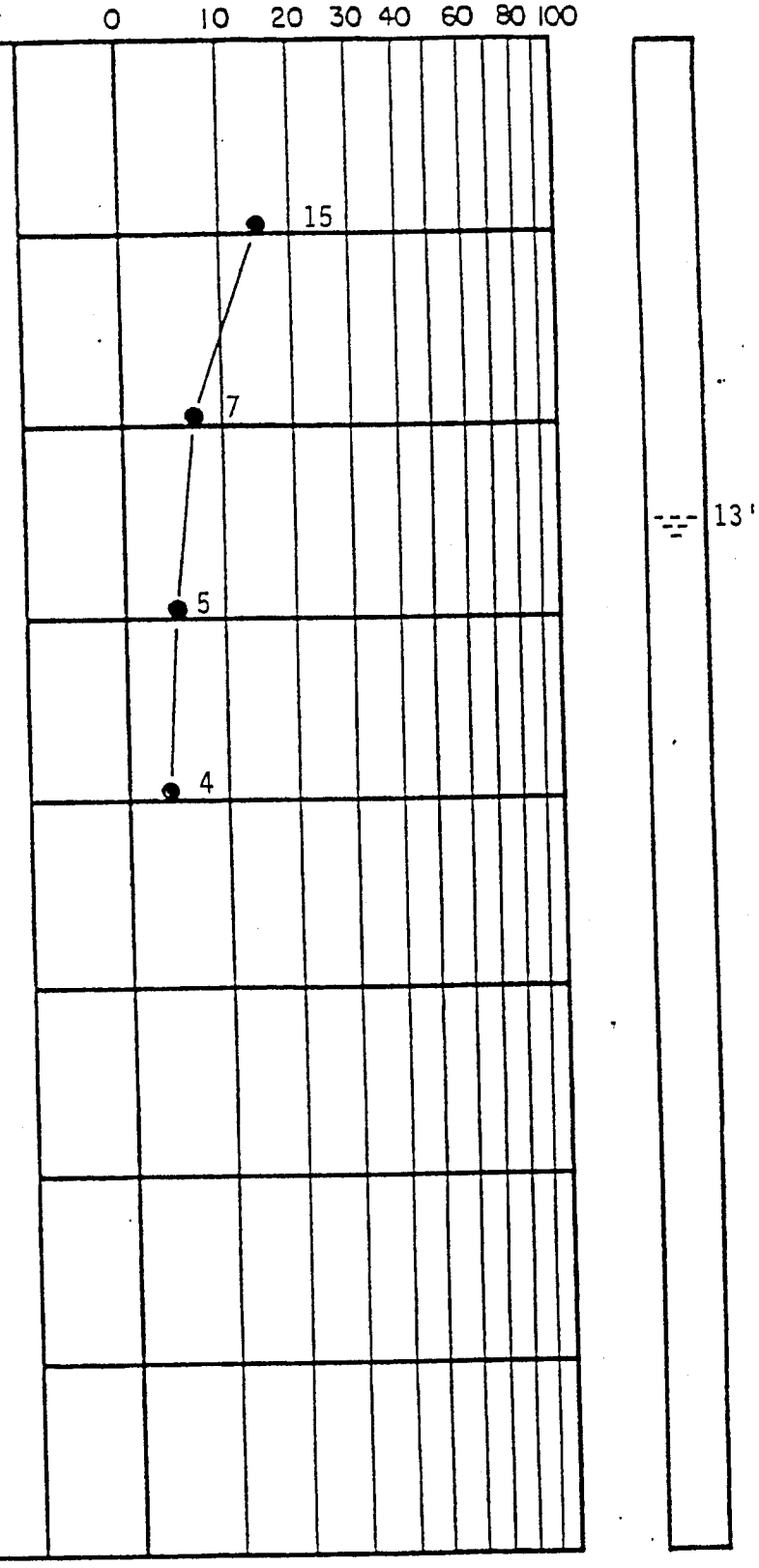
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

DEPTH FT.	DESCRIPTION	ELEV.
0	Medium Dense Orange Clayey Fine to Medium SAND (SC)	
7.0	Loose to Very Loose Tan & Gray Fine to Medium SAND (SP)	
	Boring completed at 23.0'.	

Note: A temporary 2-inch diameter PVC piezometer with a 10-foot long slotted screen was installed from a depth of approximately 13 to 23 feet.



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

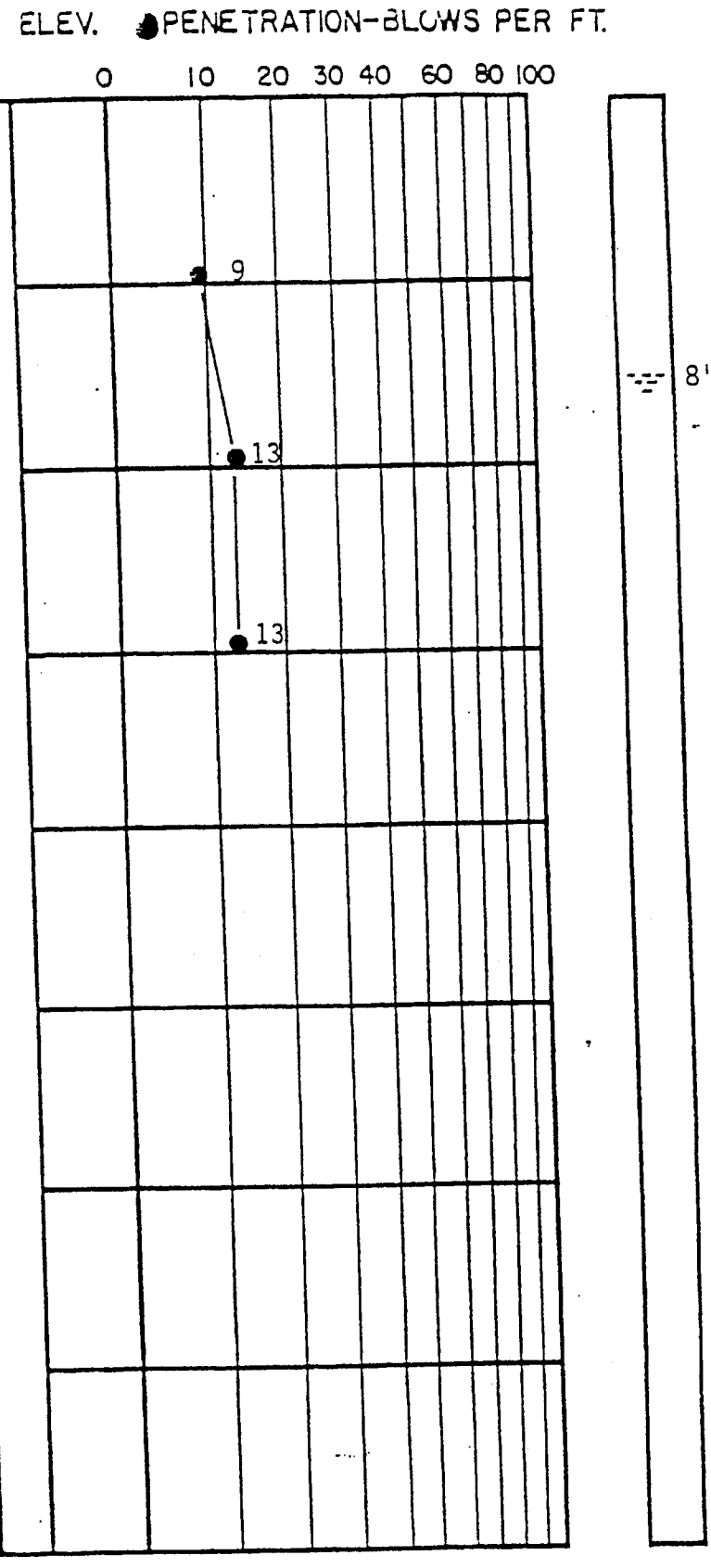
TEST BORING RECORD

BORING NO. MW-1
DATE DRILLED 2-17-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
0.0	Stiff Gray Sandy CLAY (CL)	
7.5	Medium Dense Tan Fine to Medium SAND - Trace of Clay (SP-SC)	
1.0	Medium Dense Tan Fine to Medium Sand with Shell Fragments	
7.5	Boring completed at 17.5'.	

Note: A temporary 2-inch diameter PVC piezometer with a 10-foot long slotted screen was installed from a depth of approximately 7.5 to 17.5 feet.



TEST BORING RECORD

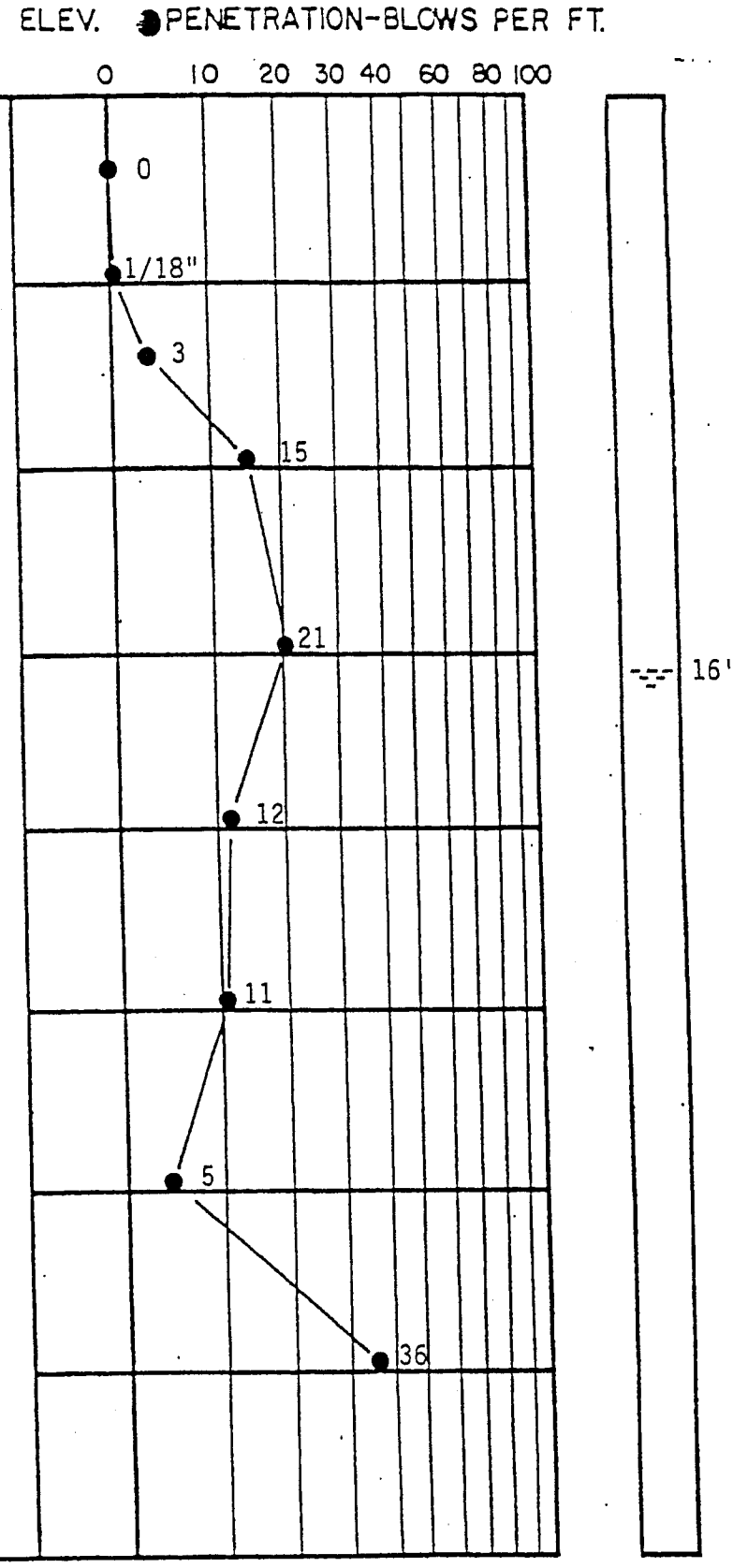
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

BORING NO. MW-2
DATE DRILLED 2-16-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +57 MSL	
0.0	Very Loose Brown Fine SAND - Some Clay (SC)	
6.0	Very Loose Gray Fine to Medium SAND - Trace of Clay (SP-SC)	
8.0	Medium Dense Tan Fine to Medium SAND (SP)	
1.0	Medium Dense Tan Clayey Fine to Medium SAND (SC)	
4.0	Medium Dense Tan Fine to Medium SAND (SP)	
21.0	Medium Dense Gray Shell Fragments - Some Fine Sand	
6.0	Loose to Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
35.0	Boring completed at 35.0'.	



BORING AND SAMPLING MEETS ASTM D-1586
E DRILLING MEETS ASTM D-2113

NETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
◀ LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

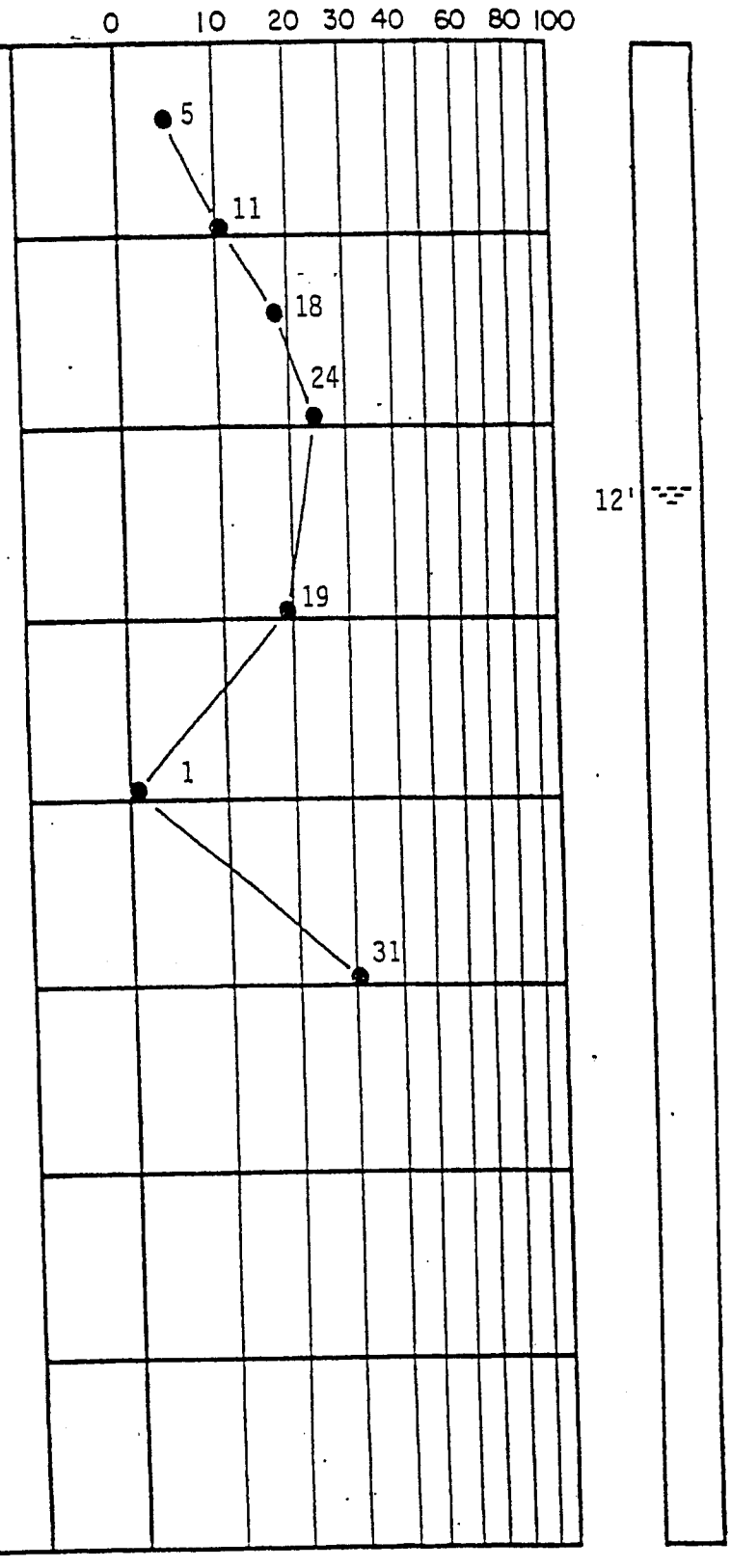
TEST BORING RECORD

BORING NO. B-1
DATE DRILLED 3-8-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION
0.0	Ground Surface Elevation: ~ +55 MSL
	Loose Tan Fine SAND (SP)
	Medium Dense Tan Fine SAND - Some Clay (SC)
6.0	Medium Dense Tan Fine to Medium SAND (SP)
17.0	Very Loose Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)
22.0	Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)
25.0	Boring completed at 25.0'

ELEV. ● PENETRATION-BLOWS PER FT.



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

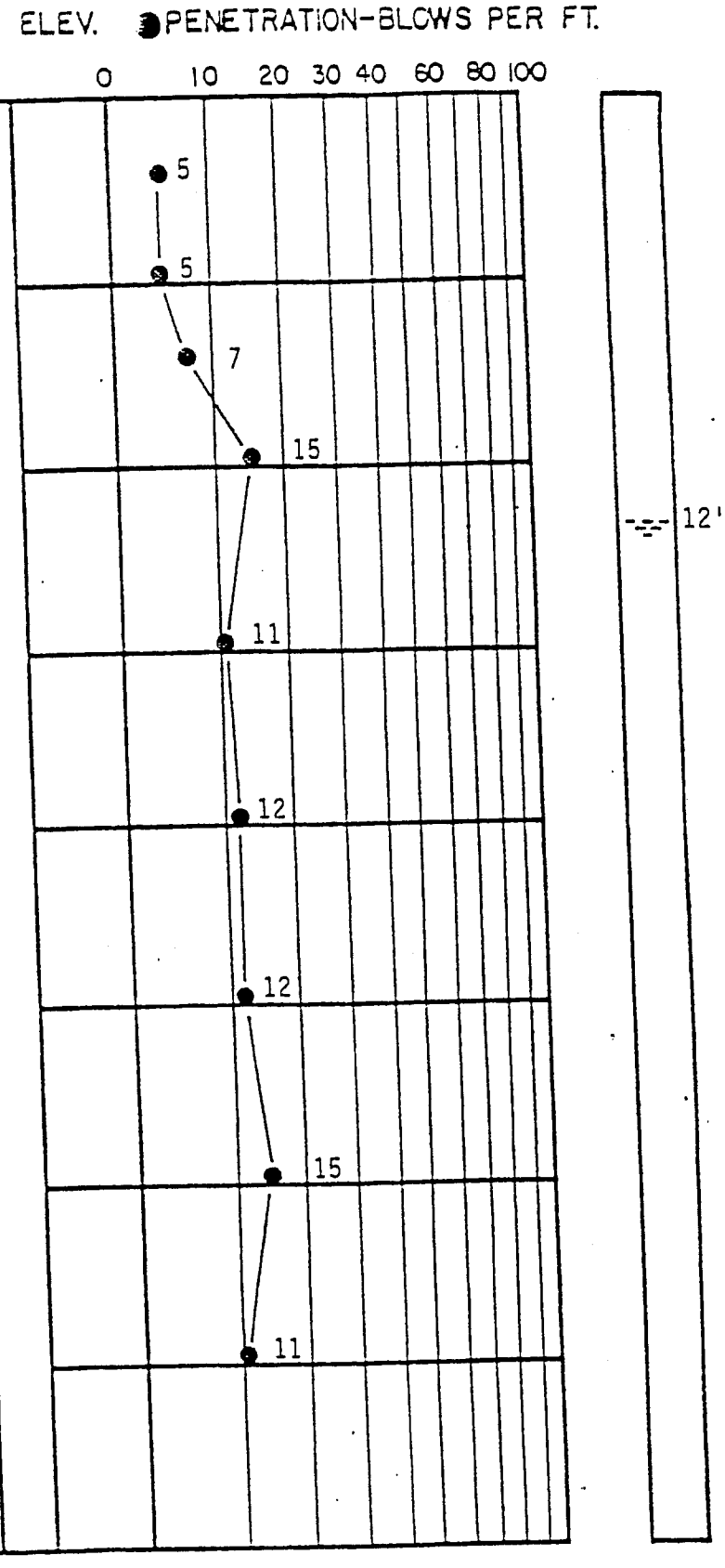
UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
◀ LOSS OF DRILLING WATER
WATER TABLE 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-2
DATE DRILLED 4-8-94
JOB NO. 1063-93-447

S&ME

EPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +45 MSL	
0	Loose Tan Fine to Medium SAND (SP)	
0	Medium Dense Brown & Gray Clayey Fine to Medium SAND (SC)	
0	Medium Dense Tan Fine to Medium SAND (SP)	
1.0	Medium Dense Tan Clayey Fine SAND (SC)	
.0	Medium Dense Tan Fine to Medium SAND (SP)	
5.0	Boring completed at 35.0'.	



BORING AND SAMPLING MEETS ASTM D-1586
'E DRILLING MEETS ASTM D-2113

.ETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

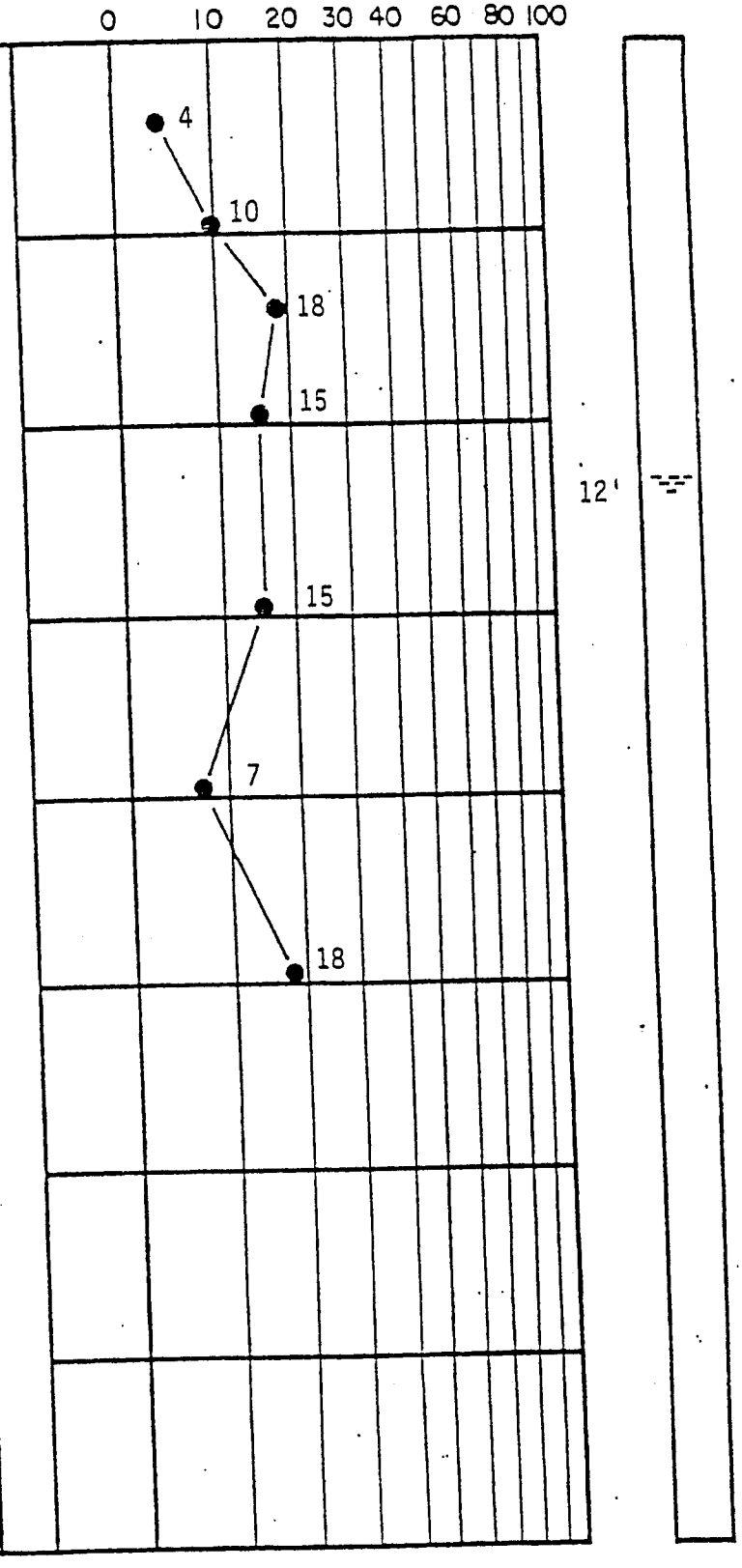
UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-3
DATE DRILLED 3-8-94
JOB NO. 1063-93-447

S&ME

EPTH	DESCRIPTION	ELEV.
0	Ground Surface Elevation: ~ +47 MSL	
	Very Loose Tan Fine to Medium SAND (SP)	
0	Loose to Medium Dense Tan Fine to Medium SAND - Trace of Clay (SP-SC)	
8.0	Medium Dense Tan Fine to Medium SAND (SP)	
.0	Firm Tan & Brown Sandy CLAY (CL)	
24.0	Medium Dense Tan Fine to Medium SAND*	
25.0	Boring completed at 25.0'	
	*(SP)	



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

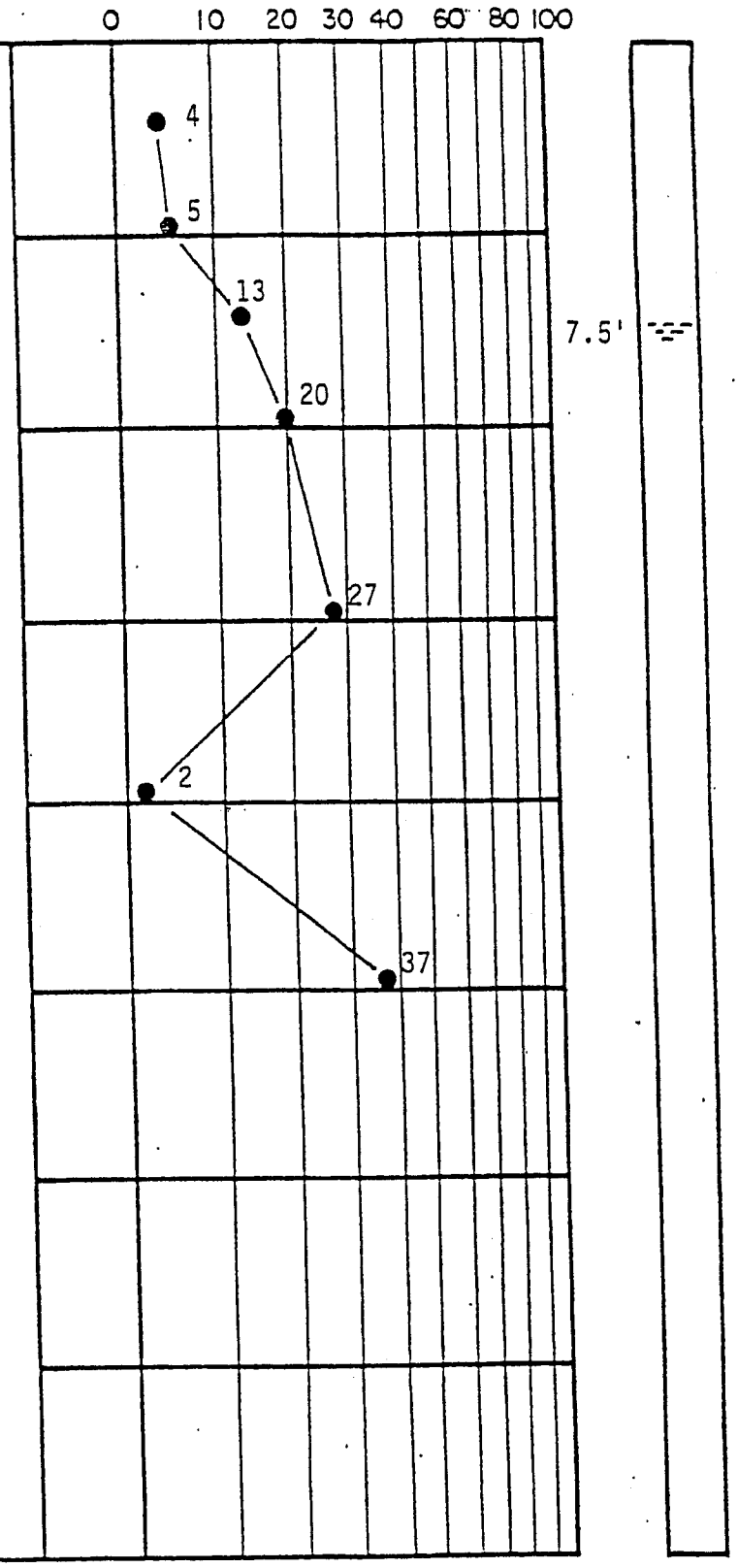
TEST BORING RECORD

BORING NO. B-4
DATE DRILLED 3-12-94
JOB NO. 1063-93-447

S&ME

EPTH FT.	DESCRIPTION	ELEV.
0	Ground Surface Elevation: ~ +52 MSL	
	Very Loose to Loose Tan & Gray Fine to Medium SAND (SP)	
3.0	Medium Dense Tan Clayey Fine to Medium SAND (SC)	
8.0	Medium Dense Brown Fine to Medium SAND (SP)	
10	Very Loose Orange Fine to Medium SAND - Trace of Clay (SP-SC)	
20	Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
25.0	Boring completed at 25.0'	

PENETRATION-BLOWS PER FT.



ORING AND SAMPLING MEETS ASTM D-1586
RE DRILLING MEETS ASTM D-2113

TRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

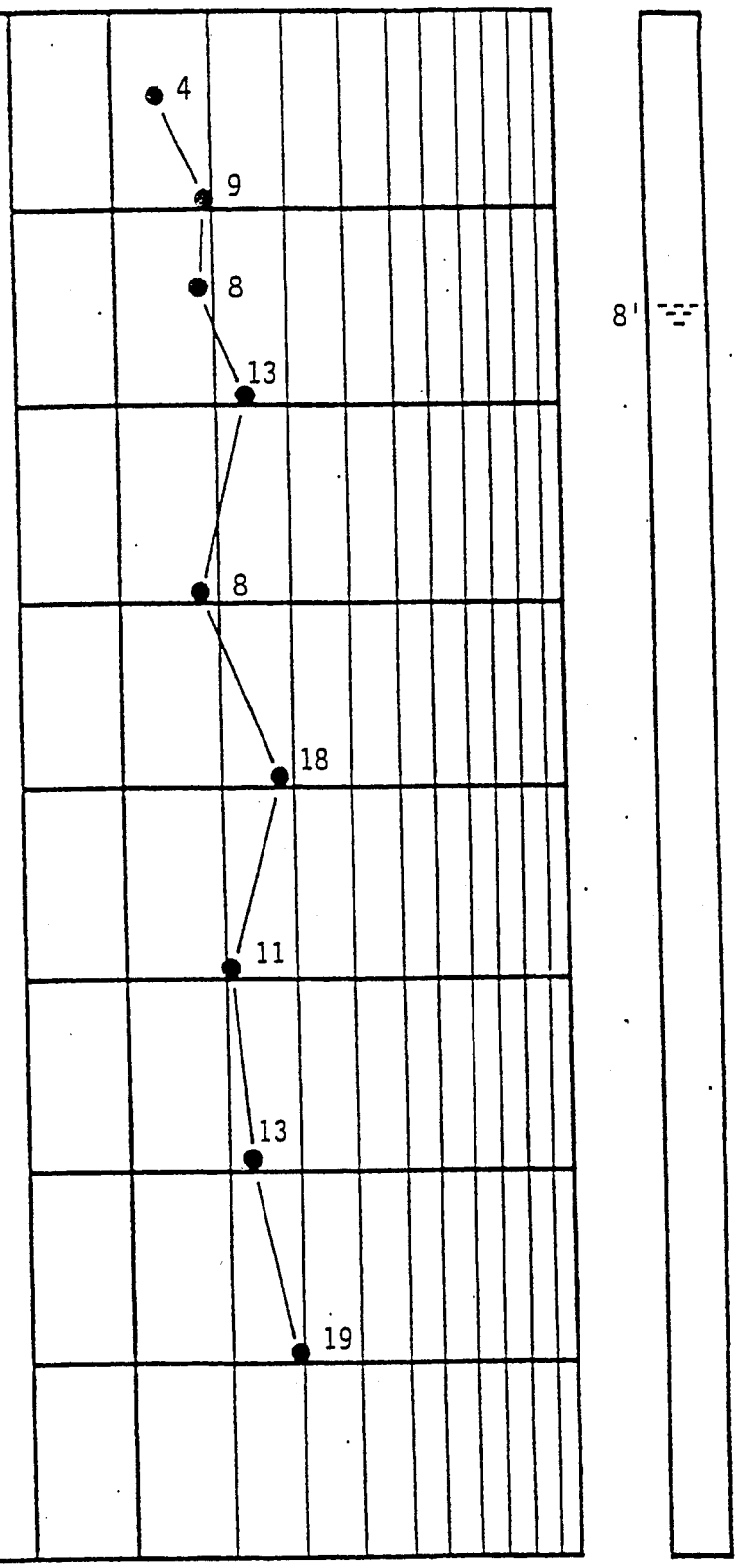
UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24HR.
WATER TABLE-1HR.

TEST BORING RECORD

BORING NO. B-6
DATE DRILLED 3-12-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +49 MSL	
0.0	Very Loose Tan Fine to Medium SAND (SP)	
3.0	Stiff Tan Sandy CLAY (CL)	
5.0	Loose Tan Clayey Fine SAND (SC)	
8.0	Medium Dense to Loose Tan Fine to Medium SAND (SP)	
18.0	PD	
	Medium Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
35.0	Boring completed at 35.0'	



BORING AND SAMPLING MEETS ASTM D-1586
DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

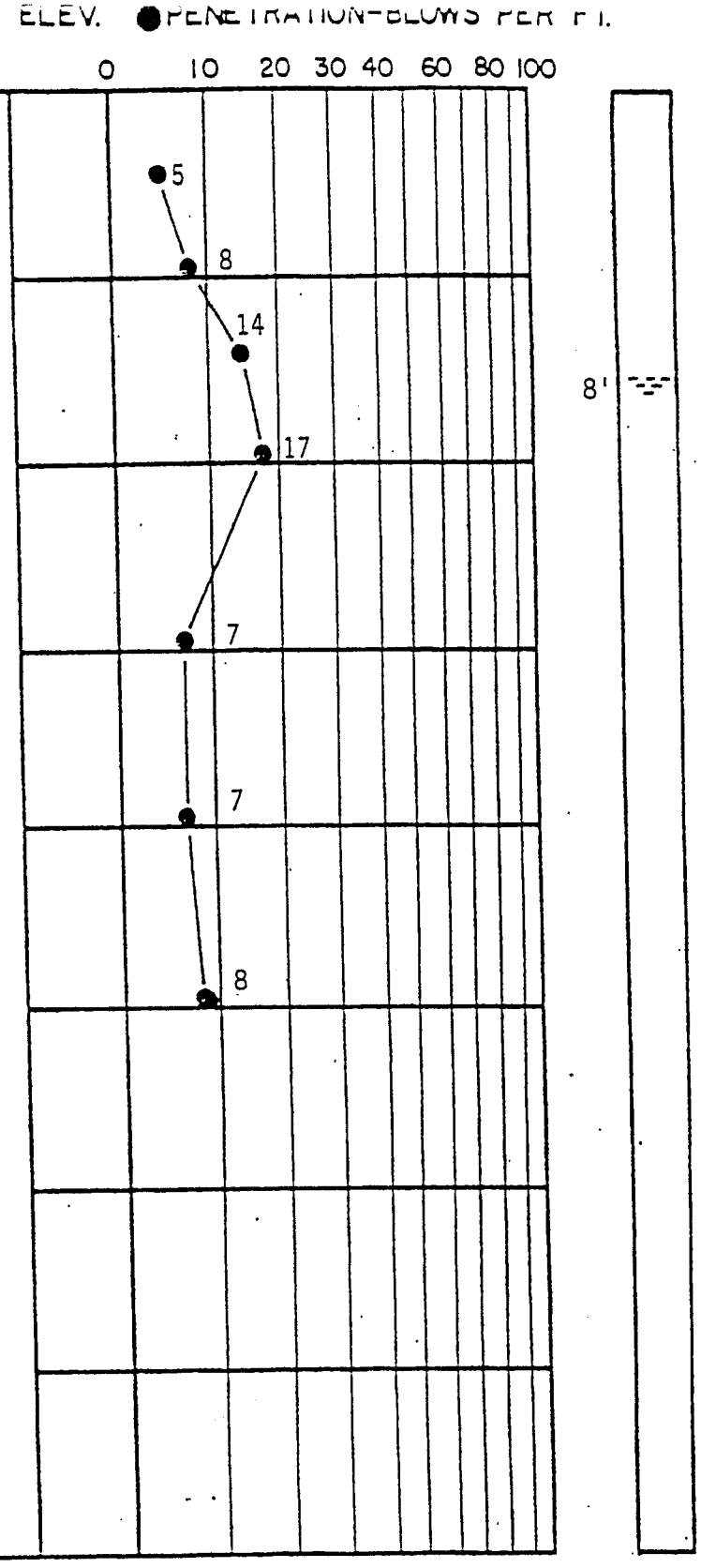
TEST BORING RECORD

BORING NO. B-8
DATE DRILLED 3-12-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
0.0	Ground Surface Elevation: ~ +56 MSL	
	Loose Tan Fine SAND (SP)	
	Loose Brown Fine to Medium SAND - Some Clay (SC)	
6.0	Medium Dense Gray & Tan Fine to Medium SAND (SP)	
12.0	Loose Gray & Tan Clayey Fine to Medium SAND (SC)	
22.0	Loose Gray Shell Fragments & Partially Cemented Sands & Shells	
25.0	Boring completed at 25.0'	

Note: Approximatley 5" of weeds and loamy soil at the ground surface.



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

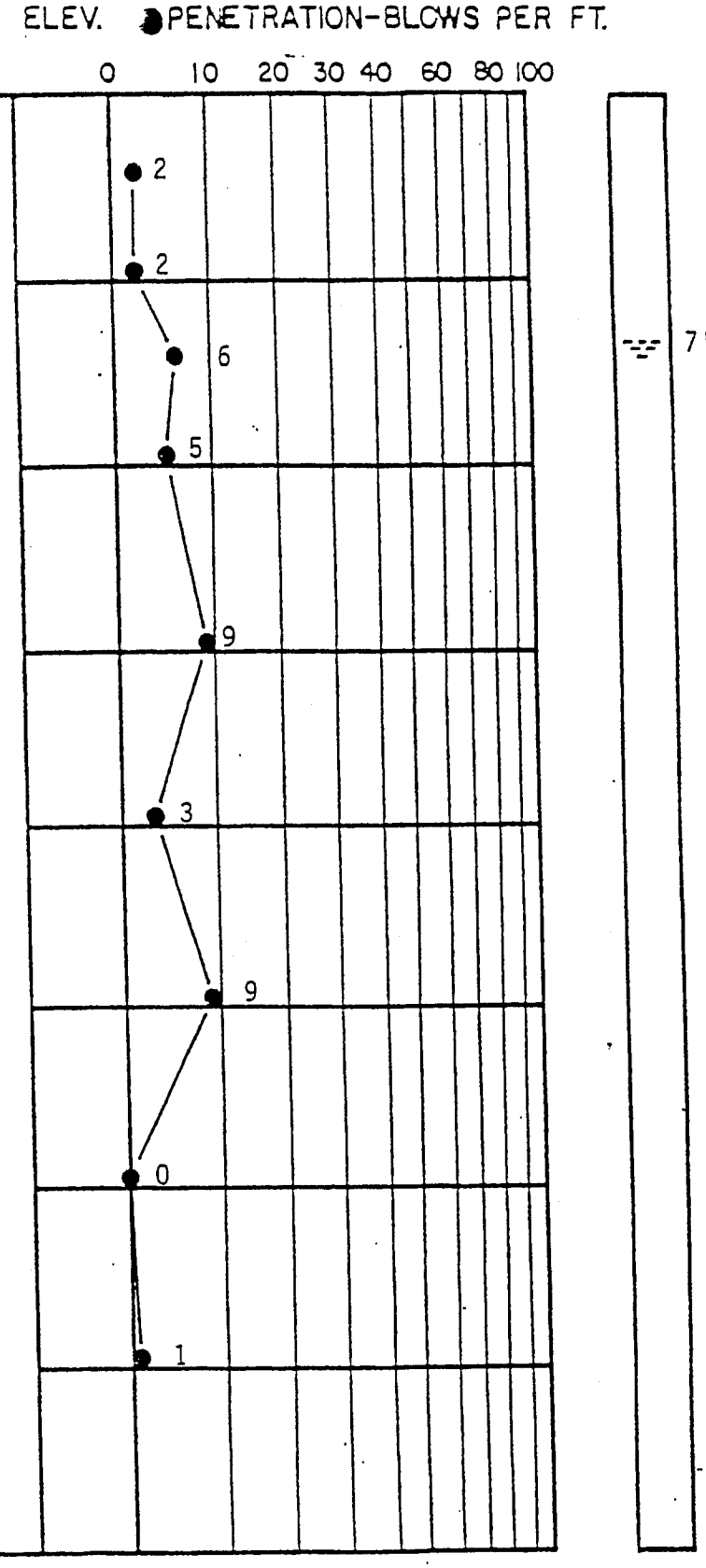
UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-9
DATE DRILLED 4-8-94
JOB NO. 1063-93-447

S&ME

EPTH FT.	DESCRIPTION	ELEV.
0	Ground Surface Elevation: ~ +44 MSL	
	Very Loose Tan Fine to Medium SAND - Some Clay (SC)	
5		
	Loose Brown Fine to Medium SAND (SP)	
0		
	Firm Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
0		
	Loose Gray Fine to Medium SAND (SP)	
.0		
	Very Loose Tan Fine to Medium SAND - Trace of Clay (SP-SC)	
1.0		
	Very Loose Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
.00		
	Tan Clayey Fine Sand and Partially Cemented Sands & Shells	
5.0		
	Boring completed at 35.0'.	



BORING AND SAMPLING MEETS ASTM D-1586
'E DRILLING MEETS ASTM D-2113
TRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER
ALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

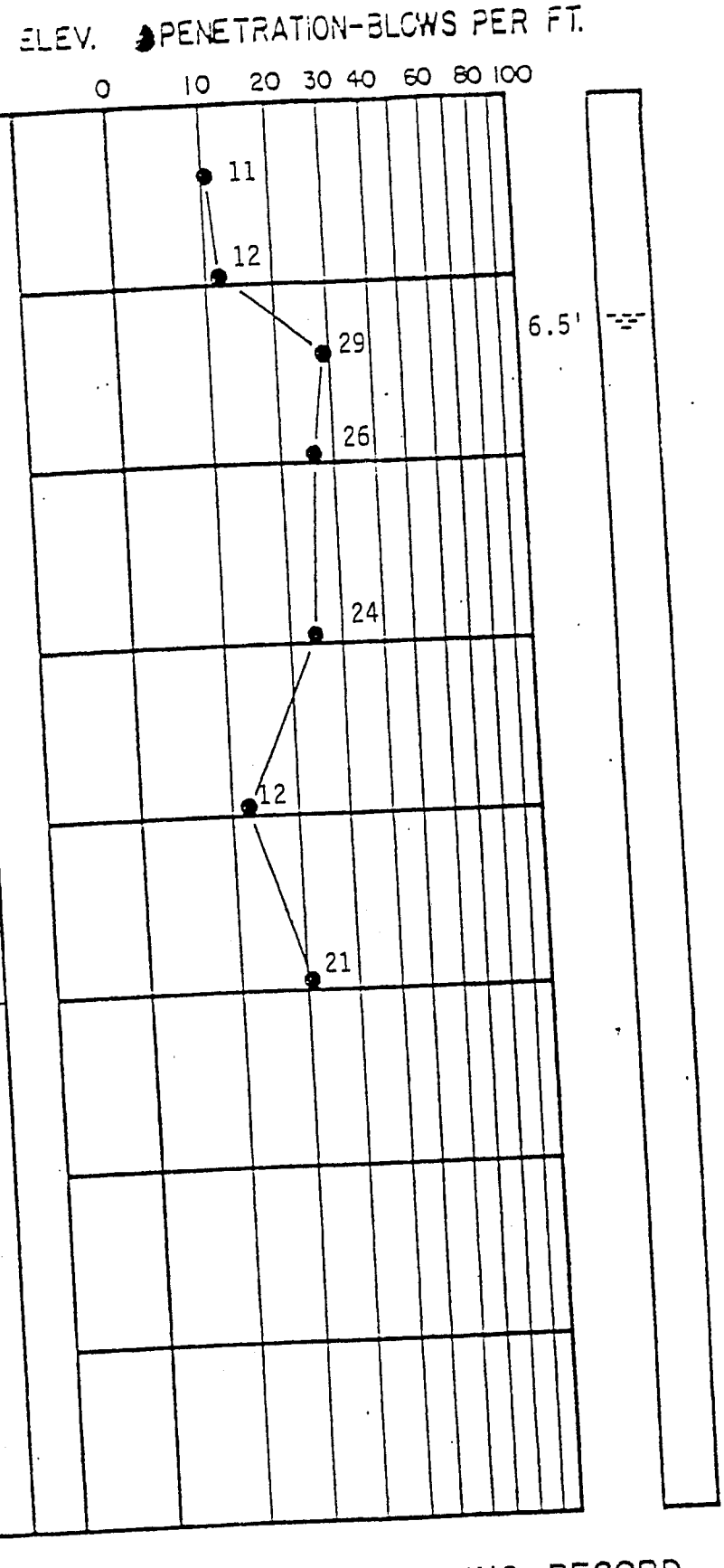
UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-12
DATE DRILLED 3-8-94
JOB NO. 1063-93-447

S&ME

EPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +57 MSL	
0.5	*	
	Stiff Brown & Orange Sandy CLAY to Clayey Fine SAND (CL/SC)	
5	Medium Dense Tan & Orange Fine to Medium SAND - Trace of Clay (SP-SC)	
10	Medium Dense Tan Fine to Medium SAND (SP)	
20	Medium Dense Dark Gray Shell Fragments -- Some Fine Sand	
25.0	Boring completed at 25.0'	
	*Topsoil	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
'E DRILLING MEETS ASTM D-2113

ETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

WATER TABLE- 24 HR.

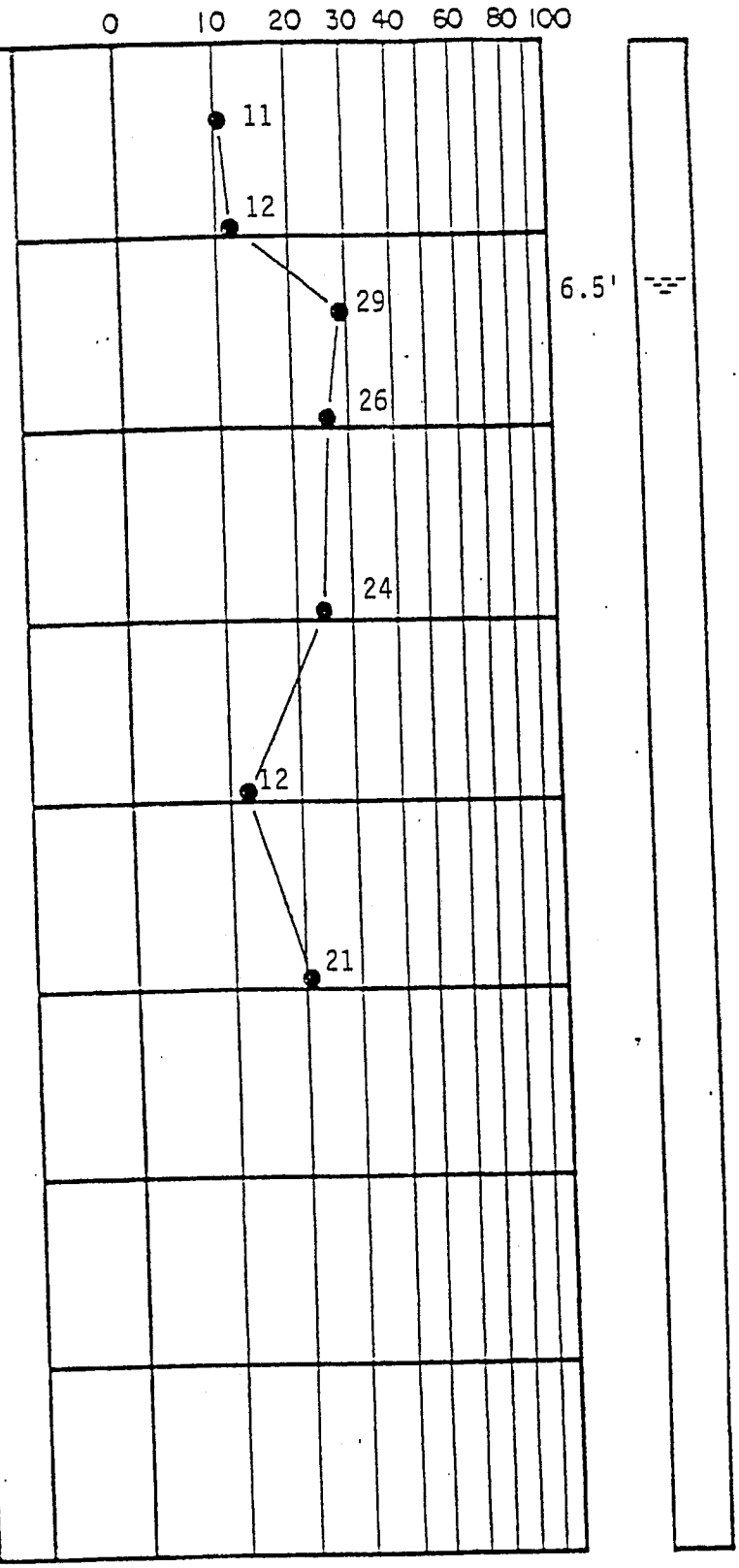
WATER TABLE-1 HR.

BORING NO. B-13
DATE DRILLED 3-15-94
JOB NO. 1063-93-447

S&ME

DEPTH	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +57 MSL	
0.5	*	
	Stiff Brown & Orange Sandy CLAY to Clayey Fine SAND (CL/SC)	
5	Medium Dense Tan & Orange Fine to Medium SAND - Trace of Clay (SP-SC)	
10	Medium Dense Tan Fine to Medium SAND (SP)	
22.0	Medium Dense Dark Gray Shell Fragments -- Some Fine Sand	
25.0	Boring completed at 25.0'	
	*Topsoil	

PENETRATION-BLOWS PER FT.



BORING AND SAMPLING MEETS ASTM D-1586
HOLE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

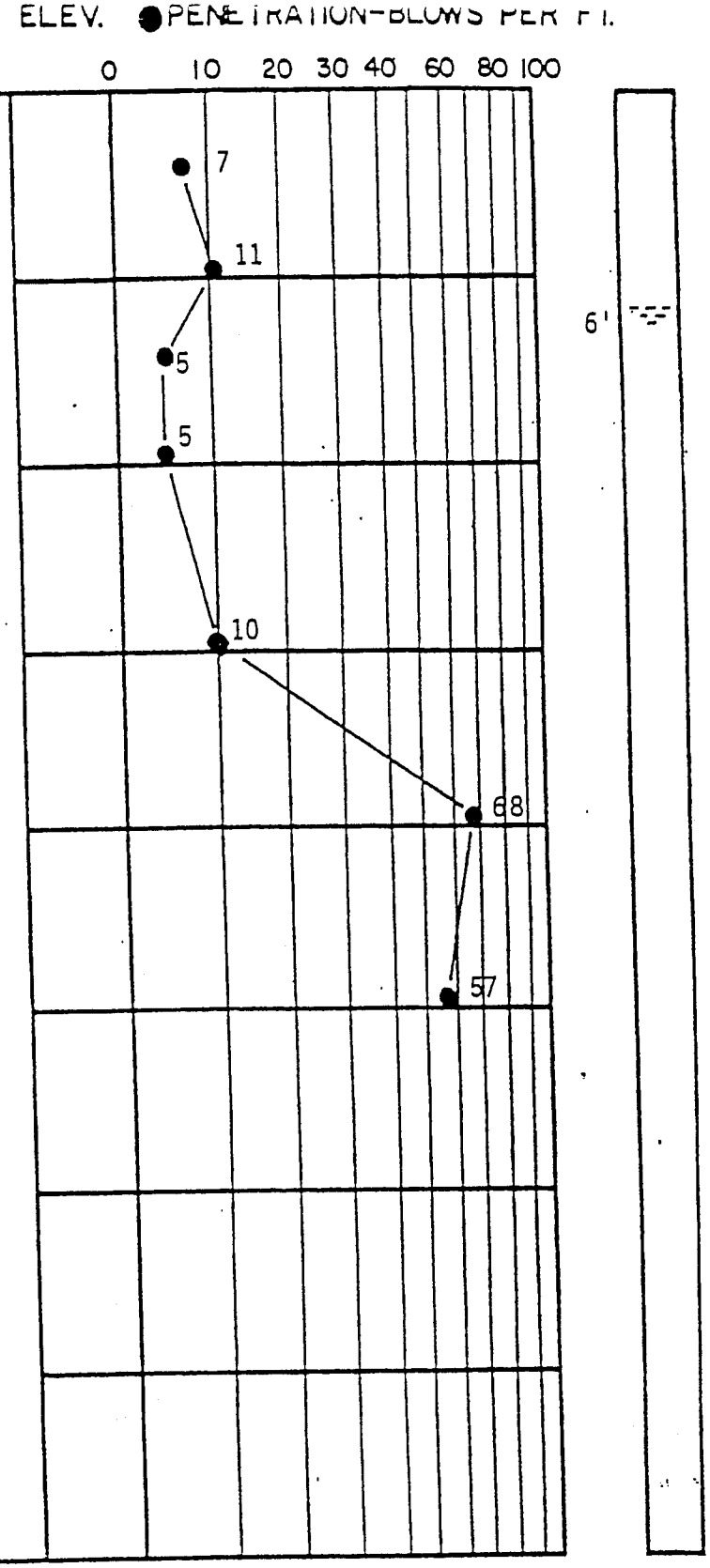
TEST BORING RECORD

BORING NO. B-13
DATE DRILLED 3-15-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +41 MSL	
0.0	Loose to Medium Dense Gray Fine to Medium SAND (SP)	
6.0	Loose Gray Clayey Fine to Medium SAND (SC)	
12.0	Loose to Very Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
25.0	Boring completed at 25.0'	

Note: Approximately 6" of weeds and loamy soil at the ground surface.



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
◀ LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-15
DATE DRILLED 4-8-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.	PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
0.0	Ground Surface Elevation: ~ +53 MSL		
	Loose Tan & Brown Fine to Medium SAND (SP)		6, 7
.0	Medium Dense Brown Fine to Medium SAND - Trace of Silt (SP-SM) PD		15, 20
.0	*		
10.0	Boring completed at 10.0'.		
	*Medium Dense Gray Clayey Fine to Medium SAND (SC)		

DRY

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
PE DRILLING MEETS ASTM D-2113

ETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER
ALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

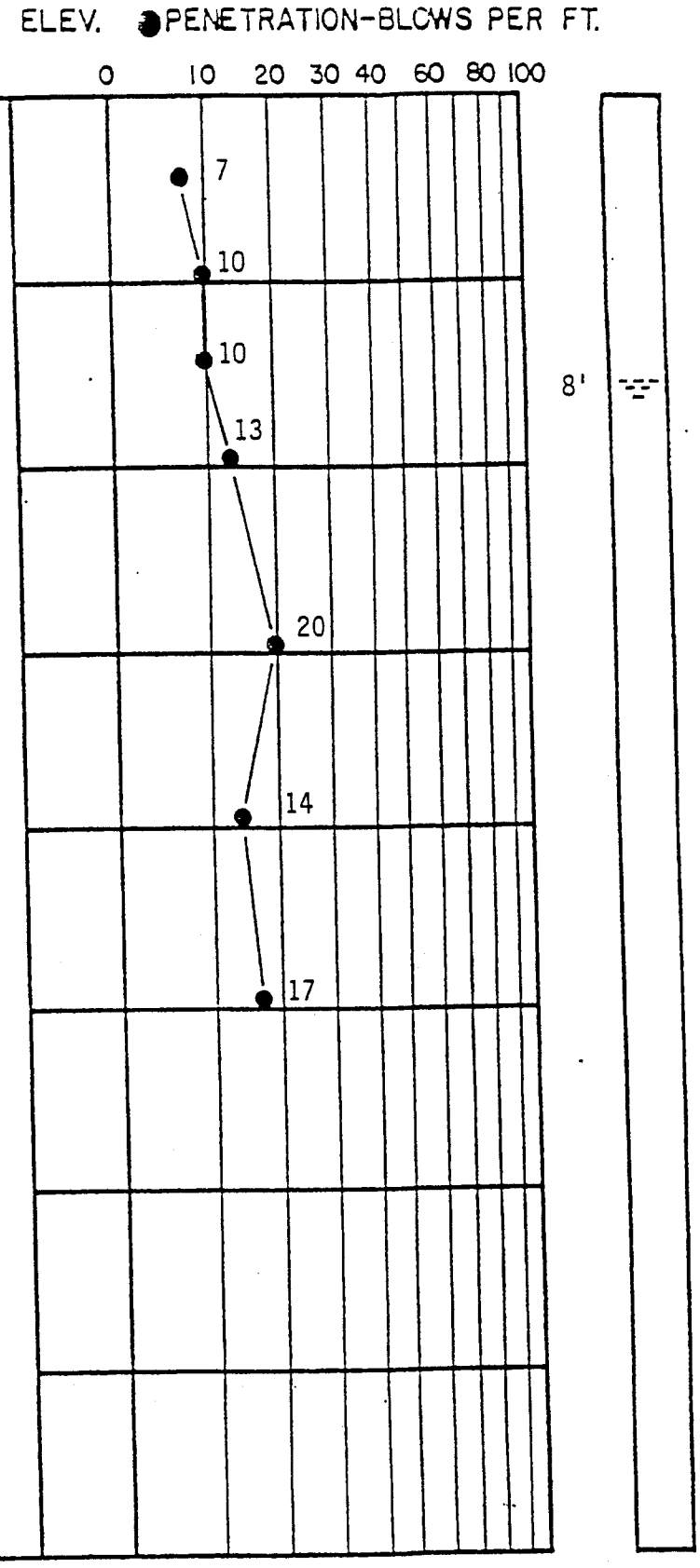
UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
◀ LOSS OF DRILLING WATER

WATER TABLE 24 HR.
WATER TABLE-1 HR.

BORING NO. B-19
DATE DRILLED 3-16-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +35 MSL	
0.0	*	
.5	Loose to Medium Dense Tan & Brown Fine to Medium SAND (SP)	
11.0	Firm to Soft Tan Sandy CLAY (CL)	
4.5	Medium Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
25.0	Boring completed at 25.0'	
	*Topsoil	



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

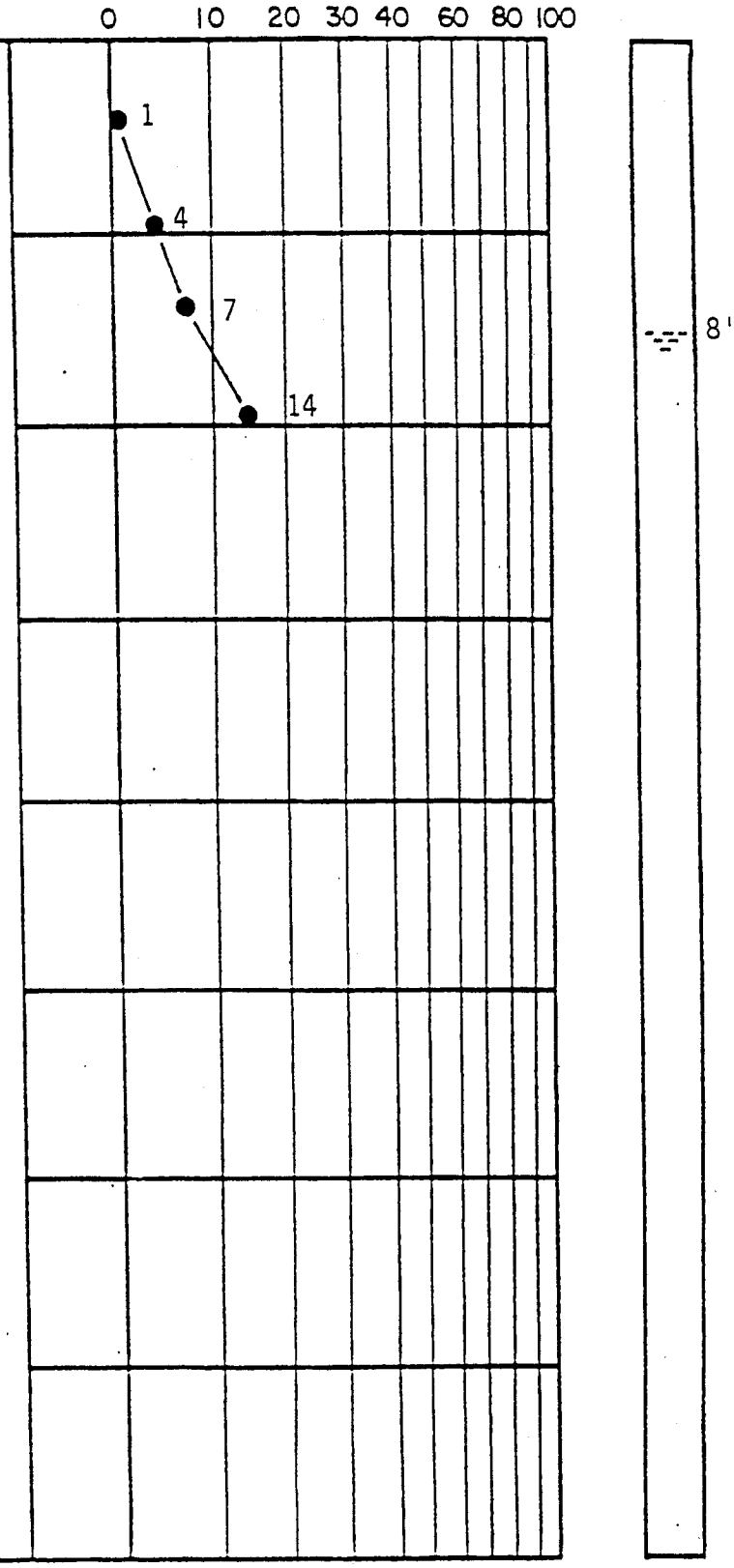
UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-21
DATE DRILLED 3-12-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION
	Ground Surface Elevation: ~ +55 MSL
0.0	
1.0	Brush & Tan Fine Sand
	Very Loose Dark Gray Fine to Medium SAND (SP)
	Very Loose to Loose Light Brown Fine to Medium SAND - Some Clay (SC)
8.0	
	Medium Dense Tan Fine to Medium SAND (SP)
10.0	
	Boring completed at 10.0'.



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

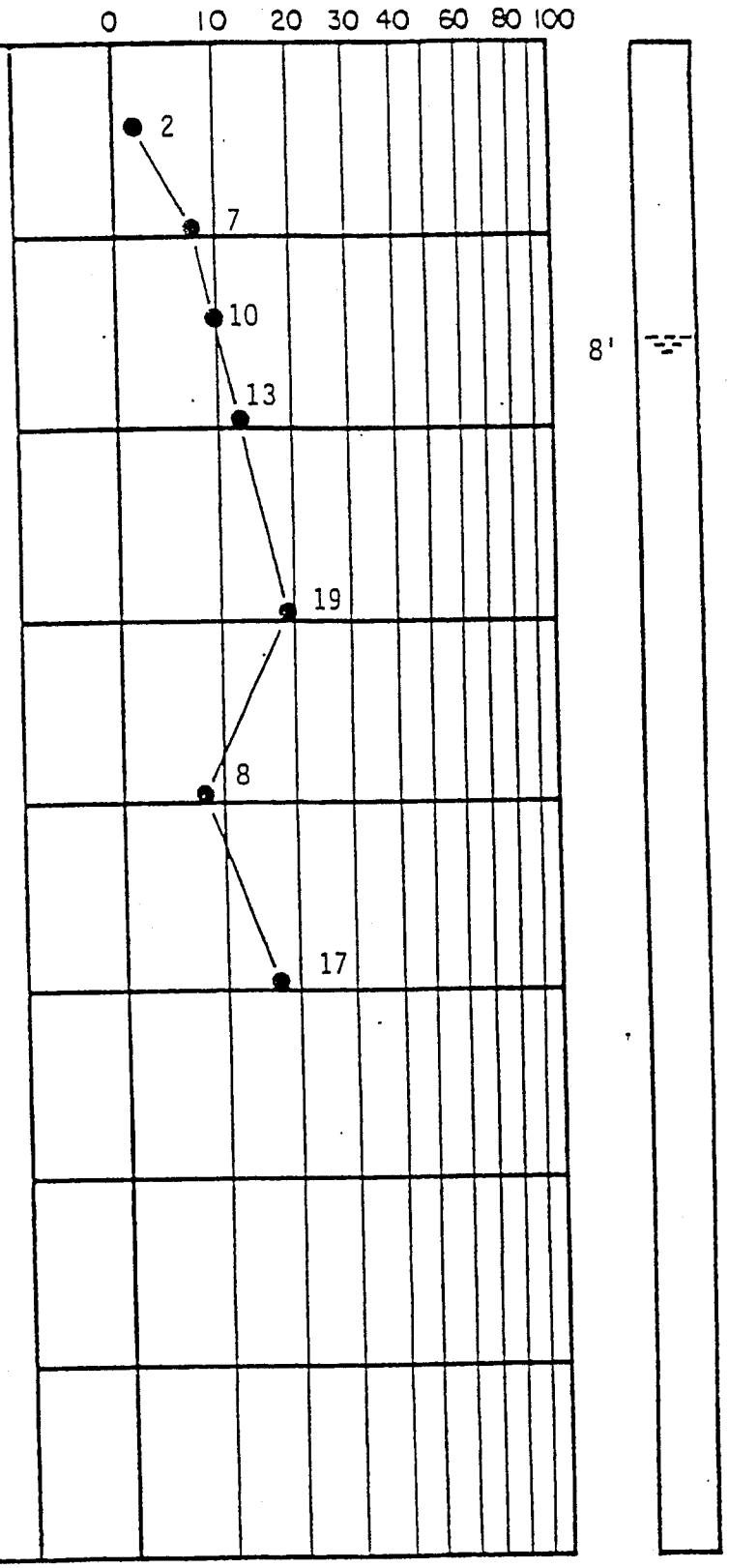
UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE 24 HR
WATER TABLE - 1 HR.

TEST BORING RECORD

BORING NO. B-38
DATE DRILLED 4-18-94
JOB NO. 1064-93-447

S&ME

DEPTH	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +48 MSL	
1.0	Very Loose Tan Fine to Medium SAND (SP)	
3.5	Loose Brown Fine to Medium SAND - Trace of Clay (SP-SC)	
8.0	Stiff Gray Sandy CLAY to Clayey Fine SAND (CL/SC)	
13.0	Medium Dense Gray Clayey Fine to Medium SAND (SC)	
18.0	Medium Dense Tan Fine to Medium SAND (SP)	
22.0	Firm Tan & Brown Sandy CLAY to Clayey Fine SAND (CL/SC)	
25.0	Medium Dense Tan Fine to Medium SAND (SP)	
	Boring completed at 25.0'	



BORING AND SAMPLING MEETS ASTM D-1586
...E DRILLING MEETS ASTM D-2113
...TRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE 24HR.
WATER TABLE-1HR.

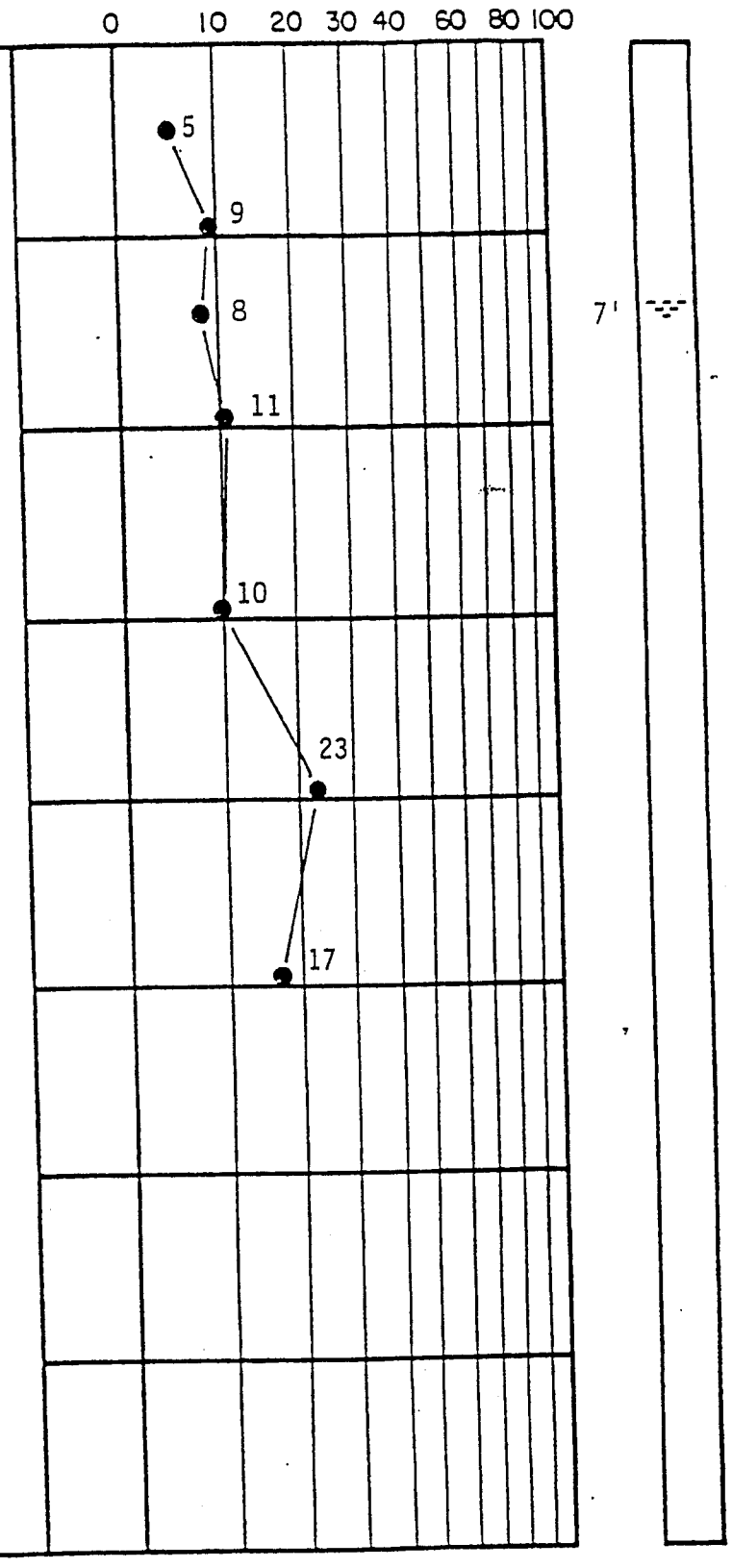
TEST BORING RECORD

BORING NO. B-42
DATE DRILLED 3-12-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
0.0	Ground Surface Elevation: ~ +46 MSL	
0.5	*	
	Loose Tan & Brown Fine to Medium SAND (SP)	
10.0	Loose to Medium Dense Tan Fine to Medium SAND - Trace of Clay (SP-SC)	
15.0	Loose to Medium Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
25.0	Boring completed at 25.0'	
	*Topsoil	

PD



BORING AND SAMPLING MEETS ASTM D-1586
RE DRILLING MEETS ASTM D-2113

ETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

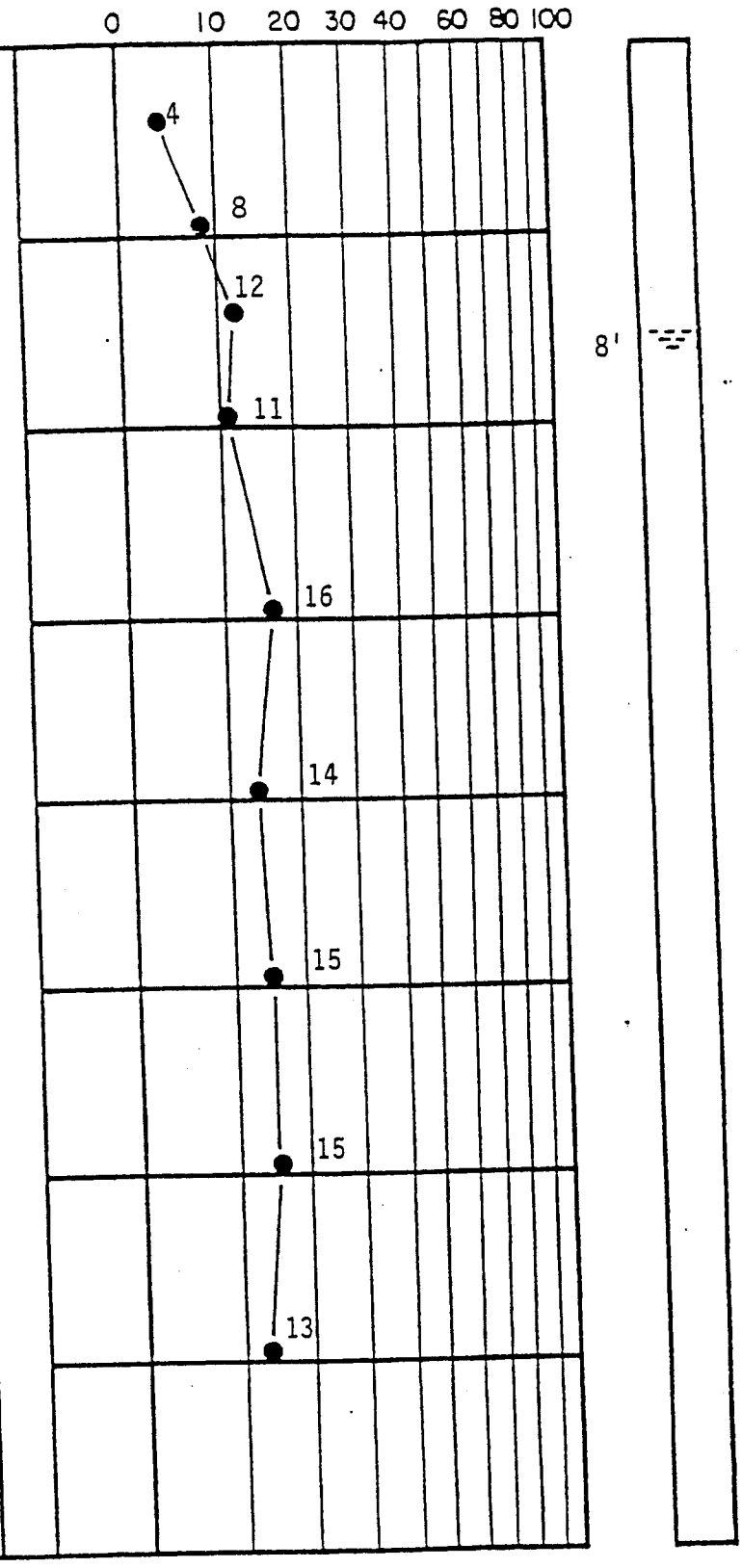
UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-55
DATE DRILLED 3-12-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
0	Ground Surface Elevation: ~ +37 MSL	
0.5	*	
	Very Loose to Medium Dense Tan & Gray Fine to Medium SAND (SP)	
12.0		
	Medium Dense Brown Clayey Fine SAND (SC)	
17.0		
	Medium Dense Dark Gray Clayey Fine SAND to Sandy CLAY (SC/CL)	
35.0	Boring completed at 35.0'	
	*Topsoil	



PD

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

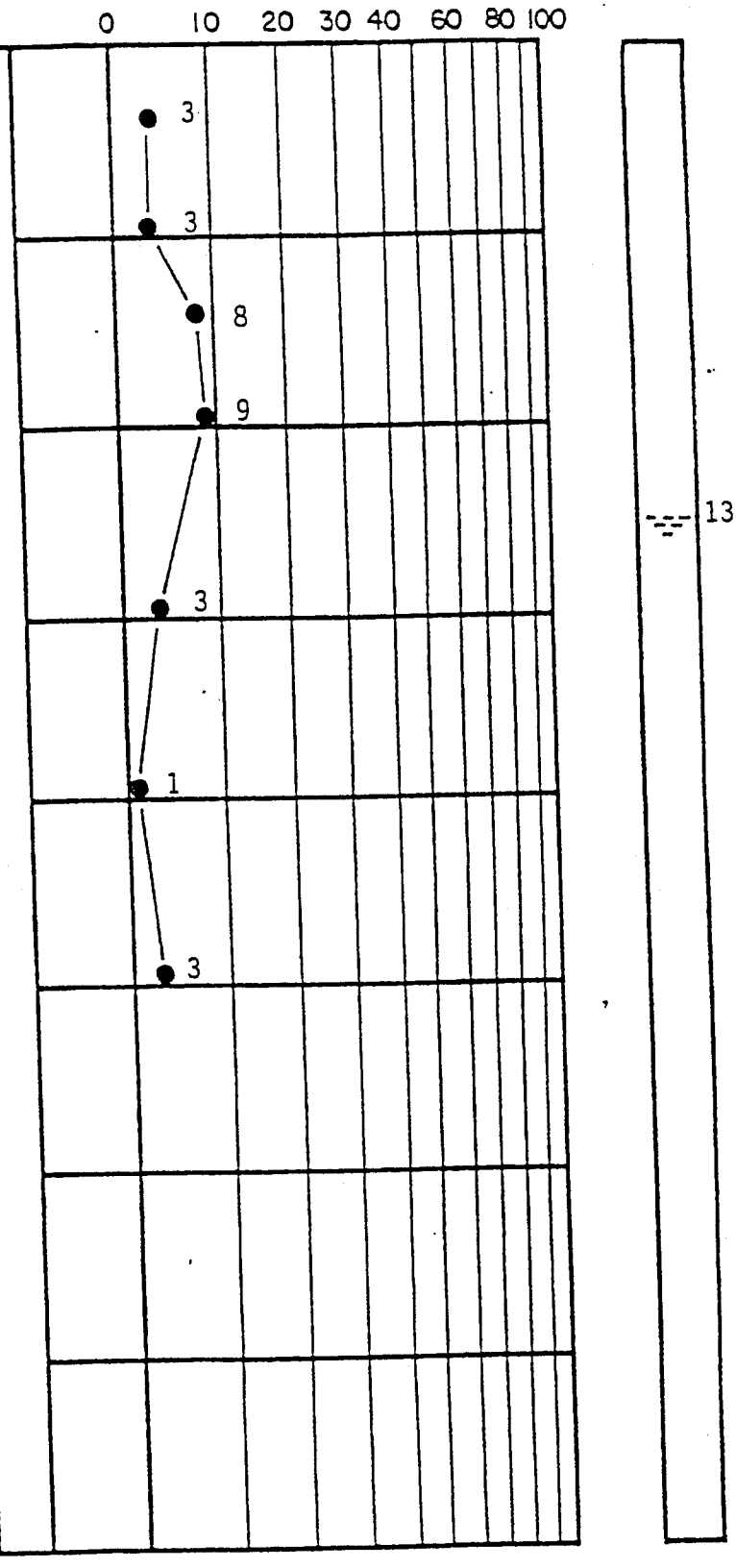
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
LOSS OF DRILLING WATER
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

BORING NO. B-56
DATE DRILLED 3-15-94
JOB NO. 1063-93-447

S&ME

DEPTH FT.	DESCRIPTION	ELEV.
	Ground Surface Elevation: ~ +43 MSL	
0.0	Very Loose Tan & Gray Fine to Medium SAND - Some Clay (SC)	
5.5	Loose to Very Loose Brown & Tan Fine to Medium SAND (SP)	
16.0	Very Loose Brown Clayey Fine to Medium SAND (SC)	
25.0	Boring completed at 25.0'.	



BORING AND SAMPLING MEETS ASTM D-1586
RE DRILLING MEETS ASTM D-2113
ENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50% ROCK CORE RECOVERY
WATER TABLE- 24 HR.
WATER TABLE-1 HR.

TEST BORING RECORD

BORING NO. B-57
DATE DRILLED 3-8-94
JOB NO. 1063-93-447

S&ME

APPENDIX II

GEOTECHNICAL ANALYSES

Boring Number	JEP-4	JEP-4	JEP-4	JEP-5	JEP-5	JEP-5
Pocket Penetrometer (tsf)	+ 4.5	3.8	4.3	N/A	4.0	4.0
VGS Sample Number	8194	8195	8196	8197	8198	8199
Sample Depth (ft)	28 - 30	38 - 40	50 - 52	30 - 31.5	36 - 38	52 - 54
Natural Moisture Content (%)	19.4	25.4	26.8	17.7	26.2	24.6
Atterberg Limits						
Liquid Limit	NP	25	38	26	29	39
Plastic Limit	NP	23	18	19	21	19
Plasticity Index	NP	2	20	7	8	20
Gradation Analysis						
% Finer by Weight						
Sieve: 3/8 inch				100.0		100.0
No. 4	100.0	100.0	100.0	99.9	100.0	99.9
No. 10	99.3	99.9	99.9	99.3	99.9	99.7
No. 40	85.5	92.3	93.8	78.4	91.9	92.2
No. 100	48.0	46.1	54.2	45.2	46.2	52.1
No. 200						
USCS Soil Classification	SM	SM	CL	SC-SM	SC	CL
AASHTO Soil Classification	A-4 (0)	A-4 (0)	A-6 (8)	A-4 (0)	A-4 (1)	A-6 (7)

Virginia Geotechnical Services, P.C.
8211 Hermitage Road
Richmond, Virginia 23228
Telephone: 804-266-2199
Fax: 804-261-5569

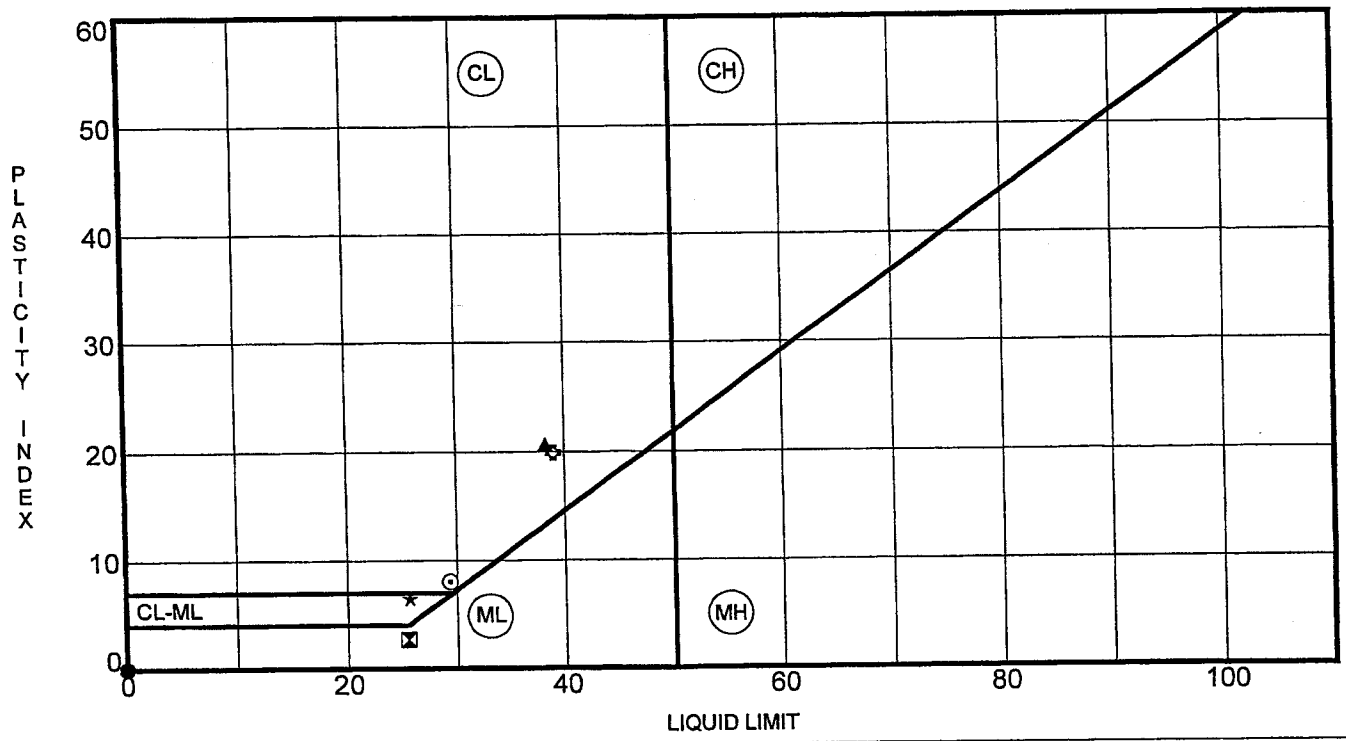
LABORATORY SUMMARY TABLE

Project: International Paper Riegelwood Mill Landfill

Location: Riegelwood, North Carolina

Number: LB1734

LABSUM-CLASSIFICATION W/ SAMPLE NO. LB1734.GPJ 8/2/01 Ed. R.A.



	Specimen Identification			LL	PL	PI	Fines	MC	Classification
●	JEP-4	8194	28.0	NP	NP	NP	48	19.4	SILTY SAND SM
⊠	JEP-4	8195	38.0	25	23	2	46	25.4	SILTY SAND SM
▲	JEP-4	8196	50.0	38	18	20	54	26.8	SANDY LEAN CLAY CL
★	JEP-5	8197	30.0	26	19	7	45	17.7	SILTY, CLAYEY SAND SC-SM
⊙	JEP-5	8198	36.0	29	21	8	46	26.2	CLAYEY SAND SC
✿	JEP-5	8199	52.0	39	19	20	52	24.6	SANDY LEAN CLAY CL

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Fax: 804-261-5569

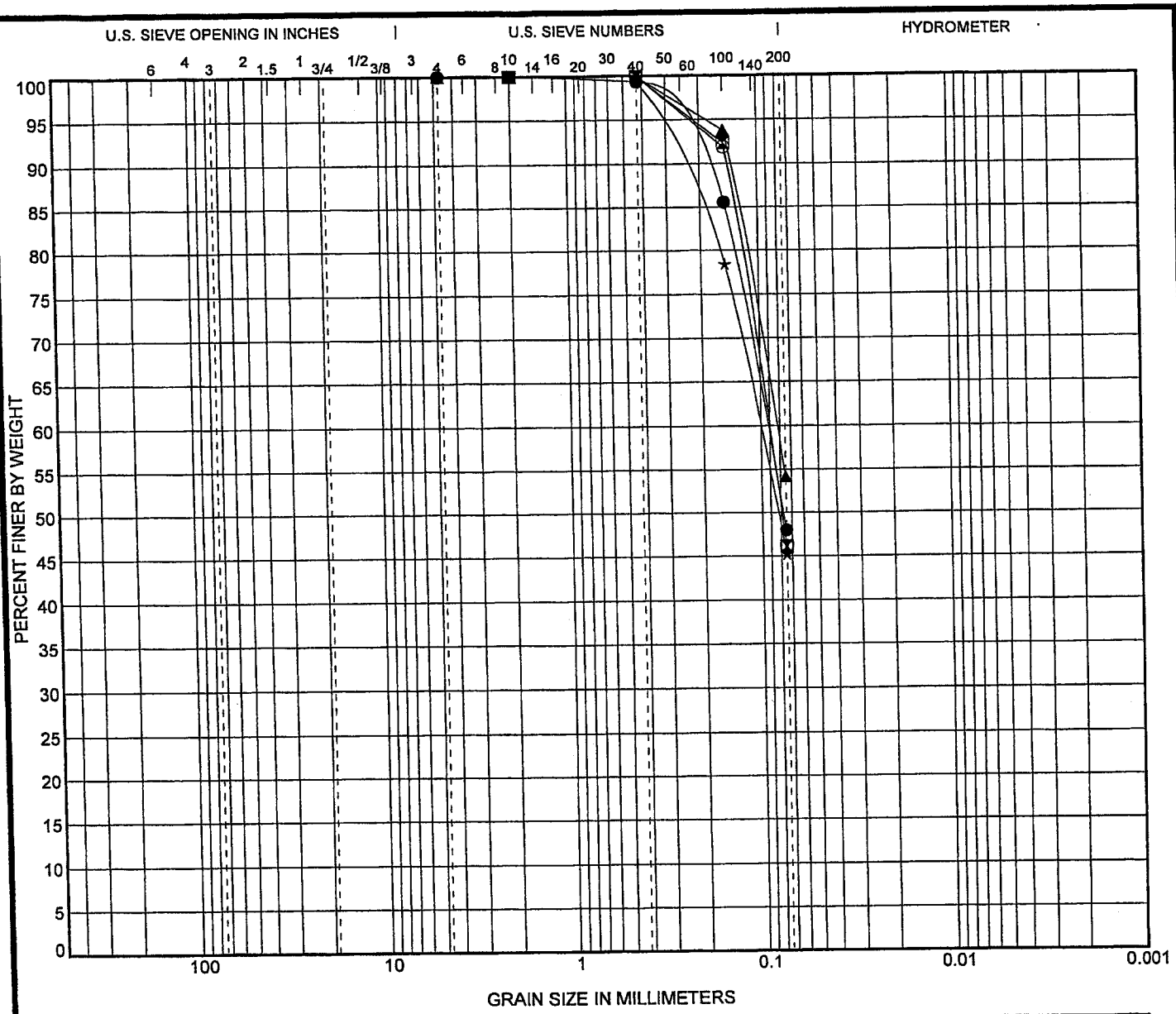
ATTERBERG LIMITS RESULTS

Project: International Paper Riegelwood Mill Landfill

Location: Riegelwood, North Carolina

Number: LB1734

US ATTERBERG LIMITS LB1734.GPJ 8/2/01 Ford, G.D.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	JEP-4	8194	28.0	SILTY SAND SM	NP	NP	NP		
⊠	JEP-4	8195	38.0	SILTY SAND SM	25	23	2		
▲	JEP-4	8196	50.0	SANDY LEAN CLAY CL	38	18	20		
★	JEP-5	8197	30.0	SILTY, CLAYEY SAND SC-SM	26	19	7		
⊙	JEP-5	8198	36.0	CLAYEY SAND SC	29	21	8		

	Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JEP-4	8194	28.0	4.75	0.094			0.0	52.0	48.0	
⊠	JEP-4	8195	38.0	2	0.092			0.0	53.9	46.1	
▲	JEP-4	8196	50.0	4.75	0.083			0.0	45.8	54.2	
★	JEP-5	8197	30.0	4.75	0.102			0.0	54.8	45.2	
⊙	JEP-5	8198	36.0	2	0.092			0.0	53.8	46.2	

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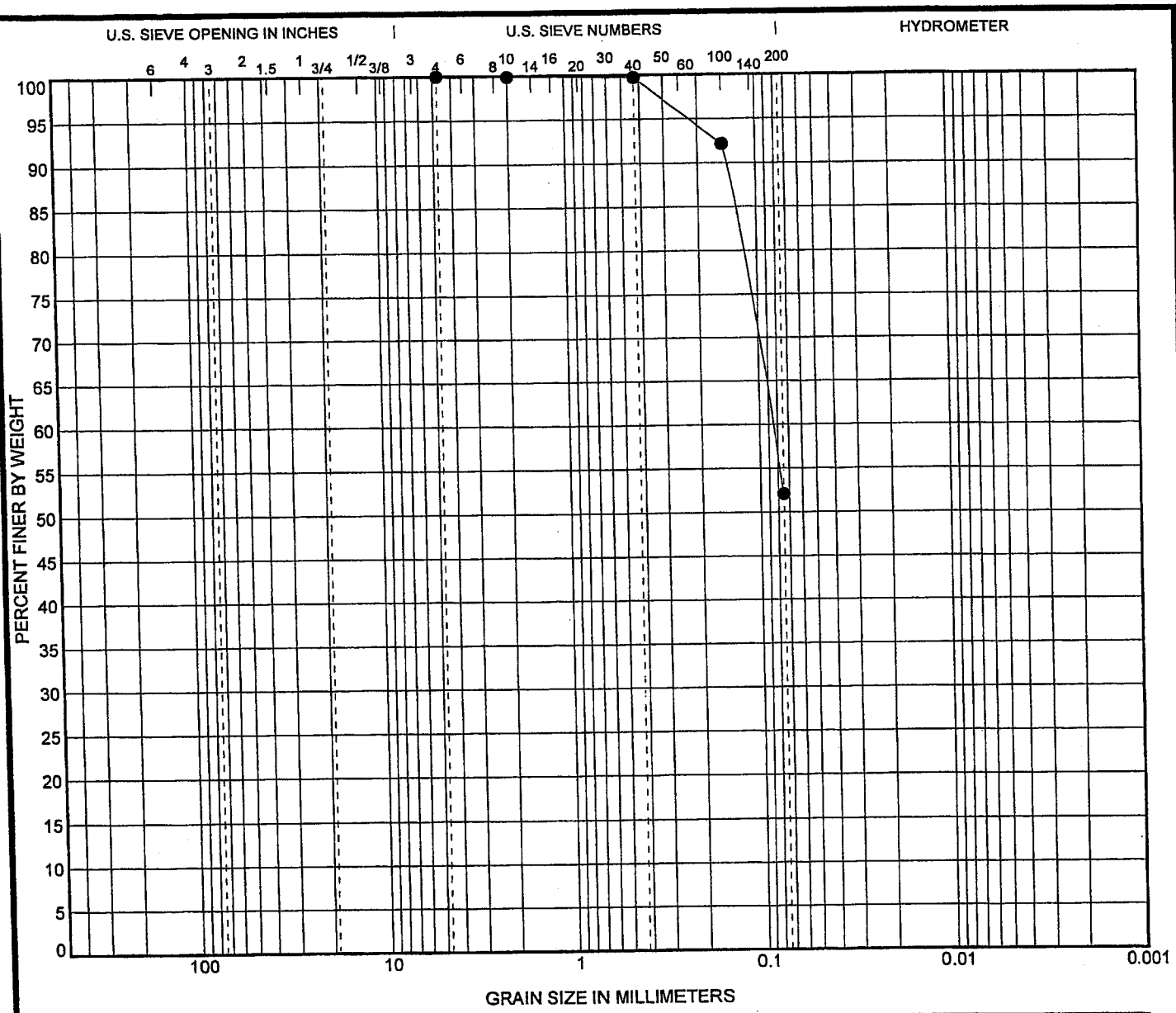
GRAIN SIZE DISTRIBUTION

Project: International Paper Riegelwood Mill Landfill

Location: Riegelwood, North Carolina

Number: LB1734

US GRAIN SIZE ROUTE1 LB1734.GPJ 8/20/01



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	JEP-5	8199	52.0	SANDY LEAN CLAY CL	39	19	20		

	Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JEP-5	8199	52.0	4.75	0.086			0.0	47.9	52.1	

Virginia Geotechnical Services, P.C.
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Fax: 804-261-5569

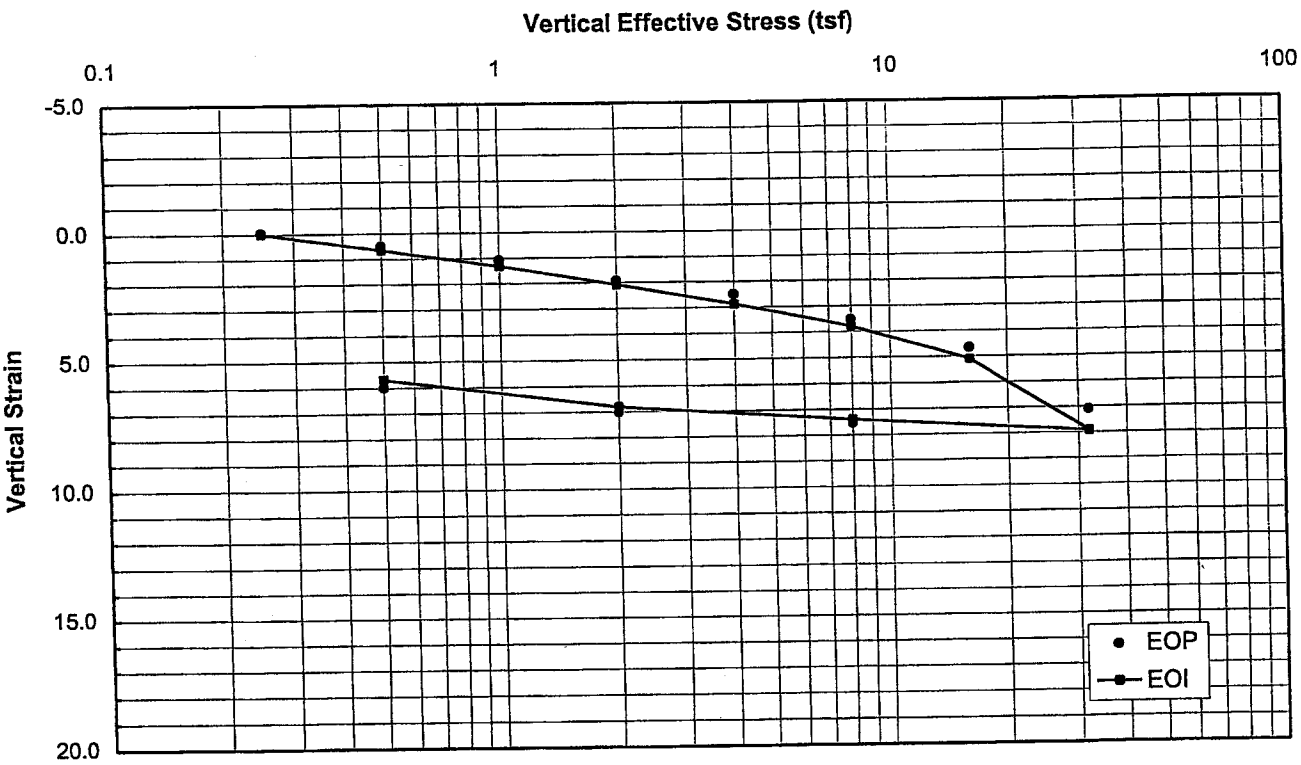
GRAIN SIZE DISTRIBUTION

Project: International Paper Riegelwood Mill Landfill

Location: Riegelwood, North Carolina

Number: LB1734

US GRAIN SIZE ROUTE1 LB1734.GPJ 8/20/01 R.D



CONSOLIDATION PARAMETERS

Preconsolidation Pressure, P'_c (tsf):	14.6
Overburden Pressure, P'_o (tsf):	2.5
Vertical Strain at P'_o (%):	2.3
Sample Quality Designation (SQD):	C
Compression Ratio (CR):	*
Recompression Ratio (RR):	*
Over Consolidation Ratio (OCR):	5.8

* To be interpreted by design engineer.

SAMPLE DATA

Sample Diameter (cm):	5.08	
Sample Area (cm^2):	20.27	
Est. Specific Gravity:	2.70	
Trimmings Moisture (%):	23.2	
% Passing #200 Sieve:	45.8	
Limits for classification performed on the tube sample.	LL:	38
	PL:	18
	PI:	20
	Initial	Final
Water Content (%):	24.9	23.4
Est. % Saturation:	83.1	89.5
Sample Height (cm):	2.540	2.395
Wet Sample Weight (g):	107.25	105.97
Dry Sample Weight (g):	85.87	85.87
Dry Unit Weight (pcf):	104.0	110.3
Void Ratio, e:	0.81	0.71
Solids Height (cm):	1.404	1.404

TEST METHOD

Test Method:	ASTM D-2435 B
Trimming Procedure:	2.0-inch Trimming Lathe
Pressure at Inundation:	0.10 tsf
Method to Compute C_v:	ASTM D-2435 12.3.1&2

SAMPLE ID

Sample No.:	8196
Exploration No.:	JEP - 4
Depth:	50 - 52 feet
USCS Description:	Gray clayey SAND (SC)

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8211 Hermitage Road
Richmond, Virginia 23228
Telephone: (804) 266-2199
Fax: (804) 261-5569

ONE-DIMENSIONAL CONSOLIDATION TEST (ASTM D2435)

Project:	International Paper Riegelwood Mill Landfill
Client:	Joyce Engineering, Inc.
Location:	Riegelwood, North Carolina
Project No.:	LB1734

X:\LB\LB1734\Consol\[8196 consol.xls]Stress-Strain Summary Foed, Q.D.

Sample No.: 8196
Exploration No.: JEP - 4
Depth: 50 - 52 feet

LOAD INC.	STRESS DURATION (Hr - min)	VERTICAL STRESS (tsf)	VERTICAL STRAIN (EOI*)	VERTICAL STRAIN (EOP*)	VOID RATIO e (EOI*)	VOID RATIO e (EOP*)	STRESS RATIO (P'/P'c)	TAYLOR COEFFICIENT OF CONSOLIDATION (ft^2/year)
1	2 - 00	0.25	0.0	0.0	0.81	0.81	0.0	198.6
2	3 - 00	0.5	0.7	0.5	0.80	0.80	0.0	490.5
3	4 - 00	1	1.3	1.1	0.79	0.79	0.1	757.5
4	6 - 00	2	2.1	1.9	0.77	0.77	0.1	476.8
5	6 - 00	4	2.9	2.5	0.76	0.76	0.3	2945.4
6	4 - 00	8	3.8	3.5	0.74	0.75	0.5	721.0
7	4 - 00	16	5.1	4.7	0.72	0.72	1.1	704.2
8	4 - 00	32	7.9	7.1	0.67	0.68	2.2	670.7
9	2 - 00	8	7.4	7.5	0.68	0.67	0.5	661.4
10	2 - 00	2	6.8	7.0	0.69	0.68	0.1	297.1
11	24 - 00	0.5	5.7	6.0	0.71	0.70	0.0	436.9

Note:

Sample collection, handling methods, and other factors not disclosed to the laboratory testing firm could have affected the test results and the values reported. The test results are based upon interpretation of data collected through the test process. These interpretations do not consider the specifics of the project to which they will be applied. Therefore, all test results must be confirmed by a qualified geotechnical engineer for consistency with their intended use.

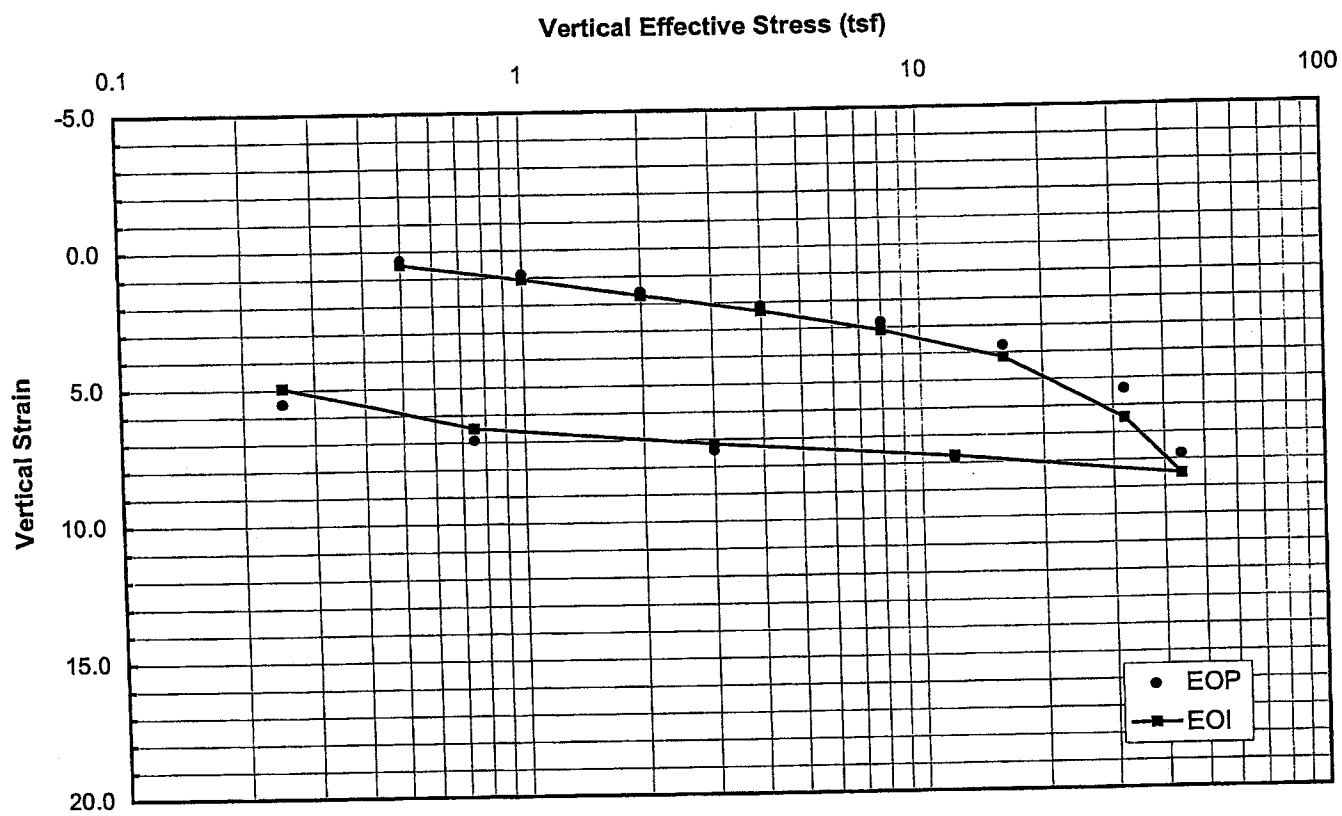
*EOI = End of Increment
*EOP = End of Primary

Virginia Geotechnical Services, P.C.
8211 Hermitage Road
Richmond, Virginia 23288
Telephone: (804) 266-2199
Fax: (804) 261-5569

ONE-DIMENSIONAL CONSOLIDATION TEST (ASTM D2435)

Project: International Paper Riegelwood Mill Landfill
Client: Joyce Engineering, Inc.
Location: Riegelwood, North Carolina
Project No.: LB1734

FORD, Q.D.



CONSOLIDATION PARAMETERS

Preconsolidation Pressure, P'_c (tsf):	19.1
Overburden Pressure, P'_o (tsf):	2.5
Vertical Strain at P'_o (%):	2.0
Sample Quality Designation (SQD):	B
Compression Ratio (CR):	*
Recompression Ratio (RR):	*
Over Consolidation Ratio (OCR):	7.6

* To be interpreted by design engineer.

TEST METHOD

Test Method:	ASTM D-2435 B
Trimming Procedure:	2.0-inch Trimming Lathe
Pressure at Inundation:	0.07 tsf
Method to Compute C_v:	ASTM D-2435 12.3.1&2

SAMPLE ID

Sample No.:	8199
Exploration No.:	JEP - 5
Depth:	52 - 54 feet
USCS Description:	Gray clayey SAND (SC)

SAMPLE DATA

Sample Diameter (cm):	5.08	
Sample Area (cm^2):	20.27	
Est. Specific Gravity	2.70	
Trimmings Moisture (%):	24.6	
% Passing #200 Sieve:	41.5	
Limits for classification performed on the tube sample.	LL:	39
	PL:	19
	PI:	20
	Initial	Final
Water Content (%):	24.2	23.6
Est. % Saturation:	81.9	89.9
Sample Height (cm):	2.540	2.414
Wet Sample Weight (g):	106.78	106.25
Dry Sample Weight (g):	85.94	85.94
Dry Unit Weight (pcf):	104.1	109.6
Void Ratio, e:	0.80	0.71
Solids Height (cm):	1.412	1.412

Virginia Geotechnical Services, P.C.
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Telephone: (804) 266-2199
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ONE-DIMENSIONAL CONSOLIDATION TEST (ASTM D2435)

Project:	International Paper Riegelwood Mill Landfill
Client:	Joyce Engineering, Inc.
Location:	Riegelwood, North Carolina
Project No.:	LB1734

X:\LB\LB1734\Consol\[8199 CONSOL.xls]Summary of Load Increment Data For RJ, Q.D.

Sample No.: 8199
Exploration No.: JEP - 5
Depth: 52 - 54 feet

LOAD INC.	STRESS DURATION (Hr - min)	VERTICAL STRESS (tsf)	VERTICAL STRAIN (EOI*)	VERTICAL STRAIN (EOP*)	VOID RATIO e (EOI*)	VOID RATIO e (EOP*)	STRESS RATIO (P'/P'c)	TAYLOR COEFFICIENT OF CONSOLIDATION (ft^2/year)
1	2 - 00	0.5	0.5	0.3	0.79	0.79	0.0	1603.7
2	2 - 04	1	1.1	0.9	0.78	0.78	0.1	1352.1
3	4 - 00	2	1.7	1.6	0.77	0.77	0.1	849.0
4	6 - 00	4	2.3	2.1	0.76	0.76	0.2	2967.2
5	6 - 00	8	3.1	2.8	0.74	0.75	0.4	2927.3
6	4 - 00	16	4.2	3.7	0.72	0.73	0.8	4720.4
7	4 - 00	32	6.5	5.4	0.68	0.70	1.7	2775.8
8	4 - 00	44	8.5	7.8	0.65	0.66	2.3	659.2
9	4 - 00	12	7.8	7.8	0.66	0.66	0.6	1765.7
10	2 - 00	3	7.2	7.4	0.67	0.67	0.2	4715.8
11	2 - 00	0.75	6.5	6.9	0.68	0.67	0.0	1015.1
12	16 - 00	0.25	5.0	5.5	0.71	0.70	0.0	110.3

Note:

Sample collection, handling methods, and other factors not disclosed to the laboratory testing firm could have affected the test results and the values reported. The test results are based upon interpretation of data collected through the test process. These interpretations do not consider the specifics of the project to which they will be applied. Therefore, all test results must be confirmed by a qualified geotechnical engineer for consistency with their intended use.

*EOI = End of Increment
*EOP = End of Primary

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ONE-DIMENSIONAL CONSOLIDATION TEST (ASTM D2435)

Project: International Paper Riegelwood Mill Landfill
Client: Joyce Engineering, Inc.
Location: Riegelwood, North Carolina
Project No.: LB1734

Ford, Q.D.

APPENDIX III

SLUG TEST DATA

JEP-1 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	6/28/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP1FHN

Well Label:	JEP-1
Aquifer Thickness:	11. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	10.16 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.998 Seconds

Test starts with trial 10
There are 186 time and drawdown measurements
Maximum head is 4.508 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.33e-002	0.	0.	0.
2	3.3e-003	-3.e-002	4.e-003	4.e-003	8.873e-004
3	6.6e-003	-2.67e-002	4.e-003	4.e-003	8.873e-004
4	1.e-002	-2.33e-002	9.e-003	9.e-003	1.996e-003
5	1.33e-002	-2.e-002	1.9e-002	1.9e-002	4.215e-003
6	1.66e-002	-1.67e-002	3.7e-002	3.7e-002	8.208e-003
7	2.e-002	-1.33e-002	5.2e-002	5.2e-002	1.154e-002
8	2.33e-002	-1.e-002	6.1e-002	6.1e-002	1.353e-002
9	2.66e-002	-6.7e-003	0.536	0.536	0.1189
10	3.e-002	-3.3e-003	4.123	4.123	0.9146
11	3.33e-002	0.	4.508	4.508	1.
12	3.66e-002	3.3e-003	3.12	3.12	0.6921
13	4.e-002	6.7e-003	1.486	1.486	0.3296
14	4.33e-002	1.e-002	0.379	0.379	8.407e-002
15	4.66e-002	1.33e-002	0.431	0.431	9.561e-002
16	5.e-002	1.67e-002	1.267	1.267	0.2811
17	5.33e-002	2.e-002	1.809	1.809	0.4013
18	5.66e-002	2.33e-002	1.761	1.761	0.3906
19	6.e-002	2.67e-002	1.642	1.642	0.3642
20	6.33e-002	3.e-002	1.59	1.59	0.3527
21	6.66e-002	3.33e-002	1.144	1.144	0.2538
22	7.e-002	3.67e-002	0.949	0.949	0.2105
23	7.33e-002	4.e-002	0.403	0.403	8.94e-002
24	7.66e-002	4.33e-002	1.429	1.429	0.317
25	8.e-002	4.67e-002	1.956	1.956	0.4339
26	8.33e-002	5.e-002	1.552	1.552	0.3443
27	8.66e-002	5.33e-002	0.745	0.745	0.1653
28	9.e-002	5.67e-002	0.242	0.242	5.368e-002
29	9.33e-002	6.e-002	0.242	0.242	5.368e-002
30	9.66e-002	6.33e-002	0.531	0.531	0.1178
31	0.1	6.67e-002	0.721	0.721	0.1599
32	0.1033	7.e-002	0.726	0.726	0.161
33	0.1066	7.33e-002	0.64	0.64	0.142

34	0.11	7.67e-002	0.602	0.602	0.1335
35	0.1133	8.e-002	0.598	0.598	0.1327
36	0.1166	8.33e-002	0.593	0.593	0.1315
37	0.12	8.67e-002	0.579	0.579	0.1284
38	0.1233	9.e-002	0.564	0.564	0.1251
39	0.1266	9.33e-002	0.555	0.555	0.1231
40	0.13	9.67e-002	0.541	0.541	0.12
41	0.1333	0.1	0.531	0.531	0.1178
42	0.1366	0.1033	0.522	0.522	0.1158
43	0.14	0.1067	0.507	0.507	0.1125
44	0.1433	0.11	0.498	0.498	0.1105
45	0.1466	0.1133	0.488	0.488	0.1083
46	0.15	0.1167	0.479	0.479	0.1063
47	0.1533	0.12	0.469	0.469	0.104
48	0.1566	0.1233	0.46	0.46	0.102
49	0.16	0.1267	0.45	0.45	9.982e-002
50	0.1633	0.13	0.441	0.441	9.783e-002
51	0.1666	0.1333	0.431	0.431	9.561e-002
52	0.17	0.1367	0.422	0.422	9.361e-002
53	0.1733	0.14	0.417	0.417	9.25e-002
54	0.1766	0.1433	0.408	0.408	9.051e-002
55	0.18	0.1467	0.398	0.398	8.829e-002
56	0.1833	0.15	0.394	0.394	8.74e-002
57	0.1866	0.1533	0.384	0.384	8.518e-002
58	0.19	0.1567	0.379	0.379	8.407e-002
59	0.1933	0.16	0.37	0.37	8.208e-002
60	0.1966	0.1633	0.365	0.365	8.097e-002
61	0.2	0.1667	0.356	0.356	7.897e-002
62	0.2033	0.17	0.351	0.351	7.786e-002
63	0.2066	0.1733	0.346	0.346	7.675e-002
64	0.21	0.1767	0.337	0.337	7.476e-002
65	0.2133	0.18	0.332	0.332	7.365e-002
66	0.2166	0.1833	0.327	0.327	7.254e-002
67	0.22	0.1867	0.322	0.322	7.143e-002
68	0.2233	0.19	0.318	0.318	7.054e-002
69	0.2266	0.1933	0.313	0.313	6.943e-002
70	0.23	0.1967	0.303	0.303	6.721e-002
71	0.2333	0.2	0.299	0.299	6.633e-002
72	0.2366	0.2033	0.294	0.294	6.522e-002
73	0.24	0.2067	0.289	0.289	6.411e-002
74	0.2433	0.21	0.284	0.284	6.3e-002
75	0.2466	0.2133	0.28	0.28	6.211e-002
76	0.25	0.2167	0.275	0.275	6.1e-002
77	0.2533	0.22	0.27	0.27	5.989e-002
78	0.2566	0.2233	0.265	0.265	5.878e-002
79	0.26	0.2267	0.261	0.261	5.79e-002
80	0.2633	0.23	0.256	0.256	5.679e-002
81	0.2666	0.2333	0.251	0.251	5.568e-002
82	0.27	0.2367	0.246	0.246	5.457e-002
83	0.2733	0.24	0.242	0.242	5.368e-002
84	0.2766	0.2433	0.242	0.242	5.368e-002
85	0.28	0.2467	0.237	0.237	5.257e-002
86	0.2833	0.25	0.232	0.232	5.146e-002
87	0.2866	0.2533	0.227	0.227	5.035e-002
88	0.29	0.2567	0.223	0.223	4.947e-002
89	0.2933	0.26	0.223	0.223	4.947e-002
90	0.2966	0.2633	0.218	0.218	4.836e-002

91	0.3	0.2667	0.213	0.213	4.725e-002
92	0.3033	0.27	0.208	0.208	4.614e-002
93	0.3066	0.2733	0.208	0.208	4.614e-002
94	0.31	0.2767	0.204	0.204	4.525e-002
95	0.3133	0.28	0.199	0.199	4.414e-002
96	0.3166	0.2833	0.199	0.199	4.414e-002
97	0.32	0.2867	0.194	0.194	4.303e-002
98	0.3233	0.29	0.194	0.194	4.303e-002
99	0.3266	0.2933	0.189	0.189	4.193e-002
100	0.33	0.2967	0.185	0.185	4.104e-002
101	0.3333	0.3	0.185	0.185	4.104e-002
102	0.35	0.3167	0.17	0.17	3.771e-002
103	0.3666	0.3333	0.156	0.156	3.461e-002
104	0.3833	0.35	0.147	0.147	3.261e-002
105	0.4	0.3667	0.137	0.137	3.039e-002
106	0.4166	0.3833	0.128	0.128	2.839e-002
107	0.4333	0.4	0.118	0.118	2.618e-002
108	0.45	0.4167	0.113	0.113	2.507e-002
109	0.4666	0.4333	0.104	0.104	2.307e-002
110	0.4833	0.45	9.9e-002	9.9e-002	2.196e-002
111	0.5	0.4667	9.4e-002	9.4e-002	2.085e-002
112	0.5166	0.4833	9.e-002	9.e-002	1.996e-002
113	0.5333	0.5	8.5e-002	8.5e-002	1.886e-002
114	0.55	0.5167	8.e-002	8.e-002	1.775e-002
115	0.5666	0.5333	7.5e-002	7.5e-002	1.664e-002
116	0.5833	0.55	7.5e-002	7.5e-002	1.664e-002
117	0.6	0.5667	7.1e-002	7.1e-002	1.575e-002
118	0.6166	0.5833	6.6e-002	6.6e-002	1.464e-002
119	0.6333	0.6	6.1e-002	6.1e-002	1.353e-002
120	0.65	0.6167	6.1e-002	6.1e-002	1.353e-002
121	0.6666	0.6333	5.6e-002	5.6e-002	1.242e-002
122	0.6833	0.65	5.6e-002	5.6e-002	1.242e-002
123	0.7	0.6667	5.2e-002	5.2e-002	1.154e-002
124	0.7166	0.6833	5.2e-002	5.2e-002	1.154e-002
125	0.7333	0.7	5.2e-002	5.2e-002	1.154e-002
126	0.75	0.7167	4.7e-002	4.7e-002	1.043e-002
127	0.7666	0.7333	4.7e-002	4.7e-002	1.043e-002
128	0.7833	0.75	4.7e-002	4.7e-002	1.043e-002
129	0.8	0.7667	4.2e-002	4.2e-002	9.317e-003
130	0.8166	0.7833	4.2e-002	4.2e-002	9.317e-003
131	0.8333	0.8	4.2e-002	4.2e-002	9.317e-003
132	0.85	0.8167	3.7e-002	3.7e-002	8.208e-003
133	0.8666	0.8333	3.7e-002	3.7e-002	8.208e-003
134	0.8833	0.85	3.7e-002	3.7e-002	8.208e-003
135	0.9	0.8667	3.3e-002	3.3e-002	7.32e-003
136	0.9166	0.8833	3.3e-002	3.3e-002	7.32e-003
137	0.9333	0.9	3.3e-002	3.3e-002	7.32e-003
138	0.95	0.9167	3.3e-002	3.3e-002	7.32e-003
139	0.9666	0.9333	3.3e-002	3.3e-002	7.32e-003
140	0.9833	0.95	3.3e-002	3.3e-002	7.32e-003
141	1.	0.9667	2.8e-002	2.8e-002	6.211e-003
142	1.2	1.167	2.8e-002	2.8e-002	6.211e-003
143	1.4	1.367	1.9e-002	1.9e-002	4.215e-003
144	1.6	1.567	1.9e-002	1.9e-002	4.215e-003
145	1.8	1.767	1.4e-002	1.4e-002	3.106e-003
146	2.	1.967	1.4e-002	1.4e-002	3.106e-003
147	2.2	2.167	1.4e-002	1.4e-002	3.106e-003

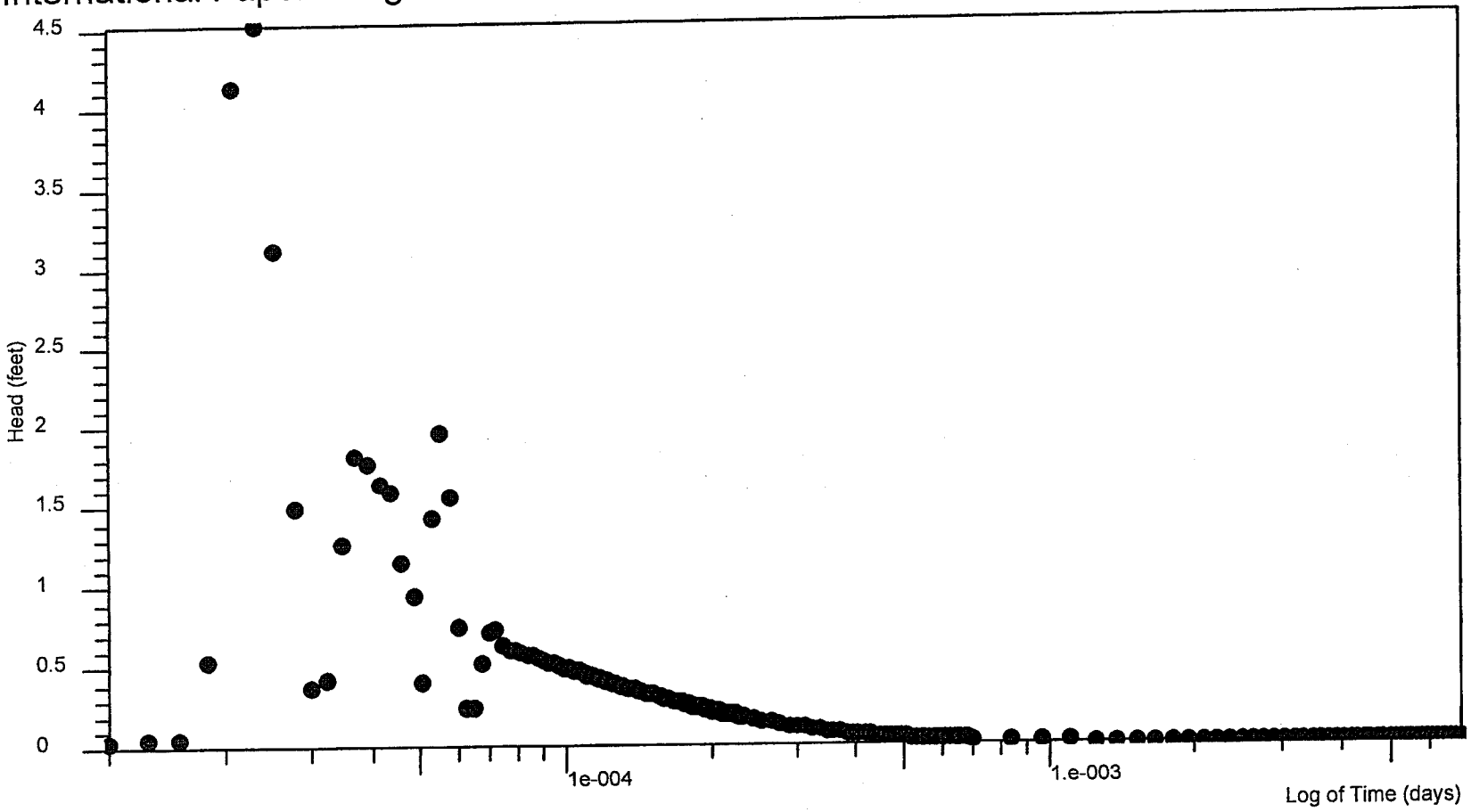
148	2.4	2.367	1.4e-002	1.4e-002	3.106e-003
149	2.6	2.567	9.e-003	9.e-003	1.996e-003
150	2.8	2.767	9.e-003	9.e-003	1.996e-003
151	3.	2.967	9.e-003	9.e-003	1.996e-003
152	3.2	3.167	9.e-003	9.e-003	1.996e-003
153	3.4	3.367	9.e-003	9.e-003	1.996e-003
154	3.6	3.567	9.e-003	9.e-003	1.996e-003
155	3.8	3.767	9.e-003	9.e-003	1.996e-003
156	4.	3.967	9.e-003	9.e-003	1.996e-003
157	4.2	4.167	4.e-003	4.e-003	8.873e-004
158	4.4	4.367	9.e-003	9.e-003	1.996e-003
159	4.6	4.567	9.e-003	9.e-003	1.996e-003
160	4.8	4.767	9.e-003	9.e-003	1.996e-003
161	5.	4.967	4.e-003	4.e-003	8.873e-004
162	5.2	5.167	1.4e-002	1.4e-002	3.106e-003
163	5.4	5.367	4.e-003	4.e-003	8.873e-004
164	5.6	5.567	4.e-003	4.e-003	8.873e-004
165	5.8	5.767	4.e-003	4.e-003	8.873e-004
166	6.	5.967	4.e-003	4.e-003	8.873e-004
167	6.2	6.167	4.e-003	4.e-003	8.873e-004
168	6.4	6.367	4.e-003	4.e-003	8.873e-004
169	6.6	6.567	4.e-003	4.e-003	8.873e-004
170	6.8	6.767	4.e-003	4.e-003	8.873e-004
171	7.	6.967	4.e-003	4.e-003	8.873e-004
172	7.2	7.167	4.e-003	4.e-003	8.873e-004
173	7.4	7.367	4.e-003	4.e-003	8.873e-004
174	7.6	7.567	4.e-003	4.e-003	8.873e-004
175	7.8	7.767	4.e-003	4.e-003	8.873e-004
176	8.	7.967	4.e-003	4.e-003	8.873e-004
177	8.2	8.167	4.e-003	4.e-003	8.873e-004
178	8.4	8.367	4.e-003	4.e-003	8.873e-004
179	8.6	8.567	4.e-003	4.e-003	8.873e-004
180	8.8	8.767	4.e-003	4.e-003	8.873e-004
181	9.	8.967	4.e-003	4.e-003	8.873e-004
182	9.2	9.167	4.e-003	4.e-003	8.873e-004
183	9.4	9.367	4.e-003	4.e-003	8.873e-004
184	9.6	9.567	4.e-003	4.e-003	8.873e-004
185	9.8	9.767	4.e-003	4.e-003	8.873e-004
186	10.	9.967	4.e-003	4.e-003	8.873e-004

JEP-1 Falling Head Test 6/28/01

International Paper- Riegelwood Plant Riegelwood, North Carolina

Head vs. Log Time

JEP-1



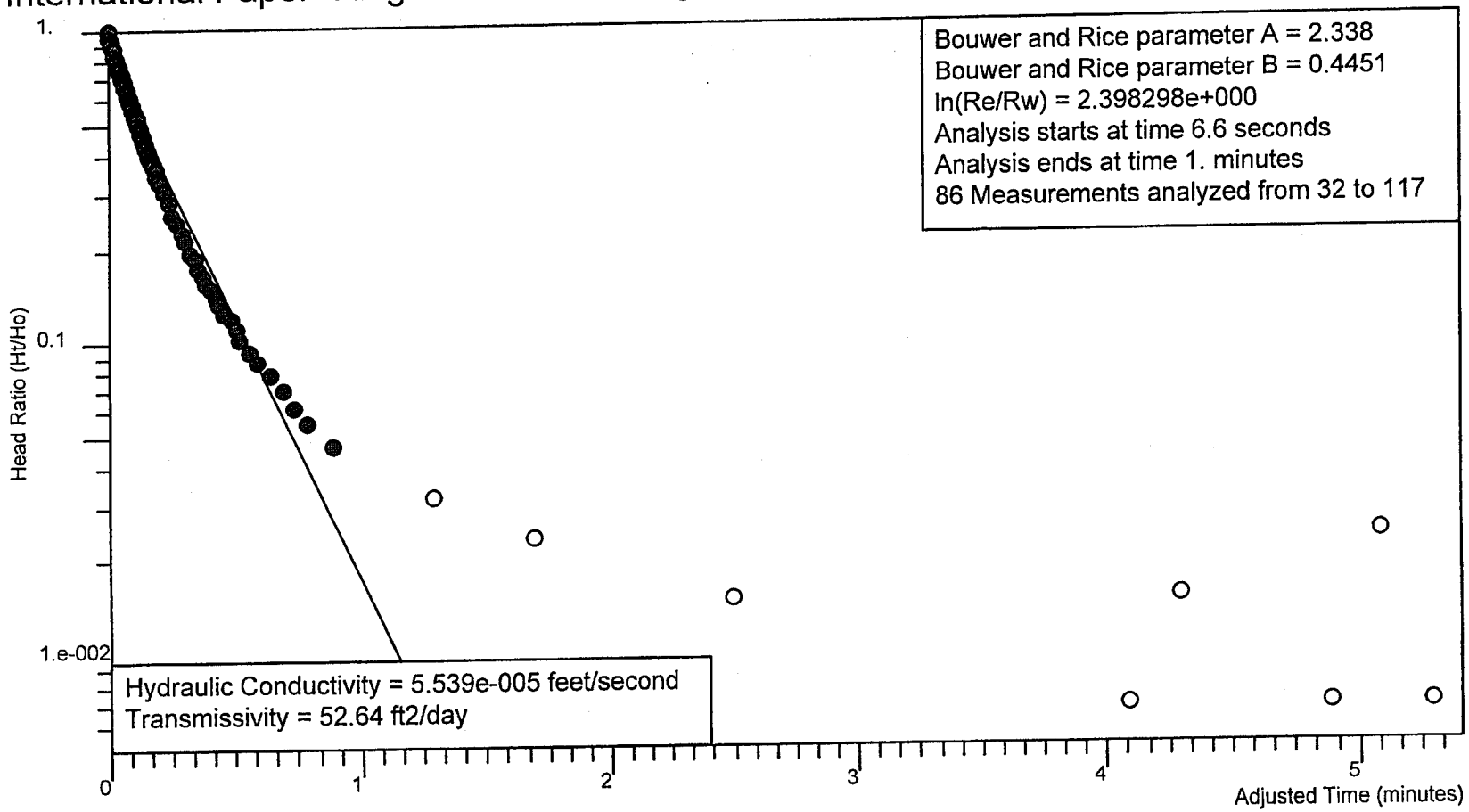
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-1 Falling Head Test 6/28/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-1



Ho is 0.602 feet at 6.6 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-1 Rising Head Test

Site Name: International Paper- Riegelwood Plant
Location: Riegelwood, North Carolina
Test Date: 6/28/01
Client: International Paper
Project Number: 478.04.01
Import File: P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP1RHN

Well Label: JEP-1
Aquifer Thickness: 11. feet
Screen Length: 10. feet
Casing Radius: 8.3e-002 feet
Effective Radius: 0.34 feet
Static Water Level: 0. feet
Water Table to Screen Bottom: 10.16 feet
Anisotropy Ratio: 2.
Time Adjustment: 6.198 Seconds
Test starts with trial 31
There are 186 time and drawdown measurements
Maximum head is 2.106 feet
Minimum head is -0.892 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-0.1033	0.	0.	0.
2	3.3e-003	-0.1	4.e-003	-4.e-003	-1.899e-003
3	6.6e-003	-9.67e-002	4.e-003	-4.e-003	-1.899e-003
4	1.e-002	-9.33e-002	4.e-003	-4.e-003	-1.899e-003
5	1.33e-002	-9.e-002	4.e-003	-4.e-003	-1.899e-003
6	1.66e-002	-8.67e-002	4.e-003	-4.e-003	-1.899e-003
7	2.e-002	-8.33e-002	4.e-003	-4.e-003	-1.899e-003
8	2.33e-002	-8.e-002	4.e-003	-4.e-003	-1.899e-003
9	2.66e-002	-7.67e-002	4.e-003	-4.e-003	-1.899e-003
10	3.e-002	-7.33e-002	-5.2e-002	5.2e-002	2.469e-002
11	3.33e-002	-7.e-002	-1.66	1.66	0.7882
12	3.66e-002	-6.67e-002	-1.447	1.447	0.6871
13	4.e-002	-6.33e-002	-1.921	1.921	0.9122
14	4.33e-002	-6.e-002	-1.802	1.802	0.8557
15	4.66e-002	-5.67e-002	-0.797	0.797	0.3784
16	5.e-002	-5.33e-002	-1.096	1.096	0.5204
17	5.33e-002	-5.e-002	-1.859	1.859	0.8827
18	5.66e-002	-4.67e-002	-1.148	1.148	0.5451
19	6.e-002	-4.33e-002	0.237	-0.237	-0.1125
20	6.33e-002	-4.e-002	0.892	-0.892	-0.4236
21	6.66e-002	-3.67e-002	0.36	-0.36	-0.1709
22	7.e-002	-3.33e-002	0.27	-0.27	-0.1282
23	7.33e-002	-3.e-002	0.213	-0.213	-0.1011
24	7.66e-002	-2.67e-002	-0.208	0.208	9.877e-002
25	8.e-002	-2.33e-002	-0.156	0.156	7.407e-002
26	8.33e-002	-2.e-002	0.256	-0.256	-0.1216
27	8.66e-002	-1.67e-002	-0.436	0.436	0.207
28	9.e-002	-1.33e-002	-1.897	1.897	0.9008
29	9.33e-002	-1.e-002	-1.3	1.3	0.6173
30	9.66e-002	-6.7e-003	-1.01	1.01	0.4796
31	0.1	-3.3e-003	-1.442	1.442	0.6847
32	0.1033	0.	-2.106	2.106	1.
33	0.1066	3.3e-003	-1.746	1.746	0.8291

34	0.11	6.7e-003	-1.347	1.347	0.6396
35	0.1133	1.e-002	-1.395	1.395	0.6624
36	0.1166	1.33e-002	-1.328	1.328	0.6306
37	0.12	1.67e-002	-1.262	1.262	0.5992
38	0.1233	2.e-002	-1.224	1.224	0.5812
39	0.1266	2.33e-002	-1.176	1.176	0.5584
40	0.13	2.67e-002	-1.129	1.129	0.5361
41	0.1333	3.e-002	-1.096	1.096	0.5204
42	0.1366	3.33e-002	-1.067	1.067	0.5066
43	0.14	3.67e-002	-1.029	1.029	0.4886
44	0.1433	4.e-002	-0.996	0.996	0.4729
45	0.1466	4.33e-002	-0.977	0.977	0.4639
46	0.15	4.67e-002	-0.949	0.949	0.4506
47	0.1533	5.e-002	-0.915	0.915	0.4345
48	0.1566	5.33e-002	-0.901	0.901	0.4278
49	0.16	5.67e-002	-0.877	0.877	0.4164
50	0.1633	6.e-002	-0.844	0.844	0.4008
51	0.1666	6.33e-002	-0.83	0.83	0.3941
52	0.17	6.67e-002	-0.811	0.811	0.3851
53	0.1733	7.e-002	-0.787	0.787	0.3737
54	0.1766	7.33e-002	-0.759	0.759	0.3604
55	0.18	7.67e-002	-0.749	0.749	0.3557
56	0.1833	8.e-002	-0.73	0.73	0.3466
57	0.1866	8.33e-002	-0.711	0.711	0.3376
58	0.19	8.67e-002	-0.697	0.697	0.331
59	0.1933	9.e-002	-0.683	0.683	0.3243
60	0.1966	9.33e-002	-0.669	0.669	0.3177
61	0.2	9.67e-002	-0.654	0.654	0.3105
62	0.2033	0.1	-0.64	0.64	0.3039
63	0.2066	0.1033	-0.626	0.626	0.2972
64	0.21	0.1067	-0.612	0.612	0.2906
65	0.2133	0.11	-0.597	0.597	0.2835
66	0.2166	0.1133	-0.588	0.588	0.2792
67	0.22	0.1167	-0.574	0.574	0.2726
68	0.2233	0.12	-0.56	0.56	0.2659
69	0.2266	0.1233	-0.55	0.55	0.2612
70	0.23	0.1267	-0.536	0.536	0.2545
71	0.2333	0.13	-0.526	0.526	0.2498
72	0.2366	0.1333	-0.517	0.517	0.2455
73	0.24	0.1367	-0.503	0.503	0.2388
74	0.2433	0.14	-0.493	0.493	0.2341
75	0.2466	0.1433	-0.484	0.484	0.2298
76	0.25	0.1467	-0.474	0.474	0.2251
77	0.2533	0.15	-0.46	0.46	0.2184
78	0.2566	0.1533	-0.45	0.45	0.2137
79	0.26	0.1567	-0.441	0.441	0.2094
80	0.2633	0.16	-0.431	0.431	0.2047
81	0.2666	0.1633	-0.422	0.422	0.2004
82	0.27	0.1667	-0.412	0.412	0.1956
83	0.2733	0.17	-0.403	0.403	0.1914
84	0.2766	0.1733	-0.398	0.398	0.189
85	0.28	0.1767	-0.389	0.389	0.1847
86	0.2833	0.18	-0.379	0.379	0.18
87	0.2866	0.1833	-0.374	0.374	0.1776
88	0.29	0.1867	-0.365	0.365	0.1733
89	0.2933	0.19	-0.355	0.355	0.1686
90	0.2966	0.1933	-0.351	0.351	0.1667

91	0.3	0.1967	-0.341	0.341	0.1619
92	0.3033	0.2	-0.336	0.336	0.1595
93	0.3066	0.2033	-0.327	0.327	0.1553
94	0.31	0.2067	-0.322	0.322	0.1529
95	0.3133	0.21	-0.313	0.313	0.1486
96	0.3166	0.2133	-0.308	0.308	0.1462
97	0.32	0.2167	-0.303	0.303	0.1439
98	0.3233	0.22	-0.294	0.294	0.1396
99	0.3266	0.2233	-0.289	0.289	0.1372
100	0.33	0.2267	-0.284	0.284	0.1349
101	0.3333	0.23	-0.279	0.279	0.1325
102	0.35	0.2467	-0.246	0.246	0.1168
103	0.3666	0.2633	-0.223	0.223	0.1059
104	0.3833	0.28	-0.199	0.199	9.449e-002
105	0.4	0.2967	-0.18	0.18	8.547e-002
106	0.4166	0.3133	-0.161	0.161	7.645e-002
107	0.4333	0.33	-0.147	0.147	6.98e-002
108	0.45	0.3467	-0.132	0.132	6.268e-002
109	0.4666	0.3633	-0.118	0.118	5.603e-002
110	0.4833	0.38	-0.109	0.109	5.176e-002
111	0.5	0.3967	-9.9e-002	9.9e-002	4.701e-002
112	0.5166	0.4133	-9.e-002	9.e-002	4.274e-002
113	0.5333	0.43	-8.e-002	8.e-002	3.799e-002
114	0.55	0.4467	-7.5e-002	7.5e-002	3.561e-002
115	0.5666	0.4633	-6.6e-002	6.6e-002	3.134e-002
116	0.5833	0.48	-6.1e-002	6.1e-002	2.896e-002
117	0.6	0.4967	-5.7e-002	5.7e-002	2.707e-002
118	0.6166	0.5133	-5.2e-002	5.2e-002	2.469e-002
119	0.6333	0.53	-4.7e-002	4.7e-002	2.232e-002
120	0.65	0.5467	-4.2e-002	4.2e-002	1.994e-002
121	0.6666	0.5633	-3.8e-002	3.8e-002	1.804e-002
122	0.6833	0.58	-3.8e-002	3.8e-002	1.804e-002
123	0.7	0.5967	-3.3e-002	3.3e-002	1.567e-002
124	0.7166	0.6133	-3.3e-002	3.3e-002	1.567e-002
125	0.7333	0.63	-2.8e-002	2.8e-002	1.33e-002
126	0.75	0.6467	-2.8e-002	2.8e-002	1.33e-002
127	0.7666	0.6633	-2.8e-002	2.8e-002	1.33e-002
128	0.7833	0.68	-2.3e-002	2.3e-002	1.092e-002
129	0.8	0.6967	-2.3e-002	2.3e-002	1.092e-002
130	0.8166	0.7133	-1.9e-002	1.9e-002	9.022e-003
131	0.8333	0.73	-1.9e-002	1.9e-002	9.022e-003
132	0.85	0.7467	-1.4e-002	1.4e-002	6.648e-003
133	0.8666	0.7633	-9.e-003	9.e-003	4.274e-003
134	0.8833	0.78	-9.e-003	9.e-003	4.274e-003
135	0.9	0.7967	-9.e-003	9.e-003	4.274e-003
136	0.9166	0.8133	-9.e-003	9.e-003	4.274e-003
137	0.9333	0.83	-9.e-003	9.e-003	4.274e-003
138	0.95	0.8467	-9.e-003	9.e-003	4.274e-003
139	0.9666	0.8633	-9.e-003	9.e-003	4.274e-003
140	0.9833	0.88	-9.e-003	9.e-003	4.274e-003
141	1.	0.8967	-9.e-003	9.e-003	4.274e-003
142	1.2	1.097	-4.e-003	4.e-003	1.899e-003
143	1.4	1.297	0.	0.	0.
144	1.6	1.497	0.	0.	0.
145	1.8	1.697	0.	0.	0.
146	2.	1.897	0.	0.	0.
147	2.2	2.097	0.	0.	0.

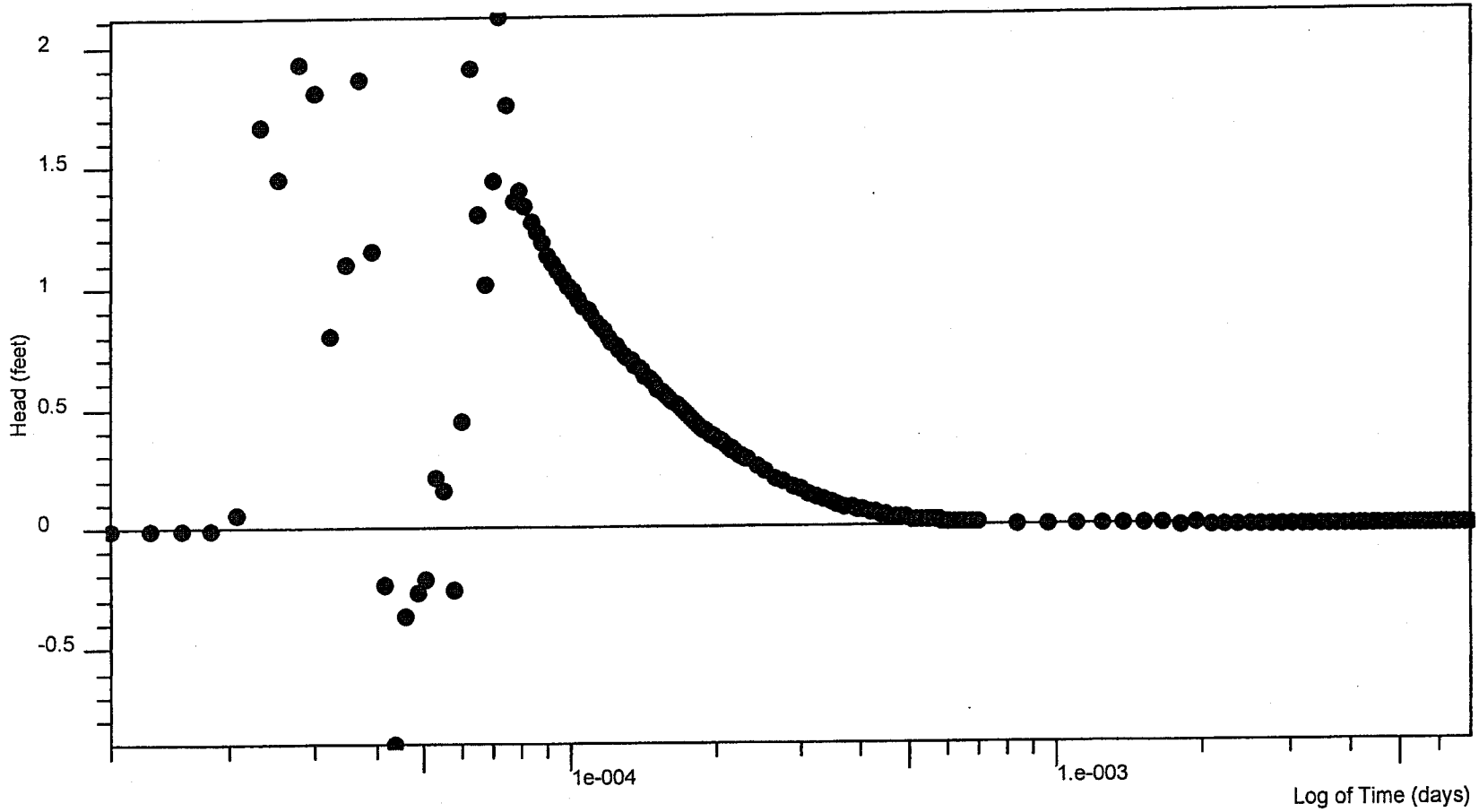
148	2.4	2.297	0.	0.	0.
149	2.6	2.497	4.e-003	-4.e-003	-1.899e-003
150	2.8	2.697	0.	0.	0.
151	3.	2.897	4.e-003	-4.e-003	-1.899e-003
152	3.2	3.097	4.e-003	-4.e-003	-1.899e-003
153	3.4	3.297	4.e-003	-4.e-003	-1.899e-003
154	3.6	3.497	4.e-003	-4.e-003	-1.899e-003
155	3.8	3.697	4.e-003	-4.e-003	-1.899e-003
156	4.	3.897	4.e-003	-4.e-003	-1.899e-003
157	4.2	4.097	4.e-003	-4.e-003	-1.899e-003
158	4.4	4.297	4.e-003	-4.e-003	-1.899e-003
159	4.6	4.497	4.e-003	-4.e-003	-1.899e-003
160	4.8	4.697	4.e-003	-4.e-003	-1.899e-003
161	5.	4.897	4.e-003	-4.e-003	-1.899e-003
162	5.2	5.097	9.e-003	-9.e-003	-4.274e-003
163	5.4	5.297	4.e-003	-4.e-003	-1.899e-003
164	5.6	5.497	4.e-003	-4.e-003	-1.899e-003
165	5.8	5.697	4.e-003	-4.e-003	-1.899e-003
166	6.	5.897	9.e-003	-9.e-003	-4.274e-003
167	6.2	6.097	9.e-003	-9.e-003	-4.274e-003
168	6.4	6.297	9.e-003	-9.e-003	-4.274e-003
169	6.6	6.497	4.e-003	-4.e-003	-1.899e-003
170	6.8	6.697	4.e-003	-4.e-003	-1.899e-003
171	7.	6.897	4.e-003	-4.e-003	-1.899e-003
172	7.2	7.097	4.e-003	-4.e-003	-1.899e-003
173	7.4	7.297	4.e-003	-4.e-003	-1.899e-003
174	7.6	7.497	4.e-003	-4.e-003	-1.899e-003
175	7.8	7.697	4.e-003	-4.e-003	-1.899e-003
176	8.	7.897	4.e-003	-4.e-003	-1.899e-003
177	8.2	8.097	4.e-003	-4.e-003	-1.899e-003
178	8.4	8.297	9.e-003	-9.e-003	-4.274e-003
179	8.6	8.497	9.e-003	-9.e-003	-4.274e-003
180	8.8	8.697	9.e-003	-9.e-003	-4.274e-003
181	9.	8.897	9.e-003	-9.e-003	-4.274e-003
182	9.2	9.097	9.e-003	-9.e-003	-4.274e-003
183	9.4	9.297	4.e-003	-4.e-003	-1.899e-003
184	9.6	9.497	4.e-003	-4.e-003	-1.899e-003
185	9.8	9.697	4.e-003	-4.e-003	-1.899e-003
186	10.	9.897	4.e-003	-4.e-003	-1.899e-003

JEP-1 Rising Head Test 6/28/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-1



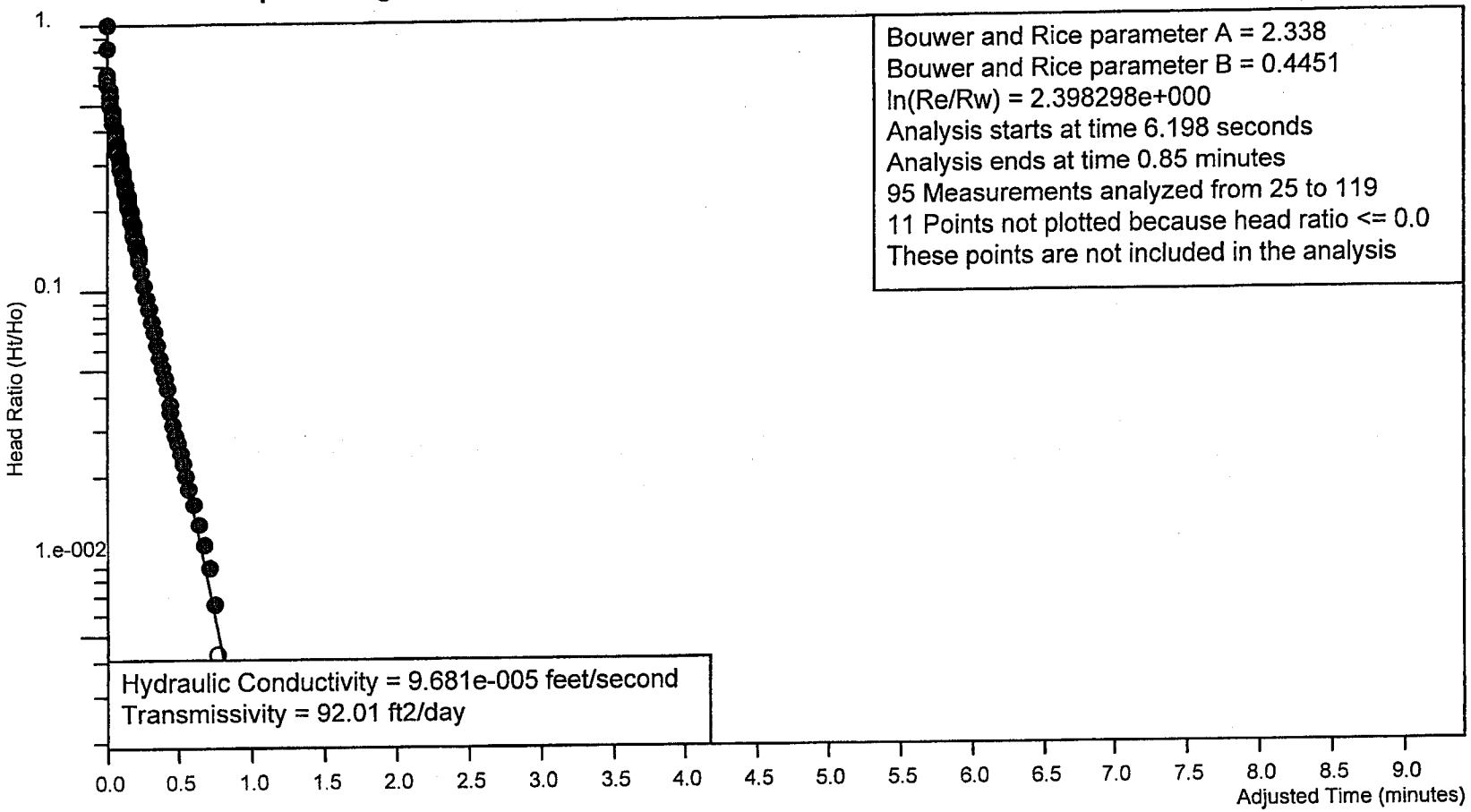
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-1 Rising Head Test 6/28/01

International Paper Riegelwood, North Carolina

Bouwer and Rice Graph

JEP-1



Ho is 2.106 feet at 6.198 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-2 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP2FHN

Well Label:	JEP-2
Aquifer Thickness:	10. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	7.27 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.596 Seconds

Test starts with trial 8
There are 186 time and drawdown measurements
Maximum head is 1.427 feet
Minimum head is -7.5e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.66e-002	-3.3e-002	-3.3e-002	-2.313e-002
2	3.3e-003	-2.33e-002	-2.8e-002	-2.8e-002	-1.962e-002
3	6.6e-003	-2.e-002	-2.8e-002	-2.8e-002	-1.962e-002
4	1.e-002	-1.66e-002	-2.8e-002	-2.8e-002	-1.962e-002
5	1.33e-002	-1.33e-002	-2.8e-002	-2.8e-002	-1.962e-002
6	1.66e-002	-1.e-002	-2.8e-002	-2.8e-002	-1.962e-002
7	2.e-002	-6.6e-003	-2.3e-002	-2.3e-002	-1.612e-002
8	2.33e-002	-3.3e-003	0.426	0.426	0.2985
9	2.66e-002	0.	1.427	1.427	1.
10	3.e-002	3.4e-003	1.361	1.361	0.9537
11	3.33e-002	6.7e-003	1.327	1.327	0.9299
12	3.66e-002	1.e-002	1.313	1.313	0.9201
13	4.e-002	1.34e-002	1.024	1.024	0.7176
14	4.33e-002	1.67e-002	1.313	1.313	0.9201
15	4.66e-002	2.e-002	1.365	1.365	0.9566
16	5.e-002	2.34e-002	1.365	1.365	0.9566
17	5.33e-002	2.67e-002	1.361	1.361	0.9537
18	5.66e-002	3.e-002	1.299	1.299	0.9103
19	6.e-002	3.34e-002	0.692	0.692	0.4849
20	6.33e-002	3.67e-002	0.863	0.863	0.6048
21	6.66e-002	4.e-002	0.967	0.967	0.6776
22	7.e-002	4.34e-002	0.962	0.962	0.6741
23	7.33e-002	4.67e-002	0.962	0.962	0.6741
24	7.66e-002	5.e-002	0.957	0.957	0.6706
25	8.e-002	5.34e-002	0.957	0.957	0.6706
26	8.33e-002	5.67e-002	0.957	0.957	0.6706
27	8.66e-002	6.e-002	0.953	0.953	0.6678
28	9.e-002	6.34e-002	0.953	0.953	0.6678
29	9.33e-002	6.67e-002	0.953	0.953	0.6678
30	9.66e-002	7.e-002	0.948	0.948	0.6643
31	0.1	7.34e-002	0.948	0.948	0.6643
32	0.1033	7.67e-002	0.943	0.943	0.6608
33	0.1066	8.e-002	0.943	0.943	0.6608

34	0.11	8.34e-002	0.939	0.939	0.658
35	0.1133	8.67e-002	0.939	0.939	0.658
36	0.1166	9.e-002	0.934	0.934	0.6545
37	0.12	9.34e-002	0.934	0.934	0.6545
38	0.1233	9.67e-002	0.929	0.929	0.651
39	0.1266	1.e-001	0.924	0.924	0.6475
40	0.13	0.1034	0.924	0.924	0.6475
41	0.1333	0.1067	0.92	0.92	0.6447
42	0.1366	0.11	0.915	0.915	0.6412
43	0.14	0.1134	0.915	0.915	0.6412
44	0.1433	0.1167	0.91	0.91	0.6377
45	0.1466	0.12	0.905	0.905	0.6342
46	0.15	0.1234	0.905	0.905	0.6342
47	0.1533	0.1267	0.901	0.901	0.6314
48	0.1566	0.13	0.896	0.896	0.6279
49	0.16	0.1334	0.891	0.891	0.6244
50	0.1633	0.1367	0.891	0.891	0.6244
51	0.1666	0.14	0.886	0.886	0.6209
52	0.17	0.1434	0.882	0.882	0.6181
53	0.1733	0.1467	0.882	0.882	0.6181
54	0.1766	0.15	0.877	0.877	0.6146
55	0.18	0.1534	0.872	0.872	0.6111
56	0.1833	0.1567	0.872	0.872	0.6111
57	0.1866	0.16	0.867	0.867	0.6076
58	0.19	0.1634	0.867	0.867	0.6076
59	0.1933	0.1667	0.863	0.863	0.6048
60	0.1966	0.17	0.858	0.858	0.6013
61	0.2	0.1734	0.858	0.858	0.6013
62	0.2033	0.1767	0.853	0.853	0.5978
63	0.2066	0.18	0.848	0.848	0.5943
64	0.21	0.1834	0.848	0.848	0.5943
65	0.2133	0.1867	0.844	0.844	0.5915
66	0.2166	0.19	0.839	0.839	0.5879
67	0.22	0.1934	0.839	0.839	0.5879
68	0.2233	0.1967	0.834	0.834	0.5844
69	0.2266	0.2	0.834	0.834	0.5844
70	0.23	0.2034	0.829	0.829	0.5809
71	0.2333	0.2067	0.829	0.829	0.5809
72	0.2366	0.21	0.825	0.825	0.5781
73	0.24	0.2134	0.825	0.825	0.5781
74	0.2433	0.2167	0.82	0.82	0.5746
75	0.2466	0.22	0.82	0.82	0.5746
76	0.25	0.2234	0.815	0.815	0.5711
77	0.2533	0.2267	0.81	0.81	0.5676
78	0.2566	0.23	0.81	0.81	0.5676
79	0.26	0.2334	0.806	0.806	0.5648
80	0.2633	0.2367	0.806	0.806	0.5648
81	0.2666	0.24	0.801	0.801	0.5613
82	0.27	0.2434	0.801	0.801	0.5613
83	0.2733	0.2467	0.796	0.796	0.5578
84	0.2766	0.25	0.796	0.796	0.5578
85	0.28	0.2534	0.791	0.791	0.5543
86	0.2833	0.2567	0.791	0.791	0.5543
87	0.2866	0.26	0.791	0.791	0.5543
88	0.29	0.2634	0.787	0.787	0.5515
89	0.2933	0.2667	0.787	0.787	0.5515
90	0.2966	0.27	0.782	0.782	0.548

91	0.3	0.2734	0.782	0.782	0.548
92	0.3033	0.2767	0.777	0.777	0.5445
93	0.3066	0.28	0.777	0.777	0.5445
94	0.31	0.2834	0.777	0.777	0.5445
95	0.3133	0.2867	0.773	0.773	0.5417
96	0.3166	0.29	0.773	0.773	0.5417
97	0.32	0.2934	0.768	0.768	0.5382
98	0.3233	0.2967	0.768	0.768	0.5382
99	0.3266	0.3	0.768	0.768	0.5382
100	0.33	0.3034	0.763	0.763	0.5347
101	0.3333	0.3067	0.763	0.763	0.5347
102	0.35	0.3234	0.749	0.749	0.5249
103	0.3666	0.34	0.739	0.739	0.5179
104	0.3833	0.3567	0.73	0.73	0.5116
105	0.4	0.3734	0.72	0.72	0.5046
106	0.4166	0.39	0.716	0.716	0.5018
107	0.4333	0.4067	0.706	0.706	0.4947
108	0.45	0.4234	0.697	0.697	0.4884
109	0.4666	0.44	0.687	0.687	0.4814
110	0.4833	0.4567	0.682	0.682	0.4779
111	0.5	0.4734	0.673	0.673	0.4716
112	0.5166	0.49	0.668	0.668	0.4681
113	0.5333	0.5067	0.659	0.659	0.4618
114	0.55	0.5234	0.654	0.654	0.4583
115	0.5666	0.54	0.649	0.649	0.4548
116	0.5833	0.5567	0.64	0.64	0.4485
117	0.6	0.5734	0.635	0.635	0.445
118	0.6166	0.59	0.63	0.63	0.4415
119	0.6333	0.6067	0.625	0.625	0.438
120	0.65	0.6234	0.621	0.621	0.4352
121	0.6666	0.64	0.611	0.611	0.4282
122	0.6833	0.6567	0.607	0.607	0.4254
123	0.7	0.6734	0.597	0.597	0.4184
124	0.7166	0.69	0.592	0.592	0.4149
125	0.7333	0.7067	0.587	0.587	0.4114
126	0.75	0.7234	0.583	0.583	0.4085
127	0.7666	0.74	0.578	0.578	0.405
128	0.7833	0.7567	0.578	0.578	0.405
129	0.8	0.7734	0.573	0.573	0.4015
130	0.8166	0.79	0.569	0.569	0.3987
131	0.8333	0.8067	0.569	0.569	0.3987
132	0.85	0.8234	0.564	0.564	0.3952
133	0.8666	0.84	0.559	0.559	0.3917
134	0.8833	0.8567	0.559	0.559	0.3917
135	0.9	0.8734	0.554	0.554	0.3882
136	0.9166	0.89	0.554	0.554	0.3882
137	0.9333	0.9067	0.55	0.55	0.3854
138	0.95	0.9234	0.55	0.55	0.3854
139	0.9666	0.94	0.545	0.545	0.3819
140	0.9833	0.9567	0.545	0.545	0.3819
141	1.	0.9734	0.54	0.54	0.3784
142	1.2	1.173	0.507	0.507	0.3553
143	1.4	1.373	0.478	0.478	0.335
144	1.6	1.573	0.455	0.455	0.3189
145	1.8	1.773	0.431	0.431	0.302
146	2.	1.973	0.412	0.412	0.2887
147	2.2	2.173	0.388	0.388	0.2719

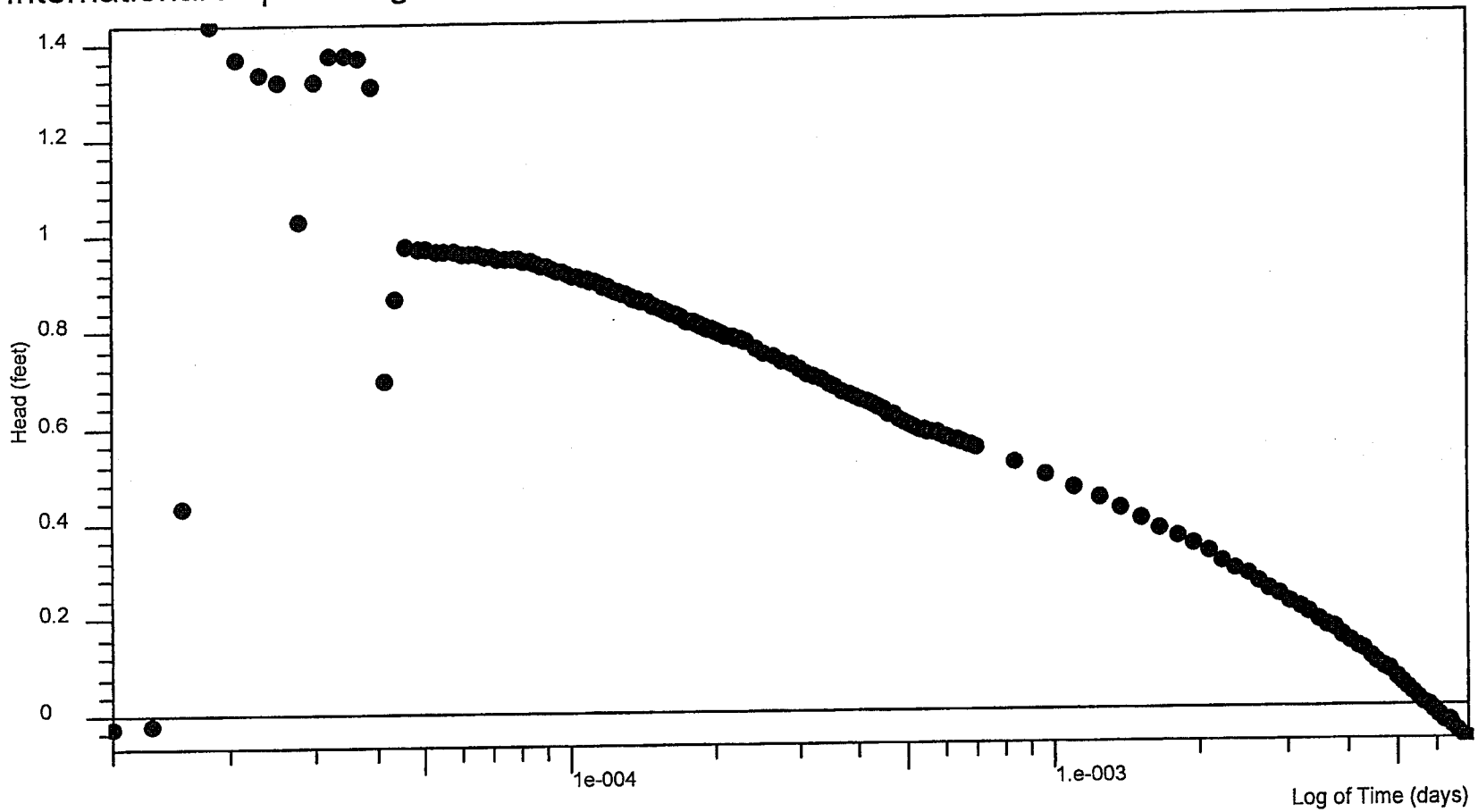
148	2.4	2.373	0.369	0.369	0.2586
149	2.6	2.573	0.35	0.35	0.2453
150	2.8	2.773	0.336	0.336	0.2355
151	3.	2.973	0.317	0.317	0.2221
152	3.2	3.173	0.298	0.298	0.2088
153	3.4	3.373	0.284	0.284	0.199
154	3.6	3.573	0.27	0.27	0.1892
155	3.8	3.773	0.256	0.256	0.1794
156	4.	3.973	0.241	0.241	0.1689
157	4.2	4.173	0.227	0.227	0.1591
158	4.4	4.373	0.213	0.213	0.1493
159	4.6	4.573	0.199	0.199	0.1395
160	4.8	4.773	0.189	0.189	0.1324
161	5.	4.973	0.175	0.175	0.1226
162	5.2	5.173	0.165	0.165	0.1156
163	5.4	5.373	0.156	0.156	0.1093
164	5.6	5.573	0.142	0.142	9.951e-002
165	5.8	5.773	0.132	0.132	9.25e-002
166	6.	5.973	0.123	0.123	8.619e-002
167	6.2	6.173	0.113	0.113	7.919e-002
168	6.4	6.373	9.9e-002	9.9e-002	6.938e-002
169	6.6	6.573	9.e-002	9.e-002	6.307e-002
170	6.8	6.773	8.e-002	8.e-002	5.606e-002
171	7.	6.973	7.1e-002	7.1e-002	4.975e-002
172	7.2	7.173	5.6e-002	5.6e-002	3.924e-002
173	7.4	7.373	4.7e-002	4.7e-002	3.294e-002
174	7.6	7.573	3.7e-002	3.7e-002	2.593e-002
175	7.8	7.773	2.3e-002	2.3e-002	1.612e-002
176	8.	7.973	1.4e-002	1.4e-002	9.811e-003
177	8.2	8.173	4.e-003	4.e-003	2.803e-003
178	8.4	8.373	-4.e-003	-4.e-003	-2.803e-003
179	8.6	8.573	-1.4e-002	-1.4e-002	-9.811e-003
180	8.8	8.773	-2.3e-002	-2.3e-002	-1.612e-002
181	9.	8.973	-3.3e-002	-3.3e-002	-2.313e-002
182	9.2	9.173	-3.7e-002	-3.7e-002	-2.593e-002
183	9.4	9.373	-4.7e-002	-4.7e-002	-3.294e-002
184	9.6	9.573	-5.6e-002	-5.6e-002	-3.924e-002
185	9.8	9.773	-6.6e-002	-6.6e-002	-4.625e-002
186	10.	9.973	-7.5e-002	-7.5e-002	-5.256e-002

JEP-2 Falling Head Test 7/3/01

Head vs. Log Time

JEP-2

International Paper- Riegelwood Plant Riegelwood, North Carolina



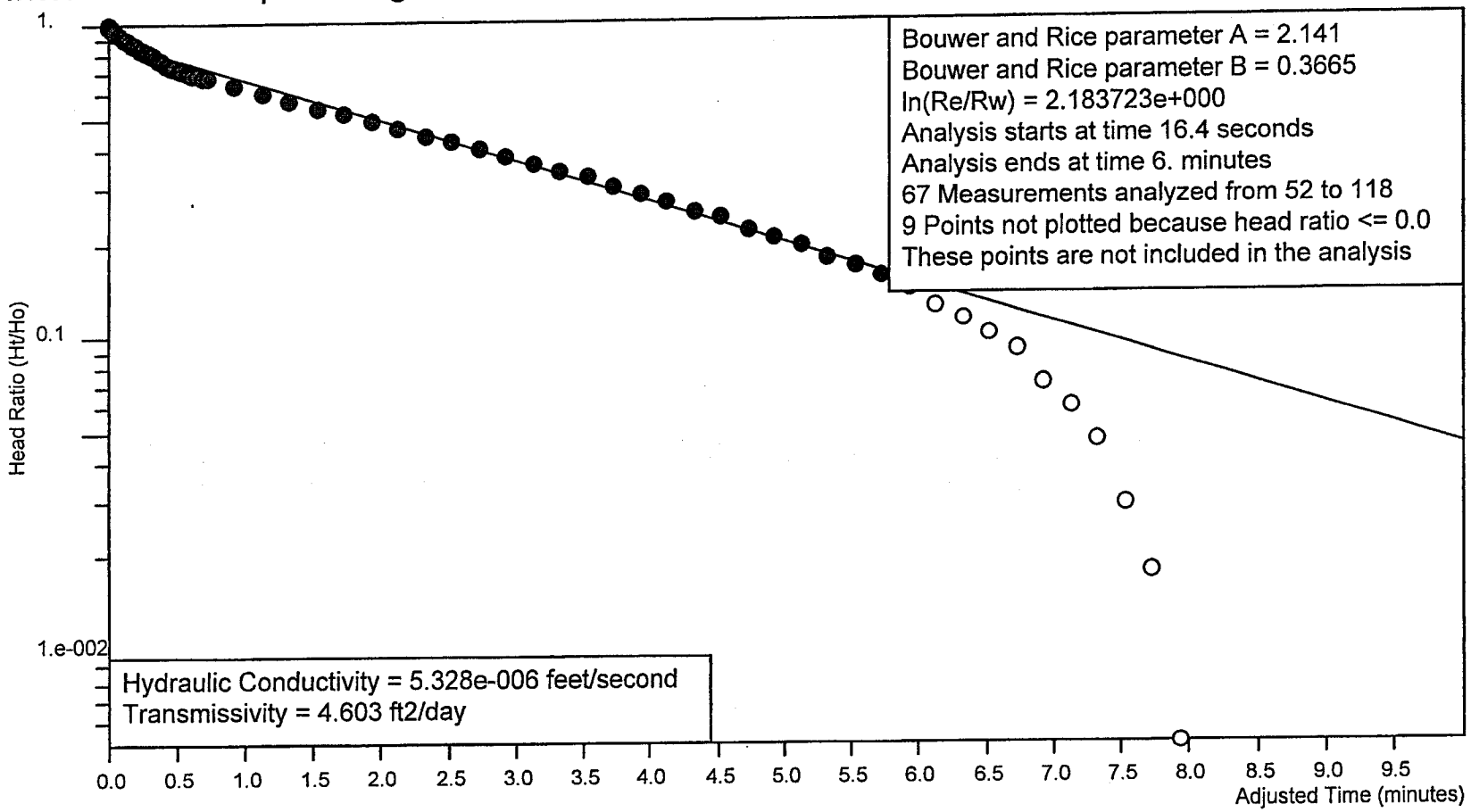
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-2 Falling Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-2



Ho is 0.796 feet at 16.4 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-2 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP2RHN

Well Label:	JEP-2
Aquifer Thickness:	10. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	7.27 feet
Anisotropy Ratio:	2.
Time Adjustment:	2.598 Seconds

Test starts with trial 6
There are 186 time and drawdown measurements
Maximum head is 2.757 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-4.33e-002	-4.e-003	4.e-003	1.451e-003
2	3.3e-003	-4.e-002	0.	0.	0.
3	6.6e-003	-3.67e-002	0.	0.	0.
4	1.e-002	-3.33e-002	-4.e-003	4.e-003	1.451e-003
5	1.33e-002	-3.e-002	-4.e-003	4.e-003	1.451e-003
6	1.66e-002	-2.67e-002	-2.412	2.412	0.8749
7	2.e-002	-2.33e-002	-2.757	2.757	1.
8	2.33e-002	-2.e-002	-1.938	1.938	0.7029
9	2.66e-002	-1.67e-002	-1.578	1.578	0.5724
10	3.e-002	-1.33e-002	-1.791	1.791	0.6496
11	3.33e-002	-1.e-002	-1.682	1.682	0.6101
12	3.66e-002	-6.7e-003	-1.753	1.753	0.6358
13	4.e-002	-3.3e-003	-1.601	1.601	0.5807
14	4.33e-002	0.	-1.488	1.488	0.5397
15	4.66e-002	3.3e-003	-1.483	1.483	0.5379
16	5.e-002	6.7e-003	-1.469	1.469	0.5328
17	5.33e-002	1.e-002	-1.455	1.455	0.5277
18	5.66e-002	1.33e-002	-1.44	1.44	0.5223
19	6.e-002	1.67e-002	-1.431	1.431	0.519
20	6.33e-002	2.e-002	-1.417	1.417	0.514
21	6.66e-002	2.33e-002	-1.403	1.403	0.5089
22	7.e-002	2.67e-002	-1.393	1.393	0.5053
23	7.33e-002	3.e-002	-1.384	1.384	0.502
24	7.66e-002	3.33e-002	-1.374	1.374	0.4984
25	8.e-002	3.67e-002	-1.36	1.36	0.4933
26	8.33e-002	4.e-002	-1.346	1.346	0.4882
27	8.66e-002	4.33e-002	-1.331	1.331	0.4828
28	9.e-002	4.67e-002	-1.317	1.317	0.4777
29	9.33e-002	5.e-002	-1.303	1.303	0.4726
30	9.66e-002	5.33e-002	-1.289	1.289	0.4675
31	0.1	5.67e-002	-1.275	1.275	0.4625
32	0.1033	6.e-002	-1.26	1.26	0.457
33	0.1066	6.33e-002	-1.246	1.246	0.4519

34	0.11	6.67e-002	-1.232	1.232	0.4469
35	0.1133	7.e-002	-1.222	1.222	0.4432
36	0.1166	7.33e-002	-1.213	1.213	0.44
37	0.12	7.67e-002	-1.199	1.199	0.4349
38	0.1233	8.e-002	-1.189	1.189	0.4313
39	0.1266	8.33e-002	-1.18	1.18	0.428
40	0.13	8.67e-002	-1.166	1.166	0.4229
41	0.1333	9.e-002	-1.161	1.161	0.4211
42	0.1366	9.33e-002	-1.151	1.151	0.4175
43	0.14	9.67e-002	-1.137	1.137	0.4124
44	0.1433	0.1	-1.132	1.132	0.4106
45	0.1466	0.1033	-1.118	1.118	0.4055
46	0.15	0.1067	-1.113	1.113	0.4037
47	0.1533	0.11	-1.104	1.104	0.4004
48	0.1566	0.1133	-1.094	1.094	0.3968
49	0.16	0.1167	-1.085	1.085	0.3935
50	0.1633	0.12	-1.076	1.076	0.3903
51	0.1666	0.1233	-1.071	1.071	0.3885
52	0.17	0.1267	-1.061	1.061	0.3848
53	0.1733	0.13	-1.052	1.052	0.3816
54	0.1766	0.1333	-1.047	1.047	0.3798
55	0.18	0.1367	-1.038	1.038	0.3765
56	0.1833	0.14	-1.028	1.028	0.3729
57	0.1866	0.1433	-1.019	1.019	0.3696
58	0.19	0.1467	-1.014	1.014	0.3678
59	0.1933	0.15	-1.004	1.004	0.3642
60	0.1966	0.1533	-1.	1.	0.3627
61	0.2	0.1567	-0.99	0.99	0.3591
62	0.2033	0.16	-0.985	0.985	0.3573
63	0.2066	0.1633	-0.976	0.976	0.354
64	0.21	0.1667	-0.971	0.971	0.3522
65	0.2133	0.17	-0.962	0.962	0.3489
66	0.2166	0.1733	-0.957	0.957	0.3471
67	0.22	0.1767	-0.948	0.948	0.3439
68	0.2233	0.18	-0.943	0.943	0.342
69	0.2266	0.1833	-0.938	0.938	0.3402
70	0.23	0.1867	-0.929	0.929	0.337
71	0.2333	0.19	-0.924	0.924	0.3351
72	0.2366	0.1933	-0.914	0.914	0.3315
73	0.24	0.1967	-0.91	0.91	0.3301
74	0.2433	0.2	-0.905	0.905	0.3283
75	0.2466	0.2033	-0.9	0.9	0.3264
76	0.25	0.2067	-0.891	0.891	0.3232
77	0.2533	0.21	-0.886	0.886	0.3214
78	0.2566	0.2133	-0.881	0.881	0.3196
79	0.26	0.2167	-0.876	0.876	0.3177
80	0.2633	0.22	-0.867	0.867	0.3145
81	0.2666	0.2233	-0.862	0.862	0.3127
82	0.27	0.2267	-0.858	0.858	0.3112
83	0.2733	0.23	-0.853	0.853	0.3094
84	0.2766	0.2333	-0.848	0.848	0.3076
85	0.28	0.2367	-0.843	0.843	0.3058
86	0.2833	0.24	-0.839	0.839	0.3043
87	0.2866	0.2433	-0.829	0.829	0.3007
88	0.29	0.2467	-0.824	0.824	0.2989
89	0.2933	0.25	-0.82	0.82	0.2974
90	0.2966	0.2533	-0.815	0.815	0.2956

91	0.3	0.2567	-0.81	0.81	0.2938
92	0.3033	0.26	-0.805	0.805	0.292
93	0.3066	0.2633	-0.801	0.801	0.2905
94	0.31	0.2667	-0.796	0.796	0.2887
95	0.3133	0.27	-0.791	0.791	0.2869
96	0.3166	0.2733	-0.786	0.786	0.2851
97	0.32	0.2767	-0.782	0.782	0.2836
98	0.3233	0.28	-0.777	0.777	0.2818
99	0.3266	0.2833	-0.772	0.772	0.28
100	0.33	0.2867	-0.767	0.767	0.2782
101	0.3333	0.29	-0.763	0.763	0.2768
102	0.35	0.3067	-0.744	0.744	0.2699
103	0.3666	0.3233	-0.72	0.72	0.2612
104	0.3833	0.34	-0.696	0.696	0.2524
105	0.4	0.3567	-0.677	0.677	0.2456
106	0.4166	0.3733	-0.654	0.654	0.2372
107	0.4333	0.39	-0.635	0.635	0.2303
108	0.45	0.4067	-0.616	0.616	0.2234
109	0.4666	0.4233	-0.597	0.597	0.2165
110	0.4833	0.44	-0.578	0.578	0.2096
111	0.5	0.4567	-0.559	0.559	0.2028
112	0.5166	0.4733	-0.54	0.54	0.1959
113	0.5333	0.49	-0.526	0.526	0.1908
114	0.55	0.5067	-0.507	0.507	0.1839
115	0.5666	0.5233	-0.493	0.493	0.1788
116	0.5833	0.54	-0.478	0.478	0.1734
117	0.6	0.5567	-0.459	0.459	0.1665
118	0.6166	0.5733	-0.45	0.45	0.1632
119	0.6333	0.59	-0.431	0.431	0.1563
120	0.65	0.6067	-0.417	0.417	0.1513
121	0.6666	0.6233	-0.407	0.407	0.1476
122	0.6833	0.64	-0.393	0.393	0.1425
123	0.7	0.6567	-0.379	0.379	0.1375
124	0.7166	0.6733	-0.365	0.365	0.1324
125	0.7333	0.69	-0.355	0.355	0.1288
126	0.75	0.7067	-0.346	0.346	0.1255
127	0.7666	0.7233	-0.331	0.331	0.1201
128	0.7833	0.74	-0.327	0.327	0.1186
129	0.8	0.7567	-0.317	0.317	0.115
130	0.8166	0.7733	-0.308	0.308	0.1117
131	0.8333	0.79	-0.298	0.298	0.1081
132	0.85	0.8067	-0.289	0.289	0.1048
133	0.8666	0.8233	-0.284	0.284	0.103
134	0.8833	0.84	-0.279	0.279	0.1012
135	0.9	0.8567	-0.27	0.27	9.793e-002
136	0.9166	0.8733	-0.265	0.265	9.612e-002
137	0.9333	0.89	-0.26	0.26	9.431e-002
138	0.95	0.9067	-0.251	0.251	9.104e-002
139	0.9666	0.9233	-0.246	0.246	8.923e-002
140	0.9833	0.94	-0.241	0.241	8.741e-002
141	1.	0.9567	-0.237	0.237	8.596e-002
142	1.2	1.157	-0.18	0.18	6.529e-002
143	1.4	1.357	-0.151	0.151	5.477e-002
144	1.6	1.557	-0.132	0.132	4.788e-002
145	1.8	1.757	-0.123	0.123	4.461e-002
146	2.	1.957	-0.118	0.118	4.28e-002
147	2.2	2.157	-0.113	0.113	4.099e-002

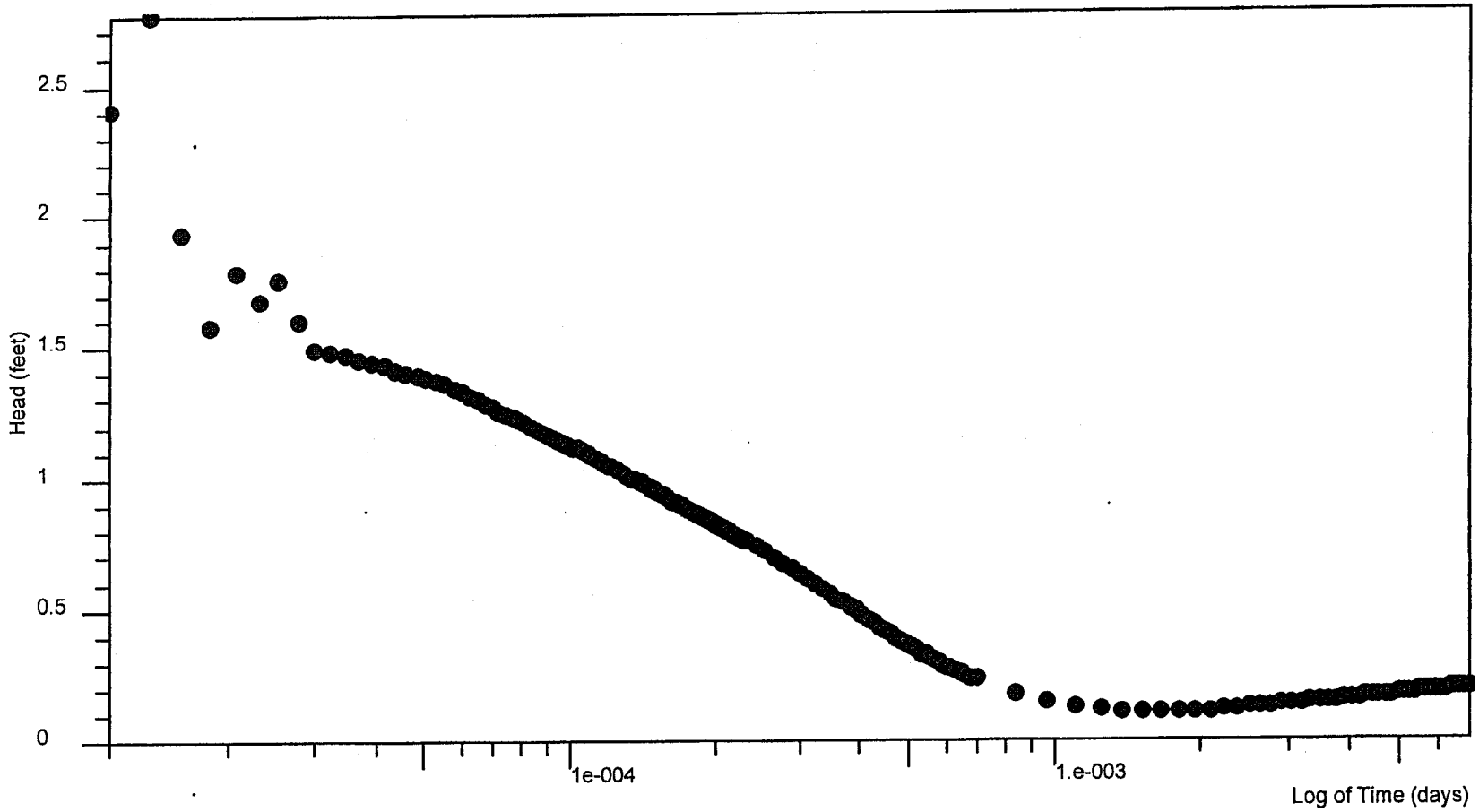
148	2.4	2.357	-0.113	0.113	4.099e-002
149	2.6	2.557	-0.113	0.113	4.099e-002
150	2.8	2.757	-0.118	0.118	4.28e-002
151	3.	2.957	-0.118	0.118	4.28e-002
152	3.2	3.157	-0.123	0.123	4.461e-002
153	3.4	3.357	-0.128	0.128	4.643e-002
154	3.6	3.557	-0.132	0.132	4.788e-002
155	3.8	3.757	-0.132	0.132	4.788e-002
156	4.	3.957	-0.137	0.137	4.969e-002
157	4.2	4.157	-0.142	0.142	5.151e-002
158	4.4	4.357	-0.146	0.146	5.296e-002
159	4.6	4.557	-0.146	0.146	5.296e-002
160	4.8	4.757	-0.151	0.151	5.477e-002
161	5.	4.957	-0.151	0.151	5.477e-002
162	5.2	5.157	-0.156	0.156	5.658e-002
163	5.4	5.357	-0.156	0.156	5.658e-002
164	5.6	5.557	-0.161	0.161	5.84e-002
165	5.8	5.757	-0.161	0.161	5.84e-002
166	6.	5.957	-0.165	0.165	5.985e-002
167	6.2	6.157	-0.17	0.17	6.166e-002
168	6.4	6.357	-0.17	0.17	6.166e-002
169	6.6	6.557	-0.17	0.17	6.166e-002
170	6.8	6.757	-0.175	0.175	6.347e-002
171	7.	6.957	-0.175	0.175	6.347e-002
172	7.2	7.157	-0.18	0.18	6.529e-002
173	7.4	7.357	-0.18	0.18	6.529e-002
174	7.6	7.557	-0.184	0.184	6.674e-002
175	7.8	7.757	-0.184	0.184	6.674e-002
176	8.	7.957	-0.189	0.189	6.855e-002
177	8.2	8.157	-0.189	0.189	6.855e-002
178	8.4	8.357	-0.189	0.189	6.855e-002
179	8.6	8.557	-0.194	0.194	7.037e-002
180	8.8	8.757	-0.194	0.194	7.037e-002
181	9.	8.957	-0.194	0.194	7.037e-002
182	9.2	9.157	-0.199	0.199	7.218e-002
183	9.4	9.357	-0.199	0.199	7.218e-002
184	9.6	9.557	-0.203	0.203	7.363e-002
185	9.8	9.757	-0.203	0.203	7.363e-002
186	10.	9.957	-0.203	0.203	7.363e-002

JEP-2 Rising Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-2



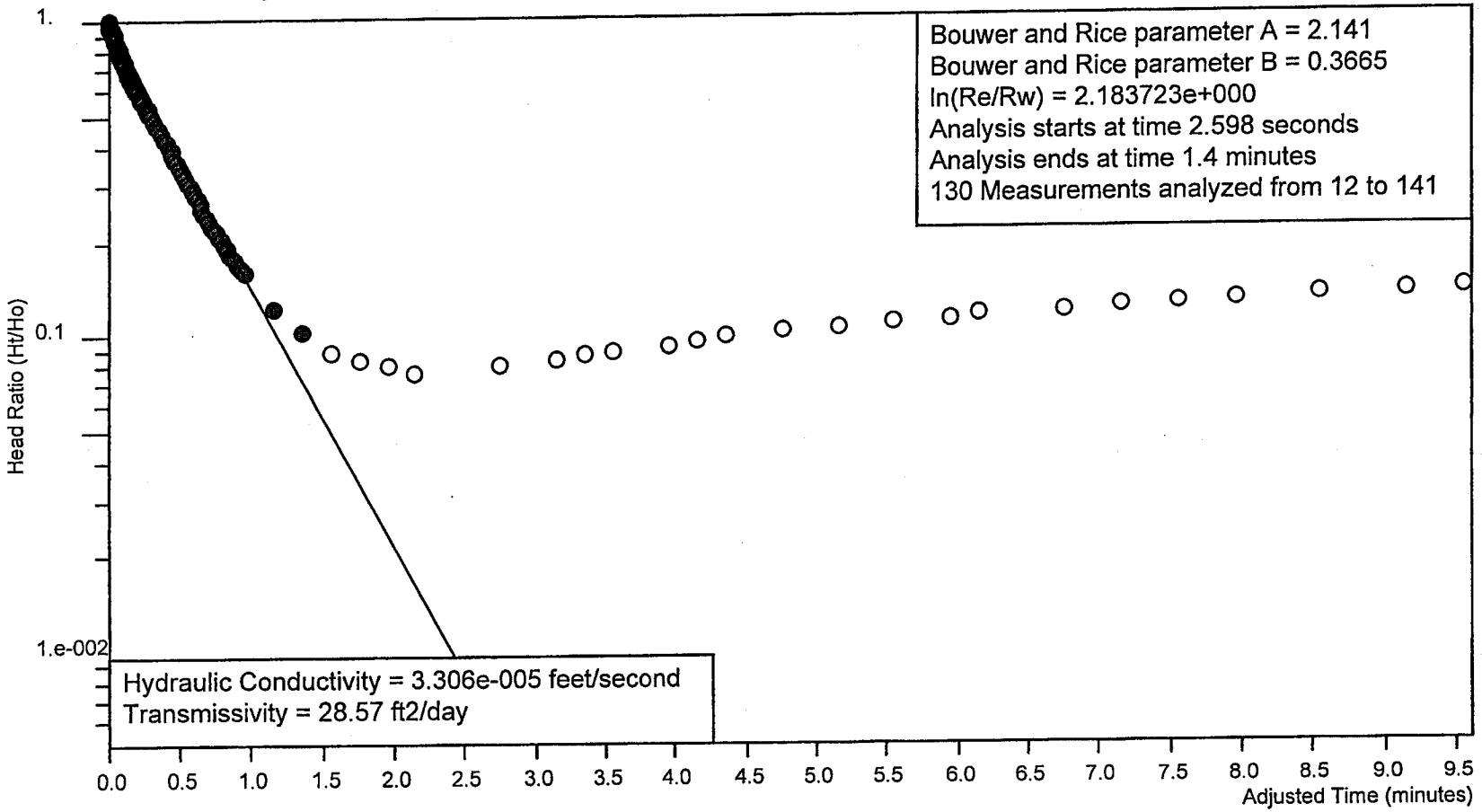
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-2 Rising Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-2



Ho is 1.488 feet at 2.598 seconds

Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

JEP-3 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:.	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP3FHN

Well Label:	JEP-3
Aquifer Thickness:	12. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	6.79 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.2 Seconds

Test starts with trial 6
There are 186 time and drawdown measurements
Maximum head is 2.757 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.e-002	-4.e-003	4.e-003	1.451e-003
2	3.3e-003	-1.67e-002	0.	0.	0.
3	6.6e-003	-1.34e-002	0.	0.	0.
4	1.e-002	-1.e-002	-4.e-003	4.e-003	1.451e-003
5	1.33e-002	-6.7e-003	-4.e-003	4.e-003	1.451e-003
6	1.66e-002	-3.4e-003	-2.412	2.412	0.8749
7	2.e-002	0.	-2.757	2.757	1.
8	2.33e-002	3.3e-003	-1.938	1.938	0.7029
9	2.66e-002	6.6e-003	-1.578	1.578	0.5724
10	3.e-002	1.e-002	-1.791	1.791	0.6496
11	3.33e-002	1.33e-002	-1.682	1.682	0.6101
12	3.66e-002	1.66e-002	-1.753	1.753	0.6358
13	4.e-002	2.e-002	-1.601	1.601	0.5807
14	4.33e-002	2.33e-002	-1.488	1.488	0.5397
15	4.66e-002	2.66e-002	-1.483	1.483	0.5379
16	5.e-002	3.e-002	-1.469	1.469	0.5328
17	5.33e-002	3.33e-002	-1.455	1.455	0.5277
18	5.66e-002	3.66e-002	-1.44	1.44	0.5223
19	6.e-002	4.e-002	-1.431	1.431	0.519
20	6.33e-002	4.33e-002	-1.417	1.417	0.514
21	6.66e-002	4.66e-002	-1.403	1.403	0.5089
22	7.e-002	5.e-002	-1.393	1.393	0.5053
23	7.33e-002	5.33e-002	-1.384	1.384	0.502
24	7.66e-002	5.66e-002	-1.374	1.374	0.4984
25	8.e-002	6.e-002	-1.36	1.36	0.4933
26	8.33e-002	6.33e-002	-1.346	1.346	0.4882
27	8.66e-002	6.66e-002	-1.331	1.331	0.4828
28	9.e-002	7.e-002	-1.317	1.317	0.4777
29	9.33e-002	7.33e-002	-1.303	1.303	0.4726
30	9.66e-002	7.66e-002	-1.289	1.289	0.4675
31	0.1	8.e-002	-1.275	1.275	0.4625
32	0.1033	8.33e-002	-1.26	1.26	0.457
33	0.1066	8.66e-002	-1.246	1.246	0.4519

34	0.11	9.e-002	-1.232	1.232	0.4469
35	0.1133	9.33e-002	-1.222	1.222	0.4432
36	0.1166	9.66e-002	-1.213	1.213	0.44
37	0.12	0.1	-1.199	1.199	0.4349
38	0.1233	0.1033	-1.189	1.189	0.4313
39	0.1266	0.1066	-1.18	1.18	0.428
40	0.13	0.11	-1.166	1.166	0.4229
41	0.1333	0.1133	-1.161	1.161	0.4211
42	0.1366	0.1166	-1.151	1.151	0.4175
43	0.14	0.12	-1.137	1.137	0.4124
44	0.1433	0.1233	-1.132	1.132	0.4106
45	0.1466	0.1266	-1.118	1.118	0.4055
46	0.15	0.13	-1.113	1.113	0.4037
47	0.1533	0.1333	-1.104	1.104	0.4004
48	0.1566	0.1366	-1.094	1.094	0.3968
49	0.16	0.14	-1.085	1.085	0.3935
50	0.1633	0.1433	-1.076	1.076	0.3903
51	0.1666	0.1466	-1.071	1.071	0.3885
52	0.17	0.15	-1.061	1.061	0.3848
53	0.1733	0.1533	-1.052	1.052	0.3816
54	0.1766	0.1566	-1.047	1.047	0.3798
55	0.18	0.16	-1.038	1.038	0.3765
56	0.1833	0.1633	-1.028	1.028	0.3729
57	0.1866	0.1666	-1.019	1.019	0.3696
58	0.19	0.17	-1.014	1.014	0.3678
59	0.1933	0.1733	-1.004	1.004	0.3642
60	0.1966	0.1766	-1.	1.	0.3627
61	0.2	0.18	-0.99	0.99	0.3591
62	0.2033	0.1833	-0.985	0.985	0.3573
63	0.2066	0.1866	-0.976	0.976	0.354
64	0.21	0.19	-0.971	0.971	0.3522
65	0.2133	0.1933	-0.962	0.962	0.3489
66	0.2166	0.1966	-0.957	0.957	0.3471
67	0.22	0.2	-0.948	0.948	0.3439
68	0.2233	0.2033	-0.943	0.943	0.342
69	0.2266	0.2066	-0.938	0.938	0.3402
70	0.23	0.21	-0.929	0.929	0.337
71	0.2333	0.2133	-0.924	0.924	0.3351
72	0.2366	0.2166	-0.914	0.914	0.3315
73	0.24	0.22	-0.91	0.91	0.3301
74	0.2433	0.2233	-0.905	0.905	0.3283
75	0.2466	0.2266	-0.9	0.9	0.3264
76	0.25	0.23	-0.891	0.891	0.3232
77	0.2533	0.2333	-0.886	0.886	0.3214
78	0.2566	0.2366	-0.881	0.881	0.3196
79	0.26	0.24	-0.876	0.876	0.3177
80	0.2633	0.2433	-0.867	0.867	0.3145
81	0.2666	0.2466	-0.862	0.862	0.3127
82	0.27	0.25	-0.858	0.858	0.3112
83	0.2733	0.2533	-0.853	0.853	0.3094
84	0.2766	0.2566	-0.848	0.848	0.3076
85	0.28	0.26	-0.843	0.843	0.3058
86	0.2833	0.2633	-0.839	0.839	0.3043
87	0.2866	0.2666	-0.829	0.829	0.3007
88	0.29	0.27	-0.824	0.824	0.2989
89	0.2933	0.2733	-0.82	0.82	0.2974
90	0.2966	0.2766	-0.815	0.815	0.2956

91	0.3	0.28	-0.81	0.81	0.2938
92	0.3033	0.2833	-0.805	0.805	0.292
93	0.3066	0.2866	-0.801	0.801	0.2905
94	0.31	0.29	-0.796	0.796	0.2887
95	0.3133	0.2933	-0.791	0.791	0.2869
96	0.3166	0.2966	-0.786	0.786	0.2851
97	0.32	0.3	-0.782	0.782	0.2836
98	0.3233	0.3033	-0.777	0.777	0.2818
99	0.3266	0.3066	-0.772	0.772	0.28
100	0.33	0.31	-0.767	0.767	0.2782
101	0.3333	0.3133	-0.763	0.763	0.2768
102	0.35	0.33	-0.744	0.744	0.2699
103	0.3666	0.3466	-0.72	0.72	0.2612
104	0.3833	0.3633	-0.696	0.696	0.2524
105	0.4	0.38	-0.677	0.677	0.2456
106	0.4166	0.3966	-0.654	0.654	0.2372
107	0.4333	0.4133	-0.635	0.635	0.2303
108	0.45	0.43	-0.616	0.616	0.2234
109	0.4666	0.4466	-0.597	0.597	0.2165
110	0.4833	0.4633	-0.578	0.578	0.2096
111	0.5	0.48	-0.559	0.559	0.2028
112	0.5166	0.4966	-0.54	0.54	0.1959
113	0.5333	0.5133	-0.526	0.526	0.1908
114	0.55	0.53	-0.507	0.507	0.1839
115	0.5666	0.5466	-0.493	0.493	0.1788
116	0.5833	0.5633	-0.478	0.478	0.1734
117	0.6	0.58	-0.459	0.459	0.1665
118	0.6166	0.5966	-0.45	0.45	0.1632
119	0.6333	0.6133	-0.431	0.431	0.1563
120	0.65	0.63	-0.417	0.417	0.1513
121	0.6666	0.6466	-0.407	0.407	0.1476
122	0.6833	0.6633	-0.393	0.393	0.1425
123	0.7	0.68	-0.379	0.379	0.1375
124	0.7166	0.6966	-0.365	0.365	0.1324
125	0.7333	0.7133	-0.355	0.355	0.1288
126	0.75	0.73	-0.346	0.346	0.1255
127	0.7666	0.7466	-0.331	0.331	0.1201
128	0.7833	0.7633	-0.327	0.327	0.1186
129	0.8	0.78	-0.317	0.317	0.115
130	0.8166	0.7966	-0.308	0.308	0.1117
131	0.8333	0.8133	-0.298	0.298	0.1081
132	0.85	0.83	-0.289	0.289	0.1048
133	0.8666	0.8466	-0.284	0.284	0.103
134	0.8833	0.8633	-0.279	0.279	0.1012
135	0.9	0.88	-0.27	0.27	9.793e-002
136	0.9166	0.8966	-0.265	0.265	9.612e-002
137	0.9333	0.9133	-0.26	0.26	9.431e-002
138	0.95	0.93	-0.251	0.251	9.104e-002
139	0.9666	0.9466	-0.246	0.246	8.923e-002
140	0.9833	0.9633	-0.241	0.241	8.741e-002
141	1.	0.98	-0.237	0.237	8.596e-002
142	1.2	1.18	-0.18	0.18	6.529e-002
143	1.4	1.38	-0.151	0.151	5.477e-002
144	1.6	1.58	-0.132	0.132	4.788e-002
145	1.8	1.78	-0.123	0.123	4.461e-002
146	2.	1.98	-0.118	0.118	4.28e-002
147	2.2	2.18	-0.113	0.113	4.099e-002

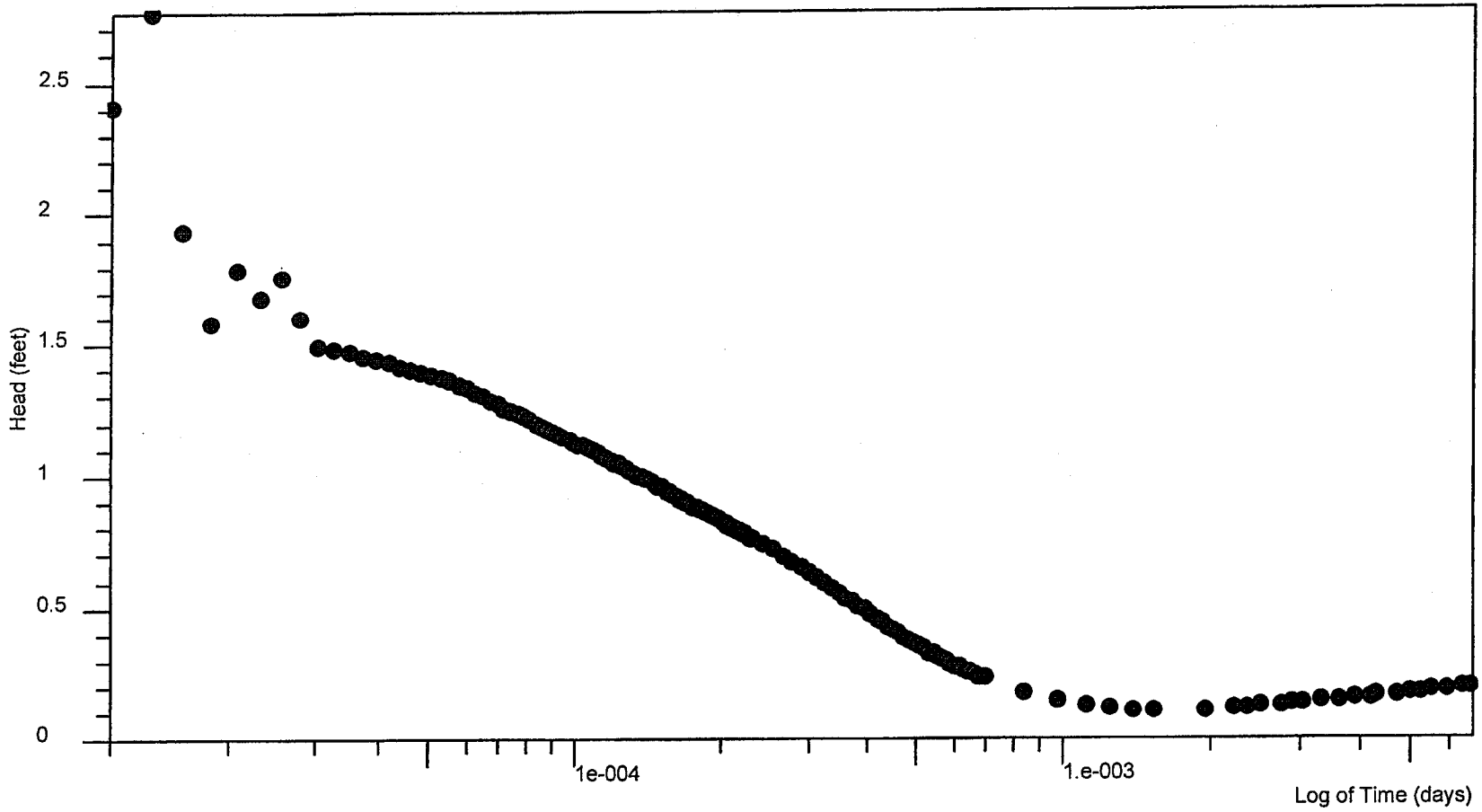
148	2.4	2.38	-0.113	0.113	4.099e-002
149	2.6	2.58	-0.113	0.113	4.099e-002
150	2.8	2.78	-0.118	0.118	4.28e-002
151	3.	2.98	-0.118	0.118	4.28e-002
152	3.2	3.18	-0.123	0.123	4.461e-002
153	3.4	3.38	-0.128	0.128	4.643e-002
154	3.6	3.58	-0.132	0.132	4.788e-002
155	3.8	3.78	-0.132	0.132	4.788e-002
156	4.	3.98	-0.137	0.137	4.969e-002
157	4.2	4.18	-0.142	0.142	5.151e-002
158	4.4	4.38	-0.146	0.146	5.296e-002
159	4.6	4.58	-0.146	0.146	5.296e-002
160	4.8	4.78	-0.151	0.151	5.477e-002
161	5.	4.98	-0.151	0.151	5.477e-002
162	5.2	5.18	-0.156	0.156	5.658e-002
163	5.4	5.38	-0.156	0.156	5.658e-002
164	5.6	5.58	-0.161	0.161	5.84e-002
165	5.8	5.78	-0.161	0.161	5.84e-002
166	6.	5.98	-0.165	0.165	5.985e-002
167	6.2	6.18	-0.17	0.17	6.166e-002
168	6.4	6.38	-0.17	0.17	6.166e-002
169	6.6	6.58	-0.17	0.17	6.166e-002
170	6.8	6.78	-0.175	0.175	6.347e-002
171	7.	6.98	-0.175	0.175	6.347e-002
172	7.2	7.18	-0.18	0.18	6.529e-002
173	7.4	7.38	-0.18	0.18	6.529e-002
174	7.6	7.58	-0.184	0.184	6.674e-002
175	7.8	7.78	-0.184	0.184	6.674e-002
176	8.	7.98	-0.189	0.189	6.855e-002
177	8.2	8.18	-0.189	0.189	6.855e-002
178	8.4	8.38	-0.189	0.189	6.855e-002
179	8.6	8.58	-0.194	0.194	7.037e-002
180	8.8	8.78	-0.194	0.194	7.037e-002
181	9.	8.98	-0.194	0.194	7.037e-002
182	9.2	9.18	-0.199	0.199	7.218e-002
183	9.4	9.38	-0.199	0.199	7.218e-002
184	9.6	9.58	-0.203	0.203	7.363e-002
185	9.8	9.78	-0.203	0.203	7.363e-002
186	10.	9.98	-0.203	0.203	7.363e-002

JEP-3 Falling Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-3



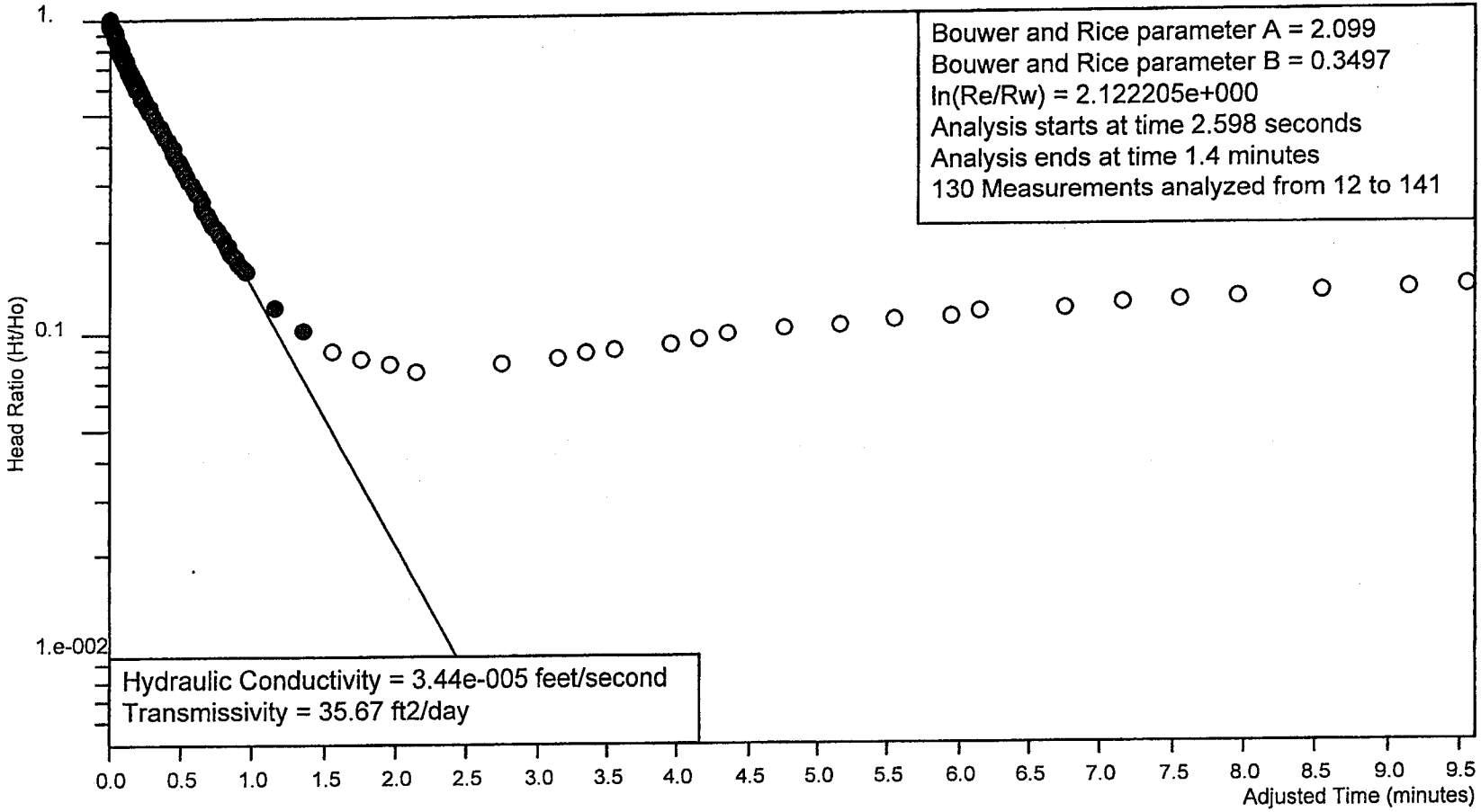
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-3 Falling Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-3



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 1.488 feet at 2.598 seconds

JEP-3 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP3RHN

Well Label:	JEP-3
Aquifer Thickness:	12. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	6.79 feet
Anisotropy Ratio:	2.
Time Adjustment:	0.996 Seconds

Test starts with trial 4
There are 140 time and drawdown measurements
Maximum head is 2.33 feet
Minimum head is -2.8e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.66e-002	-0.118	0.118	5.064e-002
2	3.3e-003	-1.33e-002	-0.114	0.114	4.893e-002
3	1.e-002	-6.6e-003	-0.321	0.321	0.1378
4	1.33e-002	-3.3e-003	-1.975	1.975	0.8476
5	1.66e-002	0.	-2.33	2.33	1.
6	2.e-002	3.4e-003	-2.174	2.174	0.933
7	2.33e-002	6.7e-003	-1.127	1.127	0.4837
8	2.66e-002	1.e-002	-1.236	1.236	0.5305
9	3.e-002	1.34e-002	-2.041	2.041	0.876
10	3.33e-002	1.67e-002	-1.335	1.335	0.573
11	3.66e-002	2.e-002	-1.468	1.468	0.63
12	4.e-002	2.34e-002	-1.406	1.406	0.6034
13	4.33e-002	2.67e-002	-1.378	1.378	0.5914
14	4.66e-002	3.e-002	-1.34	1.34	0.5751
15	5.e-002	3.34e-002	-1.307	1.307	0.5609
16	5.33e-002	3.67e-002	-1.269	1.269	0.5446
17	5.66e-002	4.e-002	-1.236	1.236	0.5305
18	6.e-002	4.34e-002	-1.207	1.207	0.518
19	6.33e-002	4.67e-002	-1.174	1.174	0.5039
20	6.66e-002	5.e-002	-1.151	1.151	0.494
21	7.e-002	5.34e-002	-1.132	1.132	0.4858
22	7.33e-002	5.67e-002	-1.103	1.103	0.4734
23	7.66e-002	6.e-002	-1.08	1.08	0.4635
24	8.e-002	6.34e-002	-1.056	1.056	0.4532
25	8.33e-002	6.67e-002	-1.032	1.032	0.4429
26	8.66e-002	7.e-002	-1.013	1.013	0.4348
27	9.e-002	7.34e-002	-0.994	0.994	0.4266
28	9.33e-002	7.67e-002	-0.975	0.975	0.4185
29	9.66e-002	8.e-002	-0.956	0.956	0.4103
30	0.1	8.34e-002	-0.937	0.937	0.4021
31	0.1033	8.67e-002	-0.918	0.918	0.394
32	0.1066	9.e-002	-0.904	0.904	0.388
33	0.11	9.34e-002	-0.885	0.885	0.3798

34	0.1133	9.67e-002	-0.866	0.866	0.3717
35	0.1166	1.e-001	-0.852	0.852	0.3657
36	0.12	0.1034	-0.838	0.838	0.3597
37	0.1233	0.1067	-0.824	0.824	0.3536
38	0.1266	0.11	-0.809	0.809	0.3472
39	0.13	0.1134	-0.795	0.795	0.3412
40	0.1333	0.1167	-0.781	0.781	0.3352
41	0.1366	0.12	-0.767	0.767	0.3292
42	0.14	0.1234	-0.753	0.753	0.3232
43	0.1433	0.1267	-0.738	0.738	0.3167
44	0.1466	0.13	-0.729	0.729	0.3129
45	0.15	0.1334	-0.715	0.715	0.3069
46	0.1533	0.1367	-0.7	0.7	0.3004
47	0.1566	0.14	-0.686	0.686	0.2944
48	0.16	0.1434	-0.677	0.677	0.2906
49	0.1633	0.1467	-0.667	0.667	0.2863
50	0.1666	0.15	-0.653	0.653	0.2803
51	0.17	0.1534	-0.644	0.644	0.2764
52	0.1733	0.1567	-0.629	0.629	0.27
53	0.1766	0.16	-0.62	0.62	0.2661
54	0.18	0.1634	-0.61	0.61	0.2618
55	0.1833	0.1667	-0.601	0.601	0.2579
56	0.1866	0.17	-0.591	0.591	0.2536
57	0.19	0.1734	-0.582	0.582	0.2498
58	0.1933	0.1767	-0.572	0.572	0.2455
59	0.1966	0.18	-0.563	0.563	0.2416
60	0.2	0.1834	-0.554	0.554	0.2378
61	0.2033	0.1867	-0.549	0.549	0.2356
62	0.2066	0.19	-0.539	0.539	0.2313
63	0.21	0.1934	-0.53	0.53	0.2275
64	0.2133	0.1967	-0.525	0.525	0.2253
65	0.2166	0.2	-0.516	0.516	0.2215
66	0.22	0.2034	-0.506	0.506	0.2172
67	0.2233	0.2067	-0.497	0.497	0.2133
68	0.2266	0.21	-0.492	0.492	0.2112
69	0.23	0.2134	-0.482	0.482	0.2069
70	0.2333	0.2167	-0.478	0.478	0.2052
71	0.2366	0.22	-0.468	0.468	0.2009
72	0.24	0.2234	-0.463	0.463	0.1987
73	0.2433	0.2267	-0.459	0.459	0.197
74	0.2466	0.23	-0.449	0.449	0.1927
75	0.25	0.2334	-0.445	0.445	0.191
76	0.2533	0.2367	-0.435	0.435	0.1867
77	0.2566	0.24	-0.43	0.43	0.1845
78	0.26	0.2434	-0.426	0.426	0.1828
79	0.2633	0.2467	-0.416	0.416	0.1785
80	0.2666	0.25	-0.411	0.411	0.1764
81	0.27	0.2534	-0.407	0.407	0.1747
82	0.2733	0.2567	-0.397	0.397	0.1704
83	0.2766	0.26	-0.392	0.392	0.1682
84	0.28	0.2634	-0.388	0.388	0.1665
85	0.2833	0.2667	-0.383	0.383	0.1644
86	0.2866	0.27	-0.378	0.378	0.1622
87	0.29	0.2734	-0.373	0.373	0.1601
88	0.2933	0.2767	-0.369	0.369	0.1584
89	0.2966	0.28	-0.359	0.359	0.1541
90	0.3	0.2834	-0.354	0.354	0.1519

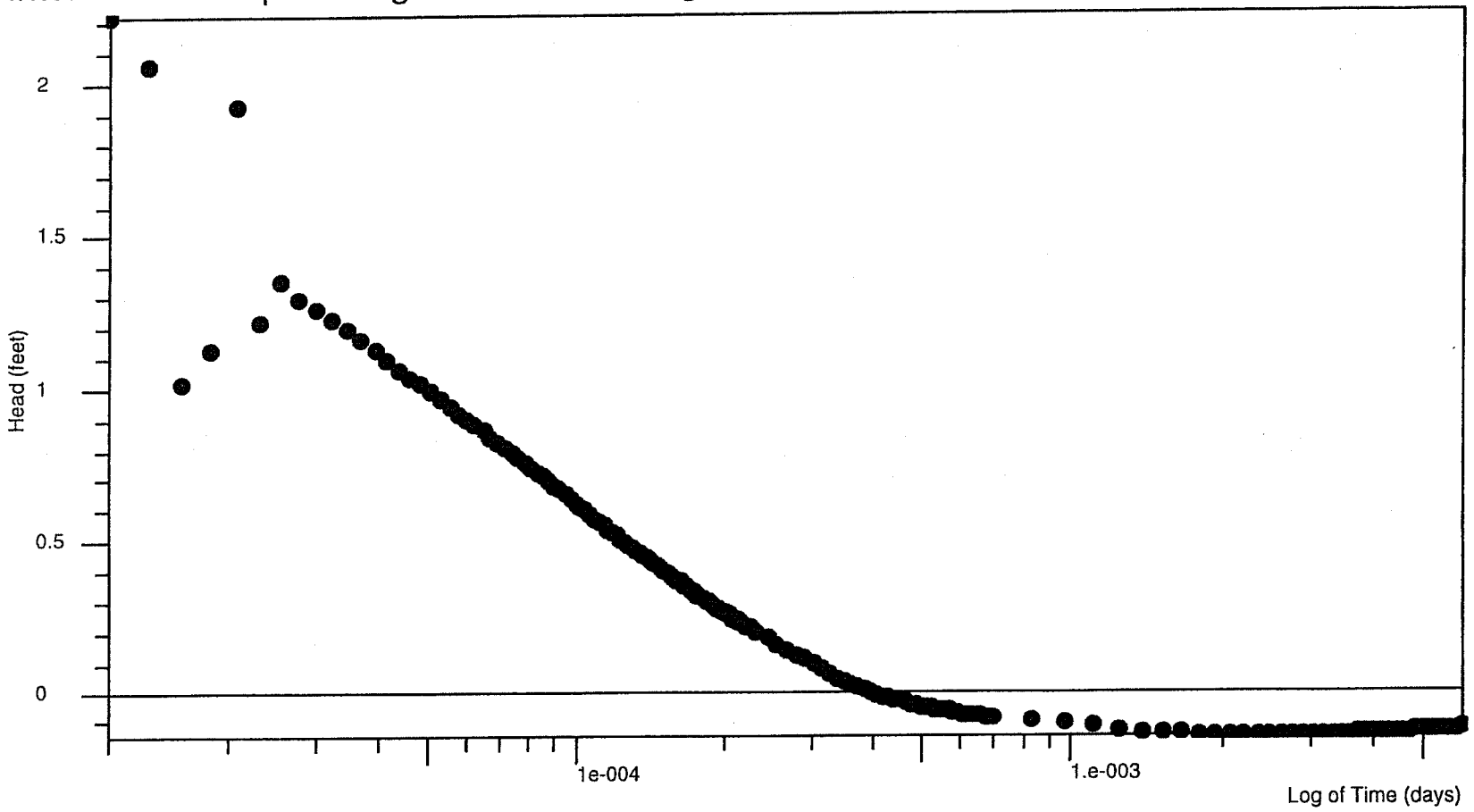
91	0.3066	0.29	-0.345	0.345	0.1481
92	0.3133	0.2967	-0.336	0.336	0.1442
93	0.3166	0.3	-0.331	0.331	0.1421
94	0.3233	0.3067	-0.326	0.326	0.1399
95	0.3266	0.31	-0.321	0.321	0.1378
96	0.33	0.3134	-0.317	0.317	0.1361
97	0.3333	0.3167	-0.312	0.312	0.1339
98	0.35	0.3334	-0.293	0.293	0.1258
99	0.3666	0.35	-0.274	0.274	0.1176
100	0.3833	0.3667	-0.255	0.255	0.1094
101	0.4	0.3834	-0.241	0.241	0.1034
102	0.4166	0.4	-0.226	0.226	9.7e-002
103	0.4333	0.4167	-0.208	0.208	8.927e-002
104	0.45	0.4334	-0.193	0.193	8.283e-002
105	0.4666	0.45	-0.179	0.179	7.682e-002
106	0.4833	0.4667	-0.165	0.165	7.082e-002
107	0.5	0.4834	-0.155	0.155	6.652e-002
108	0.5166	0.5	-0.146	0.146	6.266e-002
109	0.5333	0.5167	-0.136	0.136	5.837e-002
110	0.55	0.5334	-0.127	0.127	5.451e-002
111	0.5666	0.55	-0.118	0.118	5.064e-002
112	0.5833	0.5667	-0.114	0.114	4.893e-002
113	0.6	0.5834	-0.104	0.104	4.464e-002
114	0.6166	0.6	-9.9e-002	9.9e-002	4.249e-002
115	0.6333	0.6167	-9.5e-002	9.5e-002	4.077e-002
116	0.65	0.6334	-9.e-002	9.e-002	3.863e-002
117	0.6666	0.65	-8.5e-002	8.5e-002	3.648e-002
118	0.6833	0.6667	-8.1e-002	8.1e-002	3.476e-002
119	0.7	0.6834	-7.6e-002	7.6e-002	3.262e-002
120	0.7166	0.7	-7.1e-002	7.1e-002	3.047e-002
121	0.75	0.7334	-6.6e-002	6.6e-002	2.833e-002
122	0.7666	0.75	-6.2e-002	6.2e-002	2.661e-002
123	0.8	0.7834	-5.7e-002	5.7e-002	2.446e-002
124	0.8333	0.8167	-5.2e-002	5.2e-002	2.232e-002
125	0.8666	0.85	-4.7e-002	4.7e-002	2.017e-002
126	0.9166	0.9	-4.3e-002	4.3e-002	1.845e-002
127	0.9666	0.95	-3.8e-002	3.8e-002	1.631e-002
128	1.2	1.183	-2.4e-002	2.4e-002	1.03e-002
129	1.4	1.383	-1.9e-002	1.9e-002	8.155e-003
130	1.6	1.583	-9.e-003	9.e-003	3.863e-003
131	1.8	1.783	5.e-003	-5.e-003	-2.146e-003
132	2.	1.983	1.4e-002	-1.4e-002	-6.009e-003
133	2.2	2.183	1.9e-002	-1.9e-002	-8.155e-003
134	2.6	2.583	2.4e-002	-2.4e-002	-1.03e-002
135	4.4	4.383	2.8e-002	-2.8e-002	-1.202e-002
136	4.6	4.583	2.4e-002	-2.4e-002	-1.03e-002
137	5.4	5.383	1.9e-002	-1.9e-002	-8.155e-003
138	5.8	5.783	1.4e-002	-1.4e-002	-6.009e-003
139	7.	6.983	1.e-002	-1.e-002	-4.292e-003
140	8.	7.983	5.e-003	-5.e-003	-2.146e-003

JEP-3 Rising Head Test 7/2/01

International Paper- Riegelwood Plant Riegelwood, North Carolina

Head vs. Log Time

JEP-3



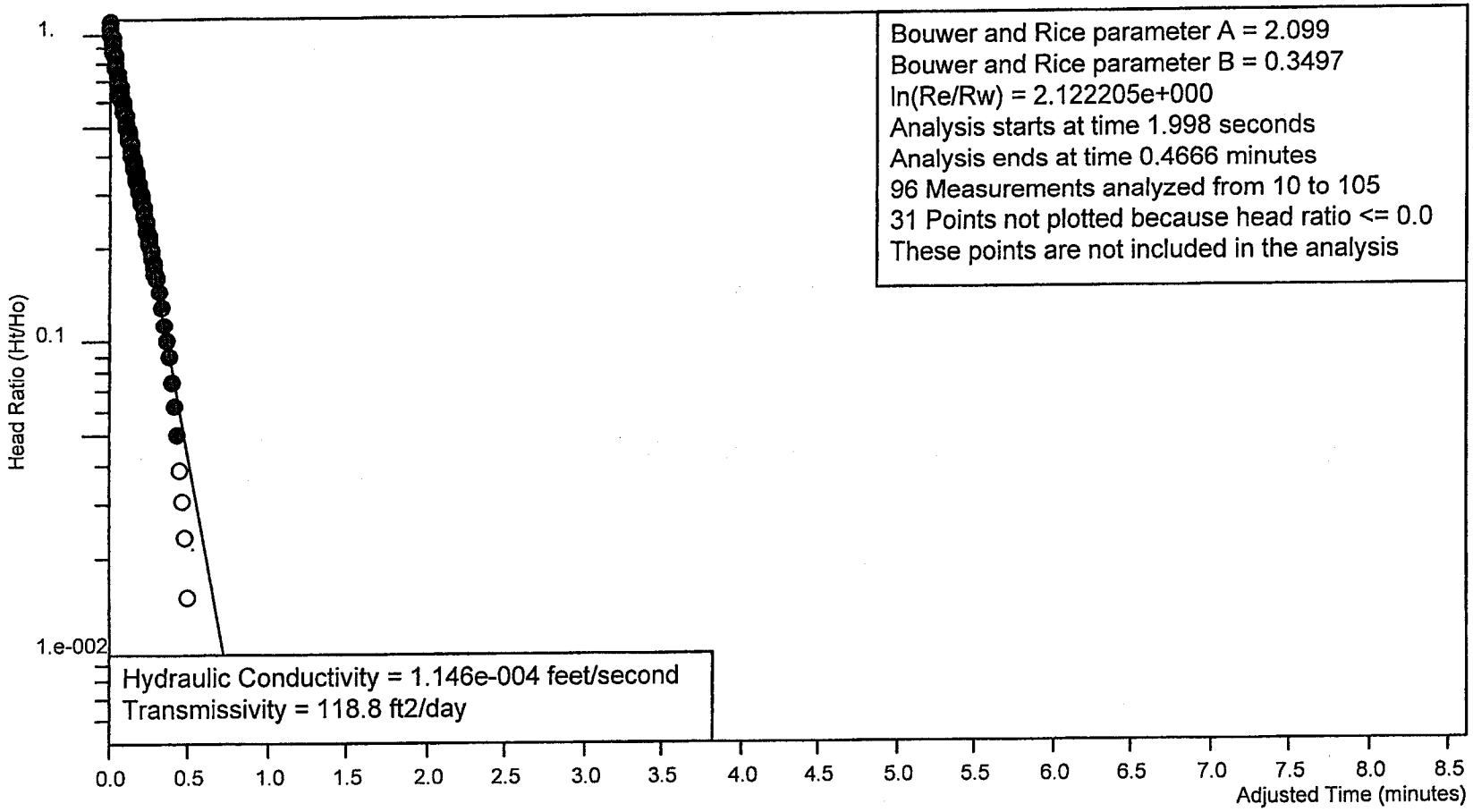
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-3 Rising Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-3



Ho is 1.217 feet at 1.998 seconds

Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

JEP-4 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP4FHN

Well Label:	JEP-4
Aquifer Thickness:	11. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	9.39 feet
Anisotropy Ratio:	2.
Time Adjustment:	3.996 Seconds

Test starts with trial 20
There are 186 time and drawdown measurements
Maximum head is 1.946 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-6.66e-002	0.	0.	0.
2	3.3e-003	-6.33e-002	4.e-003	4.e-003	2.055e-003
3	6.6e-003	-6.e-002	4.e-003	4.e-003	2.055e-003
4	1.e-002	-5.66e-002	4.e-003	4.e-003	2.055e-003
5	1.33e-002	-5.33e-002	4.e-003	4.e-003	2.055e-003
6	1.66e-002	-5.e-002	4.e-003	4.e-003	2.055e-003
7	2.e-002	-4.66e-002	4.e-003	4.e-003	2.055e-003
8	2.33e-002	-4.33e-002	1.466	1.466	0.7533
9	2.66e-002	-4.e-002	1.922	1.922	0.9877
10	3.e-002	-3.66e-002	1.727	1.727	0.8875
11	3.33e-002	-3.33e-002	1.727	1.727	0.8875
12	3.66e-002	-3.e-002	1.495	1.495	0.7682
13	4.e-002	-2.66e-002	1.537	1.537	0.7898
14	4.33e-002	-2.33e-002	1.732	1.732	0.89
15	4.66e-002	-2.e-002	1.898	1.898	0.9753
16	5.e-002	-1.66e-002	1.931	1.931	0.9923
17	5.33e-002	-1.33e-002	1.67	1.67	0.8582
18	5.66e-002	-1.e-002	1.604	1.604	0.8243
19	6.e-002	-6.6e-003	1.822	1.822	0.9363
20	6.33e-002	-3.3e-003	1.917	1.917	0.9851
21	6.66e-002	0.	1.946	1.946	1.
22	7.e-002	3.4e-003	1.865	1.865	0.9584
23	7.33e-002	6.7e-003	1.741	1.741	0.8947
24	7.66e-002	1.e-002	1.817	1.817	0.9337
25	8.e-002	1.34e-002	1.756	1.756	0.9024
26	8.33e-002	1.67e-002	1.471	1.471	0.7559
27	8.66e-002	2.e-002	1.409	1.409	0.724
28	9.e-002	2.34e-002	1.4	1.4	0.7194
29	9.33e-002	2.67e-002	1.495	1.495	0.7682
30	9.66e-002	3.e-002	1.632	1.632	0.8386
31	0.1	3.34e-002	1.509	1.509	0.7754
32	0.1033	3.67e-002	1.433	1.433	0.7364
33	0.1066	4.e-002	1.428	1.428	0.7338

34	0.11	4.34e-002	1.39	1.39	0.7143
35	0.1133	4.67e-002	1.352	1.352	0.6948
36	0.1166	5.e-002	1.324	1.324	0.6804
37	0.12	5.34e-002	1.305	1.305	0.6706
38	0.1233	5.67e-002	1.29	1.29	0.6629
39	0.1266	6.e-002	1.29	1.29	0.6629
40	0.13	6.34e-002	1.542	1.542	0.7924
41	0.1333	6.67e-002	1.414	1.414	0.7266
42	0.1366	7.e-002	1.333	1.333	0.685
43	0.14	7.34e-002	1.319	1.319	0.6778
44	0.1433	7.67e-002	1.3	1.3	0.668
45	0.1466	8.e-002	1.286	1.286	0.6608
46	0.15	8.34e-002	1.267	1.267	0.6511
47	0.1533	8.67e-002	1.248	1.248	0.6413
48	0.1566	9.e-002	1.238	1.238	0.6362
49	0.16	9.34e-002	1.229	1.229	0.6316
50	0.1633	9.67e-002	1.214	1.214	0.6238
51	0.1666	1.e-001	1.243	1.243	0.6387
52	0.17	0.1034	1.3	1.3	0.668
53	0.1733	0.1067	1.257	1.257	0.6459
54	0.1766	0.11	1.243	1.243	0.6387
55	0.18	0.1134	1.238	1.238	0.6362
56	0.1833	0.1167	1.224	1.224	0.629
57	0.1866	0.12	1.21	1.21	0.6218
58	0.19	0.1234	1.252	1.252	0.6434
59	0.1933	0.1267	1.248	1.248	0.6413
60	0.1966	0.13	1.243	1.243	0.6387
61	0.2	0.1334	1.224	1.224	0.629
62	0.2033	0.1367	1.214	1.214	0.6238
63	0.2066	0.14	1.196	1.196	0.6146
64	0.21	0.1434	1.2	1.2	0.6166
65	0.2133	0.1467	1.191	1.191	0.612
66	0.2166	0.15	1.271	1.271	0.6531
67	0.22	0.1534	1.238	1.238	0.6362
68	0.2233	0.1567	1.205	1.205	0.6192
69	0.2266	0.16	1.191	1.191	0.612
70	0.23	0.1634	1.172	1.172	0.6023
71	0.2333	0.1667	1.162	1.162	0.5971
72	0.2366	0.17	1.148	1.148	0.5899
73	0.24	0.1734	1.134	1.134	0.5827
74	0.2433	0.1767	1.124	1.124	0.5776
75	0.2466	0.18	1.115	1.115	0.573
76	0.25	0.1834	1.105	1.105	0.5678
77	0.2533	0.1867	1.096	1.096	0.5632
78	0.2566	0.19	1.086	1.086	0.5581
79	0.26	0.1934	1.077	1.077	0.5534
80	0.2633	0.1967	1.072	1.072	0.5509
81	0.2666	0.2	1.063	1.063	0.5462
82	0.27	0.2034	1.058	1.058	0.5437
83	0.2733	0.2067	1.053	1.053	0.5411
84	0.2766	0.21	1.048	1.048	0.5385
85	0.28	0.2134	1.039	1.039	0.5339
86	0.2833	0.2167	1.034	1.034	0.5313
87	0.2866	0.22	1.029	1.029	0.5288
88	0.29	0.2234	1.025	1.025	0.5267
89	0.2933	0.2267	1.015	1.015	0.5216
90	0.2966	0.23	1.01	1.01	0.519

91	0.3	0.2334	1.006	1.006	0.517
92	0.3033	0.2367	1.001	1.001	0.5144
93	0.3066	0.24	0.996	0.996	0.5118
94	0.31	0.2434	0.991	0.991	0.5092
95	0.3133	0.2467	0.987	0.987	0.5072
96	0.3166	0.25	0.982	0.982	0.5046
97	0.32	0.2534	0.977	0.977	0.5021
98	0.3233	0.2567	0.972	0.972	0.4995
99	0.3266	0.26	0.968	0.968	0.4974
100	0.33	0.2634	0.963	0.963	0.4949
101	0.3333	0.2667	0.963	0.963	0.4949
102	0.35	0.2834	0.939	0.939	0.4825
103	0.3666	0.3	0.92	0.92	0.4728
104	0.3833	0.3167	0.901	0.901	0.463
105	0.4	0.3334	0.882	0.882	0.4532
106	0.4166	0.35	0.868	0.868	0.446
107	0.4333	0.3667	0.849	0.849	0.4363
108	0.45	0.3834	0.835	0.835	0.4291
109	0.4666	0.4	0.821	0.821	0.4219
110	0.4833	0.4167	0.806	0.806	0.4142
111	0.5	0.4334	0.792	0.792	0.407
112	0.5166	0.45	0.778	0.778	0.3998
113	0.5333	0.4667	0.768	0.768	0.3947
114	0.55	0.4834	0.754	0.754	0.3875
115	0.5666	0.5	0.745	0.745	0.3828
116	0.5833	0.5167	0.73	0.73	0.3751
117	0.6	0.5334	0.721	0.721	0.3705
118	0.6166	0.55	0.707	0.707	0.3633
119	0.6333	0.5667	0.697	0.697	0.3582
120	0.65	0.5834	0.683	0.683	0.351
121	0.6666	0.6	0.673	0.673	0.3458
122	0.6833	0.6167	0.664	0.664	0.3412
123	0.7	0.6334	0.654	0.654	0.3361
124	0.7166	0.65	0.645	0.645	0.3314
125	0.7333	0.6667	0.635	0.635	0.3263
126	0.75	0.6834	0.626	0.626	0.3217
127	0.7666	0.7	0.616	0.616	0.3165
128	0.7833	0.7167	0.607	0.607	0.3119
129	0.8	0.7334	0.597	0.597	0.3068
130	0.8166	0.75	0.588	0.588	0.3022
131	0.8333	0.7667	0.583	0.583	0.2996
132	0.85	0.7834	0.574	0.574	0.295
133	0.8666	0.8	0.564	0.564	0.2898
134	0.8833	0.8167	0.555	0.555	0.2852
135	0.9	0.8334	0.55	0.55	0.2826
136	0.9166	0.85	0.54	0.54	0.2775
137	0.9333	0.8667	0.531	0.531	0.2729
138	0.95	0.8834	0.526	0.526	0.2703
139	0.9666	0.9	0.517	0.517	0.2657
140	0.9833	0.9167	0.512	0.512	0.2631
141	1.	0.9334	0.507	0.507	0.2605
142	1.2	1.133	0.422	0.422	0.2169
143	1.4	1.333	0.365	0.365	0.1876
144	1.6	1.533	0.317	0.317	0.1629
145	1.8	1.733	0.279	0.279	0.1434
146	2.	1.933	0.251	0.251	0.129
147	2.2	2.133	0.223	0.223	0.1146

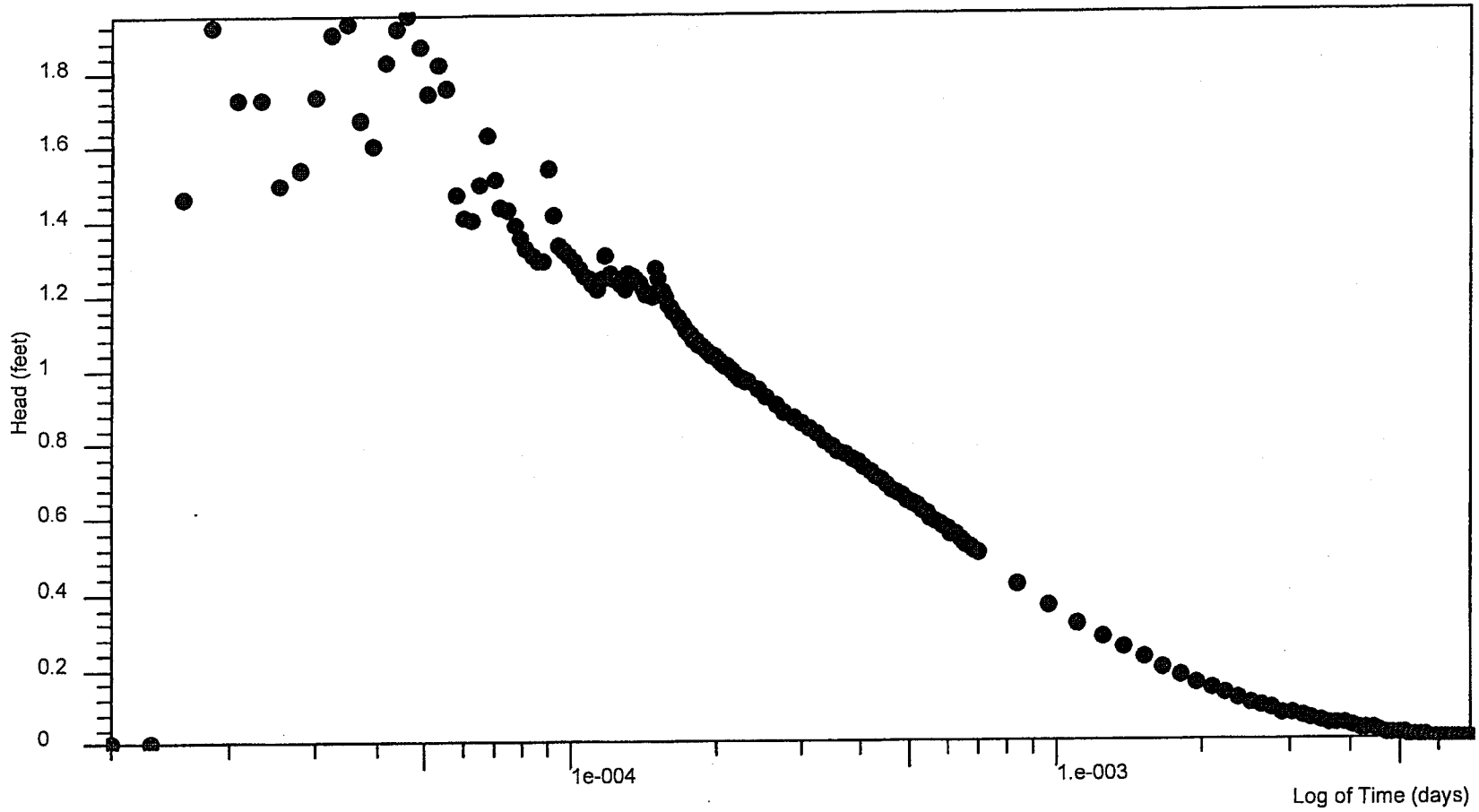
148	2.4	2.333	0.199	0.199	0.1023
149	2.6	2.533	0.175	0.175	8.993e-002
150	2.8	2.733	0.156	0.156	8.016e-002
151	3.	2.933	0.142	0.142	7.297e-002
152	3.2	3.133	0.128	0.128	6.578e-002
153	3.4	3.333	0.113	0.113	5.807e-002
154	3.6	3.533	0.104	0.104	5.344e-002
155	3.8	3.733	9.4e-002	9.4e-002	4.83e-002
156	4.	3.933	8.5e-002	8.5e-002	4.368e-002
157	4.2	4.133	7.5e-002	7.5e-002	3.854e-002
158	4.4	4.333	7.1e-002	7.1e-002	3.649e-002
159	4.6	4.533	6.6e-002	6.6e-002	3.392e-002
160	4.8	4.733	6.1e-002	6.1e-002	3.135e-002
161	5.	4.933	5.2e-002	5.2e-002	2.672e-002
162	5.2	5.133	4.7e-002	4.7e-002	2.415e-002
163	5.4	5.333	4.2e-002	4.2e-002	2.158e-002
164	5.6	5.533	4.2e-002	4.2e-002	2.158e-002
165	5.8	5.733	3.7e-002	3.7e-002	1.901e-002
166	6.	5.933	3.3e-002	3.3e-002	1.696e-002
167	6.2	6.133	2.8e-002	2.8e-002	1.439e-002
168	6.4	6.333	2.8e-002	2.8e-002	1.439e-002
169	6.6	6.533	2.3e-002	2.3e-002	1.182e-002
170	6.8	6.733	1.9e-002	1.9e-002	9.764e-003
171	7.	6.933	1.9e-002	1.9e-002	9.764e-003
172	7.2	7.133	1.4e-002	1.4e-002	7.194e-003
173	7.4	7.333	1.4e-002	1.4e-002	7.194e-003
174	7.6	7.533	9.e-003	9.e-003	4.625e-003
175	7.8	7.733	9.e-003	9.e-003	4.625e-003
176	8.	7.933	9.e-003	9.e-003	4.625e-003
177	8.2	8.133	9.e-003	9.e-003	4.625e-003
178	8.4	8.333	4.e-003	4.e-003	2.055e-003
179	8.6	8.533	4.e-003	4.e-003	2.055e-003
180	8.8	8.733	4.e-003	4.e-003	2.055e-003
181	9.	8.933	0.	0.	0.
182	9.2	9.133	0.	0.	0.
183	9.4	9.333	0.	0.	0.
184	9.6	9.533	0.	0.	0.
185	9.8	9.733	0.	0.	0.
186	10.	9.933	0.	0.	0.

JEP-4 Falling Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-4



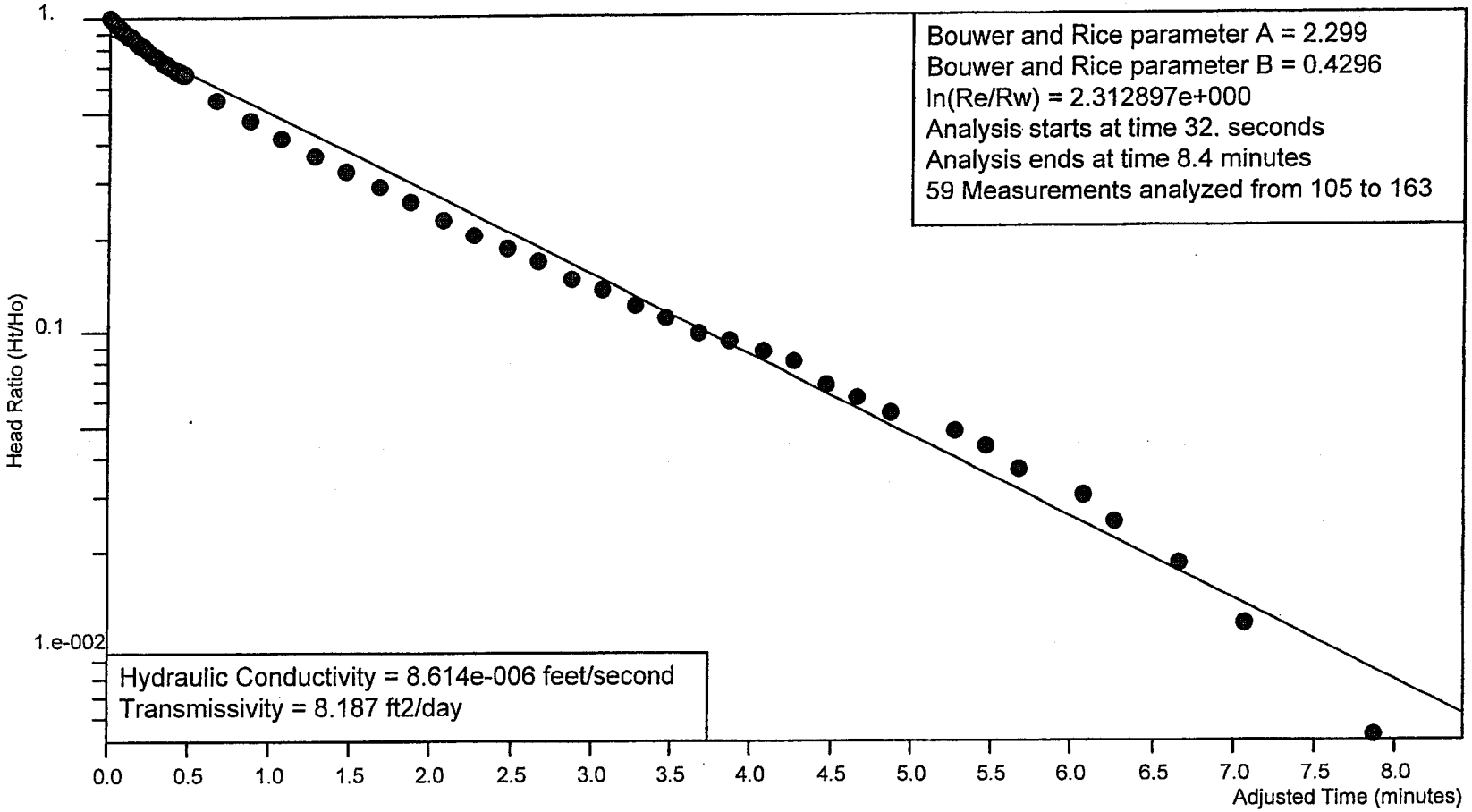
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-4 Falling Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-4



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.768 feet at 32. seconds

JEP-4 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP4RHN

Well Label:	JEP-4
Aquifer Thickness:	11. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	9.39 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.398 Seconds

Test starts with trial 7
There are 157 time and drawdown measurements
Maximum head is 1.598 feet
Minimum head is -0.223 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.33e-002	0.147	-0.147	-9.199e-002
2	3.3e-003	-2.e-002	0.17	-0.17	-0.1064
3	6.6e-003	-1.67e-002	0.223	-0.223	-0.1395
4	1.e-002	-1.33e-002	0.161	-0.161	-0.1008
5	1.33e-002	-1.e-002	-0.948	0.948	0.5932
6	1.66e-002	-6.7e-003	-1.366	1.366	0.8548
7	2.e-002	-3.3e-003	-1.37	1.37	0.8573
8	2.33e-002	0.	-1.598	1.598	1.
9	2.66e-002	3.3e-003	-0.981	0.981	0.6139
10	3.e-002	6.7e-003	-1.361	1.361	0.8517
11	3.33e-002	1.e-002	-0.744	0.744	0.4656
12	3.66e-002	1.33e-002	-0.882	0.882	0.5519
13	4.e-002	1.67e-002	-0.668	0.668	0.418
14	4.33e-002	2.e-002	-0.801	0.801	0.5013
15	4.66e-002	2.33e-002	-0.967	0.967	0.6051
16	5.e-002	2.67e-002	-0.877	0.877	0.5488
17	5.33e-002	3.e-002	-0.834	0.834	0.5219
18	5.66e-002	3.33e-002	-0.83	0.83	0.5194
19	6.e-002	3.67e-002	-0.825	0.825	0.5163
20	6.33e-002	4.e-002	-0.82	0.82	0.5131
21	6.66e-002	4.33e-002	-0.815	0.815	0.51
22	7.e-002	4.67e-002	-0.811	0.811	0.5075
23	7.33e-002	5.e-002	-0.801	0.801	0.5013
24	7.66e-002	5.33e-002	-0.796	0.796	0.4981
25	8.e-002	5.67e-002	-0.792	0.792	0.4956
26	8.33e-002	6.e-002	-0.782	0.782	0.4894
27	8.66e-002	6.33e-002	-0.782	0.782	0.4894
28	9.e-002	6.67e-002	-0.777	0.777	0.4862
29	9.33e-002	7.e-002	-0.773	0.773	0.4837
30	9.66e-002	7.33e-002	-0.768	0.768	0.4806
31	0.1	7.67e-002	-0.763	0.763	0.4775
32	0.1033	8.e-002	-0.759	0.759	0.475
33	0.1066	8.33e-002	-0.754	0.754	0.4718

34	0.11	8.67e-002	-0.749	0.749	0.4687
35	0.1133	9.e-002	-0.744	0.744	0.4656
36	0.1166	9.33e-002	-0.74	0.74	0.4631
37	0.12	9.67e-002	-0.74	0.74	0.4631
38	0.1233	0.1	-0.735	0.735	0.4599
39	0.1266	0.1033	-0.73	0.73	0.4568
40	0.13	0.1067	-0.725	0.725	0.4537
41	0.1333	0.11	-0.721	0.721	0.4512
42	0.1366	0.1133	-0.716	0.716	0.4481
43	0.14	0.1167	-0.716	0.716	0.4481
44	0.1433	0.12	-0.711	0.711	0.4449
45	0.1466	0.1233	-0.706	0.706	0.4418
46	0.15	0.1267	-0.706	0.706	0.4418
47	0.1533	0.13	-0.702	0.702	0.4393
48	0.1566	0.1333	-0.697	0.697	0.4362
49	0.16	0.1367	-0.692	0.692	0.433
50	0.1633	0.14	-0.692	0.692	0.433
51	0.1666	0.1433	-0.687	0.687	0.4299
52	0.17	0.1467	-0.683	0.683	0.4274
53	0.1733	0.15	-0.683	0.683	0.4274
54	0.1766	0.1533	-0.678	0.678	0.4243
55	0.18	0.1567	-0.678	0.678	0.4243
56	0.1833	0.16	-0.673	0.673	0.4212
57	0.1866	0.1633	-0.668	0.668	0.418
58	0.19	0.1667	-0.668	0.668	0.418
59	0.1933	0.17	-0.664	0.664	0.4155
60	0.1966	0.1733	-0.659	0.659	0.4124
61	0.2	0.1767	-0.659	0.659	0.4124
62	0.2033	0.18	-0.654	0.654	0.4093
63	0.2066	0.1833	-0.649	0.649	0.4061
64	0.21	0.1867	-0.649	0.649	0.4061
65	0.2133	0.19	-0.645	0.645	0.4036
66	0.2166	0.1933	-0.645	0.645	0.4036
67	0.22	0.1967	-0.64	0.64	0.4005
68	0.2233	0.2	-0.635	0.635	0.3974
69	0.2266	0.2033	-0.635	0.635	0.3974
70	0.23	0.2067	-0.63	0.63	0.3942
71	0.2333	0.21	-0.626	0.626	0.3917
72	0.2366	0.2133	-0.626	0.626	0.3917
73	0.24	0.2167	-0.621	0.621	0.3886
74	0.2433	0.22	-0.616	0.616	0.3855
75	0.2466	0.2233	-0.616	0.616	0.3855
76	0.25	0.2267	-0.611	0.611	0.3824
77	0.2533	0.23	-0.607	0.607	0.3798
78	0.2566	0.2333	-0.607	0.607	0.3798
79	0.26	0.2367	-0.602	0.602	0.3767
80	0.2633	0.24	-0.597	0.597	0.3736
81	0.2666	0.2433	-0.597	0.597	0.3736
82	0.27	0.2467	-0.593	0.593	0.3711
83	0.2733	0.25	-0.588	0.588	0.368
84	0.2766	0.2533	-0.588	0.588	0.368
85	0.28	0.2567	-0.583	0.583	0.3648
86	0.2833	0.26	-0.578	0.578	0.3617
87	0.2866	0.2633	-0.578	0.578	0.3617
88	0.29	0.2667	-0.574	0.574	0.3592
89	0.2933	0.27	-0.574	0.574	0.3592
90	0.2966	0.2733	-0.569	0.569	0.3561

91	0.3	0.2767	-0.564	0.564	0.3529
92	0.3033	0.28	-0.564	0.564	0.3529
93	0.3066	0.2833	-0.559	0.559	0.3498
94	0.31	0.2867	-0.559	0.559	0.3498
95	0.3133	0.29	-0.555	0.555	0.3473
96	0.3166	0.2933	-0.55	0.55	0.3442
97	0.32	0.2967	-0.55	0.55	0.3442
98	0.3233	0.3	-0.545	0.545	0.3411
99	0.3266	0.3033	-0.545	0.545	0.3411
100	0.33	0.3067	-0.54	0.54	0.3379
101	0.3333	0.31	-0.54	0.54	0.3379
102	0.35	0.3267	-0.526	0.526	0.3292
103	0.3666	0.3433	-0.507	0.507	0.3173
104	0.3833	0.36	-0.498	0.498	0.3116
105	0.4	0.3767	-0.483	0.483	0.3023
106	0.4166	0.3933	-0.469	0.469	0.2935
107	0.4333	0.41	-0.455	0.455	0.2847
108	0.45	0.4267	-0.445	0.445	0.2785
109	0.4666	0.4433	-0.431	0.431	0.2697
110	0.4833	0.46	-0.422	0.422	0.2641
111	0.5	0.4767	-0.408	0.408	0.2553
112	0.5166	0.4933	-0.398	0.398	0.2491
113	0.5333	0.51	-0.384	0.384	0.2403
114	0.55	0.5267	-0.37	0.37	0.2315
115	0.5666	0.5433	-0.36	0.36	0.2253
116	0.5833	0.56	-0.351	0.351	0.2196
117	0.6	0.5767	-0.336	0.336	0.2103
118	0.6166	0.5933	-0.327	0.327	0.2046
119	0.6333	0.61	-0.313	0.313	0.1959
120	0.65	0.6267	-0.303	0.303	0.1896
121	0.6666	0.6433	-0.294	0.294	0.184
122	0.6833	0.66	-0.284	0.284	0.1777
123	0.7	0.6767	-0.275	0.275	0.1721
124	0.7166	0.6933	-0.265	0.265	0.1658
125	0.7333	0.71	-0.256	0.256	0.1602
126	0.75	0.7267	-0.246	0.246	0.1539
127	0.7666	0.7433	-0.237	0.237	0.1483
128	0.7833	0.76	-0.227	0.227	0.1421
129	0.8	0.7767	-0.218	0.218	0.1364
130	0.8166	0.7933	-0.208	0.208	0.1302
131	0.8333	0.81	-0.204	0.204	0.1277
132	0.85	0.8267	-0.194	0.194	0.1214
133	0.8666	0.8433	-0.185	0.185	0.1158
134	0.8833	0.86	-0.18	0.18	0.1126
135	0.9	0.8767	-0.17	0.17	0.1064
136	0.9166	0.8933	-0.166	0.166	0.1039
137	0.9333	0.91	-0.156	0.156	9.762e-002
138	0.95	0.9267	-0.151	0.151	9.449e-002
139	0.9666	0.9433	-0.142	0.142	8.886e-002
140	0.9833	0.96	-0.137	0.137	8.573e-002
141	1.	0.9767	-0.132	0.132	8.26e-002
142	1.2	1.177	-6.6e-002	6.6e-002	4.13e-002
143	1.4	1.377	-3.3e-002	3.3e-002	2.065e-002
144	1.6	1.577	-9.e-003	9.e-003	5.632e-003
145	1.8	1.777	4.e-003	-4.e-003	-2.503e-003
146	2.	1.977	1.4e-002	-1.4e-002	-8.761e-003
147	2.2	2.177	1.8e-002	-1.8e-002	-1.126e-002

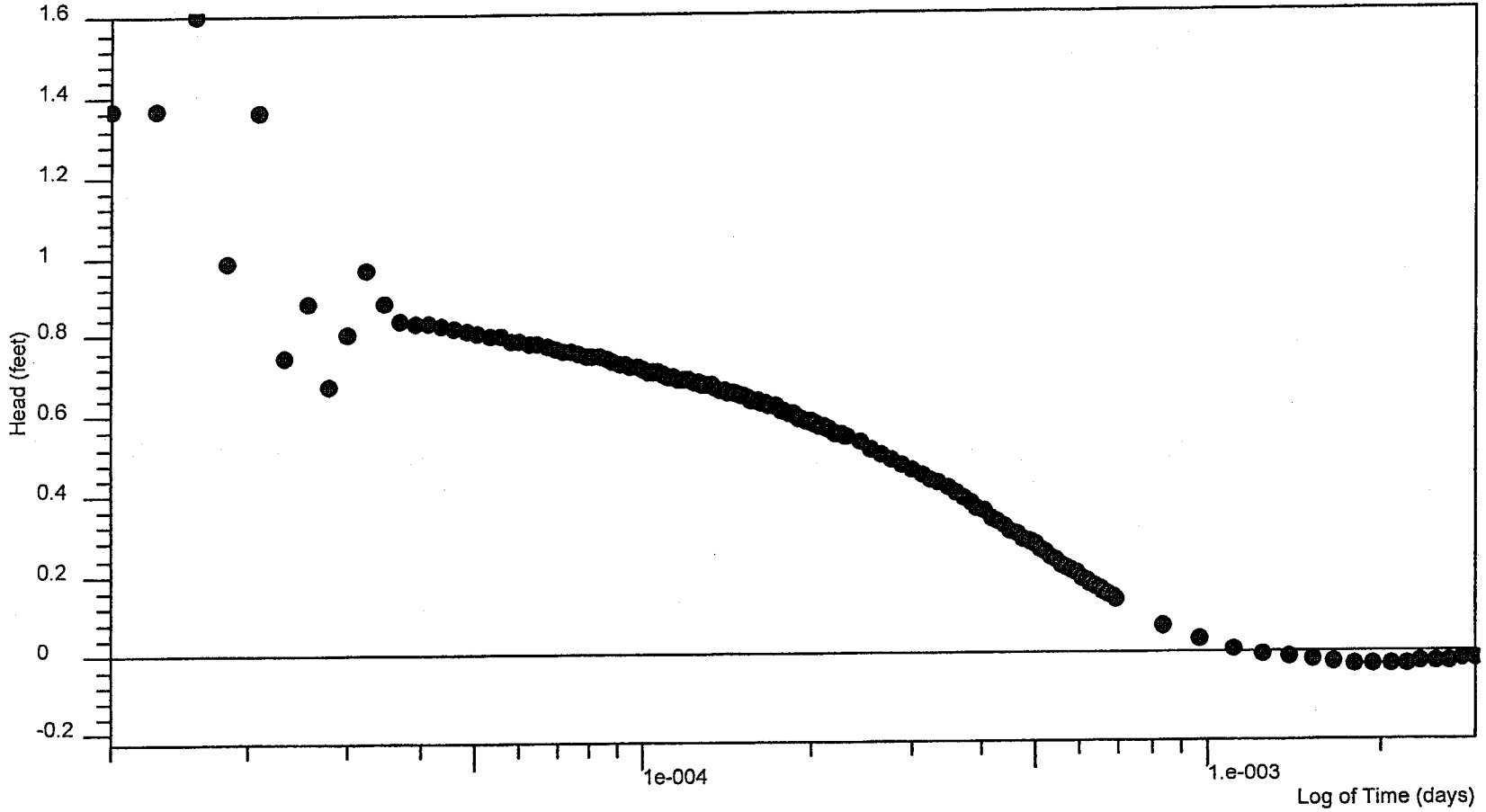
148	2.4	2.377	2.3e-002	-2.3e-002	-1.439e-002
149	2.6	2.577	2.8e-002	-2.8e-002	-1.752e-002
150	2.8	2.777	2.8e-002	-2.8e-002	-1.752e-002
151	3.	2.977	2.8e-002	-2.8e-002	-1.752e-002
152	3.2	3.177	2.8e-002	-2.8e-002	-1.752e-002
153	3.4	3.377	2.3e-002	-2.3e-002	-1.439e-002
154	3.6	3.577	2.3e-002	-2.3e-002	-1.439e-002
155	3.8	3.777	2.3e-002	-2.3e-002	-1.439e-002
156	4.	3.977	1.8e-002	-1.8e-002	-1.126e-002
157	4.2	4.177	1.8e-002	-1.8e-002	-1.126e-002

JEP-4 Rising Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-4



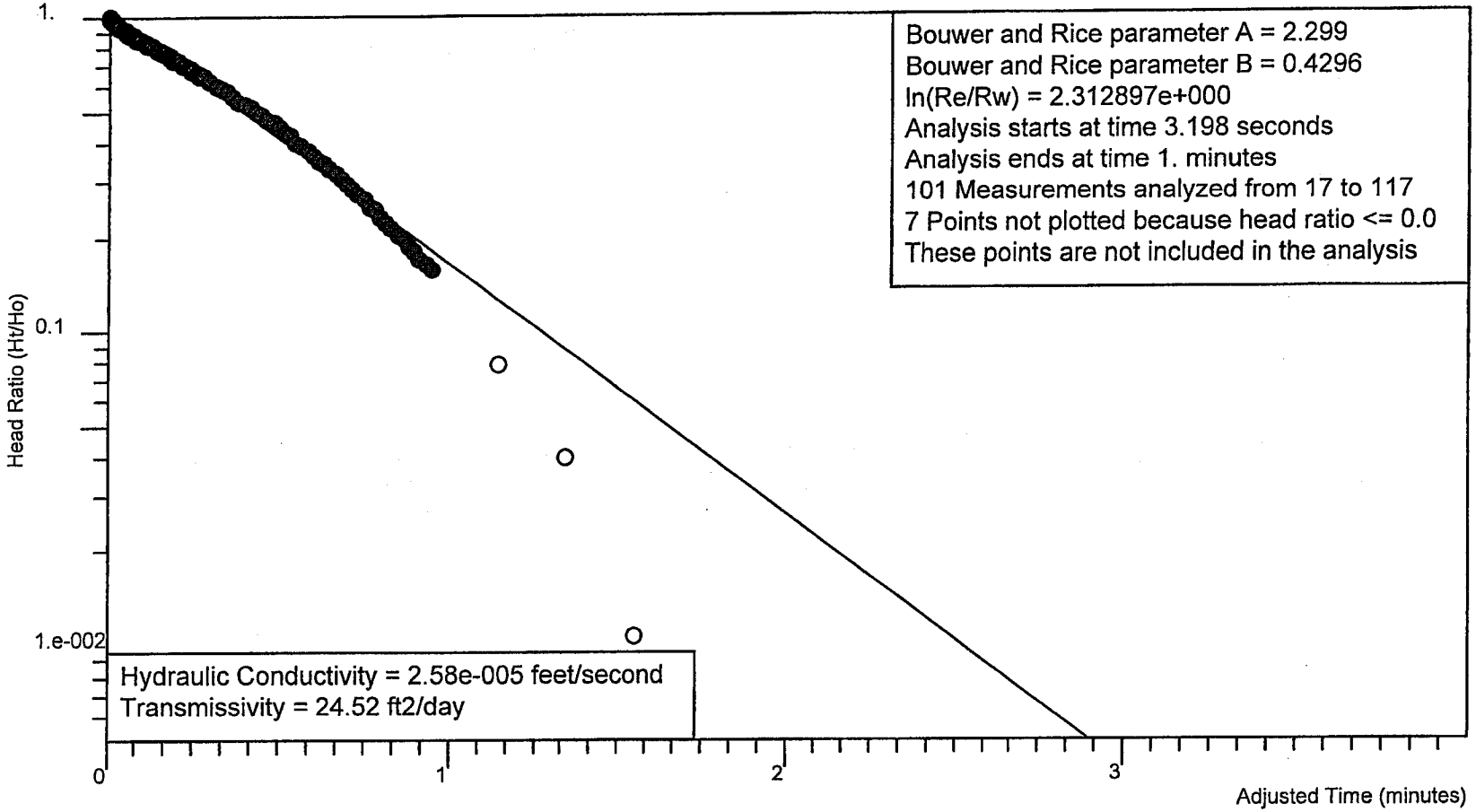
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-4 Rising Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-4



Ho is 0.834 feet at 3.198 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-5D Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP5DFHN

Well Label:	JEP-5D
Aquifer Thickness:	14.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	42.15 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.596 Seconds

Test starts with trial 8
There are 232 time and drawdown measurements
Maximum head is 8.094 feet
Minimum head is -7.442 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.66e-002	2.8e-002	2.8e-002	3.459e-003
2	3.3e-003	-2.33e-002	2.3e-002	2.3e-002	2.842e-003
3	6.6e-003	-2.e-002	2.8e-002	2.8e-002	3.459e-003
4	1.e-002	-1.66e-002	1.9e-002	1.9e-002	2.347e-003
5	1.33e-002	-1.33e-002	2.8e-002	2.8e-002	3.459e-003
6	1.66e-002	-1.e-002	3.3e-002	3.3e-002	4.077e-003
7	2.e-002	-6.6e-003	2.8e-002	2.8e-002	3.459e-003
8	2.33e-002	-3.3e-003	8.1e-002	8.1e-002	1.001e-002
9	2.66e-002	0.	8.094	8.094	1.
10	3.e-002	3.4e-003	-7.442	-7.442	-0.9194
11	3.33e-002	6.7e-003	4.928	4.928	0.6088
12	3.66e-002	1.e-002	4.813	4.813	0.5946
13	4.e-002	1.34e-002	-2.539	-2.539	-0.3137
14	4.33e-002	1.67e-002	8.094	8.094	1.
15	4.66e-002	2.e-002	-1.511	-1.511	-0.1867
16	5.e-002	2.34e-002	5.374	5.374	0.6639
17	5.33e-002	2.67e-002	3.054	3.054	0.3773
18	5.66e-002	3.e-002	1.622	1.622	0.2004
19	6.e-002	3.34e-002	5.671	5.671	0.7006
20	6.33e-002	3.67e-002	0.378	0.378	4.67e-002
21	6.66e-002	4.e-002	3.84	3.84	0.4744
22	7.e-002	4.34e-002	1.062	1.062	0.1312
23	7.33e-002	4.67e-002	1.201	1.201	0.1484
24	7.66e-002	5.e-002	3.917	3.917	0.4839
25	8.e-002	5.34e-002	1.301	1.301	0.1607
26	8.33e-002	5.67e-002	2.35	2.35	0.2903
27	8.66e-002	6.e-002	2.566	2.566	0.317
28	9.e-002	6.34e-002	2.024	2.024	0.2501
29	9.33e-002	6.67e-002	2.226	2.226	0.275
30	9.66e-002	7.e-002	2.46	2.46	0.3039
31	0.1	7.34e-002	2.077	2.077	0.2566
32	0.1033	7.67e-002	2.336	2.336	0.2886
33	0.1066	8.e-002	2.288	2.288	0.2827

34	0.11	8.34e-002	2.221	2.221	0.2744
35	0.1133	8.67e-002	2.321	2.321	0.2868
36	0.1166	9.e-002	2.293	2.293	0.2833
37	0.12	9.34e-002	2.254	2.254	0.2785
38	0.1233	9.67e-002	2.226	2.226	0.275
39	0.1266	1.e-001	2.235	2.235	0.2761
40	0.13	0.1034	2.297	2.297	0.2838
41	0.1333	0.1067	2.226	2.226	0.275
42	0.1366	0.11	2.173	2.173	0.2685
43	0.14	0.1134	2.326	2.326	0.2874
44	0.1433	0.1167	2.187	2.187	0.2702
45	0.1466	0.12	2.288	2.288	0.2827
46	0.15	0.1234	2.249	2.249	0.2779
47	0.1533	0.1267	2.206	2.206	0.2725
48	0.1566	0.13	2.283	2.283	0.2821
49	0.16	0.1334	2.216	2.216	0.2738
50	0.1633	0.1367	2.288	2.288	0.2827
51	0.1666	0.14	2.163	2.163	0.2672
52	0.17	0.1434	2.331	2.331	0.288
53	0.1733	0.1467	2.269	2.269	0.2803
54	0.1766	0.15	2.163	2.163	0.2672
55	0.18	0.1534	2.158	2.158	0.2666
56	0.1833	0.1567	2.599	2.599	0.3211
57	0.1866	0.16	1.977	1.977	0.2443
58	0.19	0.1634	2.518	2.518	0.3111
59	0.1933	0.1667	2.197	2.197	0.2714
60	0.1966	0.17	2.311	2.311	0.2855
61	0.2	0.1734	2.311	2.311	0.2855
62	0.2033	0.1767	2.264	2.264	0.2797
63	0.2066	0.18	2.307	2.307	0.285
64	0.21	0.1834	2.245	2.245	0.2774
65	0.2133	0.1867	2.249	2.249	0.2779
66	0.2166	0.19	2.269	2.269	0.2803
67	0.22	0.1934	2.211	2.211	0.2732
68	0.2233	0.1967	2.259	2.259	0.2791
69	0.2266	0.2	2.245	2.245	0.2774
70	0.23	0.2034	2.249	2.249	0.2779
71	0.2333	0.2067	2.293	2.293	0.2833
72	0.2366	0.21	2.24	2.24	0.2767
73	0.24	0.2134	2.307	2.307	0.285
74	0.2433	0.2167	2.211	2.211	0.2732
75	0.2466	0.22	2.278	2.278	0.2814
76	0.25	0.2234	2.269	2.269	0.2803
77	0.2533	0.2267	2.254	2.254	0.2785
78	0.2566	0.23	2.249	2.249	0.2779
79	0.26	0.2334	2.24	2.24	0.2767
80	0.2633	0.2367	2.297	2.297	0.2838
81	0.2666	0.24	2.163	2.163	0.2672
82	0.27	0.2434	2.307	2.307	0.285
83	0.2733	0.2467	2.235	2.235	0.2761
84	0.2766	0.25	2.249	2.249	0.2779
85	0.28	0.2534	2.264	2.264	0.2797
86	0.2833	0.2567	2.24	2.24	0.2767
87	0.2866	0.26	2.269	2.269	0.2803
88	0.29	0.2634	2.23	2.23	0.2755
89	0.2933	0.2667	2.273	2.273	0.2808
90	0.2966	0.27	2.24	2.24	0.2767

91	0.3	0.2734	2.259	2.259	0.2791
92	0.3033	0.2767	2.278	2.278	0.2814
93	0.3066	0.28	2.168	2.168	0.2679
94	0.31	0.2834	2.331	2.331	0.288
95	0.3133	0.2867	2.211	2.211	0.2732
96	0.3166	0.29	2.278	2.278	0.2814
97	0.32	0.2934	2.269	2.269	0.2803
98	0.3233	0.2967	2.216	2.216	0.2738
99	0.3266	0.3	2.293	2.293	0.2833
100	0.33	0.3034	2.221	2.221	0.2744
101	0.3333	0.3067	2.278	2.278	0.2814
102	0.35	0.3234	2.264	2.264	0.2797
103	0.3666	0.34	2.245	2.245	0.2774
104	0.3833	0.3567	2.288	2.288	0.2827
105	0.4	0.3734	2.24	2.24	0.2767
106	0.4166	0.39	2.254	2.254	0.2785
107	0.4333	0.4067	2.259	2.259	0.2791
108	0.45	0.4234	2.254	2.254	0.2785
109	0.4666	0.44	2.259	2.259	0.2791
110	0.4833	0.4567	2.259	2.259	0.2791
111	0.5	0.4734	2.254	2.254	0.2785
112	0.5166	0.49	2.254	2.254	0.2785
113	0.5333	0.5067	2.259	2.259	0.2791
114	0.55	0.5234	2.254	2.254	0.2785
115	0.5666	0.54	2.254	2.254	0.2785
116	0.5833	0.5567	2.259	2.259	0.2791
117	0.6	0.5734	2.254	2.254	0.2785
118	0.6166	0.59	2.259	2.259	0.2791
119	0.6333	0.6067	2.254	2.254	0.2785
120	0.65	0.6234	2.254	2.254	0.2785
121	0.6666	0.64	2.254	2.254	0.2785
122	0.6833	0.6567	2.254	2.254	0.2785
123	0.7	0.6734	2.254	2.254	0.2785
124	0.7166	0.69	2.254	2.254	0.2785
125	0.7333	0.7067	2.254	2.254	0.2785
126	0.75	0.7234	2.254	2.254	0.2785
127	0.7666	0.74	2.254	2.254	0.2785
128	0.7833	0.7567	2.254	2.254	0.2785
129	0.8	0.7734	2.254	2.254	0.2785
130	0.8166	0.79	2.254	2.254	0.2785
131	0.8333	0.8067	2.254	2.254	0.2785
132	0.85	0.8234	2.254	2.254	0.2785
133	0.8666	0.84	2.254	2.254	0.2785
134	0.8833	0.8567	2.254	2.254	0.2785
135	0.9	0.8734	2.254	2.254	0.2785
136	0.9166	0.89	2.254	2.254	0.2785
137	0.9333	0.9067	2.254	2.254	0.2785
138	0.95	0.9234	2.254	2.254	0.2785
139	0.9666	0.94	2.254	2.254	0.2785
140	0.9833	0.9567	2.254	2.254	0.2785
141	1.	0.9734	2.254	2.254	0.2785
142	1.2	1.173	2.254	2.254	0.2785
143	1.4	1.373	2.254	2.254	0.2785
144	1.6	1.573	2.254	2.254	0.2785
145	1.8	1.773	2.254	2.254	0.2785
146	2.	1.973	2.254	2.254	0.2785
147	2.2	2.173	2.254	2.254	0.2785

148	2.4	2.373	2.254	2.254	0.2785
149	2.6	2.573	2.249	2.249	0.2779
150	2.8	2.773	2.249	2.249	0.2779
151	3.	2.973	2.249	2.249	0.2779
152	3.2	3.173	2.249	2.249	0.2779
153	3.4	3.373	2.249	2.249	0.2779
154	3.6	3.573	2.245	2.245	0.2774
155	3.8	3.773	2.245	2.245	0.2774
156	4.	3.973	2.245	2.245	0.2774
157	4.2	4.173	2.245	2.245	0.2774
158	4.4	4.373	2.245	2.245	0.2774
159	4.6	4.573	2.24	2.24	0.2767
160	4.8	4.773	2.24	2.24	0.2767
161	5.	4.973	2.24	2.24	0.2767
162	5.2	5.173	2.24	2.24	0.2767
163	5.4	5.373	2.24	2.24	0.2767
164	5.6	5.573	2.24	2.24	0.2767
165	5.8	5.773	2.24	2.24	0.2767
166	6.	5.973	2.235	2.235	0.2761
167	6.2	6.173	2.235	2.235	0.2761
168	6.4	6.373	2.235	2.235	0.2761
169	6.6	6.573	2.235	2.235	0.2761
170	6.8	6.773	2.235	2.235	0.2761
171	7.	6.973	2.235	2.235	0.2761
172	7.2	7.173	2.235	2.235	0.2761
173	7.4	7.373	2.23	2.23	0.2755
174	7.6	7.573	2.23	2.23	0.2755
175	7.8	7.773	2.23	2.23	0.2755
176	8.	7.973	2.23	2.23	0.2755
177	8.2	8.173	2.23	2.23	0.2755
178	8.4	8.373	2.23	2.23	0.2755
179	8.6	8.573	2.226	2.226	0.275
180	8.8	8.773	2.23	2.23	0.2755
181	9.	8.973	2.226	2.226	0.275
182	9.2	9.173	2.226	2.226	0.275
183	9.4	9.373	2.226	2.226	0.275
184	9.6	9.573	2.226	2.226	0.275
185	9.8	9.773	2.226	2.226	0.275
186	10.	9.973	2.226	2.226	0.275
187	12.	11.97	2.221	2.221	0.2744
188	14.	13.97	2.211	2.211	0.2732
189	16.	15.97	2.206	2.206	0.2725
190	18.	17.97	2.201	2.201	0.2719
191	20.	19.97	2.197	2.197	0.2714
192	22.	21.97	2.192	2.192	0.2708
193	24.	23.97	2.182	2.182	0.2696
194	26.	25.97	2.178	2.178	0.2691
195	28.	27.97	2.173	2.173	0.2685
196	30.	29.97	2.168	2.168	0.2679
197	32.	31.97	2.163	2.163	0.2672
198	34.	33.97	2.158	2.158	0.2666
199	36.	35.97	2.154	2.154	0.2661
200	38.	37.97	2.149	2.149	0.2655
201	40.	39.97	2.144	2.144	0.2649
202	42.	41.97	2.139	2.139	0.2643
203	44.	43.97	2.134	2.134	0.2637
204	46.	45.97	2.13	2.13	0.2632

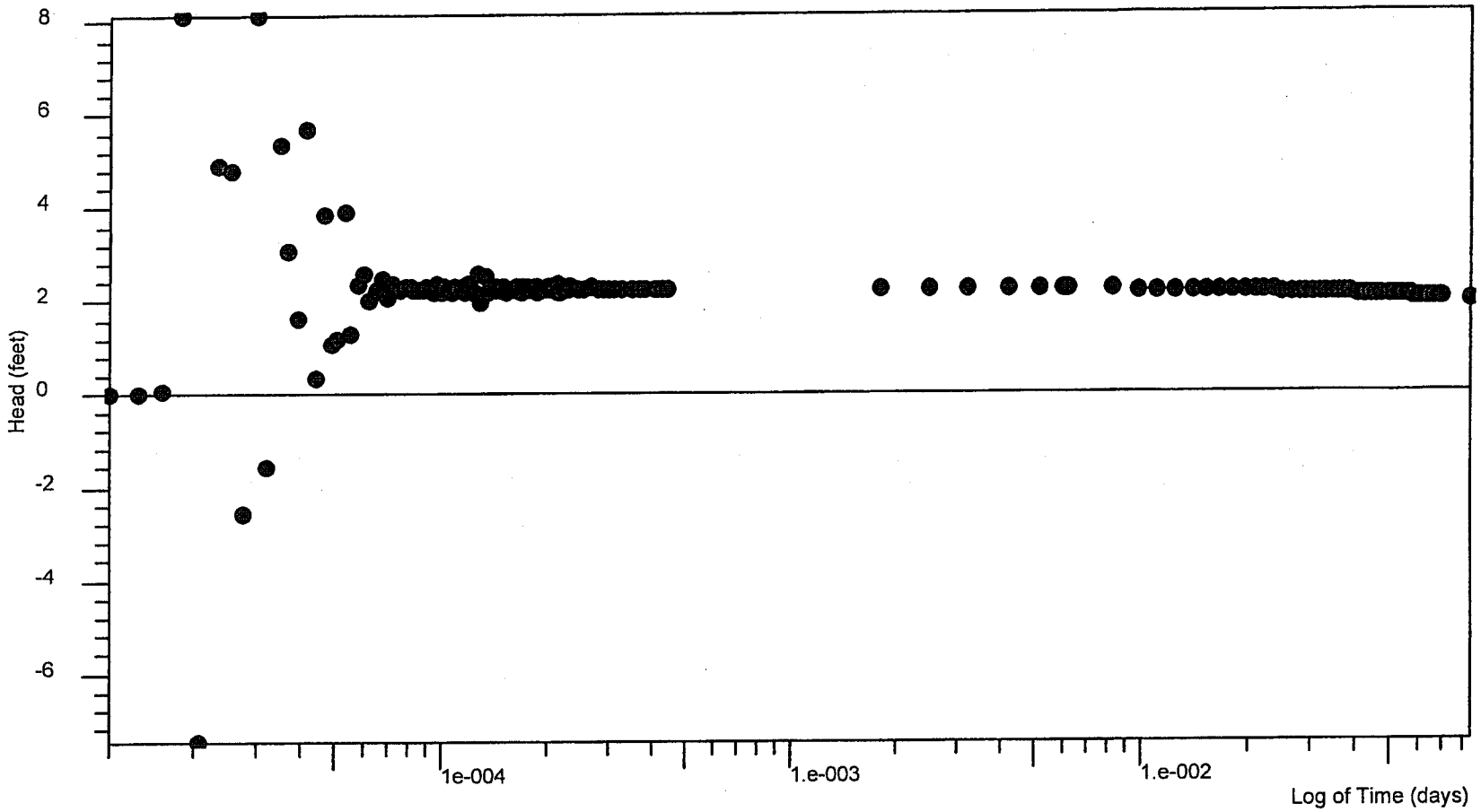
205	48.	47.97	2.125	2.125	0.2625
206	50.	49.97	2.12	2.12	0.2619
207	52.	51.97	2.115	2.115	0.2613
208	54.	53.97	2.111	2.111	0.2608
209	56.	55.97	2.106	2.106	0.2602
210	58.	57.97	2.101	2.101	0.2596
211	60.	59.97	2.096	2.096	0.259
212	62.	61.97	2.091	2.091	0.2583
213	64.	63.97	2.087	2.087	0.2578
214	66.	65.97	2.082	2.082	0.2572
215	68.	67.97	2.077	2.077	0.2566
216	70.	69.97	2.077	2.077	0.2566
217	72.	71.97	2.072	2.072	0.256
218	74.	73.97	2.067	2.067	0.2554
219	76.	75.97	2.063	2.063	0.2549
220	78.	77.97	2.058	2.058	0.2543
221	80.	79.97	2.053	2.053	0.2536
222	82.	81.97	2.048	2.048	0.253
223	84.	83.97	2.043	2.043	0.2524
224	86.	85.97	2.039	2.039	0.2519
225	88.	87.97	2.034	2.034	0.2513
226	90.	89.97	2.029	2.029	0.2507
227	92.	91.97	2.024	2.024	0.2501
228	94.	93.97	2.024	2.024	0.2501
229	96.	95.97	2.019	2.019	0.2494
230	98.	97.97	2.015	2.015	0.2489
231	100.	99.97	2.01	2.01	0.2483
232	120.	120.	1.967	1.967	0.243

JEP-5D Falling Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-5D



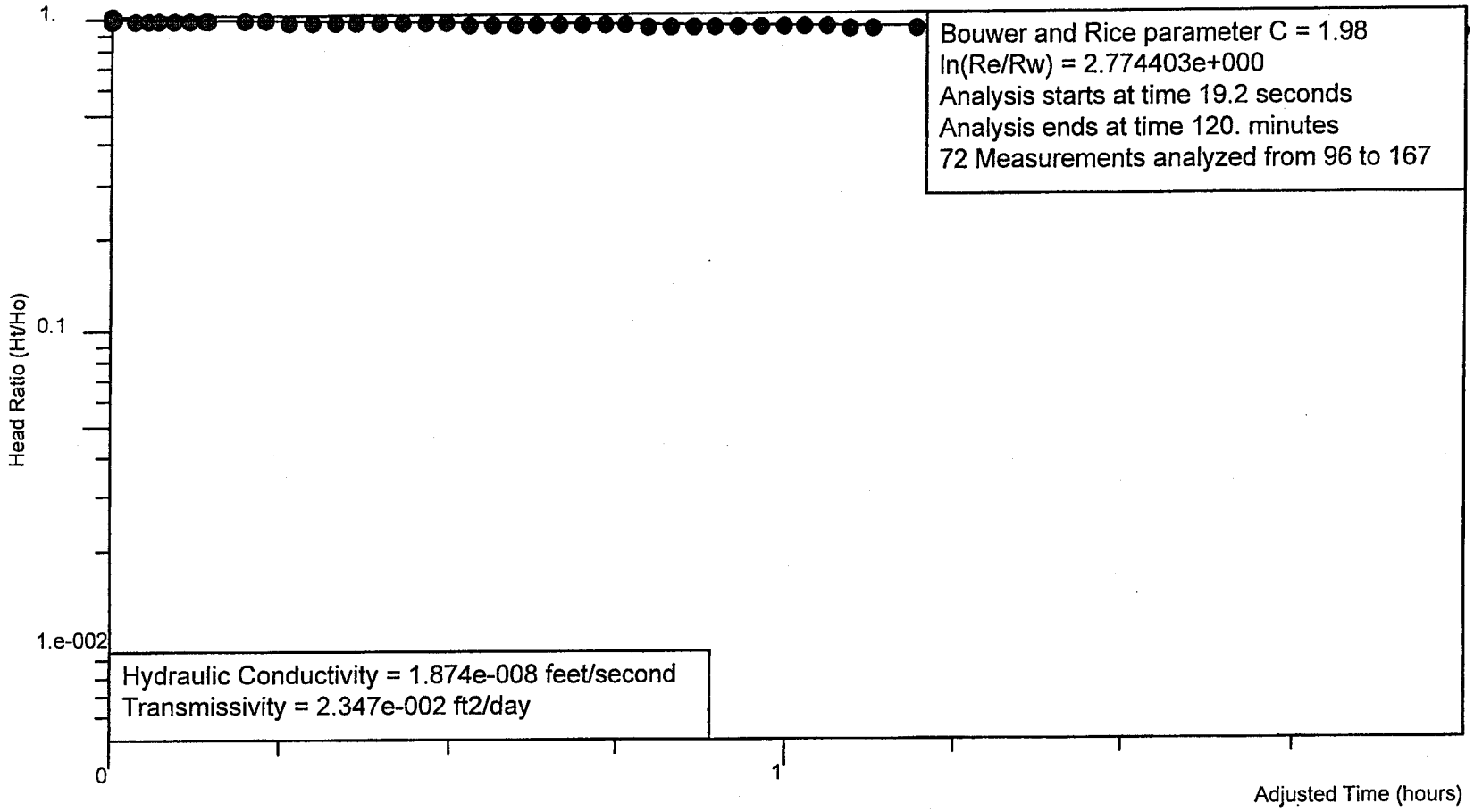
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-5D Falling Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-5D



Ho is 2.269 feet at 19.2 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-5S Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP5SFHN

Well Label:	JEP-5S
Aquifer Thickness:	13.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	8.91 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.8 Seconds

Test starts with trial 9
There are 193 time and drawdown measurements
Maximum head is 3.023 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.e-002	0.	0.	0.
2	3.3e-003	-2.67e-002	4.e-003	4.e-003	1.323e-003
3	6.6e-003	-2.34e-002	4.e-003	4.e-003	1.323e-003
4	1.e-002	-2.e-002	1.4e-002	1.4e-002	4.631e-003
5	1.33e-002	-1.67e-002	1.4e-002	1.4e-002	4.631e-003
6	1.66e-002	-1.34e-002	2.3e-002	2.3e-002	7.608e-003
7	2.e-002	-1.e-002	3.3e-002	3.3e-002	1.092e-002
8	2.33e-002	-6.7e-003	1.547	1.547	0.5117
9	2.66e-002	-3.4e-003	2.938	2.938	0.9719
10	3.e-002	0.	3.023	3.023	1.
11	3.33e-002	3.3e-003	2.045	2.045	0.6765
12	3.66e-002	6.6e-003	0.782	0.782	0.2587
13	4.e-002	1.e-002	0.806	0.806	0.2666
14	4.33e-002	1.33e-002	1.399	1.399	0.4628
15	4.66e-002	1.66e-002	1.627	1.627	0.5382
16	5.e-002	2.e-002	1.456	1.456	0.4816
17	5.33e-002	2.33e-002	0.716	0.716	0.2369
18	5.66e-002	2.66e-002	0.298	0.298	9.858e-002
19	6.e-002	3.e-002	1.072	1.072	0.3546
20	6.33e-002	3.33e-002	1.043	1.043	0.345
21	6.66e-002	3.66e-002	0.635	0.635	0.2101
22	7.e-002	4.e-002	0.612	0.612	0.2024
23	7.33e-002	4.33e-002	0.104	0.104	3.44e-002
24	7.66e-002	4.66e-002	3.7e-002	3.7e-002	1.224e-002
25	8.e-002	5.e-002	0.199	0.199	6.583e-002
26	8.33e-002	5.33e-002	0.398	0.398	0.1317
27	8.66e-002	5.66e-002	0.322	0.322	0.1065
28	9.e-002	6.e-002	0.279	0.279	9.229e-002
29	9.33e-002	6.33e-002	0.294	0.294	9.725e-002
30	9.66e-002	6.66e-002	0.284	0.284	9.395e-002
31	0.1	7.e-002	0.279	0.279	9.229e-002
32	0.1033	7.33e-002	0.275	0.275	9.097e-002
33	0.1066	7.66e-002	0.27	0.27	8.932e-002

34	0.11	8.e-002	0.265	0.265	8.766e-002
35	0.1133	8.33e-002	0.26	0.26	8.601e-002
36	0.1166	8.66e-002	0.256	0.256	8.468e-002
37	0.12	9.e-002	0.251	0.251	8.303e-002
38	0.1233	9.33e-002	0.246	0.246	8.138e-002
39	0.1266	9.66e-002	0.241	0.241	7.972e-002
40	0.13	0.1	0.237	0.237	7.84e-002
41	0.1333	0.1033	0.237	0.237	7.84e-002
42	0.1366	0.1066	0.232	0.232	7.674e-002
43	0.14	0.11	0.227	0.227	7.509e-002
44	0.1433	0.1133	0.222	0.222	7.344e-002
45	0.1466	0.1166	0.222	0.222	7.344e-002
46	0.15	0.12	0.218	0.218	7.211e-002
47	0.1533	0.1233	0.213	0.213	7.046e-002
48	0.1566	0.1266	0.208	0.208	6.881e-002
49	0.16	0.13	0.208	0.208	6.881e-002
50	0.1633	0.1333	0.204	0.204	6.748e-002
51	0.1666	0.1366	0.204	0.204	6.748e-002
52	0.17	0.14	0.199	0.199	6.583e-002
53	0.1733	0.1433	0.194	0.194	6.417e-002
54	0.1766	0.1466	0.194	0.194	6.417e-002
55	0.18	0.15	0.189	0.189	6.252e-002
56	0.1833	0.1533	0.189	0.189	6.252e-002
57	0.1866	0.1566	0.185	0.185	6.12e-002
58	0.19	0.16	0.185	0.185	6.12e-002
59	0.1933	0.1633	0.18	0.18	5.954e-002
60	0.1966	0.1666	0.18	0.18	5.954e-002
61	0.2	0.17	0.175	0.175	5.789e-002
62	0.2033	0.1733	0.175	0.175	5.789e-002
63	0.2066	0.1766	0.175	0.175	5.789e-002
64	0.21	0.18	0.17	0.17	5.624e-002
65	0.2133	0.1833	0.17	0.17	5.624e-002
66	0.2166	0.1866	0.166	0.166	5.491e-002
67	0.22	0.19	0.166	0.166	5.491e-002
68	0.2233	0.1933	0.166	0.166	5.491e-002
69	0.2266	0.1966	0.161	0.161	5.326e-002
70	0.23	0.2	0.161	0.161	5.326e-002
71	0.2333	0.2033	0.161	0.161	5.326e-002
72	0.2366	0.2066	0.156	0.156	5.16e-002
73	0.24	0.21	0.156	0.156	5.16e-002
74	0.2433	0.2133	0.156	0.156	5.16e-002
75	0.2466	0.2166	0.156	0.156	5.16e-002
76	0.25	0.22	0.151	0.151	4.995e-002
77	0.2533	0.2233	0.151	0.151	4.995e-002
78	0.2566	0.2266	0.151	0.151	4.995e-002
79	0.26	0.23	0.147	0.147	4.863e-002
80	0.2633	0.2333	0.147	0.147	4.863e-002
81	0.2666	0.2366	0.147	0.147	4.863e-002
82	0.27	0.24	0.142	0.142	4.697e-002
83	0.2733	0.2433	0.142	0.142	4.697e-002
84	0.2766	0.2466	0.142	0.142	4.697e-002
85	0.28	0.25	0.142	0.142	4.697e-002
86	0.2833	0.2533	0.142	0.142	4.697e-002
87	0.2866	0.2566	0.137	0.137	4.532e-002
88	0.29	0.26	0.137	0.137	4.532e-002
89	0.2933	0.2633	0.137	0.137	4.532e-002
90	0.2966	0.2666	0.137	0.137	4.532e-002

91	0.3	0.27	0.137	0.137	4.532e-002
92	0.3033	0.2733	0.132	0.132	4.367e-002
93	0.3066	0.2766	0.132	0.132	4.367e-002
94	0.31	0.28	0.132	0.132	4.367e-002
95	0.3133	0.2833	0.132	0.132	4.367e-002
96	0.3166	0.2866	0.132	0.132	4.367e-002
97	0.32	0.29	0.128	0.128	4.234e-002
98	0.3233	0.2933	0.128	0.128	4.234e-002
99	0.3266	0.2966	0.128	0.128	4.234e-002
100	0.33	0.3	0.128	0.128	4.234e-002
101	0.3333	0.3033	0.128	0.128	4.234e-002
102	0.35	0.32	0.118	0.118	3.903e-002
103	0.3666	0.3366	0.118	0.118	3.903e-002
104	0.3833	0.3533	0.113	0.113	3.738e-002
105	0.4	0.37	0.109	0.109	3.606e-002
106	0.4166	0.3866	0.109	0.109	3.606e-002
107	0.4333	0.4033	0.104	0.104	3.44e-002
108	0.45	0.42	9.9e-002	9.9e-002	3.275e-002
109	0.4666	0.4366	9.9e-002	9.9e-002	3.275e-002
110	0.4833	0.4533	9.4e-002	9.4e-002	3.109e-002
111	0.5	0.47	9.e-002	9.e-002	2.977e-002
112	0.5166	0.4866	9.e-002	9.e-002	2.977e-002
113	0.5333	0.5033	9.e-002	9.e-002	2.977e-002
114	0.55	0.52	8.5e-002	8.5e-002	2.812e-002
115	0.5666	0.5366	8.5e-002	8.5e-002	2.812e-002
116	0.5833	0.5533	8.e-002	8.e-002	2.646e-002
117	0.6	0.57	8.e-002	8.e-002	2.646e-002
118	0.6166	0.5866	7.5e-002	7.5e-002	2.481e-002
119	0.6333	0.6033	7.5e-002	7.5e-002	2.481e-002
120	0.65	0.62	7.5e-002	7.5e-002	2.481e-002
121	0.6666	0.6366	7.5e-002	7.5e-002	2.481e-002
122	0.6833	0.6533	7.1e-002	7.1e-002	2.349e-002
123	0.7	0.67	7.1e-002	7.1e-002	2.349e-002
124	0.7166	0.6866	6.6e-002	6.6e-002	2.183e-002
125	0.7333	0.7033	6.6e-002	6.6e-002	2.183e-002
126	0.75	0.72	6.6e-002	6.6e-002	2.183e-002
127	0.7666	0.7366	6.6e-002	6.6e-002	2.183e-002
128	0.7833	0.7533	6.1e-002	6.1e-002	2.018e-002
129	0.8	0.77	6.1e-002	6.1e-002	2.018e-002
130	0.8166	0.7866	6.1e-002	6.1e-002	2.018e-002
131	0.8333	0.8033	6.1e-002	6.1e-002	2.018e-002
132	0.85	0.82	5.6e-002	5.6e-002	1.852e-002
133	0.8666	0.8366	5.6e-002	5.6e-002	1.852e-002
134	0.8833	0.8533	5.6e-002	5.6e-002	1.852e-002
135	0.9	0.87	5.6e-002	5.6e-002	1.852e-002
136	0.9166	0.8866	5.6e-002	5.6e-002	1.852e-002
137	0.9333	0.9033	5.2e-002	5.2e-002	1.72e-002
138	0.95	0.92	5.2e-002	5.2e-002	1.72e-002
139	0.9666	0.9366	5.2e-002	5.2e-002	1.72e-002
140	0.9833	0.9533	5.2e-002	5.2e-002	1.72e-002
141	1.	0.97	5.2e-002	5.2e-002	1.72e-002
142	1.2	1.17	3.7e-002	3.7e-002	1.224e-002
143	1.4	1.37	3.3e-002	3.3e-002	1.092e-002
144	1.6	1.57	2.8e-002	2.8e-002	9.262e-003
145	1.8	1.77	2.3e-002	2.3e-002	7.608e-003
146	2.	1.97	2.3e-002	2.3e-002	7.608e-003
147	2.2	2.17	1.9e-002	1.9e-002	6.285e-003

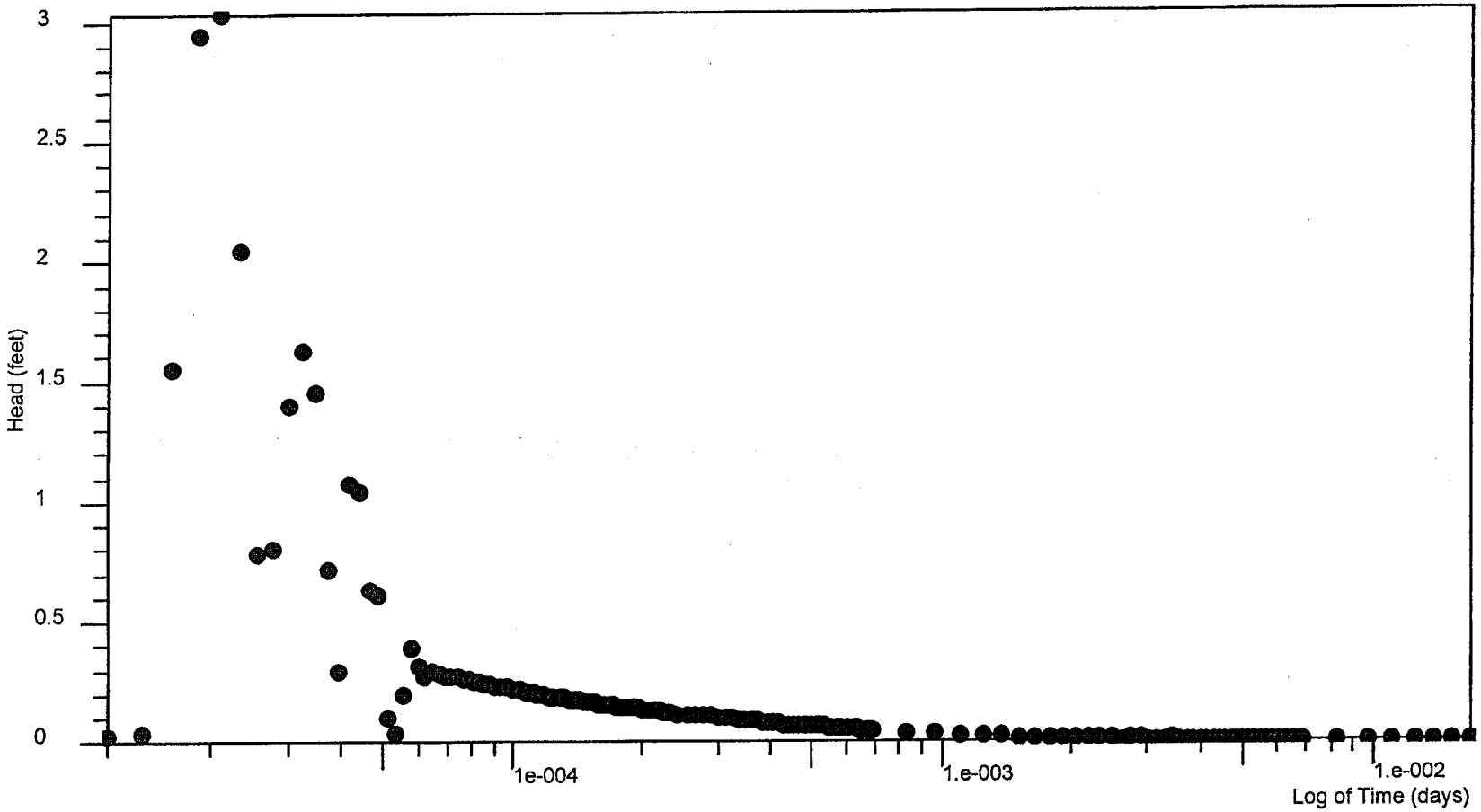
148	2.4	2.37	1.9e-002	1.9e-002	6.285e-003
149	2.6	2.57	1.4e-002	1.4e-002	4.631e-003
150	2.8	2.77	1.4e-002	1.4e-002	4.631e-003
151	3.	2.97	1.4e-002	1.4e-002	4.631e-003
152	3.2	3.17	1.4e-002	1.4e-002	4.631e-003
153	3.4	3.37	1.4e-002	1.4e-002	4.631e-003
154	3.6	3.57	1.4e-002	1.4e-002	4.631e-003
155	3.8	3.77	9.e-003	9.e-003	2.977e-003
156	4.	3.97	1.4e-002	1.4e-002	4.631e-003
157	4.2	4.17	1.4e-002	1.4e-002	4.631e-003
158	4.4	4.37	9.e-003	9.e-003	2.977e-003
159	4.6	4.57	9.e-003	9.e-003	2.977e-003
160	4.8	4.77	9.e-003	9.e-003	2.977e-003
161	5.	4.97	1.4e-002	1.4e-002	4.631e-003
162	5.2	5.17	9.e-003	9.e-003	2.977e-003
163	5.4	5.37	9.e-003	9.e-003	2.977e-003
164	5.6	5.57	9.e-003	9.e-003	2.977e-003
165	5.8	5.77	9.e-003	9.e-003	2.977e-003
166	6.	5.97	9.e-003	9.e-003	2.977e-003
167	6.2	6.17	9.e-003	9.e-003	2.977e-003
168	6.4	6.37	9.e-003	9.e-003	2.977e-003
169	6.6	6.57	9.e-003	9.e-003	2.977e-003
170	6.8	6.77	9.e-003	9.e-003	2.977e-003
171	7.	6.97	9.e-003	9.e-003	2.977e-003
172	7.2	7.17	9.e-003	9.e-003	2.977e-003
173	7.4	7.37	9.e-003	9.e-003	2.977e-003
174	7.6	7.57	9.e-003	9.e-003	2.977e-003
175	7.8	7.77	9.e-003	9.e-003	2.977e-003
176	8.	7.97	9.e-003	9.e-003	2.977e-003
177	8.2	8.17	9.e-003	9.e-003	2.977e-003
178	8.4	8.37	4.e-003	4.e-003	1.323e-003
179	8.6	8.57	4.e-003	4.e-003	1.323e-003
180	8.8	8.77	9.e-003	9.e-003	2.977e-003
181	9.	8.97	9.e-003	9.e-003	2.977e-003
182	9.2	9.17	9.e-003	9.e-003	2.977e-003
183	9.4	9.37	9.e-003	9.e-003	2.977e-003
184	9.6	9.57	9.e-003	9.e-003	2.977e-003
185	9.8	9.77	9.e-003	9.e-003	2.977e-003
186	10.	9.97	9.e-003	9.e-003	2.977e-003
187	12.	11.97	9.e-003	9.e-003	2.977e-003
188	14.	13.97	4.e-003	4.e-003	1.323e-003
189	16.	15.97	4.e-003	4.e-003	1.323e-003
190	18.	17.97	4.e-003	4.e-003	1.323e-003
191	20.	19.97	4.e-003	4.e-003	1.323e-003
192	22.	21.97	4.e-003	4.e-003	1.323e-003
193	24.	23.97	4.e-003	4.e-003	1.323e-003

JEP-5S Falling Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-5S



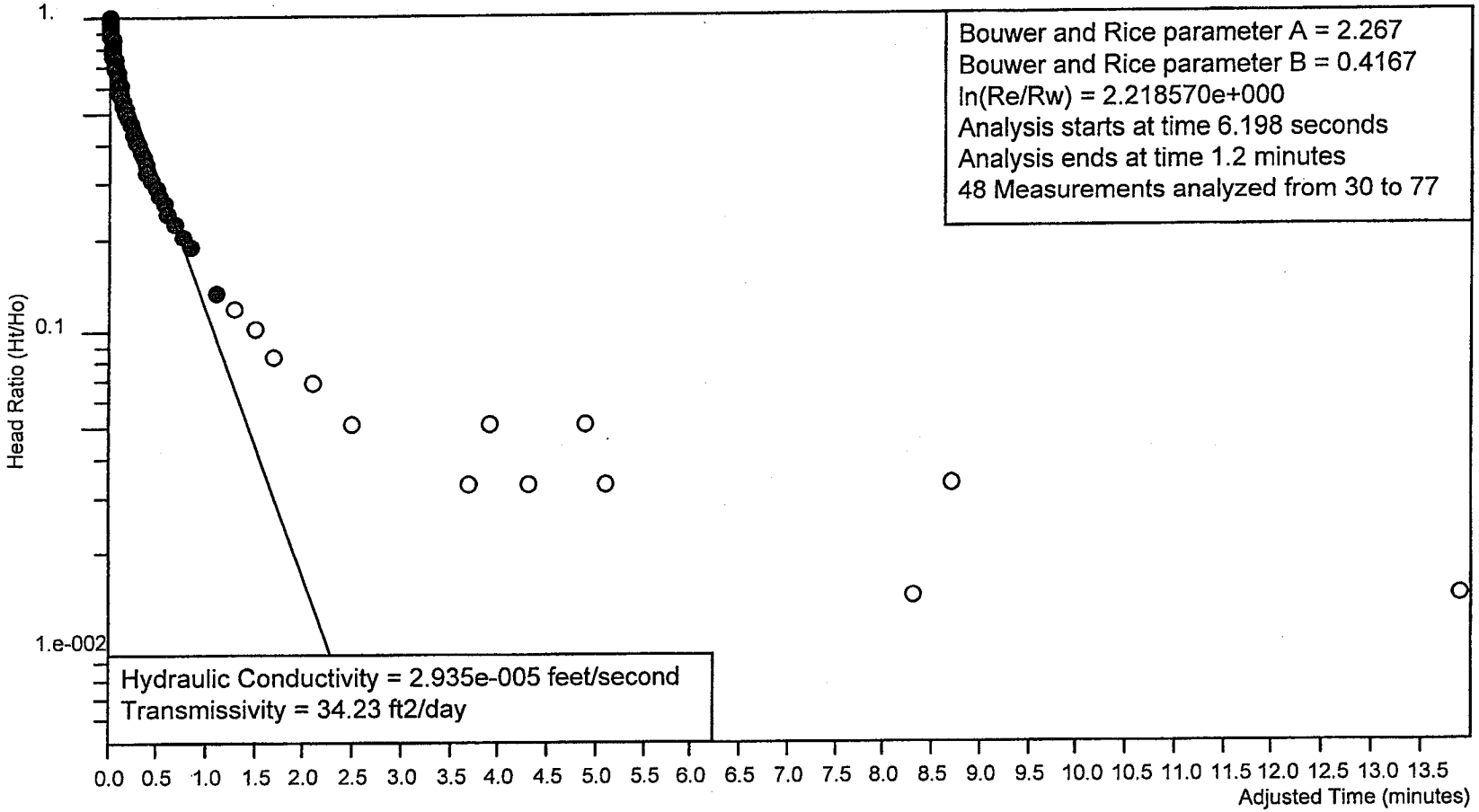
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-5S Falling Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-5S



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.275 feet at 6.198 seconds

JEP-5S Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP5SRHN

Well Label:	JEP-5S
Aquifer Thickness:	13.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	8.91 feet
Anisotropy Ratio:	2.
Time Adjustment:	2.196 Seconds

Test starts with trial 11
There are 189 time and drawdown measurements
Maximum head is 3.233 feet
Minimum head is -0.104 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.66e-002	0.	0.	0.
2	3.3e-003	-3.33e-002	4.e-003	-4.e-003	-1.237e-003
3	6.6e-003	-3.e-002	4.e-003	-4.e-003	-1.237e-003
4	1.e-002	-2.66e-002	4.e-003	-4.e-003	-1.237e-003
5	1.33e-002	-2.33e-002	4.e-003	-4.e-003	-1.237e-003
6	1.66e-002	-2.e-002	4.e-003	-4.e-003	-1.237e-003
7	2.e-002	-1.66e-002	4.e-003	-4.e-003	-1.237e-003
8	2.33e-002	-1.33e-002	-9.e-002	9.e-002	2.784e-002
9	2.66e-002	-1.e-002	-1.896	1.896	0.5865
10	3.e-002	-6.6e-003	-2.631	2.631	0.8138
11	3.33e-002	-3.3e-003	-3.176	3.176	0.9824
12	3.66e-002	0.	-3.233	3.233	1.
13	4.e-002	3.4e-003	-2.574	2.574	0.7962
14	4.33e-002	6.7e-003	-1.105	1.105	0.3418
15	4.66e-002	1.e-002	0.104	-0.104	-3.217e-002
16	5.e-002	1.34e-002	-1.683	1.683	0.5206
17	5.33e-002	1.67e-002	-1.801	1.801	0.5571
18	5.66e-002	2.e-002	-0.962	0.962	0.2976
19	6.e-002	2.34e-002	-0.986	0.986	0.305
20	6.33e-002	2.67e-002	-0.91	0.91	0.2815
21	6.66e-002	3.e-002	-0.834	0.834	0.258
22	7.e-002	3.34e-002	-0.777	0.777	0.2403
23	7.33e-002	3.67e-002	-0.697	0.697	0.2156
24	7.66e-002	4.e-002	-0.645	0.645	0.1995
25	8.e-002	4.34e-002	-0.592	0.592	0.1831
26	8.33e-002	4.67e-002	-0.536	0.536	0.1658
27	8.66e-002	5.e-002	-0.483	0.483	0.1494
28	9.e-002	5.34e-002	-0.445	0.445	0.1376
29	9.33e-002	5.67e-002	-0.412	0.412	0.1274
30	9.66e-002	6.e-002	-0.374	0.374	0.1157
31	0.1	6.34e-002	-0.346	0.346	0.107
32	0.1033	6.67e-002	-0.317	0.317	9.805e-002
33	0.1066	7.e-002	-0.284	0.284	8.784e-002

34	0.11	7.34e-002	-0.265	0.265	8.197e-002
35	0.1133	7.67e-002	-0.246	0.246	7.609e-002
36	0.1166	8.e-002	-0.232	0.232	7.176e-002
37	0.12	8.34e-002	-0.218	0.218	6.743e-002
38	0.1233	8.67e-002	-0.208	0.208	6.434e-002
39	0.1266	9.e-002	-0.194	0.194	6.001e-002
40	0.13	9.34e-002	-0.184	0.184	5.691e-002
41	0.1333	9.67e-002	-0.175	0.175	5.413e-002
42	0.1366	0.1	-0.166	0.166	5.135e-002
43	0.14	0.1034	-0.161	0.161	4.98e-002
44	0.1433	0.1067	-0.156	0.156	4.825e-002
45	0.1466	0.11	-0.151	0.151	4.671e-002
46	0.15	0.1134	-0.147	0.147	4.547e-002
47	0.1533	0.1167	-0.142	0.142	4.392e-002
48	0.1566	0.12	-0.137	0.137	4.238e-002
49	0.16	0.1234	-0.132	0.132	4.083e-002
50	0.1633	0.1267	-0.128	0.128	3.959e-002
51	0.1666	0.13	-0.123	0.123	3.805e-002
52	0.17	0.1334	-0.123	0.123	3.805e-002
53	0.1733	0.1367	-0.118	0.118	3.65e-002
54	0.1766	0.14	-0.118	0.118	3.65e-002
55	0.18	0.1434	-0.113	0.113	3.495e-002
56	0.1833	0.1467	-0.109	0.109	3.371e-002
57	0.1866	0.15	-0.109	0.109	3.371e-002
58	0.19	0.1534	-0.109	0.109	3.371e-002
59	0.1933	0.1567	-0.104	0.104	3.217e-002
60	0.1966	0.16	-0.104	0.104	3.217e-002
61	0.2	0.1634	-9.9e-002	9.9e-002	3.062e-002
62	0.2033	0.1667	-9.9e-002	9.9e-002	3.062e-002
63	0.2066	0.17	-9.9e-002	9.9e-002	3.062e-002
64	0.21	0.1734	-9.4e-002	9.4e-002	2.908e-002
65	0.2133	0.1767	-9.4e-002	9.4e-002	2.908e-002
66	0.2166	0.18	-9.4e-002	9.4e-002	2.908e-002
67	0.22	0.1834	-9.e-002	9.e-002	2.784e-002
68	0.2233	0.1867	-9.e-002	9.e-002	2.784e-002
69	0.2266	0.19	-9.e-002	9.e-002	2.784e-002
70	0.23	0.1934	-9.e-002	9.e-002	2.784e-002
71	0.2333	0.1967	-8.5e-002	8.5e-002	2.629e-002
72	0.2366	0.2	-8.5e-002	8.5e-002	2.629e-002
73	0.24	0.2034	-8.5e-002	8.5e-002	2.629e-002
74	0.2433	0.2067	-8.5e-002	8.5e-002	2.629e-002
75	0.2466	0.21	-8.e-002	8.e-002	2.474e-002
76	0.25	0.2134	-8.e-002	8.e-002	2.474e-002
77	0.2533	0.2167	-8.e-002	8.e-002	2.474e-002
78	0.2566	0.22	-7.5e-002	7.5e-002	2.32e-002
79	0.26	0.2234	-7.5e-002	7.5e-002	2.32e-002
80	0.2633	0.2267	-7.5e-002	7.5e-002	2.32e-002
81	0.2666	0.23	-7.5e-002	7.5e-002	2.32e-002
82	0.27	0.2334	-7.5e-002	7.5e-002	2.32e-002
83	0.2733	0.2367	-7.1e-002	7.1e-002	2.196e-002
84	0.2766	0.24	-7.1e-002	7.1e-002	2.196e-002
85	0.28	0.2434	-7.1e-002	7.1e-002	2.196e-002
86	0.2833	0.2467	-7.1e-002	7.1e-002	2.196e-002
87	0.2866	0.25	-7.1e-002	7.1e-002	2.196e-002
88	0.29	0.2534	-7.1e-002	7.1e-002	2.196e-002
89	0.2933	0.2567	-6.6e-002	6.6e-002	2.041e-002
90	0.2966	0.26	-6.6e-002	6.6e-002	2.041e-002

91	0.3	0.2634	-6.6e-002	6.6e-002	2.041e-002
92	0.3033	0.2667	-6.6e-002	6.6e-002	2.041e-002
93	0.3066	0.27	-6.6e-002	6.6e-002	2.041e-002
94	0.31	0.2734	-6.6e-002	6.6e-002	2.041e-002
95	0.3133	0.2767	-6.1e-002	6.1e-002	1.887e-002
96	0.3166	0.28	-6.1e-002	6.1e-002	1.887e-002
97	0.32	0.2834	-6.1e-002	6.1e-002	1.887e-002
98	0.3233	0.2867	-6.1e-002	6.1e-002	1.887e-002
99	0.3266	0.29	-6.1e-002	6.1e-002	1.887e-002
100	0.33	0.2934	-6.1e-002	6.1e-002	1.887e-002
101	0.3333	0.2967	-6.1e-002	6.1e-002	1.887e-002
102	0.35	0.3134	-5.6e-002	5.6e-002	1.732e-002
103	0.3666	0.33	-5.2e-002	5.2e-002	1.608e-002
104	0.3833	0.3467	-5.2e-002	5.2e-002	1.608e-002
105	0.4	0.3634	-4.7e-002	4.7e-002	1.454e-002
106	0.4166	0.38	-4.2e-002	4.2e-002	1.299e-002
107	0.4333	0.3967	-4.2e-002	4.2e-002	1.299e-002
108	0.45	0.4134	-3.7e-002	3.7e-002	1.144e-002
109	0.4666	0.43	-3.7e-002	3.7e-002	1.144e-002
110	0.4833	0.4467	-3.3e-002	3.3e-002	1.021e-002
111	0.5	0.4634	-3.3e-002	3.3e-002	1.021e-002
112	0.5166	0.48	-2.8e-002	2.8e-002	8.661e-003
113	0.5333	0.4967	-2.8e-002	2.8e-002	8.661e-003
114	0.55	0.5134	-2.8e-002	2.8e-002	8.661e-003
115	0.5666	0.53	-2.3e-002	2.3e-002	7.114e-003
116	0.5833	0.5467	-2.3e-002	2.3e-002	7.114e-003
117	0.6	0.5634	-2.3e-002	2.3e-002	7.114e-003
118	0.6166	0.58	-1.8e-002	1.8e-002	5.568e-003
119	0.6333	0.5967	-1.8e-002	1.8e-002	5.568e-003
120	0.65	0.6134	-1.8e-002	1.8e-002	5.568e-003
121	0.6666	0.63	-1.4e-002	1.4e-002	4.33e-003
122	0.6833	0.6467	-1.4e-002	1.4e-002	4.33e-003
123	0.7	0.6634	-1.4e-002	1.4e-002	4.33e-003
124	0.7166	0.68	-9.e-003	9.e-003	2.784e-003
125	0.7333	0.6967	-9.e-003	9.e-003	2.784e-003
126	0.75	0.7134	-9.e-003	9.e-003	2.784e-003
127	0.7666	0.73	-4.e-003	4.e-003	1.237e-003
128	0.7833	0.7467	-4.e-003	4.e-003	1.237e-003
129	0.8	0.7634	-4.e-003	4.e-003	1.237e-003
130	0.8166	0.78	-4.e-003	4.e-003	1.237e-003
131	0.8333	0.7967	0.	0.	0.
132	0.85	0.8134	0.	0.	0.
133	0.8666	0.83	0.	0.	0.
134	0.8833	0.8467	0.	0.	0.
135	0.9	0.8634	0.	0.	0.
136	0.9166	0.88	4.e-003	-4.e-003	-1.237e-003
137	0.9333	0.8967	4.e-003	-4.e-003	-1.237e-003
138	0.95	0.9134	4.e-003	-4.e-003	-1.237e-003
139	0.9666	0.93	4.e-003	-4.e-003	-1.237e-003
140	0.9833	0.9467	9.e-003	-9.e-003	-2.784e-003
141	1.	0.9634	9.e-003	-9.e-003	-2.784e-003
142	1.2	1.163	1.4e-002	-1.4e-002	-4.33e-003
143	1.4	1.363	1.9e-002	-1.9e-002	-5.877e-003
144	1.6	1.563	2.3e-002	-2.3e-002	-7.114e-003
145	1.8	1.763	2.3e-002	-2.3e-002	-7.114e-003
146	2.	1.963	2.8e-002	-2.8e-002	-8.661e-003
147	2.2	2.163	2.8e-002	-2.8e-002	-8.661e-003

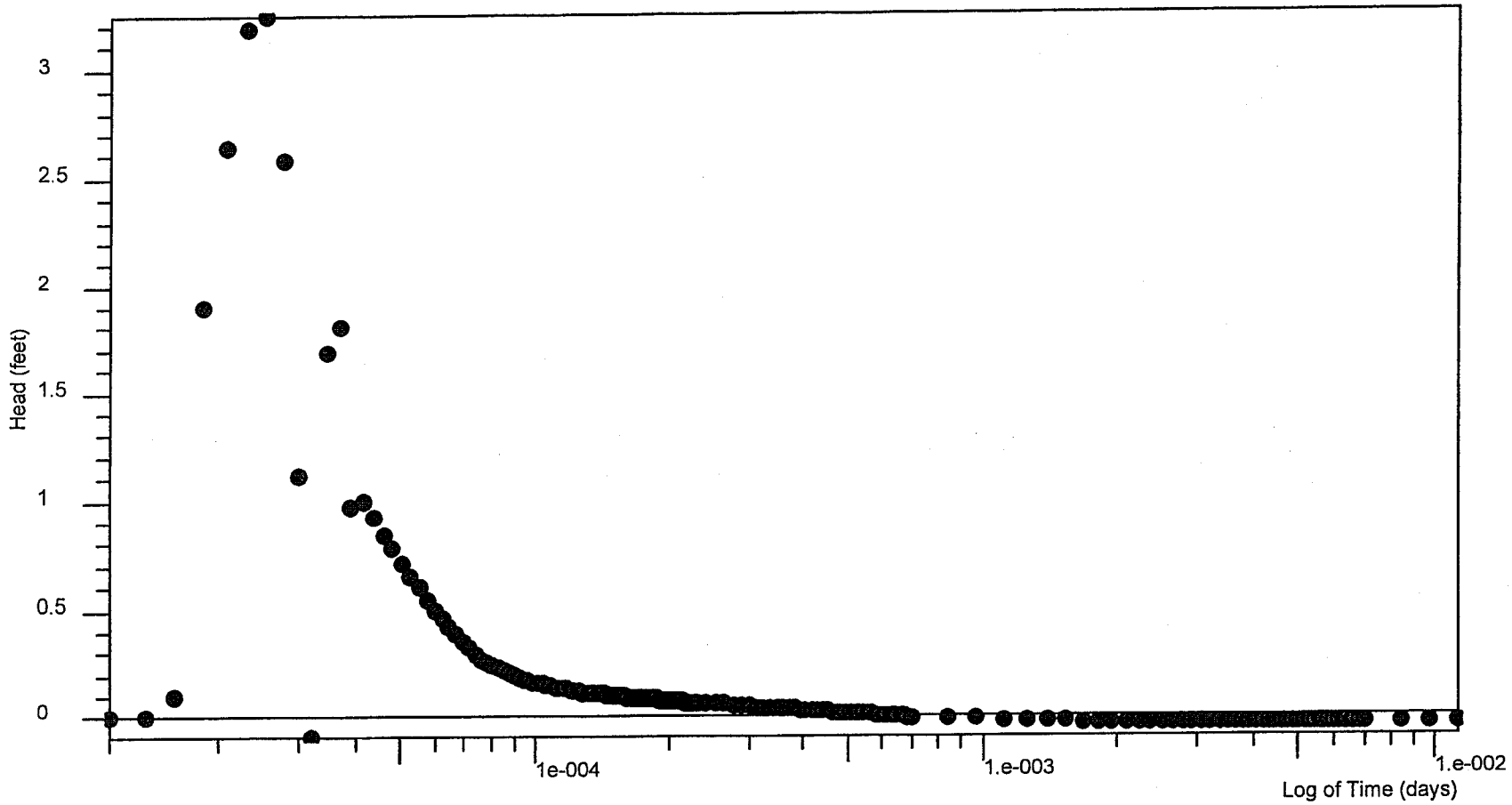
148	2.4	2.363	3.3e-002	-3.3e-002	-1.021e-002
149	2.6	2.563	3.3e-002	-3.3e-002	-1.021e-002
150	2.8	2.763	3.3e-002	-3.3e-002	-1.021e-002
151	3.	2.963	3.3e-002	-3.3e-002	-1.021e-002
152	3.2	3.163	3.7e-002	-3.7e-002	-1.144e-002
153	3.4	3.363	3.3e-002	-3.3e-002	-1.021e-002
154	3.6	3.563	3.7e-002	-3.7e-002	-1.144e-002
155	3.8	3.763	3.7e-002	-3.7e-002	-1.144e-002
156	4.	3.963	3.7e-002	-3.7e-002	-1.144e-002
157	4.2	4.163	3.7e-002	-3.7e-002	-1.144e-002
158	4.4	4.363	4.2e-002	-4.2e-002	-1.299e-002
159	4.6	4.563	3.7e-002	-3.7e-002	-1.144e-002
160	4.8	4.763	3.7e-002	-3.7e-002	-1.144e-002
161	5.	4.963	3.7e-002	-3.7e-002	-1.144e-002
162	5.2	5.163	4.2e-002	-4.2e-002	-1.299e-002
163	5.4	5.363	4.2e-002	-4.2e-002	-1.299e-002
164	5.6	5.563	3.7e-002	-3.7e-002	-1.144e-002
165	5.8	5.763	3.7e-002	-3.7e-002	-1.144e-002
166	6.	5.963	3.7e-002	-3.7e-002	-1.144e-002
167	6.2	6.163	3.7e-002	-3.7e-002	-1.144e-002
168	6.4	6.363	3.7e-002	-3.7e-002	-1.144e-002
169	6.6	6.563	3.7e-002	-3.7e-002	-1.144e-002
170	6.8	6.763	3.7e-002	-3.7e-002	-1.144e-002
171	7.	6.963	4.2e-002	-4.2e-002	-1.299e-002
172	7.2	7.163	4.2e-002	-4.2e-002	-1.299e-002
173	7.4	7.363	4.2e-002	-4.2e-002	-1.299e-002
174	7.6	7.563	4.2e-002	-4.2e-002	-1.299e-002
175	7.8	7.763	4.2e-002	-4.2e-002	-1.299e-002
176	8.	7.963	4.2e-002	-4.2e-002	-1.299e-002
177	8.2	8.163	4.2e-002	-4.2e-002	-1.299e-002
178	8.4	8.363	4.2e-002	-4.2e-002	-1.299e-002
179	8.6	8.563	4.2e-002	-4.2e-002	-1.299e-002
180	8.8	8.763	4.2e-002	-4.2e-002	-1.299e-002
181	9.	8.963	4.2e-002	-4.2e-002	-1.299e-002
182	9.2	9.163	3.7e-002	-3.7e-002	-1.144e-002
183	9.4	9.363	3.7e-002	-3.7e-002	-1.144e-002
184	9.6	9.563	3.7e-002	-3.7e-002	-1.144e-002
185	9.8	9.763	3.7e-002	-3.7e-002	-1.144e-002
186	10.	9.963	3.7e-002	-3.7e-002	-1.144e-002
187	12.	11.96	3.7e-002	-3.7e-002	-1.144e-002
188	14.	13.96	3.3e-002	-3.3e-002	-1.021e-002
189	16.	15.96	3.7e-002	-3.7e-002	-1.144e-002

JEP-5S Rising Head Test 7/2/01

International Paper- Riegelwood Plant Riegelwood, North Carolina

Head vs. Log Time

JEP-5S



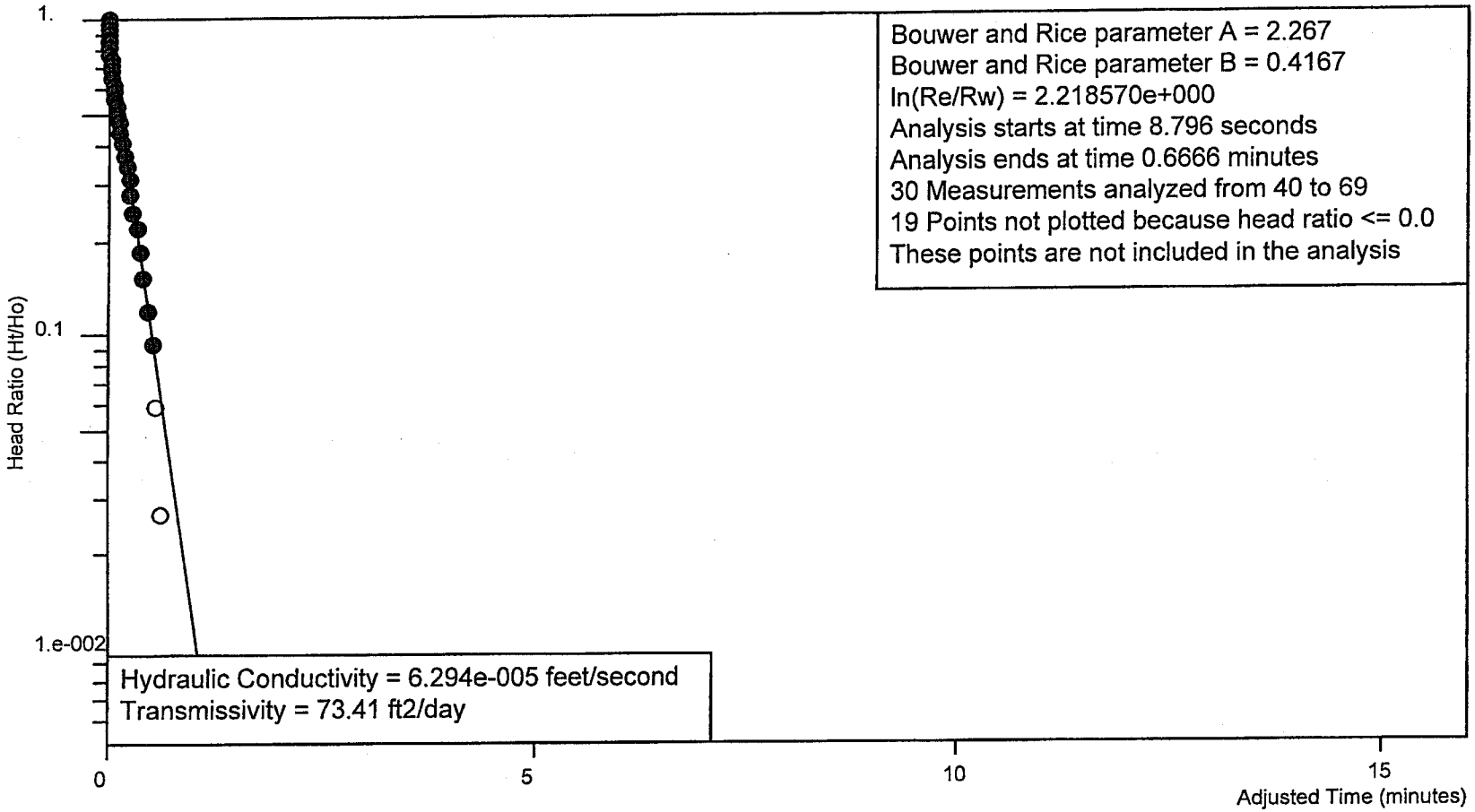
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-5S Rising Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-5S



Ho is 0.151 feet at 8.796 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-6 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP6FHN

Well Label:	JEP-6
Aquifer Thickness:	7. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	10.69 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.8 Seconds

Test starts with trial 9
There are 186 time and drawdown measurements
Maximum head is 5.632 feet
Minimum head is -0.213 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.e-002	-9.e-003	-9.e-003	-1.598e-003
2	3.3e-003	-2.67e-002	-9.e-003	-9.e-003	-1.598e-003
3	6.6e-003	-2.34e-002	-9.e-003	-9.e-003	-1.598e-003
4	1.e-002	-2.e-002	4.e-003	4.e-003	7.102e-004
5	1.33e-002	-1.67e-002	1.4e-002	1.4e-002	2.486e-003
6	1.66e-002	-1.34e-002	2.8e-002	2.8e-002	4.972e-003
7	2.e-002	-1.e-002	3.3e-002	3.3e-002	5.859e-003
8	2.33e-002	-6.7e-003	2.3e-002	2.3e-002	4.084e-003
9	2.66e-002	-3.4e-003	5.7e-002	5.7e-002	1.012e-002
10	3.e-002	0.	5.632	5.632	1.
11	3.33e-002	3.3e-003	5.399	5.399	0.9586
12	3.66e-002	6.6e-003	3.335	3.335	0.5922
13	4.e-002	1.e-002	-0.132	-0.132	-2.344e-002
14	4.33e-002	1.33e-002	1.491	1.491	0.2647
15	4.66e-002	1.66e-002	2.436	2.436	0.4325
16	5.e-002	2.e-002	2.246	2.246	0.3988
17	5.33e-002	2.33e-002	2.056	2.056	0.3651
18	5.66e-002	2.66e-002	1.909	1.909	0.339
19	6.e-002	3.e-002	1.747	1.747	0.3102
20	6.33e-002	3.33e-002	1.99	1.99	0.3533
21	6.66e-002	3.66e-002	1.177	1.177	0.209
22	7.e-002	4.e-002	1.628	1.628	0.2891
23	7.33e-002	4.33e-002	1.837	1.837	0.3262
24	7.66e-002	4.66e-002	1.396	1.396	0.2479
25	8.e-002	5.e-002	1.419	1.419	0.252
26	8.33e-002	5.33e-002	1.624	1.624	0.2884
27	8.66e-002	5.66e-002	1.771	1.771	0.3145
28	9.e-002	6.e-002	0.422	0.422	7.493e-002
29	9.33e-002	6.33e-002	0.132	0.132	2.344e-002
30	9.66e-002	6.66e-002	0.793	0.793	0.1408
31	0.1	7.e-002	1.244	1.244	0.2209
32	0.1033	7.33e-002	0.925	0.925	0.1642
33	0.1066	7.66e-002	0.636	0.636	0.1129

34	0.11	8.e-002	0.736	0.736	0.1307
35	0.1133	8.33e-002	0.835	0.835	0.1483
36	0.1166	8.66e-002	0.797	0.797	0.1415
37	0.12	9.e-002	0.166	0.166	2.947e-002
38	0.1233	9.33e-002	0.351	0.351	6.232e-002
39	0.1266	9.66e-002	1.386	1.386	0.2461
40	0.13	0.1	1.125	1.125	0.1998
41	0.1333	0.1033	0.422	0.422	7.493e-002
42	0.1366	0.1066	0.489	0.489	8.683e-002
43	0.14	0.11	0.84	0.84	0.1491
44	0.1433	0.1133	0.664	0.664	0.1179
45	0.1466	0.1166	0.579	0.579	0.1028
46	0.15	0.12	0.66	0.66	0.1172
47	0.1533	0.1233	0.626	0.626	0.1112
48	0.1566	0.1266	0.593	0.593	0.1053
49	0.16	0.13	0.603	0.603	0.1071
50	0.1633	0.1333	0.588	0.588	0.1044
51	0.1666	0.1366	0.574	0.574	0.1019
52	0.17	0.14	0.569	0.569	0.101
53	0.1733	0.1433	0.56	0.56	9.943e-002
54	0.1766	0.1466	0.55	0.55	9.766e-002
55	0.18	0.15	0.546	0.546	9.695e-002
56	0.1833	0.1533	0.531	0.531	9.428e-002
57	0.1866	0.1566	0.522	0.522	9.268e-002
58	0.19	0.16	0.517	0.517	9.18e-002
59	0.1933	0.1633	0.508	0.508	9.02e-002
60	0.1966	0.1666	0.503	0.503	8.931e-002
61	0.2	0.17	0.493	0.493	8.754e-002
62	0.2033	0.1733	0.527	0.527	9.357e-002
63	0.2066	0.1766	0.46	0.46	8.168e-002
64	0.21	0.18	0.451	0.451	8.008e-002
65	0.2133	0.1833	0.479	0.479	8.505e-002
66	0.2166	0.1866	0.46	0.46	8.168e-002
67	0.22	0.19	0.451	0.451	8.008e-002
68	0.2233	0.1933	0.451	0.451	8.008e-002
69	0.2266	0.1966	0.441	0.441	7.83e-002
70	0.23	0.2	0.436	0.436	7.741e-002
71	0.2333	0.2033	0.432	0.432	7.67e-002
72	0.2366	0.2066	0.508	0.508	9.02e-002
73	0.24	0.21	0.28	0.28	4.972e-002
74	0.2433	0.2133	0.403	0.403	7.156e-002
75	0.2466	0.2166	0.455	0.455	8.079e-002
76	0.25	0.22	0.384	0.384	6.818e-002
77	0.2533	0.2233	0.398	0.398	7.067e-002
78	0.2566	0.2266	0.398	0.398	7.067e-002
79	0.26	0.23	0.384	0.384	6.818e-002
80	0.2633	0.2333	0.384	0.384	6.818e-002
81	0.2666	0.2366	0.379	0.379	6.729e-002
82	0.27	0.24	0.375	0.375	6.658e-002
83	0.2733	0.2433	0.37	0.37	6.57e-002
84	0.2766	0.2466	0.365	0.365	6.481e-002
85	0.28	0.25	0.36	0.36	6.392e-002
86	0.2833	0.2533	0.356	0.356	6.321e-002
87	0.2866	0.2566	0.351	0.351	6.232e-002
88	0.29	0.26	0.356	0.356	6.321e-002
89	0.2933	0.2633	0.346	0.346	6.143e-002
90	0.2966	0.2666	0.346	0.346	6.143e-002

91	0.3	0.27	0.341	0.341	6.055e-002
92	0.3033	0.2733	0.341	0.341	6.055e-002
93	0.3066	0.2766	0.341	0.341	6.055e-002
94	0.31	0.28	0.337	0.337	5.984e-002
95	0.3133	0.2833	0.736	0.736	0.1307
96	0.3166	0.2866	0.717	0.717	0.1273
97	0.32	0.29	-0.213	-0.213	-3.782e-002
98	0.3233	0.2933	-0.17	-0.17	-3.018e-002
99	0.3266	0.2966	0.674	0.674	0.1197
100	0.33	0.3	0.56	0.56	9.943e-002
101	0.3333	0.3033	7.6e-002	7.6e-002	1.349e-002
102	0.35	0.32	0.313	0.313	5.558e-002
103	0.3666	0.3366	0.284	0.284	5.043e-002
104	0.3833	0.3533	0.261	0.261	4.634e-002
105	0.4	0.37	0.232	0.232	4.119e-002
106	0.4166	0.3866	0.208	0.208	3.693e-002
107	0.4333	0.4033	0.189	0.189	3.356e-002
108	0.45	0.42	0.17	0.17	3.018e-002
109	0.4666	0.4366	0.151	0.151	2.681e-002
110	0.4833	0.4533	0.137	0.137	2.433e-002
111	0.5	0.47	0.128	0.128	2.273e-002
112	0.5166	0.4866	0.114	0.114	2.024e-002
113	0.5333	0.5033	0.104	0.104	1.847e-002
114	0.55	0.52	9.4e-002	9.4e-002	1.669e-002
115	0.5666	0.5366	8.5e-002	8.5e-002	1.509e-002
116	0.5833	0.5533	8.e-002	8.e-002	1.42e-002
117	0.6	0.57	7.6e-002	7.6e-002	1.349e-002
118	0.6166	0.5866	7.1e-002	7.1e-002	1.261e-002
119	0.6333	0.6033	6.6e-002	6.6e-002	1.172e-002
120	0.65	0.62	6.1e-002	6.1e-002	1.083e-002
121	0.6666	0.6366	5.7e-002	5.7e-002	1.012e-002
122	0.6833	0.6533	5.2e-002	5.2e-002	9.233e-003
123	0.7	0.67	4.7e-002	4.7e-002	8.345e-003
124	0.7166	0.6866	4.7e-002	4.7e-002	8.345e-003
125	0.7333	0.7033	4.2e-002	4.2e-002	7.457e-003
126	0.75	0.72	4.2e-002	4.2e-002	7.457e-003
127	0.7666	0.7366	3.8e-002	3.8e-002	6.747e-003
128	0.7833	0.7533	3.8e-002	3.8e-002	6.747e-003
129	0.8	0.77	3.8e-002	3.8e-002	6.747e-003
130	0.8166	0.7866	3.3e-002	3.3e-002	5.859e-003
131	0.8333	0.8033	3.3e-002	3.3e-002	5.859e-003
132	0.85	0.82	3.3e-002	3.3e-002	5.859e-003
133	0.8666	0.8366	2.8e-002	2.8e-002	4.972e-003
134	0.8833	0.8533	2.8e-002	2.8e-002	4.972e-003
135	0.9	0.87	2.8e-002	2.8e-002	4.972e-003
136	0.9166	0.8866	2.8e-002	2.8e-002	4.972e-003
137	0.9333	0.9033	2.3e-002	2.3e-002	4.084e-003
138	0.95	0.92	2.3e-002	2.3e-002	4.084e-003
139	0.9666	0.9366	2.3e-002	2.3e-002	4.084e-003
140	0.9833	0.9533	2.3e-002	2.3e-002	4.084e-003
141	1.	0.97	2.3e-002	2.3e-002	4.084e-003
142	1.2	1.17	1.4e-002	1.4e-002	2.486e-003
143	1.4	1.37	1.4e-002	1.4e-002	2.486e-003
144	1.6	1.57	9.e-003	9.e-003	1.598e-003
145	1.8	1.77	9.e-003	9.e-003	1.598e-003
146	2.	1.97	9.e-003	9.e-003	1.598e-003
147	2.2	2.17	9.e-003	9.e-003	1.598e-003

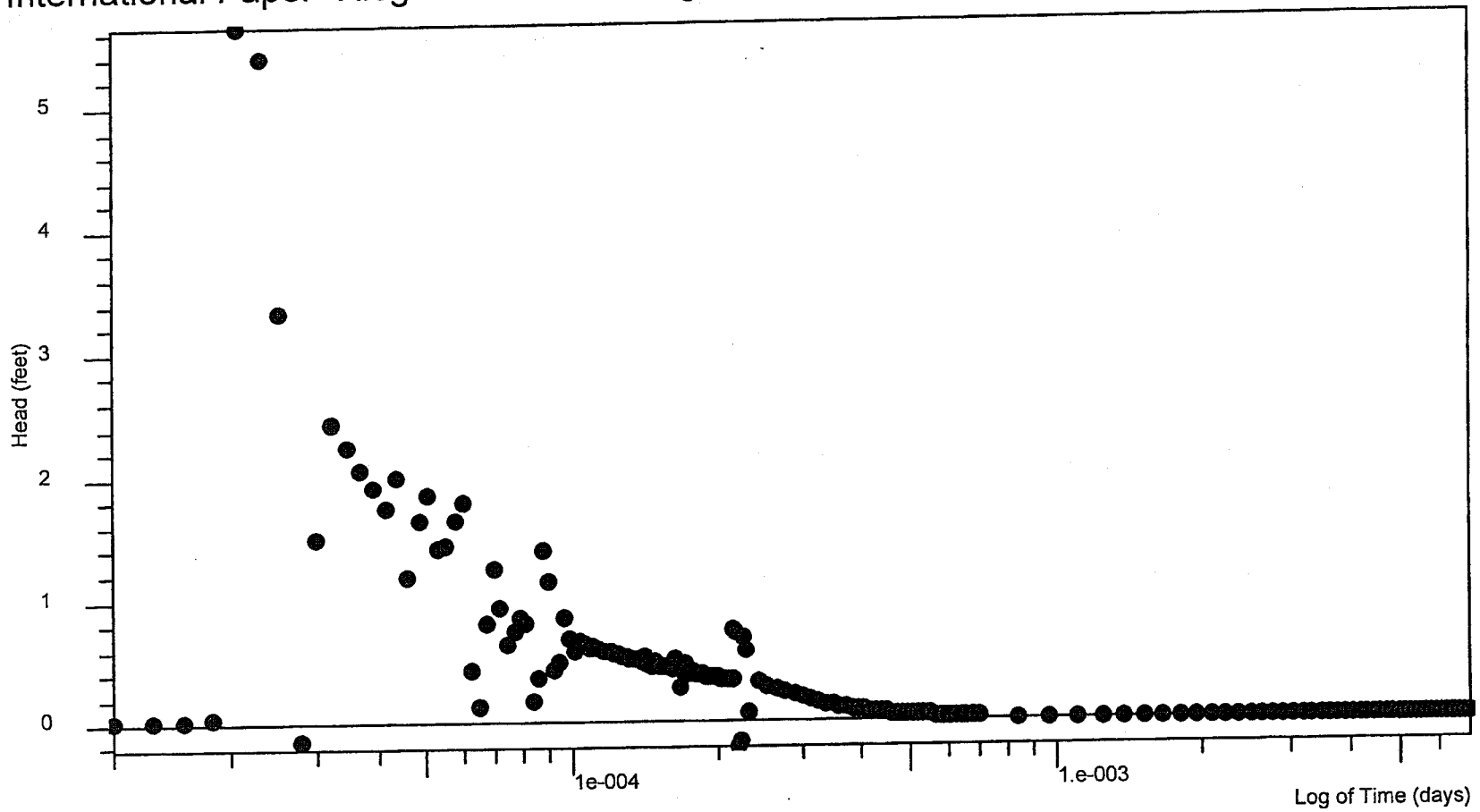
148	2.4	2.37	4.e-003	4.e-003	7.102e-004
149	2.6	2.57	4.e-003	4.e-003	7.102e-004
150	2.8	2.77	4.e-003	4.e-003	7.102e-004
151	3.	2.97	4.e-003	4.e-003	7.102e-004
152	3.2	3.17	4.e-003	4.e-003	7.102e-004
153	3.4	3.37	4.e-003	4.e-003	7.102e-004
154	3.6	3.57	0.	0.	0.
155	3.8	3.77	4.e-003	4.e-003	7.102e-004
156	4.	3.97	0.	0.	0.
157	4.2	4.17	0.	0.	0.
158	4.4	4.37	0.	0.	0.
159	4.6	4.57	0.	0.	0.
160	4.8	4.77	0.	0.	0.
161	5.	4.97	0.	0.	0.
162	5.2	5.17	0.	0.	0.
163	5.4	5.37	0.	0.	0.
164	5.6	5.57	0.	0.	0.
165	5.8	5.77	0.	0.	0.
166	6.	5.97	0.	0.	0.
167	6.2	6.17	0.	0.	0.
168	6.4	6.37	0.	0.	0.
169	6.6	6.57	0.	0.	0.
170	6.8	6.77	0.	0.	0.
171	7.	6.97	0.	0.	0.
172	7.2	7.17	0.	0.	0.
173	7.4	7.37	0.	0.	0.
174	7.6	7.57	0.	0.	0.
175	7.8	7.77	0.	0.	0.
176	8.	7.97	0.	0.	0.
177	8.2	8.17	0.	0.	0.
178	8.4	8.37	0.	0.	0.
179	8.6	8.57	0.	0.	0.
180	8.8	8.77	0.	0.	0.
181	9.	8.97	0.	0.	0.
182	9.2	9.17	0.	0.	0.
183	9.4	9.37	0.	0.	0.
184	9.6	9.57	0.	0.	0.
185	9.8	9.77	0.	0.	0.
186	10.	9.97	-4.e-003	-4.e-003	-7.102e-004

JEP-6 Falling Head Test 7/3/01

International Paper- Riegelwood Plant Riegelwood, North Carolina

Head vs. Log Time

JEP-6



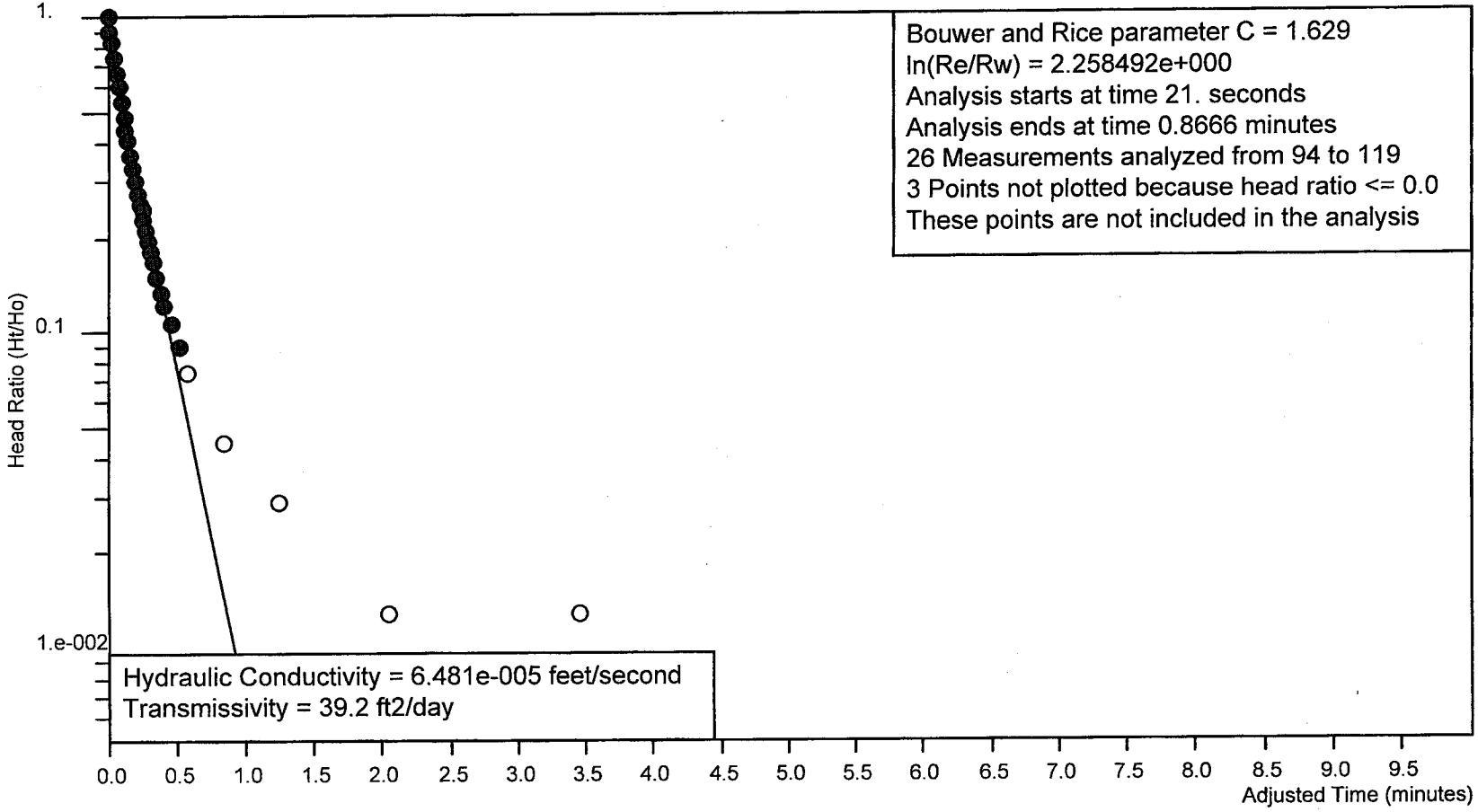
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-6 Falling Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-6



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.313 feet at 21. seconds

JEP-6 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP6RHN

Well Label:	JEP-6
Aquifer Thickness:	7. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	1.4e-002 feet
Water Table to Screen Bottom:	10.69 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.2 Seconds

Test starts with trial 6
There are 185 time and drawdown measurements
Maximum head is 2.671 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.e-002	-2.8e-002	4.2e-002	1.572e-002
2	3.3e-003	-1.67e-002	0.	1.4e-002	5.241e-003
3	6.6e-003	-1.34e-002	-0.731	0.745	0.2789
4	1.e-002	-1.e-002	-2.121	2.135	0.7993
5	1.33e-002	-6.7e-003	-2.035	2.049	0.7671
6	1.66e-002	-3.4e-003	-1.845	1.859	0.696
7	2.e-002	0.	-2.657	2.671	1.
8	2.33e-002	3.3e-003	-1.993	2.007	0.7514
9	2.66e-002	6.6e-003	-2.258	2.272	0.8506
10	3.e-002	1.e-002	-1.717	1.731	0.6481
11	3.33e-002	1.33e-002	-2.344	2.358	0.8828
12	3.66e-002	1.66e-002	-1.096	1.11	0.4156
13	4.e-002	2.e-002	-1.94	1.954	0.7316
14	4.33e-002	2.33e-002	-1.865	1.879	0.7035
15	4.66e-002	2.66e-002	-2.329	2.343	0.8772
16	5.e-002	3.e-002	-1.698	1.712	0.641
17	5.33e-002	3.33e-002	-1.931	1.945	0.7282
18	5.66e-002	3.66e-002	-1.698	1.712	0.641
19	6.e-002	4.e-002	-1.784	1.798	0.6732
20	6.33e-002	4.33e-002	-1.698	1.712	0.641
21	6.66e-002	4.66e-002	-1.698	1.712	0.641
22	7.e-002	5.e-002	-1.646	1.66	0.6215
23	7.33e-002	5.33e-002	-1.632	1.646	0.6162
24	7.66e-002	5.66e-002	-1.599	1.613	0.6039
25	8.e-002	6.e-002	-1.585	1.599	0.5987
26	8.33e-002	6.33e-002	-1.561	1.575	0.5897
27	8.66e-002	6.66e-002	-1.537	1.551	0.5807
28	9.e-002	7.e-002	-1.504	1.518	0.5683
29	9.33e-002	7.33e-002	-1.485	1.499	0.5612
30	9.66e-002	7.66e-002	-1.466	1.48	0.5541
31	0.1	8.e-002	-1.447	1.461	0.547
32	0.1033	8.33e-002	-1.419	1.433	0.5365
33	0.1066	8.66e-002	-1.404	1.418	0.5309
34	0.11	9.e-002	-1.376	1.39	0.5204

35	0.1133	9.33e-002	-1.362	1.376	0.5152
36	0.1166	9.66e-002	-1.343	1.357	0.508
37	0.12	0.1	-1.328	1.342	0.5024
38	0.1233	0.1033	-1.309	1.323	0.4953
39	0.1266	0.1066	-1.286	1.3	0.4867
40	0.13	0.11	-1.267	1.281	0.4796
41	0.1333	0.1133	-1.252	1.266	0.474
42	0.1366	0.1166	-1.238	1.252	0.4687
43	0.14	0.12	-1.224	1.238	0.4635
44	0.1433	0.1233	-1.21	1.224	0.4583
45	0.1466	0.1266	-1.191	1.205	0.4511
46	0.15	0.13	-1.177	1.191	0.4459
47	0.1533	0.1333	-1.162	1.176	0.4403
48	0.1566	0.1366	-1.148	1.162	0.435
49	0.16	0.14	-1.139	1.153	0.4317
50	0.1633	0.1433	-1.124	1.138	0.4261
51	0.1666	0.1466	-1.11	1.124	0.4208
52	0.17	0.15	-1.101	1.115	0.4174
53	0.1733	0.1533	-1.086	1.1	0.4118
54	0.1766	0.1566	-1.072	1.086	0.4066
55	0.18	0.16	-1.063	1.077	0.4032
56	0.1833	0.1633	-1.048	1.062	0.3976
57	0.1866	0.1666	-1.039	1.053	0.3942
58	0.19	0.17	-1.025	1.039	0.389
59	0.1933	0.1733	-1.015	1.029	0.3852
60	0.1966	0.1766	-1.006	1.02	0.3819
61	0.2	0.18	-0.996	1.01	0.3781
62	0.2033	0.1833	-0.982	0.996	0.3729
63	0.2066	0.1866	-0.973	0.987	0.3695
64	0.21	0.19	-0.963	0.977	0.3658
65	0.2133	0.1933	-0.954	0.968	0.3624
66	0.2166	0.1966	-0.944	0.958	0.3587
67	0.22	0.2	-0.935	0.949	0.3553
68	0.2233	0.2033	-0.925	0.939	0.3516
69	0.2266	0.2066	-0.916	0.93	0.3482
70	0.23	0.21	-0.906	0.92	0.3444
71	0.2333	0.2133	-0.897	0.911	0.3411
72	0.2366	0.2166	-0.887	0.901	0.3373
73	0.24	0.22	-0.878	0.892	0.334
74	0.2433	0.2233	-0.868	0.882	0.3302
75	0.2466	0.2266	-0.859	0.873	0.3268
76	0.25	0.23	-0.854	0.868	0.325
77	0.2533	0.2333	-0.844	0.858	0.3212
78	0.2566	0.2366	-0.835	0.849	0.3179
79	0.26	0.24	-0.83	0.844	0.316
80	0.2633	0.2433	-0.821	0.835	0.3126
81	0.2666	0.2466	-0.811	0.825	0.3089
82	0.27	0.25	-0.806	0.82	0.307
83	0.2733	0.2533	-0.797	0.811	0.3036
84	0.2766	0.2566	-0.792	0.806	0.3018
85	0.28	0.26	-0.783	0.797	0.2984
86	0.2833	0.2633	-0.773	0.787	0.2946
87	0.2866	0.2666	-0.768	0.782	0.2928
88	0.29	0.27	-0.759	0.773	0.2894
89	0.2933	0.2733	-0.754	0.768	0.2875
90	0.2966	0.2766	-0.745	0.759	0.2842
91	0.3	0.28	-0.74	0.754	0.2823

92	0.3033	0.2833	-0.735	0.749	0.2804
93	0.3066	0.2866	-0.726	0.74	0.277
94	0.31	0.29	-0.716	0.73	0.2733
95	0.3133	0.2933	-0.712	0.726	0.2718
96	0.3166	0.2966	-0.707	0.721	0.2699
97	0.32	0.3	-0.697	0.711	0.2662
98	0.3233	0.3033	-0.693	0.707	0.2647
99	0.3266	0.3066	-0.688	0.702	0.2628
100	0.33	0.31	-0.678	0.692	0.2591
101	0.3333	0.3133	-0.674	0.688	0.2576
102	0.35	0.33	-0.64	0.654	0.2449
103	0.3666	0.3466	-0.612	0.626	0.2344
104	0.3833	0.3633	-0.583	0.597	0.2235
105	0.4	0.38	-0.555	0.569	0.213
106	0.4166	0.3966	-0.526	0.54	0.2022
107	0.4333	0.4133	-0.503	0.517	0.1936
108	0.45	0.43	-0.479	0.493	0.1846
109	0.4666	0.4466	-0.46	0.474	0.1775
110	0.4833	0.4633	-0.436	0.45	0.1685
111	0.5	0.48	-0.417	0.431	0.1614
112	0.5166	0.4966	-0.398	0.412	0.1542
113	0.5333	0.5133	-0.379	0.393	0.1471
114	0.55	0.53	-0.36	0.374	0.14
115	0.5666	0.5466	-0.346	0.36	0.1348
116	0.5833	0.5633	-0.332	0.346	0.1295
117	0.6	0.58	-0.318	0.332	0.1243
118	0.6166	0.5966	-0.299	0.313	0.1172
119	0.6333	0.6133	-0.289	0.303	0.1134
120	0.65	0.63	-0.275	0.289	0.1082
121	0.6666	0.6466	-0.261	0.275	0.103
122	0.6833	0.6633	-0.251	0.265	9.921e-002
123	0.7	0.68	-0.242	0.256	9.584e-002
124	0.7166	0.6966	-0.232	0.246	9.21e-002
125	0.7333	0.7133	-0.218	0.232	8.686e-002
126	0.75	0.73	-0.208	0.222	8.311e-002
127	0.7666	0.7466	-0.199	0.213	7.975e-002
128	0.7833	0.7633	-0.194	0.208	7.787e-002
129	0.8	0.78	-0.185	0.199	7.45e-002
130	0.8166	0.7966	-0.175	0.189	7.076e-002
131	0.8333	0.8133	-0.17	0.184	6.889e-002
132	0.85	0.83	-0.161	0.175	6.552e-002
133	0.8666	0.8466	-0.151	0.165	6.177e-002
134	0.8833	0.8633	-0.147	0.161	6.028e-002
135	0.9	0.88	-0.142	0.156	5.841e-002
136	0.9166	0.8966	-0.137	0.151	5.653e-002
137	0.9333	0.9133	-0.128	0.142	5.316e-002
138	0.95	0.93	-0.123	0.137	5.129e-002
139	0.9666	0.9466	-0.118	0.132	4.942e-002
140	0.9833	0.9633	-0.114	0.128	4.792e-002
141	1.	0.98	-0.109	0.123	4.605e-002
142	1.2	1.18	-5.7e-002	7.1e-002	2.658e-002
143	1.4	1.38	-3.3e-002	4.7e-002	1.76e-002
144	1.6	1.58	-1.9e-002	3.3e-002	1.235e-002
145	1.8	1.78	-9.e-003	2.3e-002	8.611e-003
146	2.	1.98	-4.e-003	1.8e-002	6.739e-003
147	2.2	2.18	0.	1.4e-002	5.241e-003
148	2.4	2.38	4.e-003	1.e-002	3.744e-003

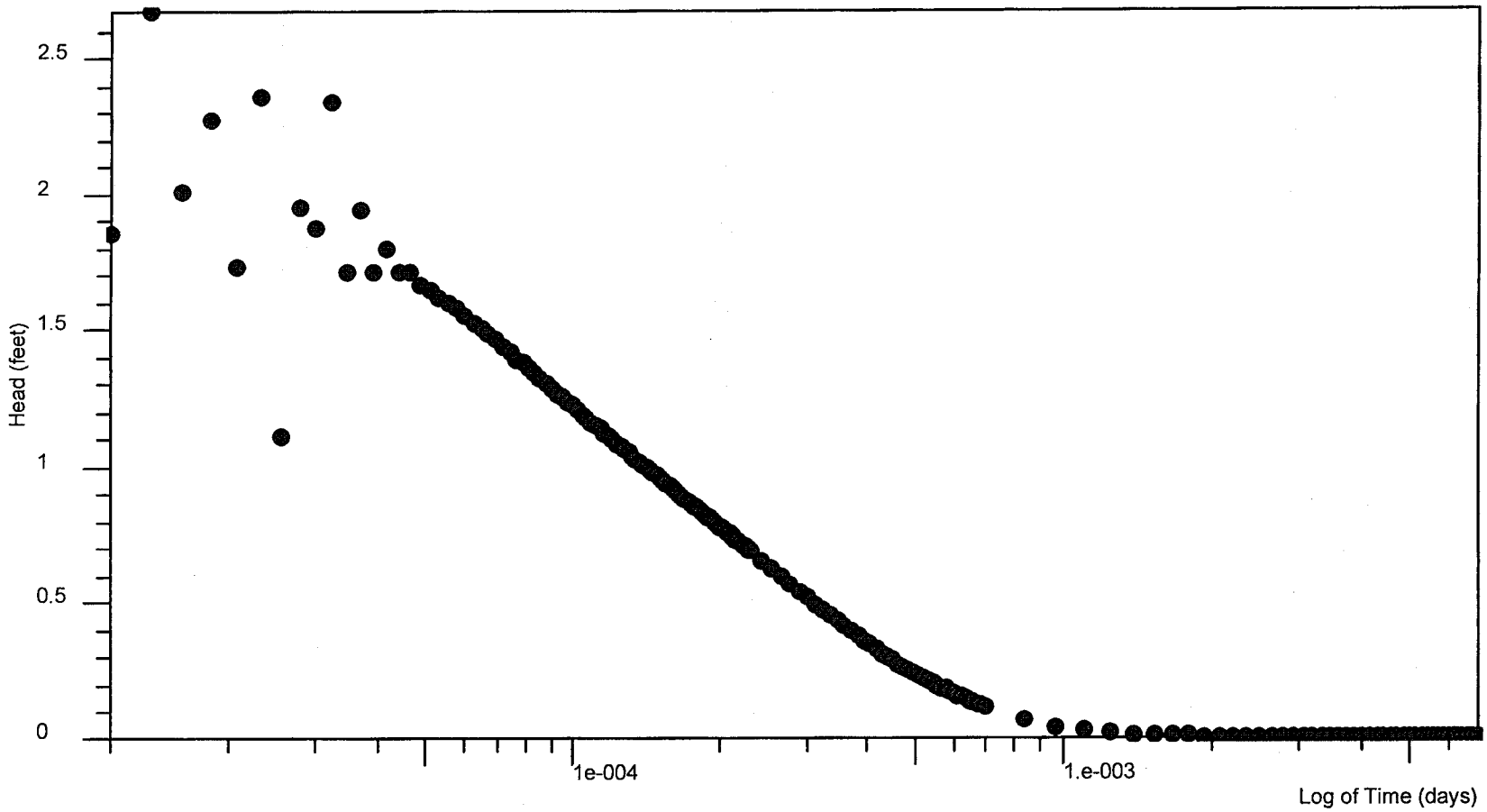
149	2.6	2.58	4.e-003	1.e-002	3.744e-003
150	2.8	2.78	9.e-003	5.e-003	1.872e-003
151	3.	2.98	9.e-003	5.e-003	1.872e-003
152	3.2	3.18	9.e-003	5.e-003	1.872e-003
153	3.4	3.38	9.e-003	5.e-003	1.872e-003
154	3.6	3.58	9.e-003	5.e-003	1.872e-003
155	3.8	3.78	9.e-003	5.e-003	1.872e-003
156	4.	3.98	9.e-003	5.e-003	1.872e-003
157	4.2	4.18	9.e-003	5.e-003	1.872e-003
158	4.4	4.38	9.e-003	5.e-003	1.872e-003
159	4.6	4.58	9.e-003	5.e-003	1.872e-003
160	4.8	4.78	9.e-003	5.e-003	1.872e-003
161	5.	4.98	1.4e-002	0.	0.
162	5.2	5.18	1.4e-002	0.	0.
163	5.4	5.38	9.e-003	5.e-003	1.872e-003
164	5.6	5.58	1.4e-002	0.	0.
165	5.8	5.78	1.4e-002	0.	0.
166	6.	5.98	1.4e-002	0.	0.
167	6.2	6.18	1.4e-002	0.	0.
168	6.4	6.38	1.4e-002	0.	0.
169	6.6	6.58	1.4e-002	0.	0.
170	6.8	6.78	9.e-003	5.e-003	1.872e-003
171	7.	6.98	9.e-003	5.e-003	1.872e-003
172	7.2	7.18	1.4e-002	0.	0.
173	7.4	7.38	1.4e-002	0.	0.
174	7.6	7.58	1.4e-002	0.	0.
175	7.8	7.78	1.4e-002	0.	0.
176	8.	7.98	1.4e-002	0.	0.
177	8.2	8.18	1.4e-002	0.	0.
178	8.4	8.38	1.4e-002	0.	0.
179	8.6	8.58	1.4e-002	0.	0.
180	8.8	8.78	9.e-003	5.e-003	1.872e-003
181	9.	8.98	9.e-003	5.e-003	1.872e-003
182	9.2	9.18	9.e-003	5.e-003	1.872e-003
183	9.4	9.38	1.4e-002	0.	0.
184	9.6	9.58	1.4e-002	0.	0.
185	9.8	9.78	1.4e-002	0.	0.

JEP-6 Rising Head Test 7/3/01

International Paper- Riegelwood Plant

Head vs. Log Time

JEP-6



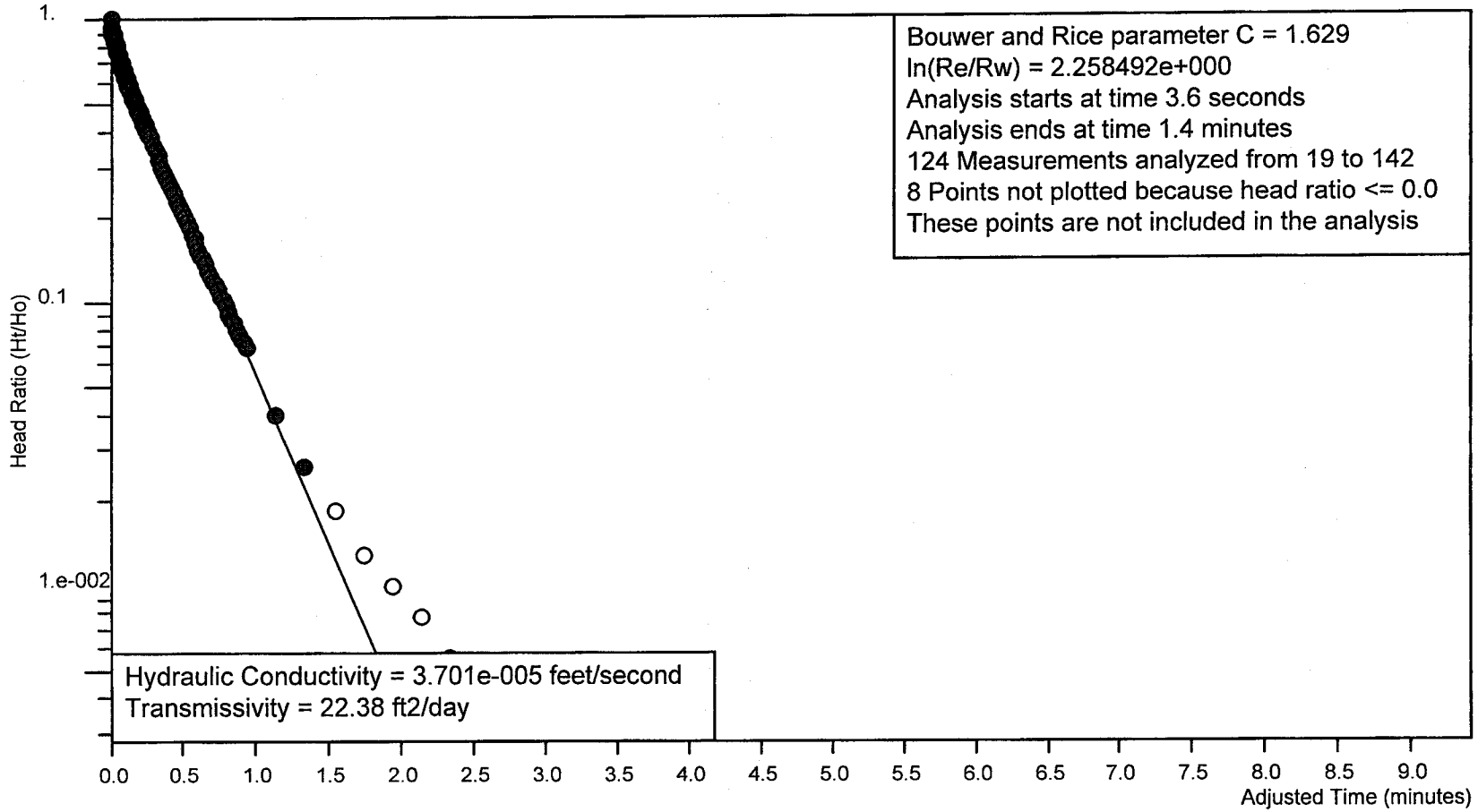
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-6 Rising Head Test 7/3/01

International Paper- Riegelwood Plant

Bouwer and Rice Graph

JEP-6



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 1.798 feet at 3.6 seconds

JEP-7 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP7FHN

Well Label:	JEP-7
Aquifer Thickness:	10.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	11.16 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.998 Seconds

Test starts with trial 10
There are 186 time and drawdown measurements
Maximum head is 3.254 feet
Minimum head is -0.152 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.33e-002	9.e-003	9.e-003	2.766e-003
2	3.3e-003	-3.e-002	1.4e-002	1.4e-002	4.302e-003
3	6.6e-003	-2.67e-002	1.4e-002	1.4e-002	4.302e-003
4	1.e-002	-2.33e-002	1.4e-002	1.4e-002	4.302e-003
5	1.33e-002	-2.e-002	1.9e-002	1.9e-002	5.839e-003
6	1.66e-002	-1.67e-002	2.3e-002	2.3e-002	7.068e-003
7	2.e-002	-1.33e-002	2.3e-002	2.3e-002	7.068e-003
8	2.33e-002	-1.e-002	7.1e-002	7.1e-002	2.182e-002
9	2.66e-002	-6.7e-003	2.75	2.75	0.8451
10	3.e-002	-3.3e-003	2.874	2.874	0.8832
11	3.33e-002	0.	3.254	3.254	1.
12	3.66e-002	3.3e-003	2.784	2.784	0.8556
13	4.e-002	6.7e-003	1.819	1.819	0.559
14	4.33e-002	1.e-002	1.458	1.458	0.4481
15	4.66e-002	1.33e-002	1.605	1.605	0.4932
16	5.e-002	1.67e-002	1.847	1.847	0.5676
17	5.33e-002	2.e-002	1.762	1.762	0.5415
18	5.66e-002	2.33e-002	1.643	1.643	0.5049
19	6.e-002	2.67e-002	1.61	1.61	0.4948
20	6.33e-002	3.e-002	0.964	0.964	0.2963
21	6.66e-002	3.33e-002	0.	0.	0.
22	7.e-002	3.67e-002	6.6e-002	6.6e-002	2.028e-002
23	7.33e-002	4.e-002	0.631	0.631	0.1939
24	7.66e-002	4.33e-002	0.883	0.883	0.2714
25	8.e-002	4.67e-002	0.65	0.65	0.1998
26	8.33e-002	5.e-002	0.688	0.688	0.2114
27	8.66e-002	5.33e-002	1.078	1.078	0.3313
28	9.e-002	5.67e-002	0.284	0.284	8.728e-002
29	9.33e-002	6.e-002	0.223	0.223	6.853e-002
30	9.66e-002	6.33e-002	0.569	0.569	0.1749
31	0.1	6.67e-002	0.631	0.631	0.1939
32	0.1033	7.e-002	1.016	1.016	0.3122
33	0.1066	7.33e-002	1.049	1.049	0.3224

34	0.11	7.67e-002	0.75	0.75	0.2305
35	0.1133	8.e-002	0.973	0.973	0.299
36	0.1166	8.33e-002	0.617	0.617	0.1896
37	0.12	8.67e-002	0.346	0.346	0.1063
38	0.1233	9.e-002	-0.152	-0.152	-4.671e-002
39	0.1266	9.33e-002	0.151	0.151	4.64e-002
40	0.13	9.67e-002	0.46	0.46	0.1414
41	0.1333	0.1	0.422	0.422	0.1297
42	0.1366	0.1033	0.37	0.37	0.1137
43	0.14	0.1067	0.308	0.308	9.465e-002
44	0.1433	0.11	0.337	0.337	0.1036
45	0.1466	0.1133	0.332	0.332	0.102
46	0.15	0.1167	0.322	0.322	9.896e-002
47	0.1533	0.12	0.313	0.313	9.619e-002
48	0.1566	0.1233	0.303	0.303	9.312e-002
49	0.16	0.1267	0.303	0.303	9.312e-002
50	0.1633	0.13	0.27	0.27	8.297e-002
51	0.1666	0.1333	0.28	0.28	8.605e-002
52	0.17	0.1367	0.275	0.275	8.451e-002
53	0.1733	0.14	0.261	0.261	8.021e-002
54	0.1766	0.1433	0.261	0.261	8.021e-002
55	0.18	0.1467	0.251	0.251	7.714e-002
56	0.1833	0.15	0.242	0.242	7.437e-002
57	0.1866	0.1533	0.261	0.261	8.021e-002
58	0.19	0.1567	0.223	0.223	6.853e-002
59	0.1933	0.16	0.227	0.227	6.976e-002
60	0.1966	0.1633	0.232	0.232	7.13e-002
61	0.2	0.1667	0.223	0.223	6.853e-002
62	0.2033	0.17	0.218	0.218	6.699e-002
63	0.2066	0.1733	0.213	0.213	6.546e-002
64	0.21	0.1767	0.213	0.213	6.546e-002
65	0.2133	0.18	0.208	0.208	6.392e-002
66	0.2166	0.1833	0.199	0.199	6.116e-002
67	0.22	0.1867	0.18	0.18	5.532e-002
68	0.2233	0.19	0.19	0.19	5.839e-002
69	0.2266	0.1933	0.19	0.19	5.839e-002
70	0.23	0.1967	0.19	0.19	5.839e-002
71	0.2333	0.2	0.175	0.175	5.378e-002
72	0.2366	0.2033	0.19	0.19	5.839e-002
73	0.24	0.2067	0.156	0.156	4.794e-002
74	0.2433	0.21	0.171	0.171	5.255e-002
75	0.2466	0.2133	0.166	0.166	5.101e-002
76	0.25	0.2167	0.166	0.166	5.101e-002
77	0.2533	0.22	0.147	0.147	4.518e-002
78	0.2566	0.2233	0.161	0.161	4.948e-002
79	0.26	0.2267	0.161	0.161	4.948e-002
80	0.2633	0.23	0.151	0.151	4.64e-002
81	0.2666	0.2333	0.151	0.151	4.64e-002
82	0.27	0.2367	0.156	0.156	4.794e-002
83	0.2733	0.24	0.142	0.142	4.364e-002
84	0.2766	0.2433	0.147	0.147	4.518e-002
85	0.28	0.2467	0.142	0.142	4.364e-002
86	0.2833	0.25	0.132	0.132	4.057e-002
87	0.2866	0.2533	0.147	0.147	4.518e-002
88	0.29	0.2567	0.137	0.137	4.21e-002
89	0.2933	0.26	0.147	0.147	4.518e-002
90	0.2966	0.2633	0.123	0.123	3.78e-002

91	0.3	0.2667	0.132	0.132	4.057e-002
92	0.3033	0.27	0.128	0.128	3.934e-002
93	0.3066	0.2733	0.123	0.123	3.78e-002
94	0.31	0.2767	0.123	0.123	3.78e-002
95	0.3133	0.28	0.123	0.123	3.78e-002
96	0.3166	0.2833	0.123	0.123	3.78e-002
97	0.32	0.2867	0.123	0.123	3.78e-002
98	0.3233	0.29	0.118	0.118	3.626e-002
99	0.3266	0.2933	0.118	0.118	3.626e-002
100	0.33	0.2967	0.114	0.114	3.503e-002
101	0.3333	0.3	0.114	0.114	3.503e-002
102	0.35	0.3167	0.246	0.246	7.56e-002
103	0.3666	0.3333	0.109	0.109	3.35e-002
104	0.3833	0.35	9.e-002	9.e-002	2.766e-002
105	0.4	0.3667	8.5e-002	8.5e-002	2.612e-002
106	0.4166	0.3833	8.e-002	8.e-002	2.459e-002
107	0.4333	0.4	7.6e-002	7.6e-002	2.336e-002
108	0.45	0.4167	7.6e-002	7.6e-002	2.336e-002
109	0.4666	0.4333	7.1e-002	7.1e-002	2.182e-002
110	0.4833	0.45	6.6e-002	6.6e-002	2.028e-002
111	0.5	0.4667	6.6e-002	6.6e-002	2.028e-002
112	0.5166	0.4833	6.1e-002	6.1e-002	1.875e-002
113	0.5333	0.5	6.1e-002	6.1e-002	1.875e-002
114	0.55	0.5167	5.7e-002	5.7e-002	1.752e-002
115	0.5666	0.5333	5.7e-002	5.7e-002	1.752e-002
116	0.5833	0.55	5.2e-002	5.2e-002	1.598e-002
117	0.6	0.5667	5.2e-002	5.2e-002	1.598e-002
118	0.6166	0.5833	5.2e-002	5.2e-002	1.598e-002
119	0.6333	0.6	4.7e-002	4.7e-002	1.444e-002
120	0.65	0.6167	4.7e-002	4.7e-002	1.444e-002
121	0.6666	0.6333	4.7e-002	4.7e-002	1.444e-002
122	0.6833	0.65	4.7e-002	4.7e-002	1.444e-002
123	0.7	0.6667	4.2e-002	4.2e-002	1.291e-002
124	0.7166	0.6833	4.2e-002	4.2e-002	1.291e-002
125	0.7333	0.7	4.2e-002	4.2e-002	1.291e-002
126	0.75	0.7167	4.2e-002	4.2e-002	1.291e-002
127	0.7666	0.7333	4.2e-002	4.2e-002	1.291e-002
128	0.7833	0.75	4.2e-002	4.2e-002	1.291e-002
129	0.8	0.7667	4.2e-002	4.2e-002	1.291e-002
130	0.8166	0.7833	4.2e-002	4.2e-002	1.291e-002
131	0.8333	0.8	4.2e-002	4.2e-002	1.291e-002
132	0.85	0.8167	4.2e-002	4.2e-002	1.291e-002
133	0.8666	0.8333	3.8e-002	3.8e-002	1.168e-002
134	0.8833	0.85	3.8e-002	3.8e-002	1.168e-002
135	0.9	0.8667	3.8e-002	3.8e-002	1.168e-002
136	0.9166	0.8833	3.8e-002	3.8e-002	1.168e-002
137	0.9333	0.9	3.8e-002	3.8e-002	1.168e-002
138	0.95	0.9167	3.8e-002	3.8e-002	1.168e-002
139	0.9666	0.9333	3.8e-002	3.8e-002	1.168e-002
140	0.9833	0.95	3.8e-002	3.8e-002	1.168e-002
141	1.	0.9667	3.8e-002	3.8e-002	1.168e-002
142	1.2	1.167	2.8e-002	2.8e-002	8.605e-003
143	1.4	1.367	2.8e-002	2.8e-002	8.605e-003
144	1.6	1.567	2.3e-002	2.3e-002	7.068e-003
145	1.8	1.767	2.3e-002	2.3e-002	7.068e-003
146	2.	1.967	2.3e-002	2.3e-002	7.068e-003
147	2.2	2.167	2.3e-002	2.3e-002	7.068e-003

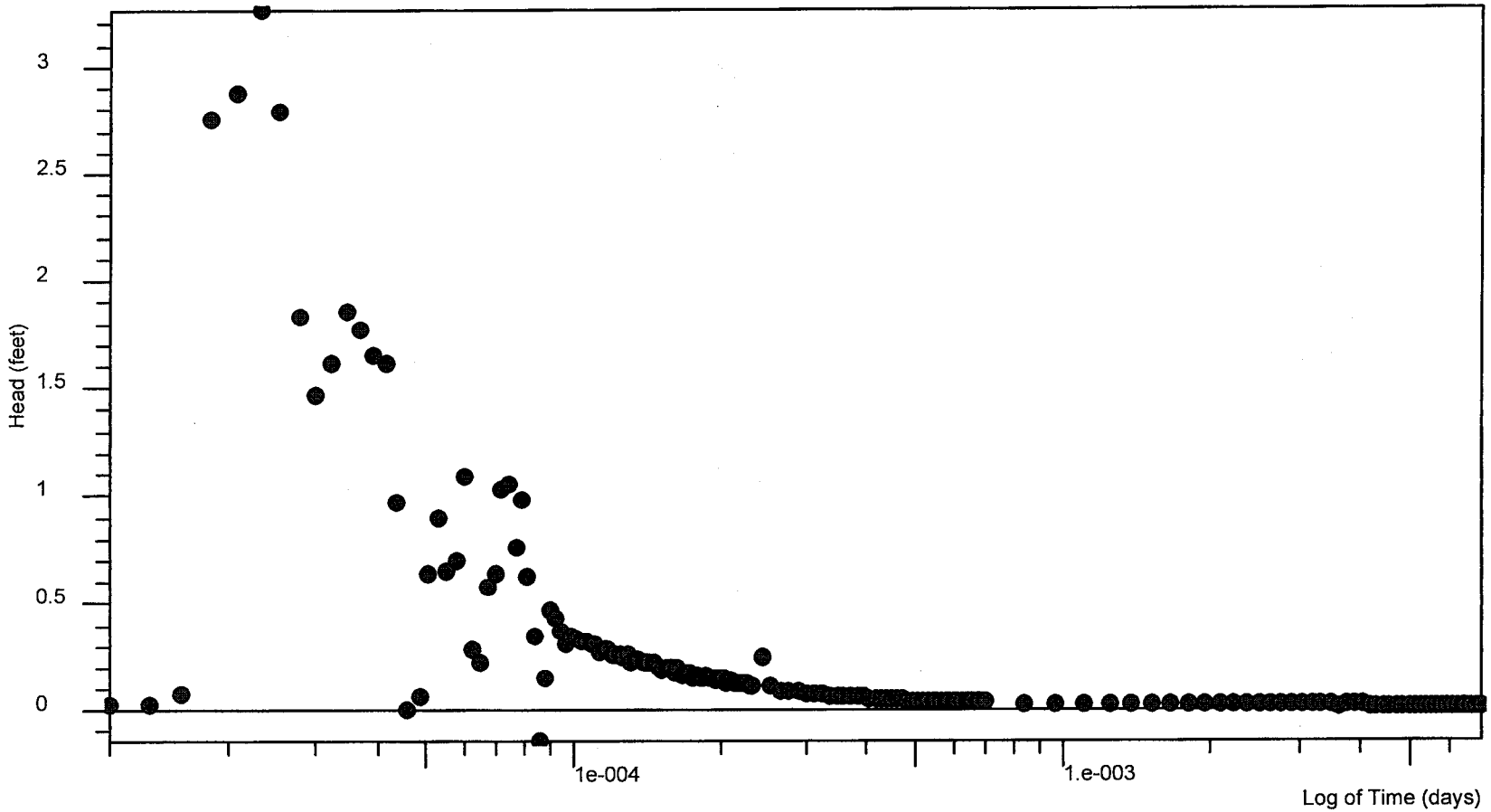
148	2.4	2.367	2.3e-002	2.3e-002	7.068e-003
149	2.6	2.567	2.3e-002	2.3e-002	7.068e-003
150	2.8	2.767	1.9e-002	1.9e-002	5.839e-003
151	3.	2.967	1.9e-002	1.9e-002	5.839e-003
152	3.2	3.167	2.3e-002	2.3e-002	7.068e-003
153	3.4	3.367	1.9e-002	1.9e-002	5.839e-003
154	3.6	3.567	1.9e-002	1.9e-002	5.839e-003
155	3.8	3.767	1.9e-002	1.9e-002	5.839e-003
156	4.	3.967	1.9e-002	1.9e-002	5.839e-003
157	4.2	4.167	1.9e-002	1.9e-002	5.839e-003
158	4.4	4.367	1.9e-002	1.9e-002	5.839e-003
159	4.6	4.567	1.9e-002	1.9e-002	5.839e-003
160	4.8	4.767	1.9e-002	1.9e-002	5.839e-003
161	5.	4.967	1.9e-002	1.9e-002	5.839e-003
162	5.2	5.167	1.4e-002	1.4e-002	4.302e-003
163	5.4	5.367	1.9e-002	1.9e-002	5.839e-003
164	5.6	5.567	1.9e-002	1.9e-002	5.839e-003
165	5.8	5.767	1.9e-002	1.9e-002	5.839e-003
166	6.	5.967	1.4e-002	1.4e-002	4.302e-003
167	6.2	6.167	1.4e-002	1.4e-002	4.302e-003
168	6.4	6.367	1.4e-002	1.4e-002	4.302e-003
169	6.6	6.567	1.4e-002	1.4e-002	4.302e-003
170	6.8	6.767	1.4e-002	1.4e-002	4.302e-003
171	7.	6.967	1.4e-002	1.4e-002	4.302e-003
172	7.2	7.167	1.4e-002	1.4e-002	4.302e-003
173	7.4	7.367	1.4e-002	1.4e-002	4.302e-003
174	7.6	7.567	1.4e-002	1.4e-002	4.302e-003
175	7.8	7.767	1.4e-002	1.4e-002	4.302e-003
176	8.	7.967	1.4e-002	1.4e-002	4.302e-003
177	8.2	8.167	1.4e-002	1.4e-002	4.302e-003
178	8.4	8.367	1.4e-002	1.4e-002	4.302e-003
179	8.6	8.567	1.4e-002	1.4e-002	4.302e-003
180	8.8	8.767	1.4e-002	1.4e-002	4.302e-003
181	9.	8.967	1.4e-002	1.4e-002	4.302e-003
182	9.2	9.167	1.4e-002	1.4e-002	4.302e-003
183	9.4	9.367	1.4e-002	1.4e-002	4.302e-003
184	9.6	9.567	1.4e-002	1.4e-002	4.302e-003
185	9.8	9.767	1.4e-002	1.4e-002	4.302e-003
186	10.	9.967	1.4e-002	1.4e-002	4.302e-003

JEP-7 Falling Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-7



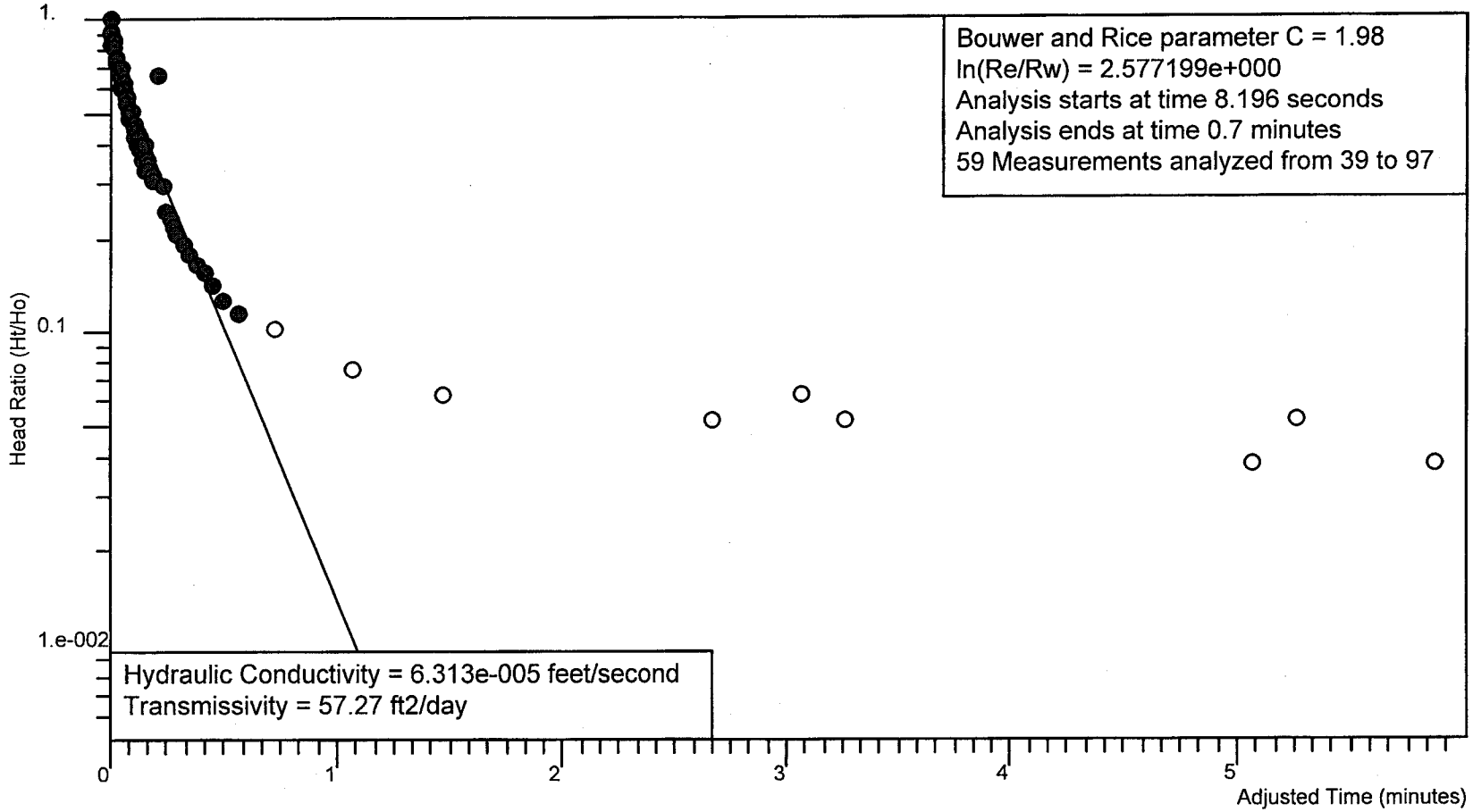
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-7 Falling Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-7



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.37 feet at 8.196 seconds

JEP-7 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/2/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP7RHN

Well Label:	JEP-7
Aquifer Thickness:	10.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	11.16 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.596 Seconds

Test starts with trial 8
There are 187 time and drawdown measurements
Maximum head is 3.705 feet
Minimum head is -1.9e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.66e-002	0.	0.	0.
2	3.3e-003	-2.33e-002	1.9e-002	-1.9e-002	-5.128e-003
3	6.6e-003	-2.e-002	-0.697	0.697	0.1881
4	1.e-002	-1.66e-002	-1.917	1.917	0.5174
5	1.33e-002	-1.33e-002	-2.254	2.254	0.6084
6	1.66e-002	-1.e-002	-2.927	2.927	0.79
7	2.e-002	-6.6e-003	-2.823	2.823	0.7619
8	2.33e-002	-3.3e-003	-1.841	1.841	0.4969
9	2.66e-002	0.	-3.705	3.705	1.
10	3.e-002	3.4e-003	-3.33	3.33	0.8988
11	3.33e-002	6.7e-003	-2.017	2.017	0.5444
12	3.66e-002	1.e-002	-0.451	0.451	0.1217
13	4.e-002	1.34e-002	-1.006	1.006	0.2715
14	4.33e-002	1.67e-002	-1.979	1.979	0.5341
15	4.66e-002	2.e-002	-1.694	1.694	0.4572
16	5.e-002	2.34e-002	-1.476	1.476	0.3984
17	5.33e-002	2.67e-002	-1.215	1.215	0.3279
18	5.66e-002	3.e-002	-1.281	1.281	0.3457
19	6.e-002	3.34e-002	-1.215	1.215	0.3279
20	6.33e-002	3.67e-002	-1.139	1.139	0.3074
21	6.66e-002	4.e-002	-1.091	1.091	0.2945
22	7.e-002	4.34e-002	-1.039	1.039	0.2804
23	7.33e-002	4.67e-002	-0.987	0.987	0.2664
24	7.66e-002	5.e-002	-0.949	0.949	0.2561
25	8.e-002	5.34e-002	-0.906	0.906	0.2445
26	8.33e-002	5.67e-002	-0.868	0.868	0.2343
27	8.66e-002	6.e-002	-0.83	0.83	0.224
28	9.e-002	6.34e-002	-0.797	0.797	0.2151
29	9.33e-002	6.67e-002	-0.754	0.754	0.2035
30	9.66e-002	7.e-002	-0.726	0.726	0.196
31	0.1	7.34e-002	-0.697	0.697	0.1881
32	0.1033	7.67e-002	-0.669	0.669	0.1806
33	0.1066	8.e-002	-0.64	0.64	0.1727

34	0.11	8.34e-002	-0.612	0.612	0.1652
35	0.1133	8.67e-002	-0.588	0.588	0.1587
36	0.1166	9.e-002	-0.564	0.564	0.1522
37	0.12	9.34e-002	-0.541	0.541	0.146
38	0.1233	9.67e-002	-0.517	0.517	0.1395
39	0.1266	1.e-001	-0.498	0.498	0.1344
40	0.13	0.1034	-0.479	0.479	0.1293
41	0.1333	0.1067	-0.46	0.46	0.1242
42	0.1366	0.11	-0.441	0.441	0.119
43	0.14	0.1134	-0.422	0.422	0.1139
44	0.1433	0.1167	-0.408	0.408	0.1101
45	0.1466	0.12	-0.394	0.394	0.1063
46	0.15	0.1234	-0.375	0.375	0.1012
47	0.1533	0.1267	-0.36	0.36	9.717e-002
48	0.1566	0.13	-0.351	0.351	9.474e-002
49	0.16	0.1334	-0.337	0.337	9.096e-002
50	0.1633	0.1367	-0.322	0.322	8.691e-002
51	0.1666	0.14	-0.313	0.313	8.448e-002
52	0.17	0.1434	-0.299	0.299	8.07e-002
53	0.1733	0.1467	-0.289	0.289	7.8e-002
54	0.1766	0.15	-0.28	0.28	7.557e-002
55	0.18	0.1534	-0.27	0.27	7.287e-002
56	0.1833	0.1567	-0.261	0.261	7.045e-002
57	0.1866	0.16	-0.251	0.251	6.775e-002
58	0.19	0.1634	-0.242	0.242	6.532e-002
59	0.1933	0.1667	-0.232	0.232	6.262e-002
60	0.1966	0.17	-0.223	0.223	6.019e-002
61	0.2	0.1734	-0.218	0.218	5.884e-002
62	0.2033	0.1767	-0.208	0.208	5.614e-002
63	0.2066	0.18	-0.204	0.204	5.506e-002
64	0.21	0.1834	-0.194	0.194	5.236e-002
65	0.2133	0.1867	-0.189	0.189	5.101e-002
66	0.2166	0.19	-0.18	0.18	4.858e-002
67	0.22	0.1934	-0.175	0.175	4.723e-002
68	0.2233	0.1967	-0.17	0.17	4.588e-002
69	0.2266	0.2	-0.166	0.166	4.48e-002
70	0.23	0.2034	-0.161	0.161	4.345e-002
71	0.2333	0.2067	-0.156	0.156	4.211e-002
72	0.2366	0.21	-0.151	0.151	4.076e-002
73	0.24	0.2134	-0.147	0.147	3.968e-002
74	0.2433	0.2167	-0.142	0.142	3.833e-002
75	0.2466	0.22	-0.137	0.137	3.698e-002
76	0.25	0.2234	-0.132	0.132	3.563e-002
77	0.2533	0.2267	-0.128	0.128	3.455e-002
78	0.2566	0.23	-0.123	0.123	3.32e-002
79	0.26	0.2334	-0.123	0.123	3.32e-002
80	0.2633	0.2367	-0.118	0.118	3.185e-002
81	0.2666	0.24	-0.113	0.113	3.05e-002
82	0.27	0.2434	-0.109	0.109	2.942e-002
83	0.2733	0.2467	-0.109	0.109	2.942e-002
84	0.2766	0.25	-0.104	0.104	2.807e-002
85	0.28	0.2534	-0.104	0.104	2.807e-002
86	0.2833	0.2567	-9.9e-002	9.9e-002	2.672e-002
87	0.2866	0.26	-9.4e-002	9.4e-002	2.537e-002
88	0.29	0.2634	-9.4e-002	9.4e-002	2.537e-002
89	0.2933	0.2667	-9.e-002	9.e-002	2.429e-002
90	0.2966	0.27	-9.e-002	9.e-002	2.429e-002

91	0.3	0.2734	-8.5e-002	8.5e-002	2.294e-002
92	0.3033	0.2767	-8.5e-002	8.5e-002	2.294e-002
93	0.3066	0.28	-8.e-002	8.e-002	2.159e-002
94	0.31	0.2834	-8.e-002	8.e-002	2.159e-002
95	0.3133	0.2867	-8.e-002	8.e-002	2.159e-002
96	0.3166	0.29	-7.5e-002	7.5e-002	2.024e-002
97	0.32	0.2934	-7.5e-002	7.5e-002	2.024e-002
98	0.3233	0.2967	-7.5e-002	7.5e-002	2.024e-002
99	0.3266	0.3	-7.1e-002	7.1e-002	1.916e-002
100	0.33	0.3034	-7.1e-002	7.1e-002	1.916e-002
101	0.3333	0.3067	-7.1e-002	7.1e-002	1.916e-002
102	0.35	0.3234	-6.1e-002	6.1e-002	1.646e-002
103	0.3666	0.34	-5.2e-002	5.2e-002	1.404e-002
104	0.3833	0.3567	-4.7e-002	4.7e-002	1.269e-002
105	0.4	0.3734	-4.2e-002	4.2e-002	1.134e-002
106	0.4166	0.39	-3.7e-002	3.7e-002	9.987e-003
107	0.4333	0.4067	-3.3e-002	3.3e-002	8.907e-003
108	0.45	0.4234	-2.8e-002	2.8e-002	7.557e-003
109	0.4666	0.44	-2.8e-002	2.8e-002	7.557e-003
110	0.4833	0.4567	-2.3e-002	2.3e-002	6.208e-003
111	0.5	0.4734	-2.3e-002	2.3e-002	6.208e-003
112	0.5166	0.49	-1.8e-002	1.8e-002	4.858e-003
113	0.5333	0.5067	-1.8e-002	1.8e-002	4.858e-003
114	0.55	0.5234	-1.4e-002	1.4e-002	3.779e-003
115	0.5666	0.54	-1.4e-002	1.4e-002	3.779e-003
116	0.5833	0.5567	-9.e-003	9.e-003	2.429e-003
117	0.6	0.5734	-9.e-003	9.e-003	2.429e-003
118	0.6166	0.59	-9.e-003	9.e-003	2.429e-003
119	0.6333	0.6067	-4.e-003	4.e-003	1.08e-003
120	0.65	0.6234	-4.e-003	4.e-003	1.08e-003
121	0.6666	0.64	-4.e-003	4.e-003	1.08e-003
122	0.6833	0.6567	0.	0.	0.
123	0.7	0.6734	0.	0.	0.
124	0.7166	0.69	0.	0.	0.
125	0.7333	0.7067	0.	0.	0.
126	0.75	0.7234	4.e-003	-4.e-003	-1.08e-003
127	0.7666	0.74	4.e-003	-4.e-003	-1.08e-003
128	0.7833	0.7567	4.e-003	-4.e-003	-1.08e-003
129	0.8	0.7734	4.e-003	-4.e-003	-1.08e-003
130	0.8166	0.79	4.e-003	-4.e-003	-1.08e-003
131	0.8333	0.8067	4.e-003	-4.e-003	-1.08e-003
132	0.85	0.8234	9.e-003	-9.e-003	-2.429e-003
133	0.8666	0.84	9.e-003	-9.e-003	-2.429e-003
134	0.8833	0.8567	9.e-003	-9.e-003	-2.429e-003
135	0.9	0.8734	9.e-003	-9.e-003	-2.429e-003
136	0.9166	0.89	9.e-003	-9.e-003	-2.429e-003
137	0.9333	0.9067	9.e-003	-9.e-003	-2.429e-003
138	0.95	0.9234	9.e-003	-9.e-003	-2.429e-003
139	0.9666	0.94	9.e-003	-9.e-003	-2.429e-003
140	0.9833	0.9567	9.e-003	-9.e-003	-2.429e-003
141	1.	0.9734	9.e-003	-9.e-003	-2.429e-003
142	1.2	1.173	1.4e-002	-1.4e-002	-3.779e-003
143	1.4	1.373	1.4e-002	-1.4e-002	-3.779e-003
144	1.6	1.573	1.4e-002	-1.4e-002	-3.779e-003
145	1.8	1.773	1.9e-002	-1.9e-002	-5.128e-003
146	2.	1.973	1.9e-002	-1.9e-002	-5.128e-003
147	2.2	2.173	1.9e-002	-1.9e-002	-5.128e-003

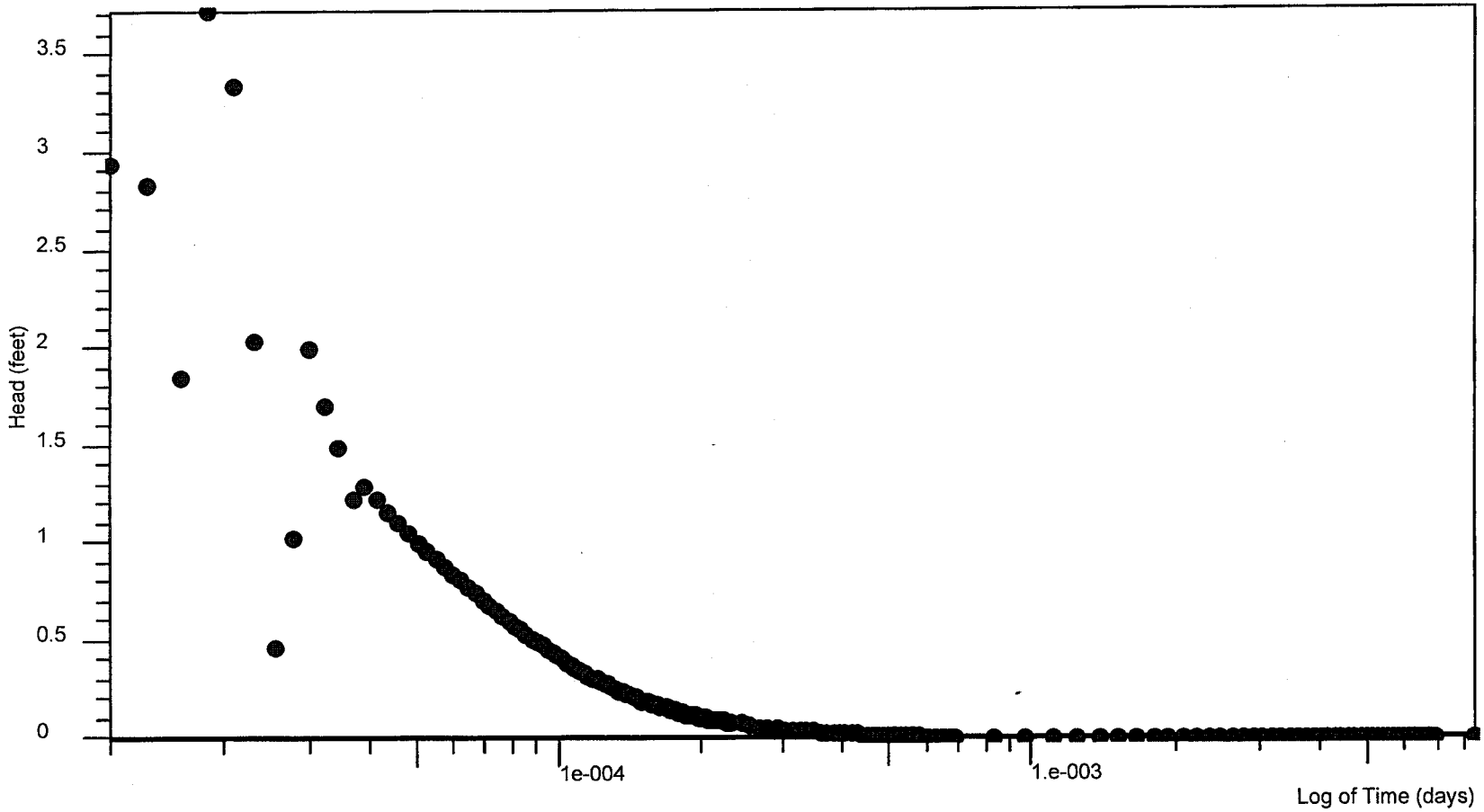
148	2.4	2.373	1.9e-002	-1.9e-002	-5.128e-003
149	2.6	2.573	1.9e-002	-1.9e-002	-5.128e-003
150	2.8	2.773	1.9e-002	-1.9e-002	-5.128e-003
151	3.	2.973	1.9e-002	-1.9e-002	-5.128e-003
152	3.2	3.173	1.9e-002	-1.9e-002	-5.128e-003
153	3.4	3.373	1.9e-002	-1.9e-002	-5.128e-003
154	3.6	3.573	1.9e-002	-1.9e-002	-5.128e-003
155	3.8	3.773	1.9e-002	-1.9e-002	-5.128e-003
156	4.	3.973	1.9e-002	-1.9e-002	-5.128e-003
157	4.2	4.173	1.9e-002	-1.9e-002	-5.128e-003
158	4.4	4.373	1.9e-002	-1.9e-002	-5.128e-003
159	4.6	4.573	1.4e-002	-1.4e-002	-3.779e-003
160	4.8	4.773	1.9e-002	-1.9e-002	-5.128e-003
161	5.	4.973	1.4e-002	-1.4e-002	-3.779e-003
162	5.2	5.173	1.9e-002	-1.9e-002	-5.128e-003
163	5.4	5.373	1.4e-002	-1.4e-002	-3.779e-003
164	5.6	5.573	1.4e-002	-1.4e-002	-3.779e-003
165	5.8	5.773	1.4e-002	-1.4e-002	-3.779e-003
166	6.	5.973	1.4e-002	-1.4e-002	-3.779e-003
167	6.2	6.173	1.4e-002	-1.4e-002	-3.779e-003
168	6.4	6.373	1.4e-002	-1.4e-002	-3.779e-003
169	6.6	6.573	1.4e-002	-1.4e-002	-3.779e-003
170	6.8	6.773	1.4e-002	-1.4e-002	-3.779e-003
171	7.	6.973	1.4e-002	-1.4e-002	-3.779e-003
172	7.2	7.173	1.4e-002	-1.4e-002	-3.779e-003
173	7.4	7.373	1.4e-002	-1.4e-002	-3.779e-003
174	7.6	7.573	1.4e-002	-1.4e-002	-3.779e-003
175	7.8	7.773	1.4e-002	-1.4e-002	-3.779e-003
176	8.	7.973	1.4e-002	-1.4e-002	-3.779e-003
177	8.2	8.173	1.4e-002	-1.4e-002	-3.779e-003
178	8.4	8.373	1.4e-002	-1.4e-002	-3.779e-003
179	8.6	8.573	1.4e-002	-1.4e-002	-3.779e-003
180	8.8	8.773	1.4e-002	-1.4e-002	-3.779e-003
181	9.	8.973	1.4e-002	-1.4e-002	-3.779e-003
182	9.2	9.173	1.4e-002	-1.4e-002	-3.779e-003
183	9.4	9.373	1.4e-002	-1.4e-002	-3.779e-003
184	9.6	9.573	1.4e-002	-1.4e-002	-3.779e-003
185	9.8	9.773	1.4e-002	-1.4e-002	-3.779e-003
186	10.	9.973	1.4e-002	-1.4e-002	-3.779e-003
187	12.	11.97	1.4e-002	-1.4e-002	-3.779e-003

JEP-7 Rising Head Test 7/2/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-7



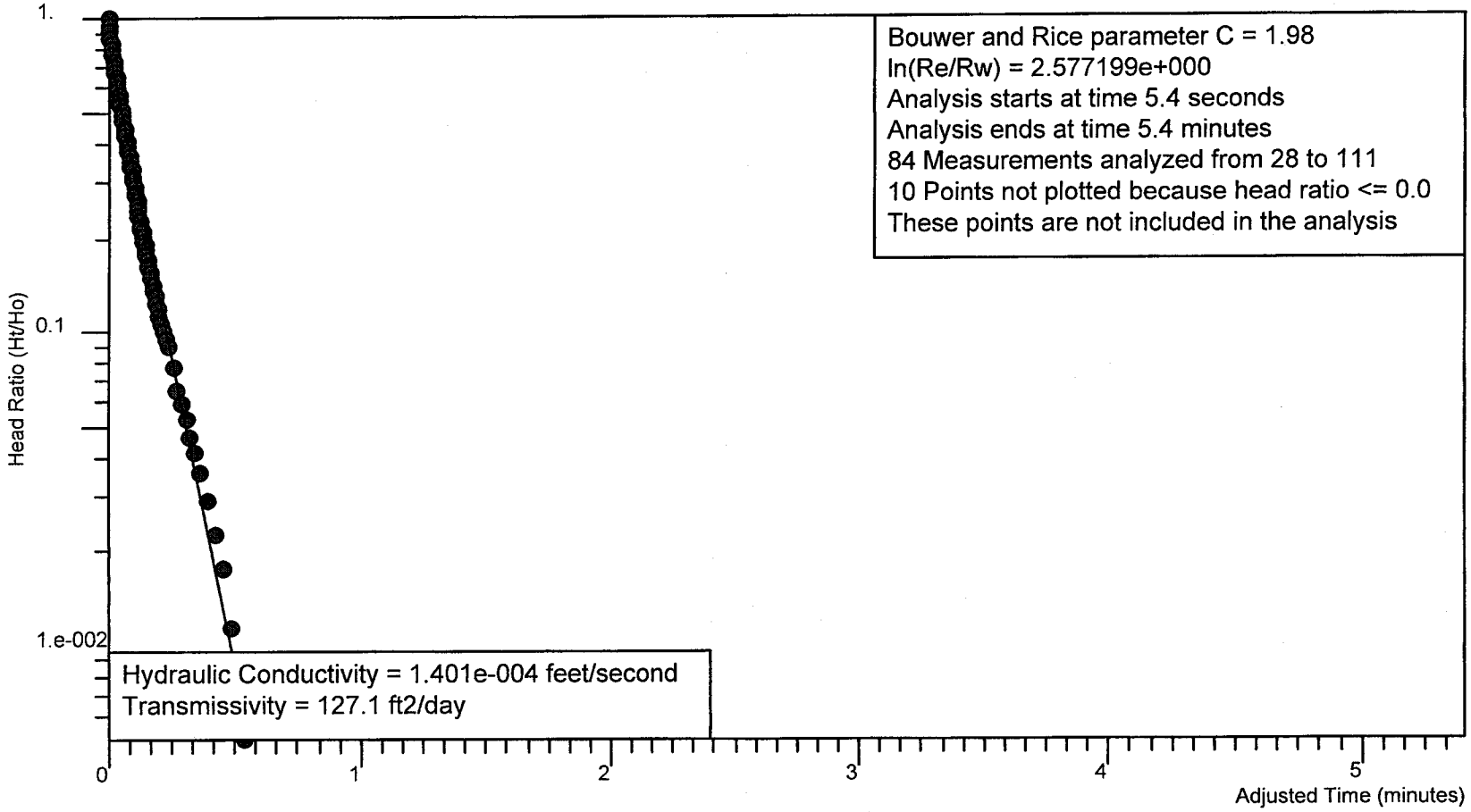
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-7 Rising Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-7



Ho is 0.797 feet at 5.4 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-8 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP8FHN

Well Label:	JEP-8
Aquifer Thickness:	8. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	10.18 feet
Anisotropy Ratio:	2.
Time Adjustment:	0.996 Seconds

Test starts with trial 5
There are 186 time and drawdown measurements
Maximum head is 3.191 feet
Minimum head is -4.e-003 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.66e-002	-4.e-003	-4.e-003	-1.254e-003
2	3.3e-003	-1.33e-002	0.	0.	0.
3	6.6e-003	-1.e-002	4.e-003	4.e-003	1.254e-003
4	1.e-002	-6.6e-003	0.897	0.897	0.2811
5	1.33e-002	-3.3e-003	2.759	2.759	0.8646
6	1.66e-002	0.	3.191	3.191	1.
7	2.e-002	3.4e-003	3.153	3.153	0.9881
8	2.33e-002	6.7e-003	1.823	1.823	0.5713
9	2.66e-002	1.e-002	0.788	0.788	0.2469
10	3.e-002	1.34e-002	1.196	1.196	0.3748
11	3.33e-002	1.67e-002	1.585	1.585	0.4967
12	3.66e-002	2.e-002	2.094	2.094	0.6562
13	4.e-002	2.34e-002	1.885	1.885	0.5907
14	4.33e-002	2.67e-002	1.59	1.59	0.4983
15	4.66e-002	3.e-002	1.509	1.509	0.4729
16	5.e-002	3.34e-002	1.78	1.78	0.5578
17	5.33e-002	3.67e-002	1.771	1.771	0.555
18	5.66e-002	4.e-002	1.224	1.224	0.3836
19	6.e-002	4.34e-002	0.835	0.835	0.2617
20	6.33e-002	4.67e-002	0.436	0.436	0.1366
21	6.66e-002	5.e-002	0.939	0.939	0.2943
22	7.e-002	5.34e-002	1.148	1.148	0.3598
23	7.33e-002	5.67e-002	1.025	1.025	0.3212
24	7.66e-002	6.e-002	0.773	0.773	0.2422
25	8.e-002	6.34e-002	0.636	0.636	0.1993
26	8.33e-002	6.67e-002	0.185	0.185	5.798e-002
27	8.66e-002	7.e-002	0.465	0.465	0.1457
28	9.e-002	7.34e-002	0.593	0.593	0.1858
29	9.33e-002	7.67e-002	0.503	0.503	0.1576
30	9.66e-002	8.e-002	0.488	0.488	0.1529
31	0.1	8.34e-002	0.484	0.484	0.1517
32	0.1033	8.67e-002	0.465	0.465	0.1457
33	0.1066	9.e-002	0.45	0.45	0.141

34	0.11	9.34e-002	0.436	0.436	0.1366
35	0.1133	9.67e-002	0.422	0.422	0.1322
36	0.1166	1.e-001	0.408	0.408	0.1279
37	0.12	0.1034	0.398	0.398	0.1247
38	0.1233	0.1067	0.389	0.389	0.1219
39	0.1266	0.11	0.375	0.375	0.1175
40	0.13	0.1134	0.37	0.37	0.116
41	0.1333	0.1167	0.356	0.356	0.1116
42	0.1366	0.12	0.351	0.351	0.11
43	0.14	0.1234	0.341	0.341	0.1069
44	0.1433	0.1267	0.332	0.332	0.104
45	0.1466	0.13	0.322	0.322	0.1009
46	0.15	0.1334	0.318	0.318	9.966e-002
47	0.1533	0.1367	0.308	0.308	9.652e-002
48	0.1566	0.14	0.303	0.303	9.495e-002
49	0.16	0.1434	0.299	0.299	9.37e-002
50	0.1633	0.1467	0.289	0.289	9.057e-002
51	0.1666	0.15	0.284	0.284	8.9e-002
52	0.17	0.1534	0.28	0.28	8.775e-002
53	0.1733	0.1567	0.27	0.27	8.461e-002
54	0.1766	0.16	0.265	0.265	8.305e-002
55	0.18	0.1634	0.261	0.261	8.179e-002
56	0.1833	0.1667	0.256	0.256	8.023e-002
57	0.1866	0.17	0.251	0.251	7.866e-002
58	0.19	0.1734	0.246	0.246	7.709e-002
59	0.1933	0.1767	0.242	0.242	7.584e-002
60	0.1966	0.18	0.237	0.237	7.427e-002
61	0.2	0.1834	0.232	0.232	7.27e-002
62	0.2033	0.1867	0.227	0.227	7.114e-002
63	0.2066	0.19	0.227	0.227	7.114e-002
64	0.21	0.1934	0.223	0.223	6.988e-002
65	0.2133	0.1967	0.218	0.218	6.832e-002
66	0.2166	0.2	0.213	0.213	6.675e-002
67	0.22	0.2034	0.208	0.208	6.518e-002
68	0.2233	0.2067	0.208	0.208	6.518e-002
69	0.2266	0.21	0.204	0.204	6.393e-002
70	0.23	0.2134	0.199	0.199	6.236e-002
71	0.2333	0.2167	0.199	0.199	6.236e-002
72	0.2366	0.22	0.194	0.194	6.08e-002
73	0.24	0.2234	0.189	0.189	5.923e-002
74	0.2433	0.2267	0.189	0.189	5.923e-002
75	0.2466	0.23	0.185	0.185	5.798e-002
76	0.25	0.2334	0.185	0.185	5.798e-002
77	0.2533	0.2367	0.18	0.18	5.641e-002
78	0.2566	0.24	0.18	0.18	5.641e-002
79	0.26	0.2434	0.175	0.175	5.484e-002
80	0.2633	0.2467	0.17	0.17	5.327e-002
81	0.2666	0.25	0.17	0.17	5.327e-002
82	0.27	0.2534	0.166	0.166	5.202e-002
83	0.2733	0.2567	0.166	0.166	5.202e-002
84	0.2766	0.26	0.161	0.161	5.045e-002
85	0.28	0.2634	0.161	0.161	5.045e-002
86	0.2833	0.2667	0.156	0.156	4.889e-002
87	0.2866	0.27	0.156	0.156	4.889e-002
88	0.29	0.2734	0.156	0.156	4.889e-002
89	0.2933	0.2767	0.151	0.151	4.732e-002
90	0.2966	0.28	0.151	0.151	4.732e-002

91	0.3	0.2834	0.151	0.151	4.732e-002
92	0.3033	0.2867	0.147	0.147	4.607e-002
93	0.3066	0.29	0.147	0.147	4.607e-002
94	0.31	0.2934	0.142	0.142	4.45e-002
95	0.3133	0.2967	0.142	0.142	4.45e-002
96	0.3166	0.3	0.142	0.142	4.45e-002
97	0.32	0.3034	0.137	0.137	4.293e-002
98	0.3233	0.3067	0.137	0.137	4.293e-002
99	0.3266	0.31	0.137	0.137	4.293e-002
100	0.33	0.3134	0.132	0.132	4.137e-002
101	0.3333	0.3167	0.132	0.132	4.137e-002
102	0.35	0.3334	0.123	0.123	3.855e-002
103	0.3666	0.35	0.118	0.118	3.698e-002
104	0.3833	0.3667	0.109	0.109	3.416e-002
105	0.4	0.3834	0.104	0.104	3.259e-002
106	0.4166	0.4	9.9e-002	9.9e-002	3.102e-002
107	0.4333	0.4167	9.9e-002	9.9e-002	3.102e-002
108	0.45	0.4334	9.4e-002	9.4e-002	2.946e-002
109	0.4666	0.45	9.e-002	9.e-002	2.82e-002
110	0.4833	0.4667	9.e-002	9.e-002	2.82e-002
111	0.5	0.4834	8.5e-002	8.5e-002	2.664e-002
112	0.5166	0.5	8.e-002	8.e-002	2.507e-002
113	0.5333	0.5167	8.e-002	8.e-002	2.507e-002
114	0.55	0.5334	8.e-002	8.e-002	2.507e-002
115	0.5666	0.55	7.5e-002	7.5e-002	2.35e-002
116	0.5833	0.5667	7.5e-002	7.5e-002	2.35e-002
117	0.6	0.5834	7.1e-002	7.1e-002	2.225e-002
118	0.6166	0.6	7.1e-002	7.1e-002	2.225e-002
119	0.6333	0.6167	7.1e-002	7.1e-002	2.225e-002
120	0.65	0.6334	6.6e-002	6.6e-002	2.068e-002
121	0.6666	0.65	6.6e-002	6.6e-002	2.068e-002
122	0.6833	0.6667	6.6e-002	6.6e-002	2.068e-002
123	0.7	0.6834	6.6e-002	6.6e-002	2.068e-002
124	0.7166	0.7	6.1e-002	6.1e-002	1.912e-002
125	0.7333	0.7167	6.1e-002	6.1e-002	1.912e-002
126	0.75	0.7334	6.1e-002	6.1e-002	1.912e-002
127	0.7666	0.75	5.6e-002	5.6e-002	1.755e-002
128	0.7833	0.7667	5.6e-002	5.6e-002	1.755e-002
129	0.8	0.7834	5.6e-002	5.6e-002	1.755e-002
130	0.8166	0.8	5.6e-002	5.6e-002	1.755e-002
131	0.8333	0.8167	5.6e-002	5.6e-002	1.755e-002
132	0.85	0.8334	5.2e-002	5.2e-002	1.63e-002
133	0.8666	0.85	5.2e-002	5.2e-002	1.63e-002
134	0.8833	0.8667	5.2e-002	5.2e-002	1.63e-002
135	0.9	0.8834	5.2e-002	5.2e-002	1.63e-002
136	0.9166	0.9	5.2e-002	5.2e-002	1.63e-002
137	0.9333	0.9167	5.2e-002	5.2e-002	1.63e-002
138	0.95	0.9334	5.2e-002	5.2e-002	1.63e-002
139	0.9666	0.95	5.2e-002	5.2e-002	1.63e-002
140	0.9833	0.9667	4.7e-002	4.7e-002	1.473e-002
141	1.	0.9834	4.7e-002	4.7e-002	1.473e-002
142	1.2	1.183	3.7e-002	3.7e-002	1.16e-002
143	1.4	1.383	3.7e-002	3.7e-002	1.16e-002
144	1.6	1.583	3.7e-002	3.7e-002	1.16e-002
145	1.8	1.783	3.7e-002	3.7e-002	1.16e-002
146	2.	1.983	3.3e-002	3.3e-002	1.034e-002
147	2.2	2.183	2.8e-002	2.8e-002	8.775e-003

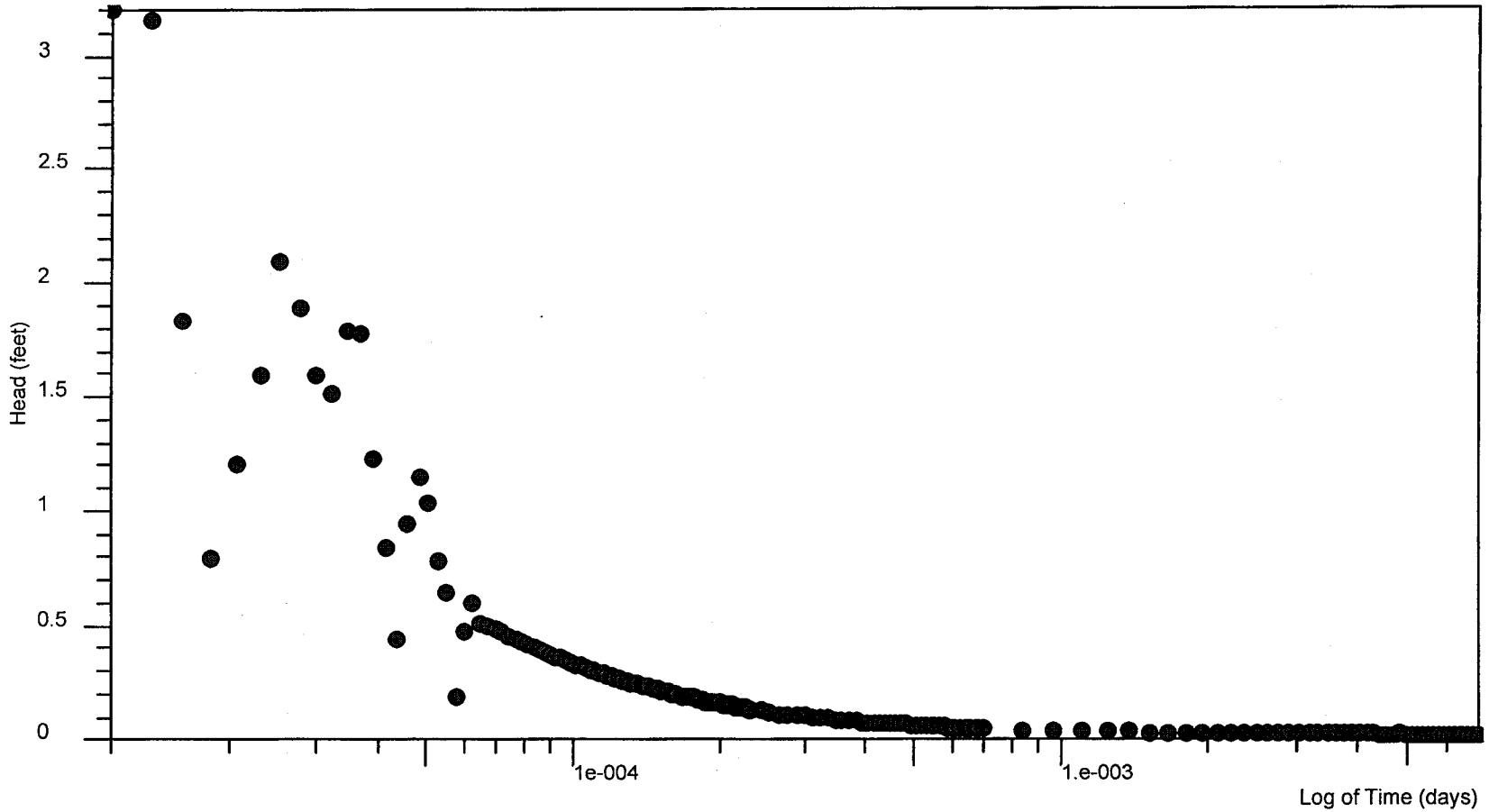
148	2.4	2.383	2.8e-002	2.8e-002	8.775e-003
149	2.6	2.583	2.8e-002	2.8e-002	8.775e-003
150	2.8	2.783	2.8e-002	2.8e-002	8.775e-003
151	3.	2.983	2.3e-002	2.3e-002	7.208e-003
152	3.2	3.183	2.3e-002	2.3e-002	7.208e-003
153	3.4	3.383	2.3e-002	2.3e-002	7.208e-003
154	3.6	3.583	2.3e-002	2.3e-002	7.208e-003
155	3.8	3.783	1.9e-002	1.9e-002	5.954e-003
156	4.	3.983	1.9e-002	1.9e-002	5.954e-003
157	4.2	4.183	1.9e-002	1.9e-002	5.954e-003
158	4.4	4.383	1.9e-002	1.9e-002	5.954e-003
159	4.6	4.583	1.9e-002	1.9e-002	5.954e-003
160	4.8	4.783	1.9e-002	1.9e-002	5.954e-003
161	5.	4.983	1.9e-002	1.9e-002	5.954e-003
162	5.2	5.183	1.9e-002	1.9e-002	5.954e-003
163	5.4	5.383	1.9e-002	1.9e-002	5.954e-003
164	5.6	5.583	1.9e-002	1.9e-002	5.954e-003
165	5.8	5.783	1.9e-002	1.9e-002	5.954e-003
166	6.	5.983	1.9e-002	1.9e-002	5.954e-003
167	6.2	6.183	1.9e-002	1.9e-002	5.954e-003
168	6.4	6.383	1.4e-002	1.4e-002	4.387e-003
169	6.6	6.583	1.4e-002	1.4e-002	4.387e-003
170	6.8	6.783	1.4e-002	1.4e-002	4.387e-003
171	7.	6.983	1.9e-002	1.9e-002	5.954e-003
172	7.2	7.183	1.4e-002	1.4e-002	4.387e-003
173	7.4	7.383	1.4e-002	1.4e-002	4.387e-003
174	7.6	7.583	1.4e-002	1.4e-002	4.387e-003
175	7.8	7.783	1.4e-002	1.4e-002	4.387e-003
176	8.	7.983	1.4e-002	1.4e-002	4.387e-003
177	8.2	8.183	1.4e-002	1.4e-002	4.387e-003
178	8.4	8.383	1.4e-002	1.4e-002	4.387e-003
179	8.6	8.583	1.4e-002	1.4e-002	4.387e-003
180	8.8	8.783	1.4e-002	1.4e-002	4.387e-003
181	9.	8.983	1.4e-002	1.4e-002	4.387e-003
182	9.2	9.183	1.4e-002	1.4e-002	4.387e-003
183	9.4	9.383	1.4e-002	1.4e-002	4.387e-003
184	9.6	9.583	1.4e-002	1.4e-002	4.387e-003
185	9.8	9.783	1.4e-002	1.4e-002	4.387e-003
186	10.	9.983	1.4e-002	1.4e-002	4.387e-003

JEP-8 Falling Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-8



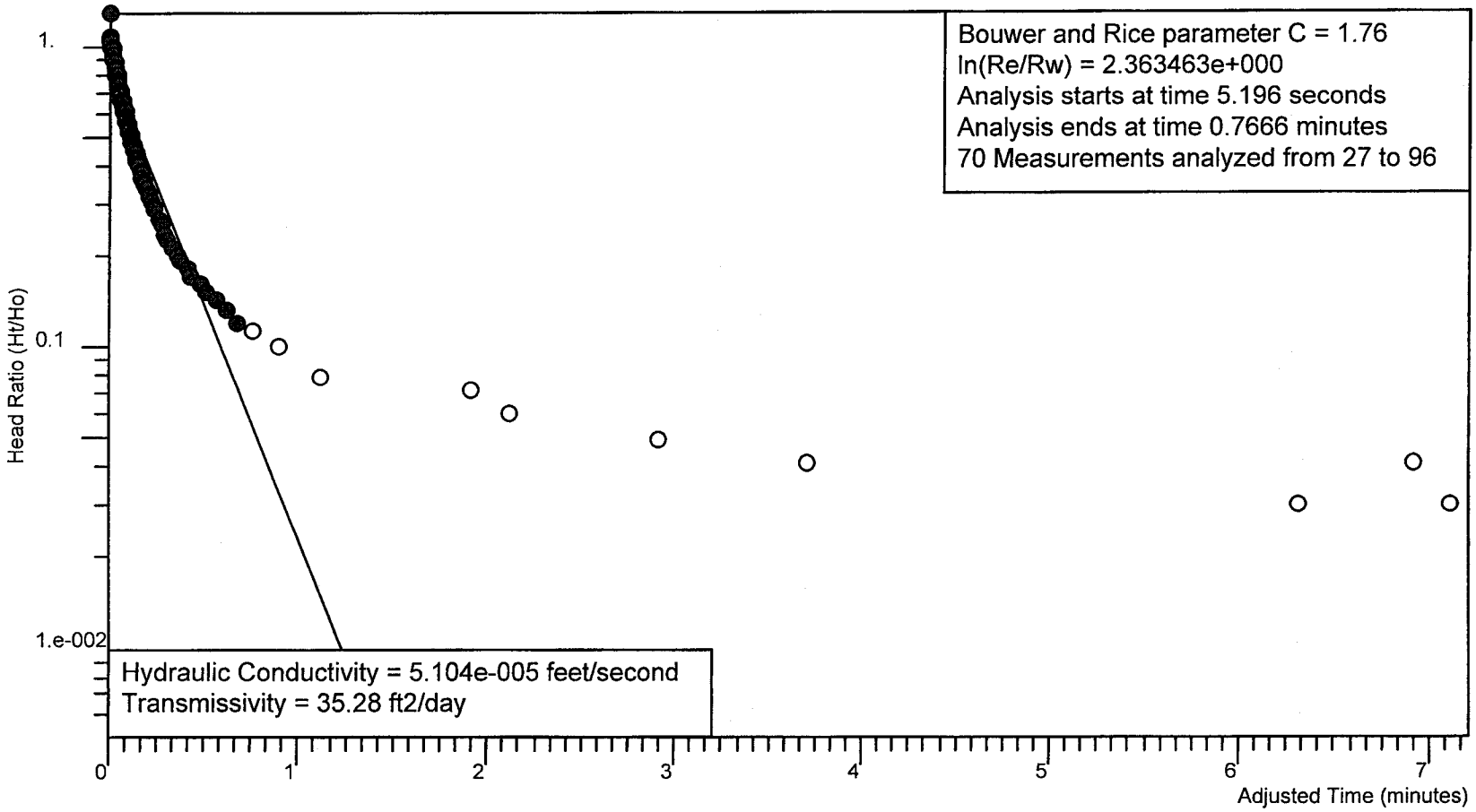
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-8 Falling Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-8



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.465 feet at 5.196 seconds

JEP-8 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\JEP8RHN

Well Label:	JEP-8
Aquifer Thickness:	8. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	10.18 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.398 Seconds

Test starts with trial 7
There are 186 time and drawdown measurements
Maximum head is 3.585 feet
Minimum head is -1.4e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.33e-002	0.	0.	0.
2	3.3e-003	-2.e-002	0.	0.	0.
3	6.6e-003	-1.67e-002	0.	0.	0.
4	1.e-002	-1.33e-002	-2.647	2.647	0.7384
5	1.33e-002	-1.e-002	-2.789	2.789	0.778
6	1.66e-002	-6.7e-003	-3.268	3.268	0.9116
7	2.e-002	-3.3e-003	-2.334	2.334	0.651
8	2.33e-002	0.	-3.585	3.585	1.
9	2.66e-002	3.3e-003	-2.566	2.566	0.7158
10	3.e-002	6.7e-003	-1.722	1.722	0.4803
11	3.33e-002	1.e-002	-0.673	0.673	0.1877
12	3.66e-002	1.33e-002	-0.925	0.925	0.258
13	4.e-002	1.67e-002	-2.556	2.556	0.713
14	4.33e-002	2.e-002	-1.949	1.949	0.5437
15	4.66e-002	2.33e-002	-1.233	1.233	0.3439
16	5.e-002	2.67e-002	-1.461	1.461	0.4075
17	5.33e-002	3.e-002	-1.39	1.39	0.3877
18	5.66e-002	3.33e-002	-1.257	1.257	0.3506
19	6.e-002	3.67e-002	-1.243	1.243	0.3467
20	6.33e-002	4.e-002	-1.167	1.167	0.3255
21	6.66e-002	4.33e-002	-1.105	1.105	0.3082
22	7.e-002	4.67e-002	-1.043	1.043	0.2909
23	7.33e-002	5.e-002	-0.991	0.991	0.2764
24	7.66e-002	5.33e-002	-0.944	0.944	0.2633
25	8.e-002	5.67e-002	-0.901	0.901	0.2513
26	8.33e-002	6.e-002	-0.858	0.858	0.2393
27	8.66e-002	6.33e-002	-0.802	0.802	0.2237
28	9.e-002	6.67e-002	-0.773	0.773	0.2156
29	9.33e-002	7.e-002	-0.735	0.735	0.205
30	9.66e-002	7.33e-002	-0.702	0.702	0.1958
31	0.1	7.67e-002	-0.669	0.669	0.1866
32	0.1033	8.e-002	-0.64	0.64	0.1785
33	0.1066	8.33e-002	-0.612	0.612	0.1707

34	0.11	8.67e-002	-0.583	0.583	0.1626
35	0.1133	9.e-002	-0.56	0.56	0.1562
36	0.1166	9.33e-002	-0.531	0.531	0.1481
37	0.12	9.67e-002	-0.512	0.512	0.1428
38	0.1233	0.1	-0.488	0.488	0.1361
39	0.1266	0.1033	-0.469	0.469	0.1308
40	0.13	0.1067	-0.45	0.45	0.1255
41	0.1333	0.11	-0.431	0.431	0.1202
42	0.1366	0.1133	-0.417	0.417	0.1163
43	0.14	0.1167	-0.403	0.403	0.1124
44	0.1433	0.12	-0.389	0.389	0.1085
45	0.1466	0.1233	-0.374	0.374	0.1043
46	0.15	0.1267	-0.36	0.36	0.1004
47	0.1533	0.13	-0.351	0.351	9.791e-002
48	0.1566	0.1333	-0.336	0.336	9.372e-002
49	0.16	0.1367	-0.327	0.327	9.121e-002
50	0.1633	0.14	-0.313	0.313	8.731e-002
51	0.1666	0.1433	-0.303	0.303	8.452e-002
52	0.17	0.1467	-0.294	0.294	8.201e-002
53	0.1733	0.15	-0.284	0.284	7.922e-002
54	0.1766	0.1533	-0.275	0.275	7.671e-002
55	0.18	0.1567	-0.265	0.265	7.392e-002
56	0.1833	0.16	-0.261	0.261	7.28e-002
57	0.1866	0.1633	-0.251	0.251	7.001e-002
58	0.19	0.1667	-0.246	0.246	6.862e-002
59	0.1933	0.17	-0.237	0.237	6.611e-002
60	0.1966	0.1733	-0.232	0.232	6.471e-002
61	0.2	0.1767	-0.227	0.227	6.332e-002
62	0.2033	0.18	-0.218	0.218	6.081e-002
63	0.2066	0.1833	-0.213	0.213	5.941e-002
64	0.21	0.1867	-0.208	0.208	5.802e-002
65	0.2133	0.19	-0.199	0.199	5.551e-002
66	0.2166	0.1933	-0.194	0.194	5.411e-002
67	0.22	0.1967	-0.189	0.189	5.272e-002
68	0.2233	0.2	-0.185	0.185	5.16e-002
69	0.2266	0.2033	-0.18	0.18	5.021e-002
70	0.23	0.2067	-0.18	0.18	5.021e-002
71	0.2333	0.21	-0.175	0.175	4.881e-002
72	0.2366	0.2133	-0.166	0.166	4.63e-002
73	0.24	0.2167	-0.166	0.166	4.63e-002
74	0.2433	0.22	-0.161	0.161	4.491e-002
75	0.2466	0.2233	-0.156	0.156	4.351e-002
76	0.25	0.2267	-0.151	0.151	4.212e-002
77	0.2533	0.23	-0.151	0.151	4.212e-002
78	0.2566	0.2333	-0.147	0.147	4.1e-002
79	0.26	0.2367	-0.142	0.142	3.961e-002
80	0.2633	0.24	-0.142	0.142	3.961e-002
81	0.2666	0.2433	-0.137	0.137	3.821e-002
82	0.27	0.2467	-0.132	0.132	3.682e-002
83	0.2733	0.25	-0.132	0.132	3.682e-002
84	0.2766	0.2533	-0.128	0.128	3.57e-002
85	0.28	0.2567	-0.128	0.128	3.57e-002
86	0.2833	0.26	-0.123	0.123	3.431e-002
87	0.2866	0.2633	-0.123	0.123	3.431e-002
88	0.29	0.2667	-0.118	0.118	3.291e-002
89	0.2933	0.27	-0.118	0.118	3.291e-002
90	0.2966	0.2733	-0.118	0.118	3.291e-002

91	0.3	0.2767	-0.113	0.113	3.152e-002
92	0.3033	0.28	-0.113	0.113	3.152e-002
93	0.3066	0.2833	-0.113	0.113	3.152e-002
94	0.31	0.2867	-0.109	0.109	3.04e-002
95	0.3133	0.29	-0.109	0.109	3.04e-002
96	0.3166	0.2933	-0.109	0.109	3.04e-002
97	0.32	0.2967	-0.104	0.104	2.901e-002
98	0.3233	0.3	-0.104	0.104	2.901e-002
99	0.3266	0.3033	-0.104	0.104	2.901e-002
100	0.33	0.3067	-9.9e-002	9.9e-002	2.762e-002
101	0.3333	0.31	-9.9e-002	9.9e-002	2.762e-002
102	0.35	0.3267	-9.4e-002	9.4e-002	2.622e-002
103	0.3666	0.3433	-9.e-002	9.e-002	2.51e-002
104	0.3833	0.36	-8.e-002	8.e-002	2.232e-002
105	0.4	0.3767	-7.5e-002	7.5e-002	2.092e-002
106	0.4166	0.3933	-7.1e-002	7.1e-002	1.98e-002
107	0.4333	0.41	-7.1e-002	7.1e-002	1.98e-002
108	0.45	0.4267	-6.6e-002	6.6e-002	1.841e-002
109	0.4666	0.4433	-6.6e-002	6.6e-002	1.841e-002
110	0.4833	0.46	-6.1e-002	6.1e-002	1.702e-002
111	0.5	0.4767	-5.6e-002	5.6e-002	1.562e-002
112	0.5166	0.4933	-5.6e-002	5.6e-002	1.562e-002
113	0.5333	0.51	-5.2e-002	5.2e-002	1.45e-002
114	0.55	0.5267	-5.2e-002	5.2e-002	1.45e-002
115	0.5666	0.5433	-4.7e-002	4.7e-002	1.311e-002
116	0.5833	0.56	-4.7e-002	4.7e-002	1.311e-002
117	0.6	0.5767	-4.2e-002	4.2e-002	1.172e-002
118	0.6166	0.5933	-4.2e-002	4.2e-002	1.172e-002
119	0.6333	0.61	-3.8e-002	3.8e-002	1.06e-002
120	0.65	0.6267	-3.8e-002	3.8e-002	1.06e-002
121	0.6666	0.6433	-3.3e-002	3.3e-002	9.205e-003
122	0.6833	0.66	-3.3e-002	3.3e-002	9.205e-003
123	0.7	0.6767	-3.3e-002	3.3e-002	9.205e-003
124	0.7166	0.6933	-2.8e-002	2.8e-002	7.81e-003
125	0.7333	0.71	-2.8e-002	2.8e-002	7.81e-003
126	0.75	0.7267	-2.8e-002	2.8e-002	7.81e-003
127	0.7666	0.7433	-2.8e-002	2.8e-002	7.81e-003
128	0.7833	0.76	-2.8e-002	2.8e-002	7.81e-003
129	0.8	0.7767	-2.8e-002	2.8e-002	7.81e-003
130	0.8166	0.7933	-2.3e-002	2.3e-002	6.416e-003
131	0.8333	0.81	-2.3e-002	2.3e-002	6.416e-003
132	0.85	0.8267	-2.3e-002	2.3e-002	6.416e-003
133	0.8666	0.8433	-2.3e-002	2.3e-002	6.416e-003
134	0.8833	0.86	-2.3e-002	2.3e-002	6.416e-003
135	0.9	0.8767	-1.9e-002	1.9e-002	5.3e-003
136	0.9166	0.8933	-1.9e-002	1.9e-002	5.3e-003
137	0.9333	0.91	-1.9e-002	1.9e-002	5.3e-003
138	0.95	0.9267	-1.9e-002	1.9e-002	5.3e-003
139	0.9666	0.9433	-1.9e-002	1.9e-002	5.3e-003
140	0.9833	0.96	-1.4e-002	1.4e-002	3.905e-003
141	1.	0.9767	-1.4e-002	1.4e-002	3.905e-003
142	1.2	1.177	-4.e-003	4.e-003	1.116e-003
143	1.4	1.377	0.	0.	0.
144	1.6	1.577	4.e-003	-4.e-003	-1.116e-003
145	1.8	1.777	4.e-003	-4.e-003	-1.116e-003
146	2.	1.977	4.e-003	-4.e-003	-1.116e-003
147	2.2	2.177	4.e-003	-4.e-003	-1.116e-003

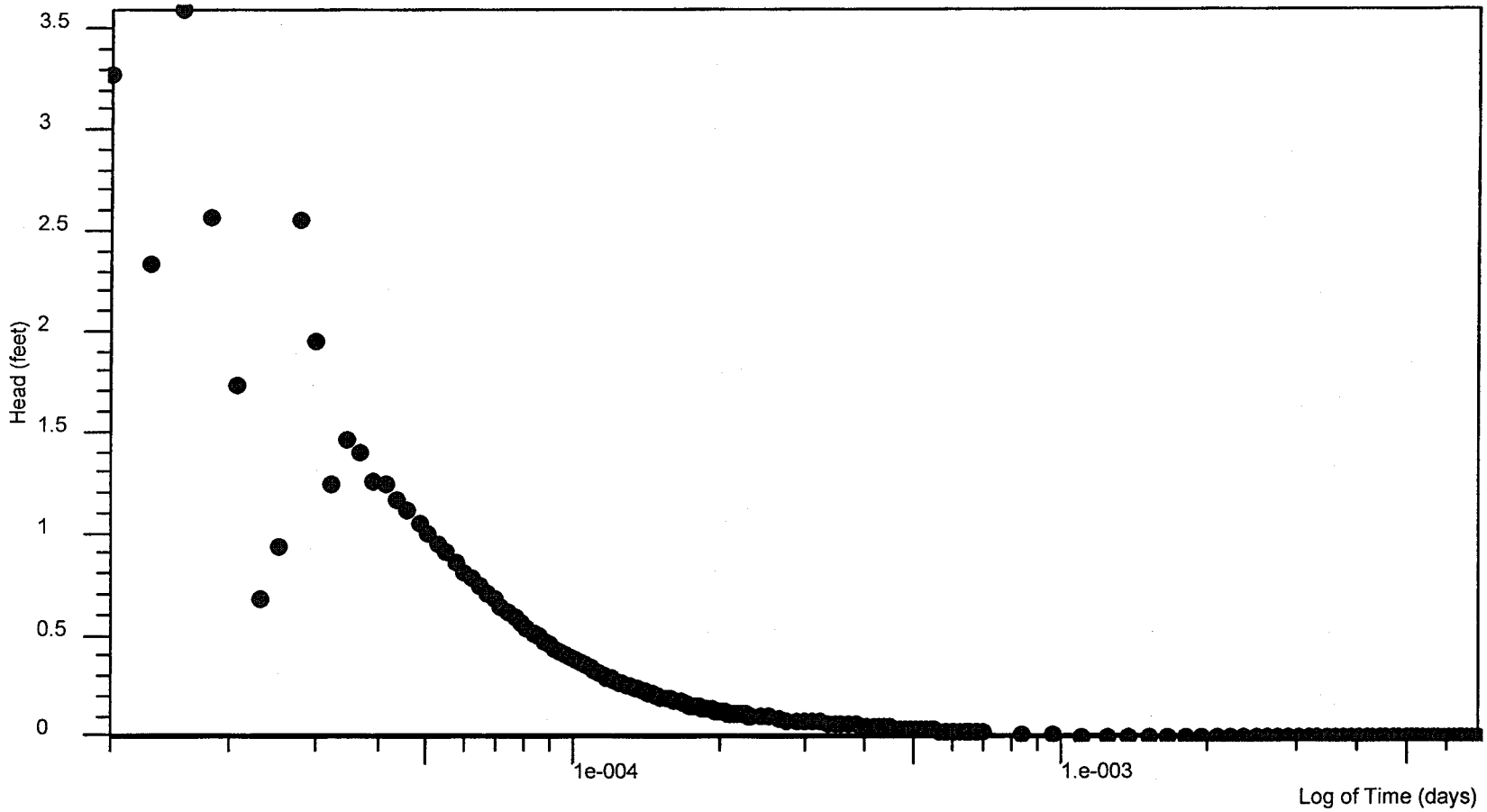
148	2.4	2.377	4.e-003	-4.e-003	-1.116e-003
149	2.6	2.577	9.e-003	-9.e-003	-2.51e-003
150	2.8	2.777	9.e-003	-9.e-003	-2.51e-003
151	3.	2.977	9.e-003	-9.e-003	-2.51e-003
152	3.2	3.177	9.e-003	-9.e-003	-2.51e-003
153	3.4	3.377	9.e-003	-9.e-003	-2.51e-003
154	3.6	3.577	1.4e-002	-1.4e-002	-3.905e-003
155	3.8	3.777	9.e-003	-9.e-003	-2.51e-003
156	4.	3.977	9.e-003	-9.e-003	-2.51e-003
157	4.2	4.177	9.e-003	-9.e-003	-2.51e-003
158	4.4	4.377	9.e-003	-9.e-003	-2.51e-003
159	4.6	4.577	9.e-003	-9.e-003	-2.51e-003
160	4.8	4.777	1.4e-002	-1.4e-002	-3.905e-003
161	5.	4.977	1.4e-002	-1.4e-002	-3.905e-003
162	5.2	5.177	9.e-003	-9.e-003	-2.51e-003
163	5.4	5.377	9.e-003	-9.e-003	-2.51e-003
164	5.6	5.577	1.4e-002	-1.4e-002	-3.905e-003
165	5.8	5.777	9.e-003	-9.e-003	-2.51e-003
166	6.	5.977	9.e-003	-9.e-003	-2.51e-003
167	6.2	6.177	1.4e-002	-1.4e-002	-3.905e-003
168	6.4	6.377	1.4e-002	-1.4e-002	-3.905e-003
169	6.6	6.577	9.e-003	-9.e-003	-2.51e-003
170	6.8	6.777	1.4e-002	-1.4e-002	-3.905e-003
171	7.	6.977	1.4e-002	-1.4e-002	-3.905e-003
172	7.2	7.177	9.e-003	-9.e-003	-2.51e-003
173	7.4	7.377	1.4e-002	-1.4e-002	-3.905e-003
174	7.6	7.577	1.4e-002	-1.4e-002	-3.905e-003
175	7.8	7.777	1.4e-002	-1.4e-002	-3.905e-003
176	8.	7.977	9.e-003	-9.e-003	-2.51e-003
177	8.2	8.177	1.4e-002	-1.4e-002	-3.905e-003
178	8.4	8.377	1.4e-002	-1.4e-002	-3.905e-003
179	8.6	8.577	1.4e-002	-1.4e-002	-3.905e-003
180	8.8	8.777	1.4e-002	-1.4e-002	-3.905e-003
181	9.	8.977	9.e-003	-9.e-003	-2.51e-003
182	9.2	9.177	9.e-003	-9.e-003	-2.51e-003
183	9.4	9.377	9.e-003	-9.e-003	-2.51e-003
184	9.6	9.577	9.e-003	-9.e-003	-2.51e-003
185	9.8	9.777	9.e-003	-9.e-003	-2.51e-003
186	10.	9.977	9.e-003	-9.e-003	-2.51e-003

JEP-8 Rising Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-8



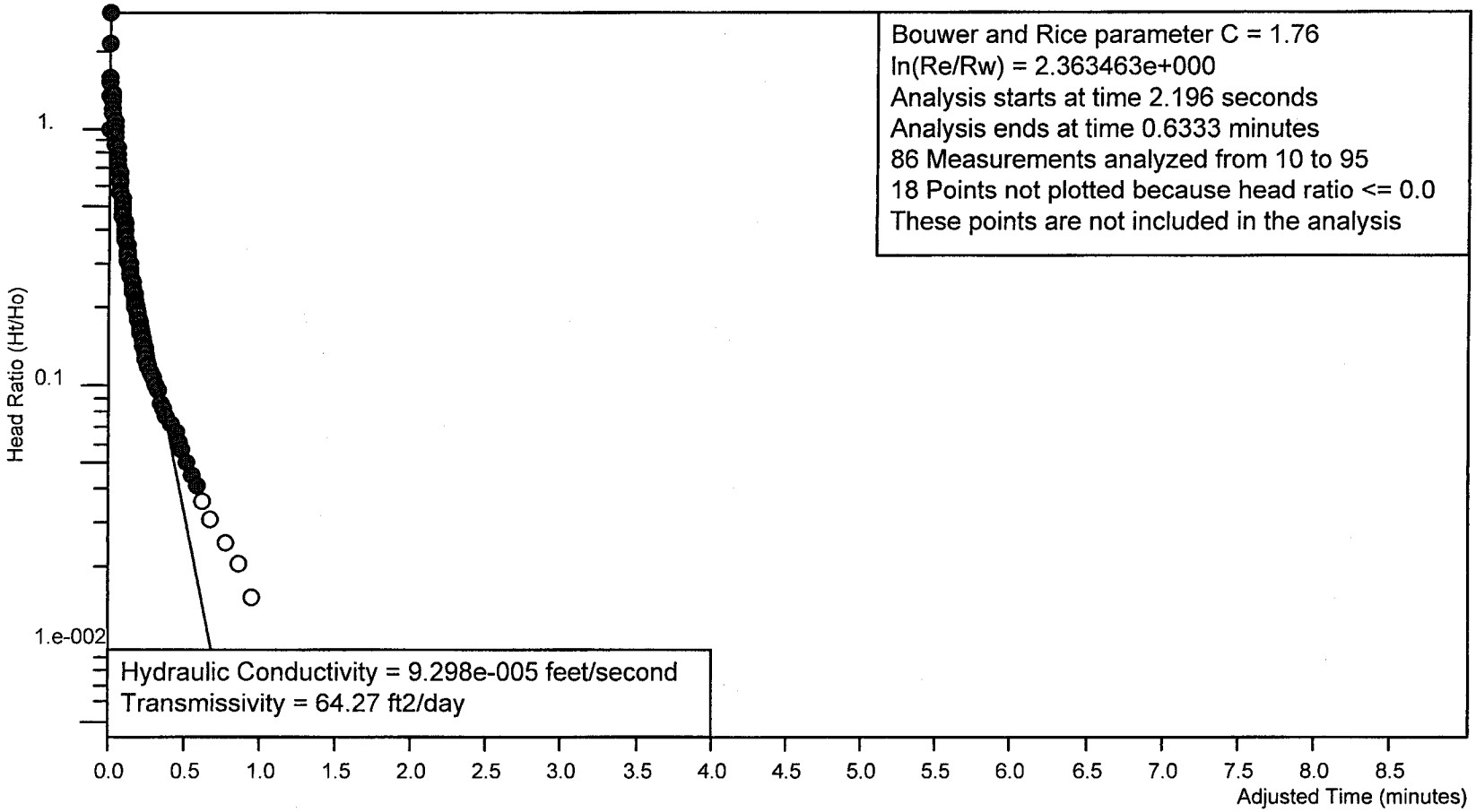
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

JEP-8 Rising Head Test 7/2/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

JEP-8



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.925 feet at 2.196 seconds

PZ-4S Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\PZ4SFHN

Well Label:	PZ-4S
Aquifer Thickness:	3. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	6.7 feet
Anisotropy Ratio:	2.
Time Adjustment:	0.798 Seconds

Test starts with trial 4
There are 186 time and drawdown measurements
Maximum head is 6.345 feet
Minimum head is -4.e-003 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.33e-002	-4.e-003	-4.e-003	-6.304e-004
2	3.3e-003	-1.e-002	4.e-003	4.e-003	6.304e-004
3	6.6e-003	-6.7e-003	1.4e-002	1.4e-002	2.206e-003
4	1.e-002	-3.3e-003	2.361	2.361	0.3721
5	1.33e-002	0.	6.345	6.345	1.
6	1.66e-002	3.3e-003	4.725	4.725	0.7447
7	2.e-002	6.7e-003	2.636	2.636	0.4154
8	2.33e-002	1.e-002	1.251	1.251	0.1972
9	2.66e-002	1.33e-002	2.219	2.219	0.3497
10	3.e-002	1.67e-002	2.698	2.698	0.4252
11	3.33e-002	2.e-002	1.806	1.806	0.2846
12	3.66e-002	2.33e-002	1.194	1.194	0.1882
13	4.e-002	2.67e-002	0.929	0.929	0.1464
14	4.33e-002	3.e-002	1.597	1.597	0.2517
15	4.66e-002	3.33e-002	1.811	1.811	0.2854
16	5.e-002	3.67e-002	1.512	1.512	0.2383
17	5.33e-002	4.e-002	1.46	1.46	0.2301
18	5.66e-002	4.33e-002	1.555	1.555	0.2451
19	6.e-002	4.67e-002	1.521	1.521	0.2397
20	6.33e-002	5.e-002	1.483	1.483	0.2337
21	6.66e-002	5.33e-002	1.488	1.488	0.2345
22	7.e-002	5.67e-002	1.474	1.474	0.2323
23	7.33e-002	6.e-002	1.46	1.46	0.2301
24	7.66e-002	6.33e-002	1.446	1.446	0.2279
25	8.e-002	6.67e-002	1.436	1.436	0.2263
26	8.33e-002	7.e-002	1.422	1.422	0.2241
27	8.66e-002	7.33e-002	1.408	1.408	0.2219
28	9.e-002	7.67e-002	1.398	1.398	0.2203
29	9.33e-002	8.e-002	1.384	1.384	0.2181
30	9.66e-002	8.33e-002	1.374	1.374	0.2165
31	0.1	8.67e-002	1.365	1.365	0.2151
32	0.1033	9.e-002	1.351	1.351	0.2129
33	0.1066	9.33e-002	1.341	1.341	0.2113

34	0.11	9.67e-002	1.332	1.332	0.2099
35	0.1133	0.1	1.322	1.322	0.2084
36	0.1166	0.1033	1.308	1.308	0.2061
37	0.12	0.1067	1.299	1.299	0.2047
38	0.1233	0.11	1.289	1.289	0.2032
39	0.1266	0.1133	1.28	1.28	0.2017
40	0.13	0.1167	1.27	1.27	0.2002
41	0.1333	0.12	1.261	1.261	0.1987
42	0.1366	0.1233	1.251	1.251	0.1972
43	0.14	0.1267	1.242	1.242	0.1957
44	0.1433	0.13	1.232	1.232	0.1942
45	0.1466	0.1333	1.223	1.223	0.1928
46	0.15	0.1367	1.213	1.213	0.1912
47	0.1533	0.14	1.204	1.204	0.1898
48	0.1566	0.1433	1.194	1.194	0.1882
49	0.16	0.1467	1.185	1.185	0.1868
50	0.1633	0.15	1.175	1.175	0.1852
51	0.1666	0.1533	1.166	1.166	0.1838
52	0.17	0.1567	1.156	1.156	0.1822
53	0.1733	0.16	1.152	1.152	0.1816
54	0.1766	0.1633	1.142	1.142	0.18
55	0.18	0.1667	1.133	1.133	0.1786
56	0.1833	0.17	1.123	1.123	0.177
57	0.1866	0.1733	1.118	1.118	0.1762
58	0.19	0.1767	1.109	1.109	0.1748
59	0.1933	0.18	1.099	1.099	0.1732
60	0.1966	0.1833	1.095	1.095	0.1726
61	0.2	0.1867	1.085	1.085	0.171
62	0.2033	0.19	1.08	1.08	0.1702
63	0.2066	0.1933	1.071	1.071	0.1688
64	0.21	0.1967	1.061	1.061	0.1672
65	0.2133	0.2	1.057	1.057	0.1666
66	0.2166	0.2033	1.047	1.047	0.165
67	0.22	0.2067	1.038	1.038	0.1636
68	0.2233	0.21	1.033	1.033	0.1628
69	0.2266	0.2133	1.024	1.024	0.1614
70	0.23	0.2167	1.019	1.019	0.1606
71	0.2333	0.22	1.009	1.009	0.159
72	0.2366	0.2233	1.005	1.005	0.1584
73	0.24	0.2267	0.995	0.995	0.1568
74	0.2433	0.23	0.99	0.99	0.156
75	0.2466	0.2333	0.981	0.981	0.1546
76	0.25	0.2367	0.976	0.976	0.1538
77	0.2533	0.24	0.967	0.967	0.1524
78	0.2566	0.2433	0.962	0.962	0.1516
79	0.26	0.2467	0.957	0.957	0.1508
80	0.2633	0.25	0.948	0.948	0.1494
81	0.2666	0.2533	0.943	0.943	0.1486
82	0.27	0.2567	0.933	0.933	0.147
83	0.2733	0.26	0.929	0.929	0.1464
84	0.2766	0.2633	0.924	0.924	0.1456
85	0.28	0.2667	0.914	0.914	0.1441
86	0.2833	0.27	0.91	0.91	0.1434
87	0.2866	0.2733	0.905	0.905	0.1426
88	0.29	0.2767	0.895	0.895	0.1411
89	0.2933	0.28	0.891	0.891	0.1404
90	0.2966	0.2833	0.886	0.886	0.1396

91	0.3	0.2867	0.881	0.881	0.1388
92	0.3033	0.29	0.872	0.872	0.1374
93	0.3066	0.2933	0.867	0.867	0.1366
94	0.31	0.2967	0.862	0.862	0.1359
95	0.3133	0.3	0.858	0.858	0.1352
96	0.3166	0.3033	0.853	0.853	0.1344
97	0.32	0.3067	0.848	0.848	0.1336
98	0.3233	0.31	0.839	0.839	0.1322
99	0.3266	0.3133	0.834	0.834	0.1314
100	0.33	0.3167	0.829	0.829	0.1307
101	0.3333	0.32	0.824	0.824	0.1299
102	0.35	0.3367	0.791	0.791	0.1247
103	0.3666	0.3533	0.763	0.763	0.1203
104	0.3833	0.37	0.739	0.739	0.1165
105	0.4	0.3867	0.715	0.715	0.1127
106	0.4166	0.4033	0.687	0.687	0.1083
107	0.4333	0.42	0.663	0.663	0.1045
108	0.45	0.4367	0.639	0.639	0.1007
109	0.4666	0.4533	0.62	0.62	9.771e-002
110	0.4833	0.47	0.597	0.597	9.409e-002
111	0.5	0.4867	0.578	0.578	9.11e-002
112	0.5166	0.5033	0.559	0.559	8.81e-002
113	0.5333	0.52	0.54	0.54	8.511e-002
114	0.55	0.5367	0.521	0.521	8.211e-002
115	0.5666	0.5533	0.502	0.502	7.912e-002
116	0.5833	0.57	0.483	0.483	7.612e-002
117	0.6	0.5867	0.469	0.469	7.392e-002
118	0.6166	0.6033	0.455	0.455	7.171e-002
119	0.6333	0.62	0.44	0.44	6.935e-002
120	0.65	0.6367	0.421	0.421	6.635e-002
121	0.6666	0.6533	0.407	0.407	6.414e-002
122	0.6833	0.67	0.398	0.398	6.273e-002
123	0.7	0.6867	0.383	0.383	6.036e-002
124	0.7166	0.7033	0.369	0.369	5.816e-002
125	0.7333	0.72	0.36	0.36	5.674e-002
126	0.75	0.7367	0.346	0.346	5.453e-002
127	0.7666	0.7533	0.336	0.336	5.296e-002
128	0.7833	0.77	0.327	0.327	5.154e-002
129	0.8	0.7867	0.312	0.312	4.917e-002
130	0.8166	0.8033	0.303	0.303	4.775e-002
131	0.8333	0.82	0.293	0.293	4.618e-002
132	0.85	0.8367	0.284	0.284	4.476e-002
133	0.8666	0.8533	0.274	0.274	4.318e-002
134	0.8833	0.87	0.265	0.265	4.177e-002
135	0.9	0.8867	0.26	0.26	4.098e-002
136	0.9166	0.9033	0.251	0.251	3.956e-002
137	0.9333	0.92	0.241	0.241	3.798e-002
138	0.95	0.9367	0.237	0.237	3.735e-002
139	0.9666	0.9533	0.227	0.227	3.578e-002
140	0.9833	0.97	0.218	0.218	3.436e-002
141	1.	0.9867	0.213	0.213	3.357e-002
142	1.2	1.187	0.137	0.137	2.159e-002
143	1.4	1.387	9.9e-002	9.9e-002	1.56e-002
144	1.6	1.587	7.5e-002	7.5e-002	1.182e-002
145	1.8	1.787	6.1e-002	6.1e-002	9.614e-003
146	2.	1.987	5.2e-002	5.2e-002	8.195e-003
147	2.2	2.187	4.2e-002	4.2e-002	6.619e-003

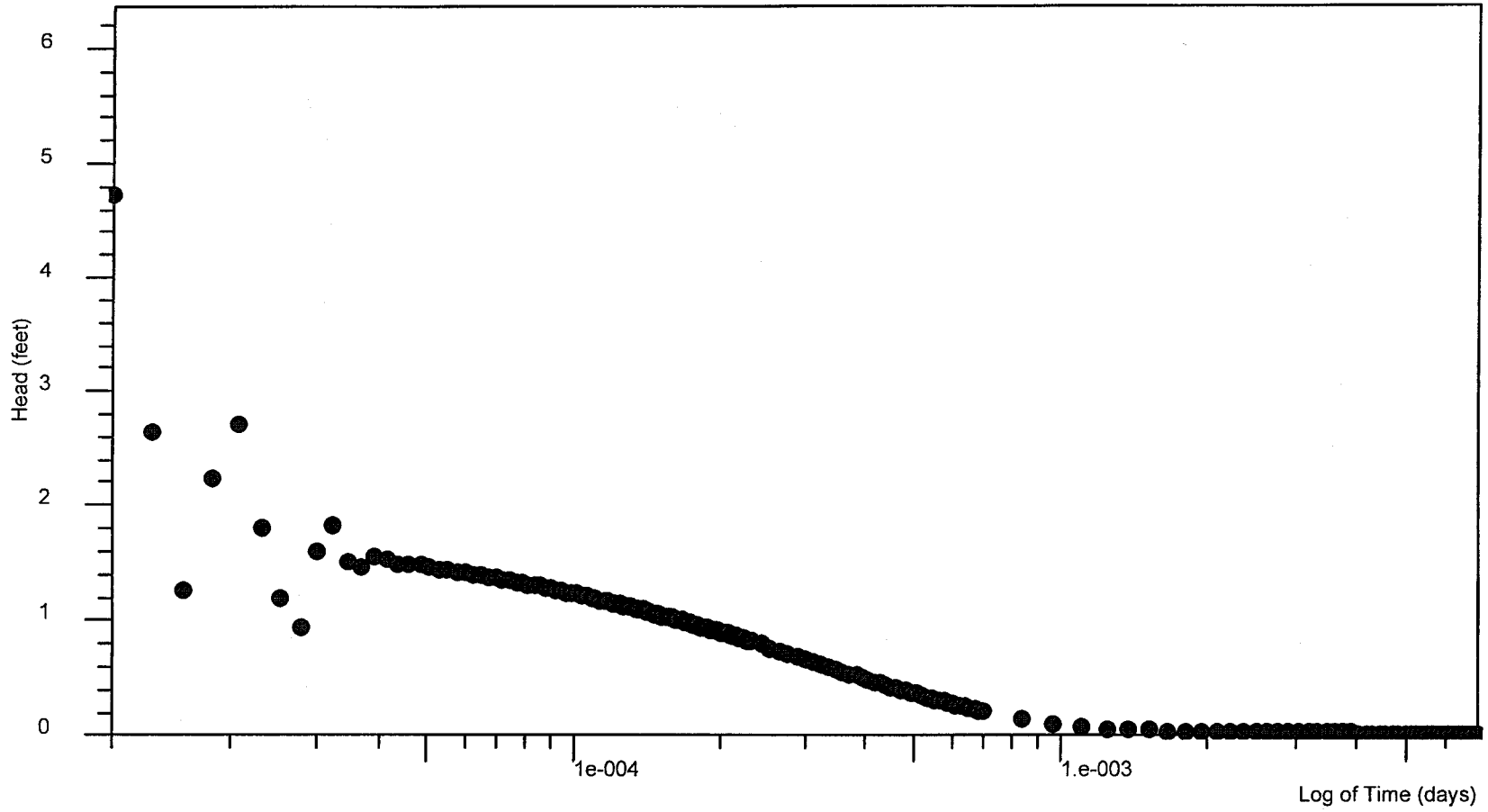
148	2.4	2.387	3.3e-002	3.3e-002	5.201e-003
149	2.6	2.587	3.3e-002	3.3e-002	5.201e-003
150	2.8	2.787	2.8e-002	2.8e-002	4.413e-003
151	3.	2.987	2.3e-002	2.3e-002	3.625e-003
152	3.2	3.187	2.3e-002	2.3e-002	3.625e-003
153	3.4	3.387	2.3e-002	2.3e-002	3.625e-003
154	3.6	3.587	2.8e-002	2.8e-002	4.413e-003
155	3.8	3.787	2.8e-002	2.8e-002	4.413e-003
156	4.	3.987	2.8e-002	2.8e-002	4.413e-003
157	4.2	4.187	2.8e-002	2.8e-002	4.413e-003
158	4.4	4.387	2.8e-002	2.8e-002	4.413e-003
159	4.6	4.587	2.3e-002	2.3e-002	3.625e-003
160	4.8	4.787	2.3e-002	2.3e-002	3.625e-003
161	5.	4.987	1.9e-002	1.9e-002	2.994e-003
162	5.2	5.187	1.9e-002	1.9e-002	2.994e-003
163	5.4	5.387	1.9e-002	1.9e-002	2.994e-003
164	5.6	5.587	1.9e-002	1.9e-002	2.994e-003
165	5.8	5.787	1.4e-002	1.4e-002	2.206e-003
166	6.	5.987	1.4e-002	1.4e-002	2.206e-003
167	6.2	6.187	1.4e-002	1.4e-002	2.206e-003
168	6.4	6.387	1.4e-002	1.4e-002	2.206e-003
169	6.6	6.587	1.4e-002	1.4e-002	2.206e-003
170	6.8	6.787	1.4e-002	1.4e-002	2.206e-003
171	7.	6.987	1.4e-002	1.4e-002	2.206e-003
172	7.2	7.187	1.4e-002	1.4e-002	2.206e-003
173	7.4	7.387	9.e-003	9.e-003	1.418e-003
174	7.6	7.587	9.e-003	9.e-003	1.418e-003
175	7.8	7.787	9.e-003	9.e-003	1.418e-003
176	8.	7.987	9.e-003	9.e-003	1.418e-003
177	8.2	8.187	9.e-003	9.e-003	1.418e-003
178	8.4	8.387	9.e-003	9.e-003	1.418e-003
179	8.6	8.587	9.e-003	9.e-003	1.418e-003
180	8.8	8.787	9.e-003	9.e-003	1.418e-003
181	9.	8.987	9.e-003	9.e-003	1.418e-003
182	9.2	9.187	9.e-003	9.e-003	1.418e-003
183	9.4	9.387	9.e-003	9.e-003	1.418e-003
184	9.6	9.587	4.e-003	4.e-003	6.304e-004
185	9.8	9.787	4.e-003	4.e-003	6.304e-004
186	10.	9.987	4.e-003	4.e-003	6.304e-004

PZ-4S Falling Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

PZ-4S



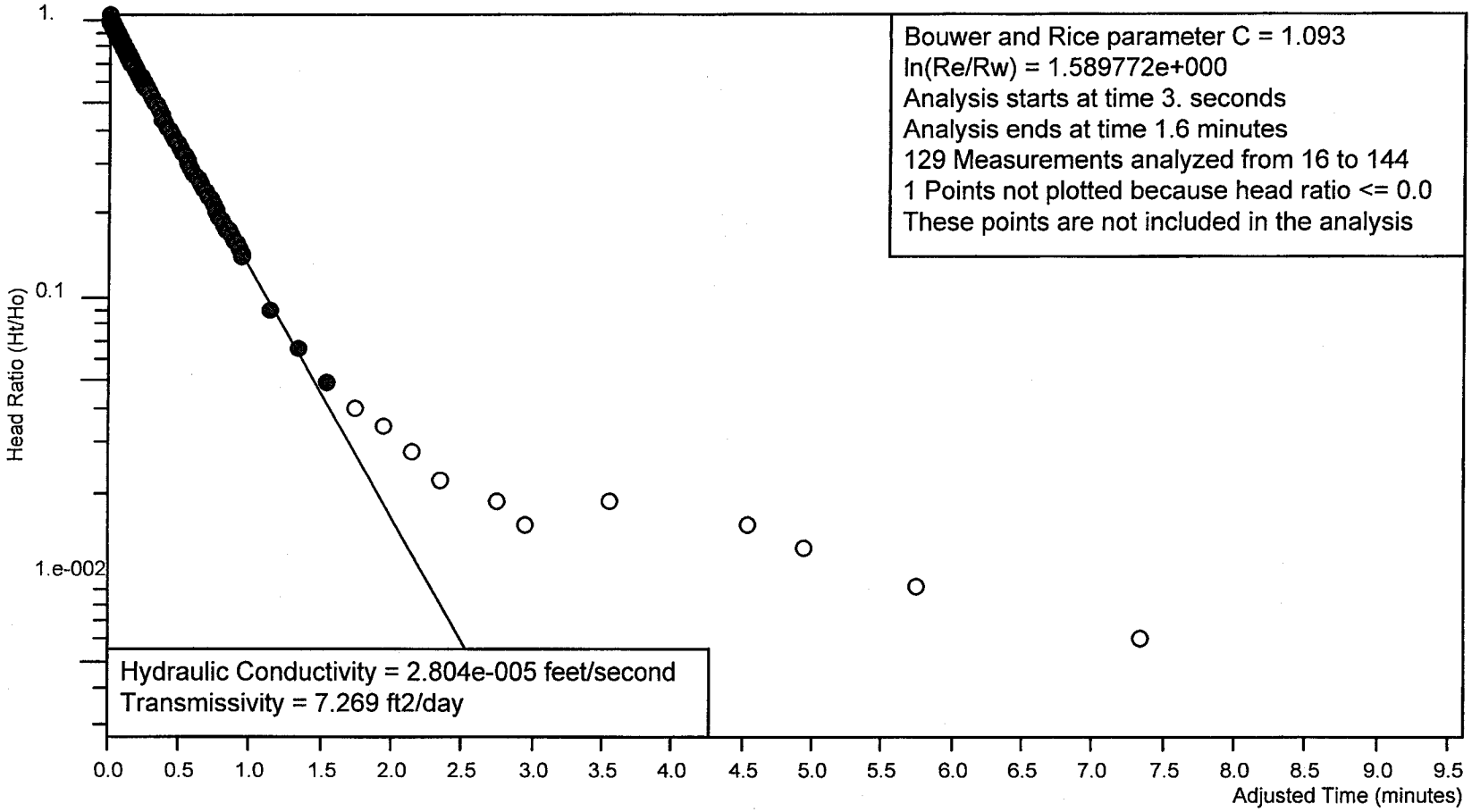
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

PZ-4S Falling Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

PZ-4S



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 1.512 feet at 3. seconds

PZ-4S Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\PZ4SRHN

Well Label:	PZ-4S
Aquifer Thickness:	3. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	6.7 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.2 Seconds

Test starts with trial 6
There are 181 time and drawdown measurements
Maximum head is 3.163 feet
Minimum head is -4.e-003 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.e-002	0.	0.	0.
2	3.3e-003	-1.67e-002	0.	0.	0.
3	6.6e-003	-1.34e-002	4.e-003	-4.e-003	-1.265e-003
4	1.e-002	-1.e-002	4.e-003	-4.e-003	-1.265e-003
5	1.33e-002	-6.7e-003	-4.e-003	4.e-003	1.265e-003
6	1.66e-002	-3.4e-003	-2.397	2.397	0.7578
7	2.e-002	0.	-3.163	3.163	1.
8	2.33e-002	3.3e-003	-0.9	0.9	0.2845
9	2.66e-002	6.6e-003	-1.89	1.89	0.5975
10	3.e-002	1.e-002	-2.046	2.046	0.6469
11	3.33e-002	1.33e-002	-2.368	2.368	0.7487
12	3.66e-002	1.66e-002	-1.904	1.904	0.602
13	4.e-002	2.e-002	-1.795	1.795	0.5675
14	4.33e-002	2.33e-002	-1.776	1.776	0.5615
15	4.66e-002	2.66e-002	-1.748	1.748	0.5526
16	5.e-002	3.e-002	-1.724	1.724	0.5451
17	5.33e-002	3.33e-002	-1.71	1.71	0.5406
18	5.66e-002	3.66e-002	-1.686	1.686	0.533
19	6.e-002	4.e-002	-1.667	1.667	0.527
20	6.33e-002	4.33e-002	-1.658	1.658	0.5242
21	6.66e-002	4.66e-002	-1.644	1.644	0.5198
22	7.e-002	5.e-002	-1.625	1.625	0.5138
23	7.33e-002	5.33e-002	-1.61	1.61	0.509
24	7.66e-002	5.66e-002	-1.596	1.596	0.5046
25	8.e-002	6.e-002	-1.582	1.582	0.5002
26	8.33e-002	6.33e-002	-1.573	1.573	0.4973
27	8.66e-002	6.66e-002	-1.558	1.558	0.4926
28	9.e-002	7.e-002	-1.544	1.544	0.4881
29	9.33e-002	7.33e-002	-1.535	1.535	0.4853
30	9.66e-002	7.66e-002	-1.52	1.52	0.4806
31	0.1	8.e-002	-1.511	1.511	0.4777
32	0.1033	8.33e-002	-1.497	1.497	0.4733
33	0.1066	8.66e-002	-1.487	1.487	0.4701

34	0.11	9.e-002	-1.473	1.473	0.4657
35	0.1133	9.33e-002	-1.464	1.464	0.4629
36	0.1166	9.66e-002	-1.454	1.454	0.4597
37	0.12	0.1	-1.44	1.44	0.4553
38	0.1233	0.1033	-1.43	1.43	0.4521
39	0.1266	0.1066	-1.421	1.421	0.4493
40	0.13	0.11	-1.407	1.407	0.4448
41	0.1333	0.1133	-1.397	1.397	0.4417
42	0.1366	0.1166	-1.388	1.388	0.4388
43	0.14	0.12	-1.378	1.378	0.4357
44	0.1433	0.1233	-1.369	1.369	0.4328
45	0.1466	0.1266	-1.359	1.359	0.4297
46	0.15	0.13	-1.35	1.35	0.4268
47	0.1533	0.1333	-1.336	1.336	0.4224
48	0.1566	0.1366	-1.331	1.331	0.4208
49	0.16	0.14	-1.321	1.321	0.4176
50	0.1633	0.1433	-1.312	1.312	0.4148
51	0.1666	0.1466	-1.303	1.303	0.412
52	0.17	0.15	-1.293	1.293	0.4088
53	0.1733	0.1533	-1.284	1.284	0.4059
54	0.1766	0.1566	-1.274	1.274	0.4028
55	0.18	0.16	-1.265	1.265	0.3999
56	0.1833	0.1633	-1.255	1.255	0.3968
57	0.1866	0.1666	-1.246	1.246	0.3939
58	0.19	0.17	-1.241	1.241	0.3923
59	0.1933	0.1733	-1.231	1.231	0.3892
60	0.1966	0.1766	-1.222	1.222	0.3863
61	0.2	0.18	-1.213	1.213	0.3835
62	0.2033	0.1833	-1.203	1.203	0.3803
63	0.2066	0.1866	-1.198	1.198	0.3788
64	0.21	0.19	-1.189	1.189	0.3759
65	0.2133	0.1933	-1.184	1.184	0.3743
66	0.2166	0.1966	-1.175	1.175	0.3715
67	0.22	0.2	-1.165	1.165	0.3683
68	0.2233	0.2033	-1.156	1.156	0.3655
69	0.2266	0.2066	-1.151	1.151	0.3639
70	0.23	0.21	-1.141	1.141	0.3607
71	0.2333	0.2133	-1.137	1.137	0.3595
72	0.2366	0.2166	-1.127	1.127	0.3563
73	0.24	0.22	-1.123	1.123	0.355
74	0.2433	0.2233	-1.113	1.113	0.3519
75	0.2466	0.2266	-1.108	1.108	0.3503
76	0.25	0.23	-1.099	1.099	0.3475
77	0.2533	0.2333	-1.089	1.089	0.3443
78	0.2566	0.2366	-1.085	1.085	0.343
79	0.26	0.24	-1.075	1.075	0.3399
80	0.2633	0.2433	-1.07	1.07	0.3383
81	0.2666	0.2466	-1.061	1.061	0.3354
82	0.27	0.25	-1.056	1.056	0.3339
83	0.2733	0.2533	-1.047	1.047	0.331
84	0.2766	0.2566	-1.042	1.042	0.3294
85	0.28	0.26	-1.032	1.032	0.3263
86	0.2833	0.2633	-1.028	1.028	0.325
87	0.2866	0.2666	-1.023	1.023	0.3234
88	0.29	0.27	-1.014	1.014	0.3206
89	0.2933	0.2733	-1.009	1.009	0.319
90	0.2966	0.2766	-1.004	1.004	0.3174

91	0.3	0.28	-0.995	0.995	0.3146
92	0.3033	0.2833	-0.99	0.99	0.313
93	0.3066	0.2866	-0.985	0.985	0.3114
94	0.31	0.29	-0.976	0.976	0.3086
95	0.3133	0.2933	-0.971	0.971	0.307
96	0.3166	0.2966	-0.966	0.966	0.3054
97	0.32	0.3	-0.961	0.961	0.3038
98	0.3233	0.3033	-0.952	0.952	0.301
99	0.3266	0.3066	-0.947	0.947	0.2994
100	0.33	0.31	-0.942	0.942	0.2978
101	0.3333	0.3133	-0.938	0.938	0.2966
102	0.35	0.33	-0.909	0.909	0.2874
103	0.3666	0.3466	-0.881	0.881	0.2785
104	0.3833	0.3633	-0.848	0.848	0.2681
105	0.4	0.38	-0.824	0.824	0.2605
106	0.4166	0.3966	-0.8	0.8	0.2529
107	0.4333	0.4133	-0.777	0.777	0.2457
108	0.45	0.43	-0.748	0.748	0.2365
109	0.4666	0.4466	-0.729	0.729	0.2305
110	0.4833	0.4633	-0.71	0.71	0.2245
111	0.5	0.48	-0.687	0.687	0.2172
112	0.5166	0.4966	-0.668	0.668	0.2112
113	0.5333	0.5133	-0.649	0.649	0.2052
114	0.55	0.53	-0.63	0.63	0.1992
115	0.5666	0.5466	-0.616	0.616	0.1948
116	0.5833	0.5633	-0.597	0.597	0.1887
117	0.6	0.58	-0.578	0.578	0.1827
118	0.6166	0.5966	-0.563	0.563	0.178
119	0.6333	0.6133	-0.549	0.549	0.1736
120	0.65	0.63	-0.535	0.535	0.1691
121	0.6666	0.6466	-0.521	0.521	0.1647
122	0.6833	0.6633	-0.507	0.507	0.1603
123	0.7	0.68	-0.492	0.492	0.1555
124	0.7166	0.6966	-0.483	0.483	0.1527
125	0.7333	0.7133	-0.469	0.469	0.1483
126	0.75	0.73	-0.454	0.454	0.1435
127	0.7666	0.7466	-0.445	0.445	0.1407
128	0.7833	0.7633	-0.435	0.435	0.1375
129	0.8	0.78	-0.421	0.421	0.1331
130	0.8166	0.7966	-0.412	0.412	0.1303
131	0.8333	0.8133	-0.402	0.402	0.1271
132	0.85	0.83	-0.393	0.393	0.1242
133	0.8666	0.8466	-0.388	0.388	0.1227
134	0.8833	0.8633	-0.379	0.379	0.1198
135	0.9	0.88	-0.369	0.369	0.1167
136	0.9166	0.8966	-0.36	0.36	0.1138
137	0.9333	0.9133	-0.35	0.35	0.1107
138	0.95	0.93	-0.345	0.345	0.1091
139	0.9666	0.9466	-0.336	0.336	0.1062
140	0.9833	0.9633	-0.326	0.326	0.1031
141	1.	0.98	-0.322	0.322	0.1018
142	1.2	1.18	-0.241	0.241	7.619e-002
143	1.4	1.38	-0.194	0.194	6.133e-002
144	1.6	1.58	-0.156	0.156	4.932e-002
145	1.8	1.78	-0.132	0.132	4.173e-002
146	2.	1.98	-0.113	0.113	3.573e-002
147	2.2	2.18	-0.104	0.104	3.288e-002

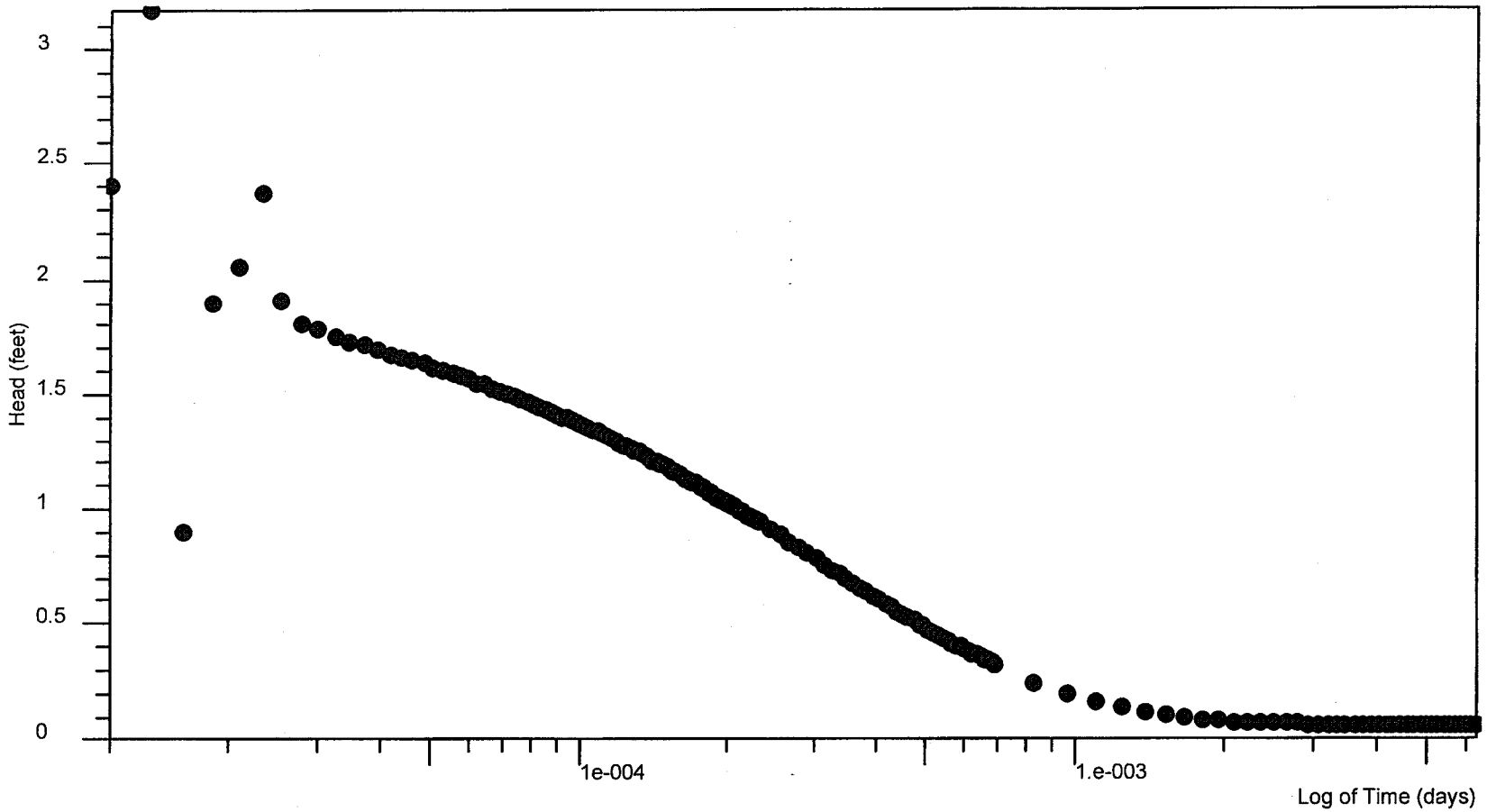
148	2.4	2.38	-9.4e-002	9.4e-002	2.972e-002
149	2.6	2.58	-8.5e-002	8.5e-002	2.687e-002
150	2.8	2.78	-8.e-002	8.e-002	2.529e-002
151	3.	2.98	-7.5e-002	7.5e-002	2.371e-002
152	3.2	3.18	-7.5e-002	7.5e-002	2.371e-002
153	3.4	3.38	-7.1e-002	7.1e-002	2.245e-002
154	3.6	3.58	-7.1e-002	7.1e-002	2.245e-002
155	3.8	3.78	-6.6e-002	6.6e-002	2.087e-002
156	4.	3.98	-6.6e-002	6.6e-002	2.087e-002
157	4.2	4.18	-6.1e-002	6.1e-002	1.929e-002
158	4.4	4.38	-6.1e-002	6.1e-002	1.929e-002
159	4.6	4.58	-6.1e-002	6.1e-002	1.929e-002
160	4.8	4.78	-6.1e-002	6.1e-002	1.929e-002
161	5.	4.98	-6.1e-002	6.1e-002	1.929e-002
162	5.2	5.18	-6.1e-002	6.1e-002	1.929e-002
163	5.4	5.38	-6.1e-002	6.1e-002	1.929e-002
164	5.6	5.58	-6.1e-002	6.1e-002	1.929e-002
165	5.8	5.78	-6.1e-002	6.1e-002	1.929e-002
166	6.	5.98	-6.1e-002	6.1e-002	1.929e-002
167	6.2	6.18	-6.1e-002	6.1e-002	1.929e-002
168	6.4	6.38	-5.6e-002	5.6e-002	1.77e-002
169	6.6	6.58	-5.6e-002	5.6e-002	1.77e-002
170	6.8	6.78	-5.6e-002	5.6e-002	1.77e-002
171	7.	6.98	-5.6e-002	5.6e-002	1.77e-002
172	7.2	7.18	-5.6e-002	5.6e-002	1.77e-002
173	7.4	7.38	-5.6e-002	5.6e-002	1.77e-002
174	7.6	7.58	-5.6e-002	5.6e-002	1.77e-002
175	7.8	7.78	-5.6e-002	5.6e-002	1.77e-002
176	8.	7.98	-5.6e-002	5.6e-002	1.77e-002
177	8.2	8.18	-5.6e-002	5.6e-002	1.77e-002
178	8.4	8.38	-5.6e-002	5.6e-002	1.77e-002
179	8.6	8.58	-5.6e-002	5.6e-002	1.77e-002
180	8.8	8.78	-5.6e-002	5.6e-002	1.77e-002
181	9.	8.98	-5.6e-002	5.6e-002	1.77e-002

PZ-4S Rising Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

PZ-4S



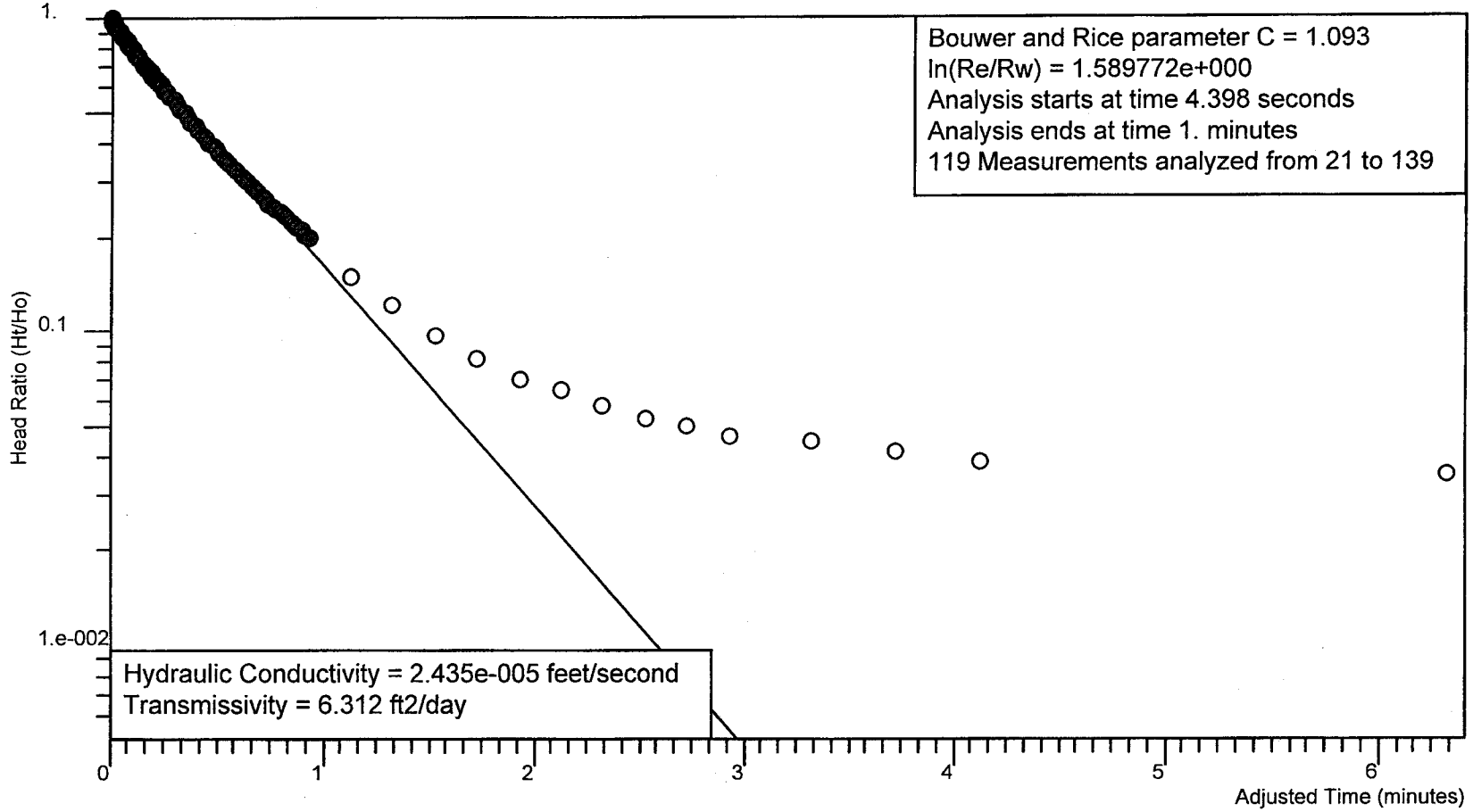
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

PZ-4S Rising Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

PZ-4S



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 1.61 feet at 4.398 seconds

PZ-4D Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\PZ4DFHN

Well Label:	PZ-4D
Aquifer Thickness:	3. feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	42.02 feet
Anisotropy Ratio:	2.
Time Adjustment:	2.196 Seconds

Test starts with trial 11
There are 206 time and drawdown measurements
Maximum head is 9.246 feet
Minimum head is -2.191 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.66e-002	4.7e-002	4.7e-002	5.083e-003
2	3.3e-003	-3.33e-002	4.3e-002	4.3e-002	4.651e-003
3	6.6e-003	-3.e-002	4.3e-002	4.3e-002	4.651e-003
4	1.e-002	-2.66e-002	4.7e-002	4.7e-002	5.083e-003
5	1.33e-002	-2.33e-002	4.3e-002	4.3e-002	4.651e-003
6	1.66e-002	-2.e-002	4.3e-002	4.3e-002	4.651e-003
7	2.e-002	-1.66e-002	4.3e-002	4.3e-002	4.651e-003
8	2.33e-002	-1.33e-002	4.7e-002	4.7e-002	5.083e-003
9	2.66e-002	-1.e-002	5.2e-002	5.2e-002	5.624e-003
10	3.e-002	-6.6e-003	5.7e-002	5.7e-002	6.165e-003
11	3.33e-002	-3.3e-003	7.6e-002	7.6e-002	8.22e-003
12	3.66e-002	0.	9.246	9.246	1.
13	4.e-002	3.4e-003	-2.191	-2.191	-0.237
14	4.33e-002	6.7e-003	6.481	6.481	0.701
15	4.66e-002	1.e-002	5.7e-002	5.7e-002	6.165e-003
16	5.e-002	1.34e-002	4.58	4.58	0.4953
17	5.33e-002	1.67e-002	1.639	1.639	0.1773
18	5.66e-002	2.e-002	3.298	3.298	0.3567
19	6.e-002	2.34e-002	2.542	2.542	0.2749
20	6.33e-002	2.67e-002	3.207	3.207	0.3469
21	6.66e-002	3.e-002	2.509	2.509	0.2714
22	7.e-002	3.34e-002	3.212	3.212	0.3474
23	7.33e-002	3.67e-002	2.657	2.657	0.2874
24	7.66e-002	4.e-002	3.192	3.192	0.3452
25	8.e-002	4.34e-002	2.767	2.767	0.2993
26	8.33e-002	4.67e-002	2.47	2.47	0.2671
27	8.66e-002	5.e-002	1.275	1.275	0.1379
28	9.e-002	5.34e-002	2.054	2.054	0.2222
29	9.33e-002	5.67e-002	2.992	2.992	0.3236
30	9.66e-002	6.e-002	1.983	1.983	0.2145
31	0.1	6.34e-002	2.418	2.418	0.2615
32	0.1033	6.67e-002	2.514	2.514	0.2719
33	0.1066	7.e-002	1.94	1.94	0.2098

34	0.11	7.34e-002	2.533	2.533	0.274
35	0.1133	7.67e-002	2.207	2.207	0.2387
36	0.1166	8.e-002	2.265	2.265	0.245
37	0.12	8.34e-002	2.327	2.327	0.2517
38	0.1233	8.67e-002	2.255	2.255	0.2439
39	0.1266	9.e-002	2.308	2.308	0.2496
40	0.13	9.34e-002	2.274	2.274	0.2459
41	0.1333	9.67e-002	2.294	2.294	0.2481
42	0.1366	0.1	2.294	2.294	0.2481
43	0.14	0.1034	2.294	2.294	0.2481
44	0.1433	0.1067	2.289	2.289	0.2476
45	0.1466	0.11	2.289	2.289	0.2476
46	0.15	0.1134	2.289	2.289	0.2476
47	0.1533	0.1167	2.289	2.289	0.2476
48	0.1566	0.12	2.294	2.294	0.2481
49	0.16	0.1234	2.289	2.289	0.2476
50	0.1633	0.1267	2.289	2.289	0.2476
51	0.1666	0.13	2.289	2.289	0.2476
52	0.17	0.1334	2.289	2.289	0.2476
53	0.1733	0.1367	2.289	2.289	0.2476
54	0.1766	0.14	2.289	2.289	0.2476
55	0.18	0.1434	2.289	2.289	0.2476
56	0.1833	0.1467	2.289	2.289	0.2476
57	0.1866	0.15	2.289	2.289	0.2476
58	0.19	0.1534	2.289	2.289	0.2476
59	0.1933	0.1567	2.289	2.289	0.2476
60	0.1966	0.16	2.289	2.289	0.2476
61	0.2	0.1634	2.289	2.289	0.2476
62	0.2033	0.1667	2.289	2.289	0.2476
63	0.2066	0.17	2.284	2.284	0.247
64	0.21	0.1734	2.289	2.289	0.2476
65	0.2133	0.1767	2.289	2.289	0.2476
66	0.2166	0.18	2.289	2.289	0.2476
67	0.22	0.1834	2.289	2.289	0.2476
68	0.2233	0.1867	2.289	2.289	0.2476
69	0.2266	0.19	2.289	2.289	0.2476
70	0.23	0.1934	2.289	2.289	0.2476
71	0.2333	0.1967	2.289	2.289	0.2476
72	0.2366	0.2	2.289	2.289	0.2476
73	0.24	0.2034	2.289	2.289	0.2476
74	0.2433	0.2067	2.289	2.289	0.2476
75	0.2466	0.21	2.289	2.289	0.2476
76	0.25	0.2134	2.289	2.289	0.2476
77	0.2533	0.2167	2.289	2.289	0.2476
78	0.2566	0.22	2.289	2.289	0.2476
79	0.26	0.2234	2.289	2.289	0.2476
80	0.2633	0.2267	2.289	2.289	0.2476
81	0.2666	0.23	2.289	2.289	0.2476
82	0.27	0.2334	2.289	2.289	0.2476
83	0.2733	0.2367	2.289	2.289	0.2476
84	0.2766	0.24	2.289	2.289	0.2476
85	0.28	0.2434	2.289	2.289	0.2476
86	0.2833	0.2467	2.289	2.289	0.2476
87	0.2866	0.25	2.289	2.289	0.2476
88	0.29	0.2534	2.289	2.289	0.2476
89	0.2933	0.2567	2.289	2.289	0.2476
90	0.2966	0.26	2.289	2.289	0.2476

91	0.3	0.2634	2.289	2.289	0.2476
92	0.3033	0.2667	2.284	2.284	0.247
93	0.3066	0.27	2.289	2.289	0.2476
94	0.31	0.2734	2.284	2.284	0.247
95	0.3133	0.2767	2.289	2.289	0.2476
96	0.3166	0.28	2.284	2.284	0.247
97	0.32	0.2834	2.289	2.289	0.2476
98	0.3233	0.2867	2.284	2.284	0.247
99	0.3266	0.29	2.289	2.289	0.2476
100	0.33	0.2934	2.284	2.284	0.247
101	0.3333	0.2967	2.289	2.289	0.2476
102	0.35	0.3134	2.289	2.289	0.2476
103	0.3666	0.33	2.289	2.289	0.2476
104	0.3833	0.3467	2.284	2.284	0.247
105	0.4	0.3634	2.289	2.289	0.2476
106	0.4166	0.38	2.284	2.284	0.247
107	0.4333	0.3967	2.284	2.284	0.247
108	0.45	0.4134	2.284	2.284	0.247
109	0.4666	0.43	2.284	2.284	0.247
110	0.4833	0.4467	2.284	2.284	0.247
111	0.5	0.4634	2.284	2.284	0.247
112	0.5166	0.48	2.284	2.284	0.247
113	0.5333	0.4967	2.284	2.284	0.247
114	0.55	0.5134	2.284	2.284	0.247
115	0.5666	0.53	2.284	2.284	0.247
116	0.5833	0.5467	2.284	2.284	0.247
117	0.6	0.5634	2.284	2.284	0.247
118	0.6166	0.58	2.279	2.279	0.2465
119	0.6333	0.5967	2.279	2.279	0.2465
120	0.65	0.6134	2.279	2.279	0.2465
121	0.6666	0.63	2.279	2.279	0.2465
122	0.6833	0.6467	2.279	2.279	0.2465
123	0.7	0.6634	2.279	2.279	0.2465
124	0.7166	0.68	2.279	2.279	0.2465
125	0.7333	0.6967	2.279	2.279	0.2465
126	0.75	0.7134	2.279	2.279	0.2465
127	0.7666	0.73	2.274	2.274	0.2459
128	0.7833	0.7467	2.274	2.274	0.2459
129	0.8	0.7634	2.279	2.279	0.2465
130	0.8166	0.78	2.274	2.274	0.2459
131	0.8333	0.7967	2.274	2.274	0.2459
132	0.85	0.8134	2.274	2.274	0.2459
133	0.8666	0.83	2.274	2.274	0.2459
134	0.8833	0.8467	2.274	2.274	0.2459
135	0.9	0.8634	2.274	2.274	0.2459
136	0.9166	0.88	2.274	2.274	0.2459
137	0.9333	0.8967	2.274	2.274	0.2459
138	0.95	0.9134	2.274	2.274	0.2459
139	0.9666	0.93	2.274	2.274	0.2459
140	0.9833	0.9467	2.274	2.274	0.2459
141	1.	0.9634	2.274	2.274	0.2459
142	1.2	1.163	2.27	2.27	0.2455
143	1.4	1.363	2.27	2.27	0.2455
144	1.6	1.563	2.265	2.265	0.245
145	1.8	1.763	2.26	2.26	0.2444
146	2.	1.963	2.26	2.26	0.2444
147	2.2	2.163	2.255	2.255	0.2439

148	2.4	2.363	2.255	2.255	0.2439
149	2.6	2.563	2.25	2.25	0.2433
150	2.8	2.763	2.25	2.25	0.2433
151	3.	2.963	2.246	2.246	0.2429
152	3.2	3.163	2.246	2.246	0.2429
153	3.4	3.363	2.241	2.241	0.2424
154	3.6	3.563	2.241	2.241	0.2424
155	3.8	3.763	2.241	2.241	0.2424
156	4.	3.963	2.236	2.236	0.2418
157	4.2	4.163	2.236	2.236	0.2418
158	4.4	4.363	2.231	2.231	0.2413
159	4.6	4.563	2.231	2.231	0.2413
160	4.8	4.763	2.227	2.227	0.2409
161	5.	4.963	2.227	2.227	0.2409
162	5.2	5.163	2.222	2.222	0.2403
163	5.4	5.363	2.222	2.222	0.2403
164	5.6	5.563	2.222	2.222	0.2403
165	5.8	5.763	2.217	2.217	0.2398
166	6.	5.963	2.217	2.217	0.2398
167	6.2	6.163	2.212	2.212	0.2392
168	6.4	6.363	2.212	2.212	0.2392
169	6.6	6.563	2.212	2.212	0.2392
170	6.8	6.763	2.207	2.207	0.2387
171	7.	6.963	2.207	2.207	0.2387
172	7.2	7.163	2.203	2.203	0.2383
173	7.4	7.363	2.203	2.203	0.2383
174	7.6	7.563	2.198	2.198	0.2377
175	7.8	7.763	2.198	2.198	0.2377
176	8.	7.963	2.198	2.198	0.2377
177	8.2	8.163	2.193	2.193	0.2372
178	8.4	8.363	2.193	2.193	0.2372
179	8.6	8.563	2.193	2.193	0.2372
180	8.8	8.763	2.193	2.193	0.2372
181	9.	8.963	2.189	2.189	0.2368
182	9.2	9.163	2.189	2.189	0.2368
183	9.4	9.363	2.184	2.184	0.2362
184	9.6	9.563	2.184	2.184	0.2362
185	9.8	9.763	2.184	2.184	0.2362
186	10.	9.963	2.179	2.179	0.2357
187	12.	11.96	2.169	2.169	0.2346
188	14.	13.96	2.155	2.155	0.2331
189	16.	15.96	2.141	2.141	0.2316
190	18.	17.96	2.126	2.126	0.2299
191	20.	19.96	2.112	2.112	0.2284
192	22.	21.96	2.102	2.102	0.2273
193	24.	23.96	2.093	2.093	0.2264
194	26.	25.96	2.083	2.083	0.2253
195	28.	27.96	2.073	2.073	0.2242
196	30.	29.96	2.059	2.059	0.2227
197	32.	31.96	2.05	2.05	0.2217
198	34.	33.96	2.04	2.04	0.2206
199	36.	35.96	2.031	2.031	0.2197
200	38.	37.96	2.021	2.021	0.2186
201	40.	39.96	2.011	2.011	0.2175
202	42.	41.96	2.002	2.002	0.2165
203	44.	43.96	1.997	1.997	0.216
204	46.	45.96	1.988	1.988	0.215

PZ-4D Falling Head Test International Paper- Riegelwood Plant

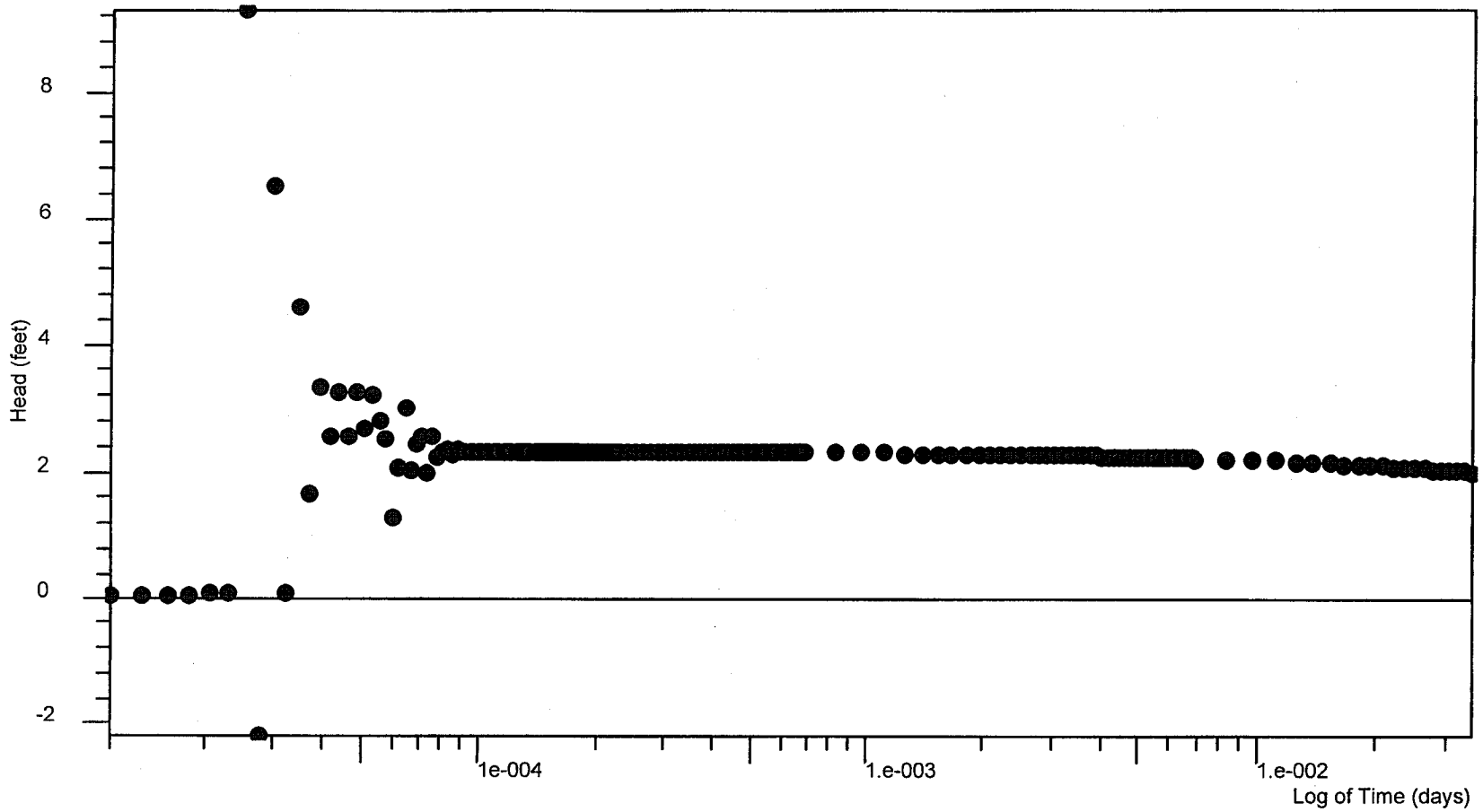
205	48.	47.96	1.978	1.978	0.2139
206	50.	49.96	1.973	1.973	0.2134

PZ-4D Falling Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

PZ-4D



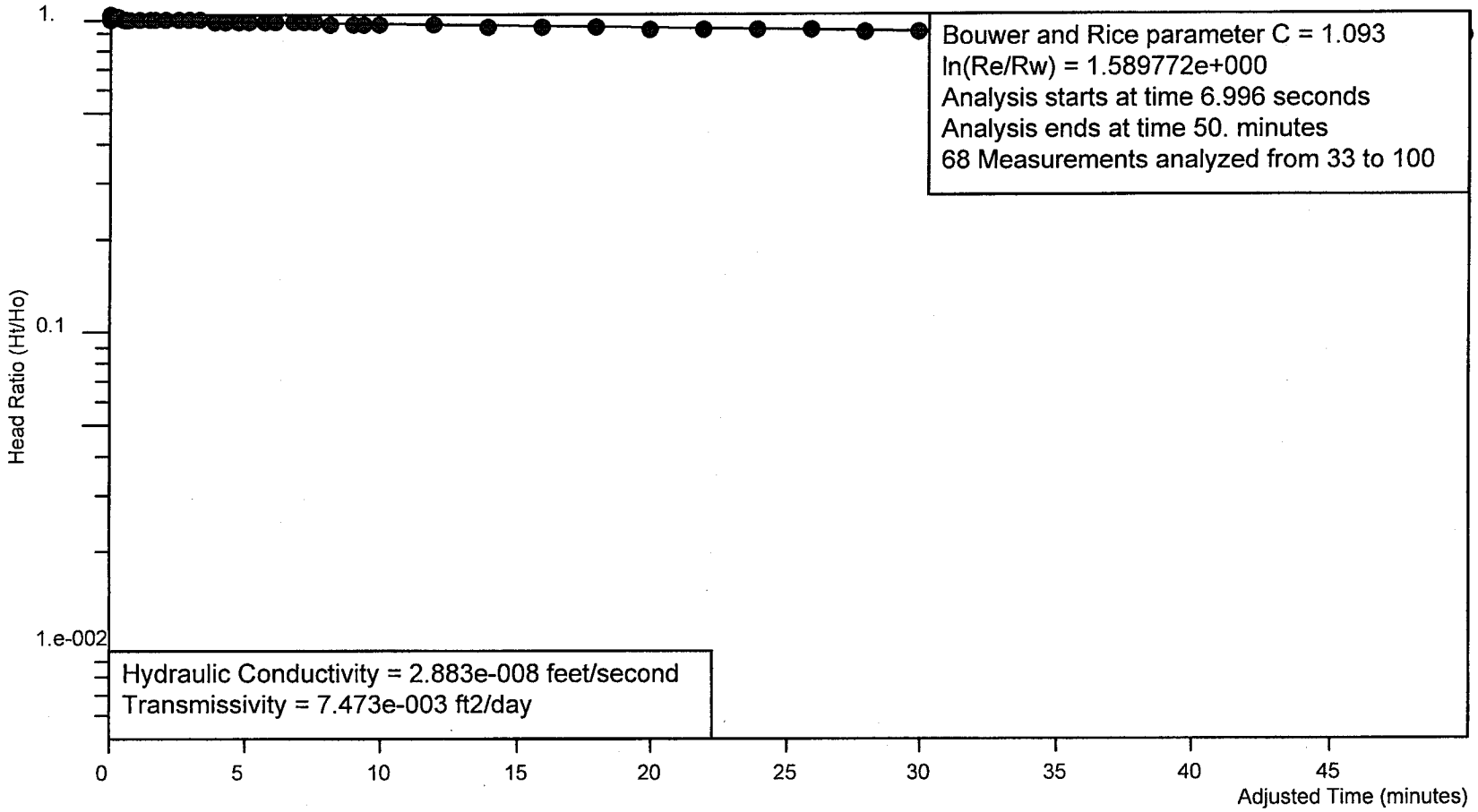
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

PZ-4D Falling Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

PZ-4D



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 2.265 feet at 6.996 seconds

MW-1 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\MW1FHN

Well Label:	MW-1
Aquifer Thickness:	14.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	11.51 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.596 Seconds

Test starts with trial 8
There are 186 time and drawdown measurements
Maximum head is 3.003 feet
Minimum head is -3.8e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.66e-002	4.e-003	4.e-003	1.332e-003
2	3.3e-003	-2.33e-002	9.e-003	9.e-003	2.997e-003
3	6.6e-003	-2.e-002	9.e-003	9.e-003	2.997e-003
4	1.e-002	-1.66e-002	9.e-003	9.e-003	2.997e-003
5	1.33e-002	-1.33e-002	9.e-003	9.e-003	2.997e-003
6	1.66e-002	-1.e-002	9.e-003	9.e-003	2.997e-003
7	2.e-002	-6.6e-003	1.4e-002	1.4e-002	4.662e-003
8	2.33e-002	-3.3e-003	9.e-003	9.e-003	2.997e-003
9	2.66e-002	0.	3.003	3.003	1.
10	3.e-002	3.4e-003	2.894	2.894	0.9637
11	3.33e-002	6.7e-003	2.504	2.504	0.8338
12	3.66e-002	1.e-002	2.694	2.694	0.8971
13	4.e-002	1.34e-002	2.504	2.504	0.8338
14	4.33e-002	1.67e-002	2.442	2.442	0.8132
15	4.66e-002	2.e-002	2.295	2.295	0.7642
16	5.e-002	2.34e-002	2.233	2.233	0.7436
17	5.33e-002	2.67e-002	2.185	2.185	0.7276
18	5.66e-002	3.e-002	1.948	1.948	0.6487
19	6.e-002	3.34e-002	1.748	1.748	0.5821
20	6.33e-002	3.67e-002	1.762	1.762	0.5867
21	6.66e-002	4.e-002	1.857	1.857	0.6184
22	7.e-002	4.34e-002	1.843	1.843	0.6137
23	7.33e-002	4.67e-002	1.81	1.81	0.6027
24	7.66e-002	5.e-002	1.781	1.781	0.5931
25	8.e-002	5.34e-002	1.762	1.762	0.5867
26	8.33e-002	5.67e-002	0.836	0.836	0.2784
27	8.66e-002	6.e-002	0.318	0.318	0.1059
28	9.e-002	6.34e-002	0.456	0.456	0.1518
29	9.33e-002	6.67e-002	0.679	0.679	0.2261
30	9.66e-002	7.e-002	0.703	0.703	0.2341
31	0.1	7.34e-002	0.684	0.684	0.2278
32	0.1033	7.67e-002	0.665	0.665	0.2214
33	0.1066	8.e-002	0.646	0.646	0.2151

34	0.11	8.34e-002	0.631	0.631	0.2101
35	0.1133	8.67e-002	0.617	0.617	0.2055
36	0.1166	9.e-002	0.603	0.603	0.2008
37	0.12	9.34e-002	0.584	0.584	0.1945
38	0.1233	9.67e-002	0.56	0.56	0.1865
39	0.1266	1.e-001	0.536	0.536	0.1785
40	0.13	0.1034	0.541	0.541	0.1802
41	0.1333	0.1067	0.527	0.527	0.1755
42	0.1366	0.11	0.508	0.508	0.1692
43	0.14	0.1134	0.494	0.494	0.1645
44	0.1433	0.1167	0.479	0.479	0.1595
45	0.1466	0.12	0.47	0.47	0.1565
46	0.15	0.1234	0.46	0.46	0.1532
47	0.1533	0.1267	0.446	0.446	0.1485
48	0.1566	0.13	0.437	0.437	0.1455
49	0.16	0.1334	0.427	0.427	0.1422
50	0.1633	0.1367	0.418	0.418	0.1392
51	0.1666	0.14	0.408	0.408	0.1359
52	0.17	0.1434	0.399	0.399	0.1329
53	0.1733	0.1467	0.389	0.389	0.1295
54	0.1766	0.15	0.38	0.38	0.1265
55	0.18	0.1534	0.37	0.37	0.1232
56	0.1833	0.1567	0.361	0.361	0.1202
57	0.1866	0.16	0.356	0.356	0.1185
58	0.19	0.1634	0.346	0.346	0.1152
59	0.1933	0.1667	0.337	0.337	0.1122
60	0.1966	0.17	0.332	0.332	0.1106
61	0.2	0.1734	0.323	0.323	0.1076
62	0.2033	0.1767	0.318	0.318	0.1059
63	0.2066	0.18	0.313	0.313	0.1042
64	0.21	0.1834	0.304	0.304	0.1012
65	0.2133	0.1867	0.299	0.299	9.957e-002
66	0.2166	0.19	0.289	0.289	9.624e-002
67	0.22	0.1934	0.28	0.28	9.324e-002
68	0.2233	0.1967	0.275	0.275	9.158e-002
69	0.2266	0.2	0.27	0.27	8.991e-002
70	0.23	0.2034	0.266	0.266	8.858e-002
71	0.2333	0.2067	0.261	0.261	8.691e-002
72	0.2366	0.21	0.251	0.251	8.358e-002
73	0.24	0.2134	0.247	0.247	8.225e-002
74	0.2433	0.2167	0.242	0.242	8.059e-002
75	0.2466	0.22	0.237	0.237	7.892e-002
76	0.25	0.2234	0.232	0.232	7.726e-002
77	0.2533	0.2267	0.228	0.228	7.592e-002
78	0.2566	0.23	0.223	0.223	7.426e-002
79	0.26	0.2334	0.218	0.218	7.259e-002
80	0.2633	0.2367	0.213	0.213	7.093e-002
81	0.2666	0.24	0.209	0.209	6.96e-002
82	0.27	0.2434	0.209	0.209	6.96e-002
83	0.2733	0.2467	0.204	0.204	6.793e-002
84	0.2766	0.25	0.199	0.199	6.627e-002
85	0.28	0.2534	0.194	0.194	6.46e-002
86	0.2833	0.2567	0.194	0.194	6.46e-002
87	0.2866	0.26	0.19	0.19	6.327e-002
88	0.29	0.2634	0.185	0.185	6.161e-002
89	0.2933	0.2667	0.185	0.185	6.161e-002
90	0.2966	0.27	0.18	0.18	5.994e-002

91	0.3	0.2734	0.175	0.175	5.828e-002
92	0.3033	0.2767	0.175	0.175	5.828e-002
93	0.3066	0.28	0.171	0.171	5.694e-002
94	0.31	0.2834	0.171	0.171	5.694e-002
95	0.3133	0.2867	0.166	0.166	5.528e-002
96	0.3166	0.29	0.161	0.161	5.361e-002
97	0.32	0.2934	0.161	0.161	5.361e-002
98	0.3233	0.2967	0.156	0.156	5.195e-002
99	0.3266	0.3	0.156	0.156	5.195e-002
100	0.33	0.3034	0.156	0.156	5.195e-002
101	0.3333	0.3067	0.152	0.152	5.062e-002
102	0.35	0.3234	0.137	0.137	4.562e-002
103	0.3666	0.34	0.128	0.128	4.262e-002
104	0.3833	0.3567	0.118	0.118	3.929e-002
105	0.4	0.3734	0.109	0.109	3.63e-002
106	0.4166	0.39	0.104	0.104	3.463e-002
107	0.4333	0.4067	9.5e-002	9.5e-002	3.164e-002
108	0.45	0.4234	9.e-002	9.e-002	2.997e-002
109	0.4666	0.44	8.5e-002	8.5e-002	2.831e-002
110	0.4833	0.4567	8.e-002	8.e-002	2.664e-002
111	0.5	0.4734	7.6e-002	7.6e-002	2.531e-002
112	0.5166	0.49	7.1e-002	7.1e-002	2.364e-002
113	0.5333	0.5067	7.1e-002	7.1e-002	2.364e-002
114	0.55	0.5234	6.6e-002	6.6e-002	2.198e-002
115	0.5666	0.54	6.1e-002	6.1e-002	2.031e-002
116	0.5833	0.5567	6.1e-002	6.1e-002	2.031e-002
117	0.6	0.5734	5.7e-002	5.7e-002	1.898e-002
118	0.6166	0.59	5.2e-002	5.2e-002	1.732e-002
119	0.6333	0.6067	5.2e-002	5.2e-002	1.732e-002
120	0.65	0.6234	4.7e-002	4.7e-002	1.565e-002
121	0.6666	0.64	4.2e-002	4.2e-002	1.399e-002
122	0.6833	0.6567	3.8e-002	3.8e-002	1.265e-002
123	0.7	0.6734	3.8e-002	3.8e-002	1.265e-002
124	0.7166	0.69	3.3e-002	3.3e-002	1.099e-002
125	0.7333	0.7067	3.3e-002	3.3e-002	1.099e-002
126	0.75	0.7234	3.3e-002	3.3e-002	1.099e-002
127	0.7666	0.74	2.8e-002	2.8e-002	9.324e-003
128	0.7833	0.7567	2.8e-002	2.8e-002	9.324e-003
129	0.8	0.7734	2.3e-002	2.3e-002	7.659e-003
130	0.8166	0.79	2.3e-002	2.3e-002	7.659e-003
131	0.8333	0.8067	2.3e-002	2.3e-002	7.659e-003
132	0.85	0.8234	2.3e-002	2.3e-002	7.659e-003
133	0.8666	0.84	2.3e-002	2.3e-002	7.659e-003
134	0.8833	0.8567	2.3e-002	2.3e-002	7.659e-003
135	0.9	0.8734	2.3e-002	2.3e-002	7.659e-003
136	0.9166	0.89	1.9e-002	1.9e-002	6.327e-003
137	0.9333	0.9067	2.3e-002	2.3e-002	7.659e-003
138	0.95	0.9234	1.9e-002	1.9e-002	6.327e-003
139	0.9666	0.94	1.9e-002	1.9e-002	6.327e-003
140	0.9833	0.9567	1.9e-002	1.9e-002	6.327e-003
141	1.	0.9734	1.9e-002	1.9e-002	6.327e-003
142	1.2	1.173	1.4e-002	1.4e-002	4.662e-003
143	1.4	1.373	9.e-003	9.e-003	2.997e-003
144	1.6	1.573	4.e-003	4.e-003	1.332e-003
145	1.8	1.773	0.	0.	0.
146	2.	1.973	0.	0.	0.
147	2.2	2.173	-4.e-003	-4.e-003	-1.332e-003

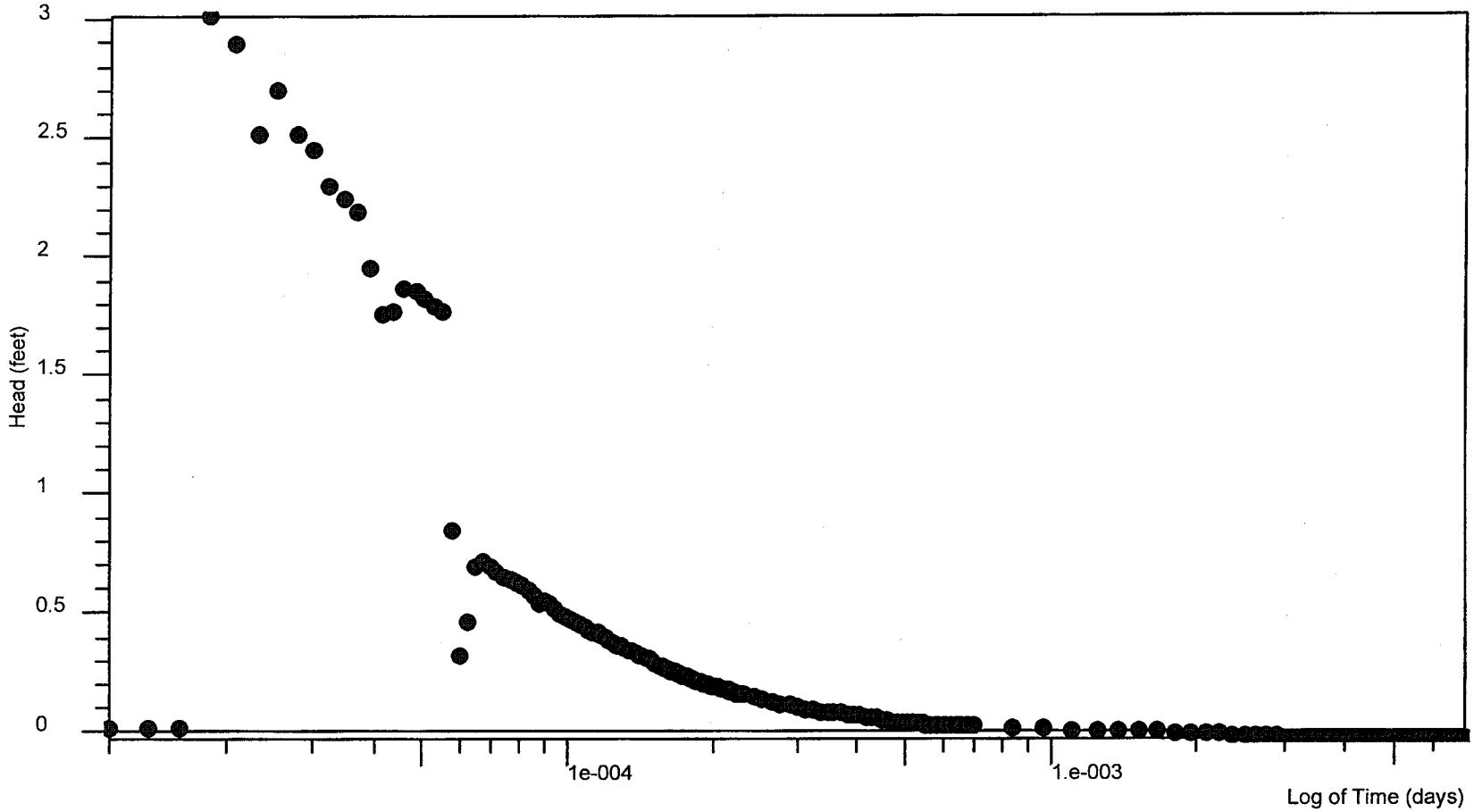
148	2.4	2.373	-4.e-003	-4.e-003	-1.332e-003
149	2.6	2.573	-9.e-003	-9.e-003	-2.997e-003
150	2.8	2.773	-9.e-003	-9.e-003	-2.997e-003
151	3.	2.973	-1.4e-002	-1.4e-002	-4.662e-003
152	3.2	3.173	-1.4e-002	-1.4e-002	-4.662e-003
153	3.4	3.373	-1.9e-002	-1.9e-002	-6.327e-003
154	3.6	3.573	-2.3e-002	-2.3e-002	-7.659e-003
155	3.8	3.773	-2.3e-002	-2.3e-002	-7.659e-003
156	4.	3.973	-2.3e-002	-2.3e-002	-7.659e-003
157	4.2	4.173	-2.3e-002	-2.3e-002	-7.659e-003
158	4.4	4.373	-2.8e-002	-2.8e-002	-9.324e-003
159	4.6	4.573	-2.8e-002	-2.8e-002	-9.324e-003
160	4.8	4.773	-2.8e-002	-2.8e-002	-9.324e-003
161	5.	4.973	-2.8e-002	-2.8e-002	-9.324e-003
162	5.2	5.173	-2.8e-002	-2.8e-002	-9.324e-003
163	5.4	5.373	-2.8e-002	-2.8e-002	-9.324e-003
164	5.6	5.573	-2.8e-002	-2.8e-002	-9.324e-003
165	5.8	5.773	-2.8e-002	-2.8e-002	-9.324e-003
166	6.	5.973	-2.8e-002	-2.8e-002	-9.324e-003
167	6.2	6.173	-2.8e-002	-2.8e-002	-9.324e-003
168	6.4	6.373	-2.8e-002	-2.8e-002	-9.324e-003
169	6.6	6.573	-3.3e-002	-3.3e-002	-1.099e-002
170	6.8	6.773	-3.3e-002	-3.3e-002	-1.099e-002
171	7.	6.973	-3.3e-002	-3.3e-002	-1.099e-002
172	7.2	7.173	-3.3e-002	-3.3e-002	-1.099e-002
173	7.4	7.373	-3.3e-002	-3.3e-002	-1.099e-002
174	7.6	7.573	-3.3e-002	-3.3e-002	-1.099e-002
175	7.8	7.773	-3.3e-002	-3.3e-002	-1.099e-002
176	8.	7.973	-3.3e-002	-3.3e-002	-1.099e-002
177	8.2	8.173	-3.3e-002	-3.3e-002	-1.099e-002
178	8.4	8.373	-3.3e-002	-3.3e-002	-1.099e-002
179	8.6	8.573	-3.3e-002	-3.3e-002	-1.099e-002
180	8.8	8.773	-3.3e-002	-3.3e-002	-1.099e-002
181	9.	8.973	-3.3e-002	-3.3e-002	-1.099e-002
182	9.2	9.173	-3.3e-002	-3.3e-002	-1.099e-002
183	9.4	9.373	-3.8e-002	-3.8e-002	-1.265e-002
184	9.6	9.573	-3.3e-002	-3.3e-002	-1.099e-002
185	9.8	9.773	-3.3e-002	-3.3e-002	-1.099e-002
186	10.	9.973	-3.8e-002	-3.8e-002	-1.265e-002

MW-1 Falling Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-1



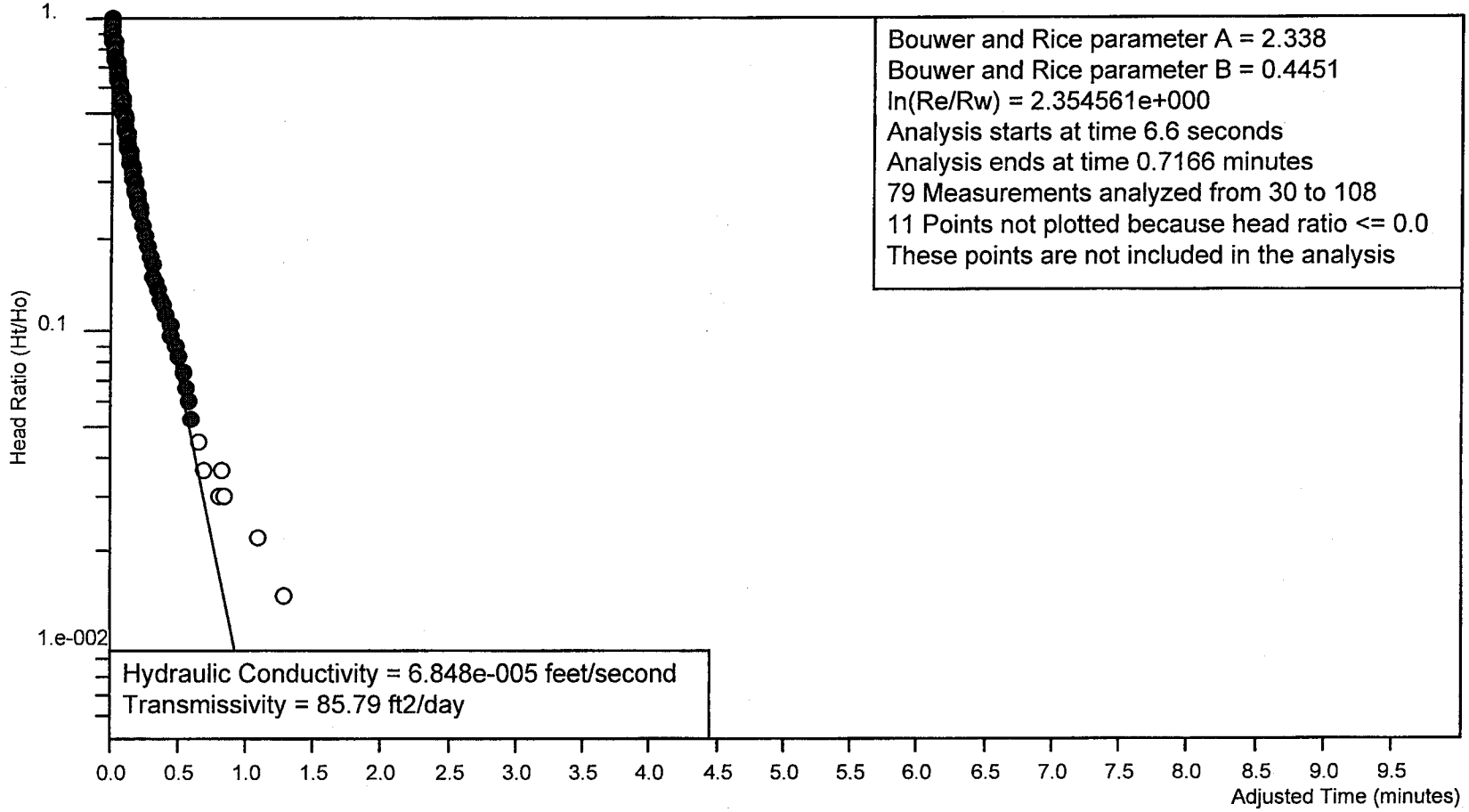
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

MW-1 Falling Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-1



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.631 feet at 6.6 seconds

MW-1 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\MW1RH

Well Label:	MW-1
Aquifer Thickness:	14.5 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	11.51 feet
Anisotropy Ratio:	2.
Time Adjustment:	6.396 Seconds

Test starts with trial 32
There are 187 time and drawdown measurements
Maximum head is 3.886 feet
Minimum head is -5.2e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-0.1066	0.	0.	0.
2	3.3e-003	-0.1033	0.	0.	0.
3	6.6e-003	-0.1	0.	0.	0.
4	1.e-002	-9.66e-002	0.	0.	0.
5	1.33e-002	-9.33e-002	0.	0.	0.
6	1.66e-002	-9.e-002	0.	0.	0.
7	2.e-002	-8.66e-002	0.	0.	0.
8	2.33e-002	-8.33e-002	0.	0.	0.
9	2.66e-002	-8.e-002	0.	0.	0.
10	3.e-002	-7.66e-002	0.	0.	0.
11	3.33e-002	-7.33e-002	0.	0.	0.
12	3.66e-002	-7.e-002	0.	0.	0.
13	4.e-002	-6.66e-002	0.	0.	0.
14	4.33e-002	-6.33e-002	0.	0.	0.
15	4.66e-002	-6.e-002	0.	0.	0.
16	5.e-002	-5.66e-002	0.	0.	0.
17	5.33e-002	-5.33e-002	0.	0.	0.
18	5.66e-002	-5.e-002	0.	0.	0.
19	6.e-002	-4.66e-002	0.	0.	0.
20	6.33e-002	-4.33e-002	0.	0.	0.
21	6.66e-002	-4.e-002	0.	0.	0.
22	7.e-002	-3.66e-002	0.	0.	0.
23	7.33e-002	-3.33e-002	0.	0.	0.
24	7.66e-002	-3.e-002	0.	0.	0.
25	8.e-002	-2.66e-002	0.	0.	0.
26	8.33e-002	-2.33e-002	4.e-003	-4.e-003	-1.029e-003
27	8.66e-002	-2.e-002	0.	0.	0.
28	9.e-002	-1.66e-002	0.	0.	0.
29	9.33e-002	-1.33e-002	4.e-003	-4.e-003	-1.029e-003
30	9.66e-002	-1.e-002	0.	0.	0.
31	0.1	-6.6e-003	-0.209	0.209	5.378e-002
32	0.1033	-3.3e-003	-2.406	2.406	0.6191
33	0.1066	0.	-3.886	3.886	1.

34	0.11	3.4e-003	-3.739	3.739	0.9622
35	0.1133	6.7e-003	-2.871	2.871	0.7388
36	0.1166	1.e-002	-3.018	3.018	0.7766
37	0.12	1.34e-002	-2.994	2.994	0.7705
38	0.1233	1.67e-002	-2.269	2.269	0.5839
39	0.1266	2.e-002	-0.417	0.417	0.1073
40	0.13	2.34e-002	-1.234	1.234	0.3176
41	0.1333	2.67e-002	-2.164	2.164	0.5569
42	0.1366	3.e-002	-1.571	1.571	0.4043
43	0.14	3.34e-002	-1.182	1.182	0.3042
44	0.1433	3.67e-002	-1.106	1.106	0.2846
45	0.1466	4.e-002	-1.096	1.096	0.282
46	0.15	4.34e-002	-1.063	1.063	0.2735
47	0.1533	4.67e-002	-1.016	1.016	0.2615
48	0.1566	5.e-002	-0.973	0.973	0.2504
49	0.16	5.34e-002	-0.935	0.935	0.2406
50	0.1633	5.67e-002	-0.906	0.906	0.2331
51	0.1666	6.e-002	-0.878	0.878	0.2259
52	0.17	6.34e-002	-0.845	0.845	0.2174
53	0.1733	6.67e-002	-0.807	0.807	0.2077
54	0.1766	7.e-002	-0.778	0.778	0.2002
55	0.18	7.34e-002	-0.755	0.755	0.1943
56	0.1833	7.67e-002	-0.731	0.731	0.1881
57	0.1866	8.e-002	-0.707	0.707	0.1819
58	0.19	8.34e-002	-0.683	0.683	0.1758
59	0.1933	8.67e-002	-0.655	0.655	0.1686
60	0.1966	9.e-002	-0.636	0.636	0.1637
61	0.2	9.34e-002	-0.617	0.617	0.1588
62	0.2033	9.67e-002	-0.598	0.598	0.1539
63	0.2066	0.1	-0.579	0.579	0.149
64	0.21	0.1034	-0.555	0.555	0.1428
65	0.2133	0.1067	-0.536	0.536	0.1379
66	0.2166	0.11	-0.522	0.522	0.1343
67	0.22	0.1134	-0.508	0.508	0.1307
68	0.2233	0.1167	-0.493	0.493	0.1269
69	0.2266	0.12	-0.479	0.479	0.1233
70	0.23	0.1234	-0.465	0.465	0.1197
71	0.2333	0.1267	-0.451	0.451	0.1161
72	0.2366	0.13	-0.436	0.436	0.1122
73	0.24	0.1334	-0.422	0.422	0.1086
74	0.2433	0.1367	-0.408	0.408	0.105
75	0.2466	0.14	-0.394	0.394	0.1014
76	0.25	0.1434	-0.384	0.384	9.882e-002
77	0.2533	0.1467	-0.37	0.37	9.521e-002
78	0.2566	0.15	-0.36	0.36	9.264e-002
79	0.26	0.1534	-0.346	0.346	8.904e-002
80	0.2633	0.1567	-0.337	0.337	8.672e-002
81	0.2666	0.16	-0.327	0.327	8.415e-002
82	0.27	0.1634	-0.318	0.318	8.183e-002
83	0.2733	0.1667	-0.308	0.308	7.926e-002
84	0.2766	0.17	-0.299	0.299	7.694e-002
85	0.28	0.1734	-0.289	0.289	7.437e-002
86	0.2833	0.1767	-0.28	0.28	7.205e-002
87	0.2866	0.18	-0.27	0.27	6.948e-002
88	0.29	0.1834	-0.261	0.261	6.716e-002
89	0.2933	0.1867	-0.256	0.256	6.588e-002
90	0.2966	0.19	-0.246	0.246	6.33e-002

91	0.3	0.1934	-0.237	0.237	6.099e-002
92	0.3033	0.1967	-0.232	0.232	5.97e-002
93	0.3066	0.2	-0.223	0.223	5.739e-002
94	0.31	0.2034	-0.218	0.218	5.61e-002
95	0.3133	0.2067	-0.209	0.209	5.378e-002
96	0.3166	0.21	-0.204	0.204	5.25e-002
97	0.32	0.2134	-0.199	0.199	5.121e-002
98	0.3233	0.2167	-0.189	0.189	4.864e-002
99	0.3266	0.22	-0.185	0.185	4.761e-002
100	0.33	0.2234	-0.175	0.175	4.503e-002
101	0.3333	0.2267	-0.171	0.171	4.4e-002
102	0.35	0.2434	-0.142	0.142	3.654e-002
103	0.3666	0.26	-0.118	0.118	3.037e-002
104	0.3833	0.2767	-9.5e-002	9.5e-002	2.445e-002
105	0.4	0.2934	-8.e-002	8.e-002	2.059e-002
106	0.4166	0.31	-6.1e-002	6.1e-002	1.57e-002
107	0.4333	0.3267	-5.2e-002	5.2e-002	1.338e-002
108	0.45	0.3434	-3.8e-002	3.8e-002	9.779e-003
109	0.4666	0.36	-2.8e-002	2.8e-002	7.205e-003
110	0.4833	0.3767	-1.9e-002	1.9e-002	4.889e-003
111	0.5	0.3934	-1.4e-002	1.4e-002	3.603e-003
112	0.5166	0.41	-4.e-003	4.e-003	1.029e-003
113	0.5333	0.4267	0.	0.	0.
114	0.55	0.4434	4.e-003	-4.e-003	-1.029e-003
115	0.5666	0.46	9.e-003	-9.e-003	-2.316e-003
116	0.5833	0.4767	1.4e-002	-1.4e-002	-3.603e-003
117	0.6	0.4934	1.9e-002	-1.9e-002	-4.889e-003
118	0.6166	0.51	2.3e-002	-2.3e-002	-5.919e-003
119	0.6333	0.5267	2.3e-002	-2.3e-002	-5.919e-003
120	0.65	0.5434	2.8e-002	-2.8e-002	-7.205e-003
121	0.6666	0.56	2.8e-002	-2.8e-002	-7.205e-003
122	0.6833	0.5767	2.8e-002	-2.8e-002	-7.205e-003
123	0.7	0.5934	3.3e-002	-3.3e-002	-8.492e-003
124	0.7166	0.61	3.3e-002	-3.3e-002	-8.492e-003
125	0.7333	0.6267	3.8e-002	-3.8e-002	-9.779e-003
126	0.75	0.6434	3.8e-002	-3.8e-002	-9.779e-003
127	0.7666	0.66	3.8e-002	-3.8e-002	-9.779e-003
128	0.7833	0.6767	3.8e-002	-3.8e-002	-9.779e-003
129	0.8	0.6934	3.8e-002	-3.8e-002	-9.779e-003
130	0.8166	0.71	3.8e-002	-3.8e-002	-9.779e-003
131	0.8333	0.7267	4.2e-002	-4.2e-002	-1.081e-002
132	0.85	0.7434	4.2e-002	-4.2e-002	-1.081e-002
133	0.8666	0.76	4.2e-002	-4.2e-002	-1.081e-002
134	0.8833	0.7767	4.2e-002	-4.2e-002	-1.081e-002
135	0.9	0.7934	4.2e-002	-4.2e-002	-1.081e-002
136	0.9166	0.81	4.7e-002	-4.7e-002	-1.209e-002
137	0.9333	0.8267	4.7e-002	-4.7e-002	-1.209e-002
138	0.95	0.8434	4.7e-002	-4.7e-002	-1.209e-002
139	0.9666	0.86	4.7e-002	-4.7e-002	-1.209e-002
140	0.9833	0.8767	4.7e-002	-4.7e-002	-1.209e-002
141	1.	0.8934	4.7e-002	-4.7e-002	-1.209e-002
142	1.2	1.093	5.2e-002	-5.2e-002	-1.338e-002
143	1.4	1.293	5.2e-002	-5.2e-002	-1.338e-002
144	1.6	1.493	5.2e-002	-5.2e-002	-1.338e-002
145	1.8	1.693	5.2e-002	-5.2e-002	-1.338e-002
146	2.	1.893	5.2e-002	-5.2e-002	-1.338e-002
147	2.2	2.093	4.7e-002	-4.7e-002	-1.209e-002

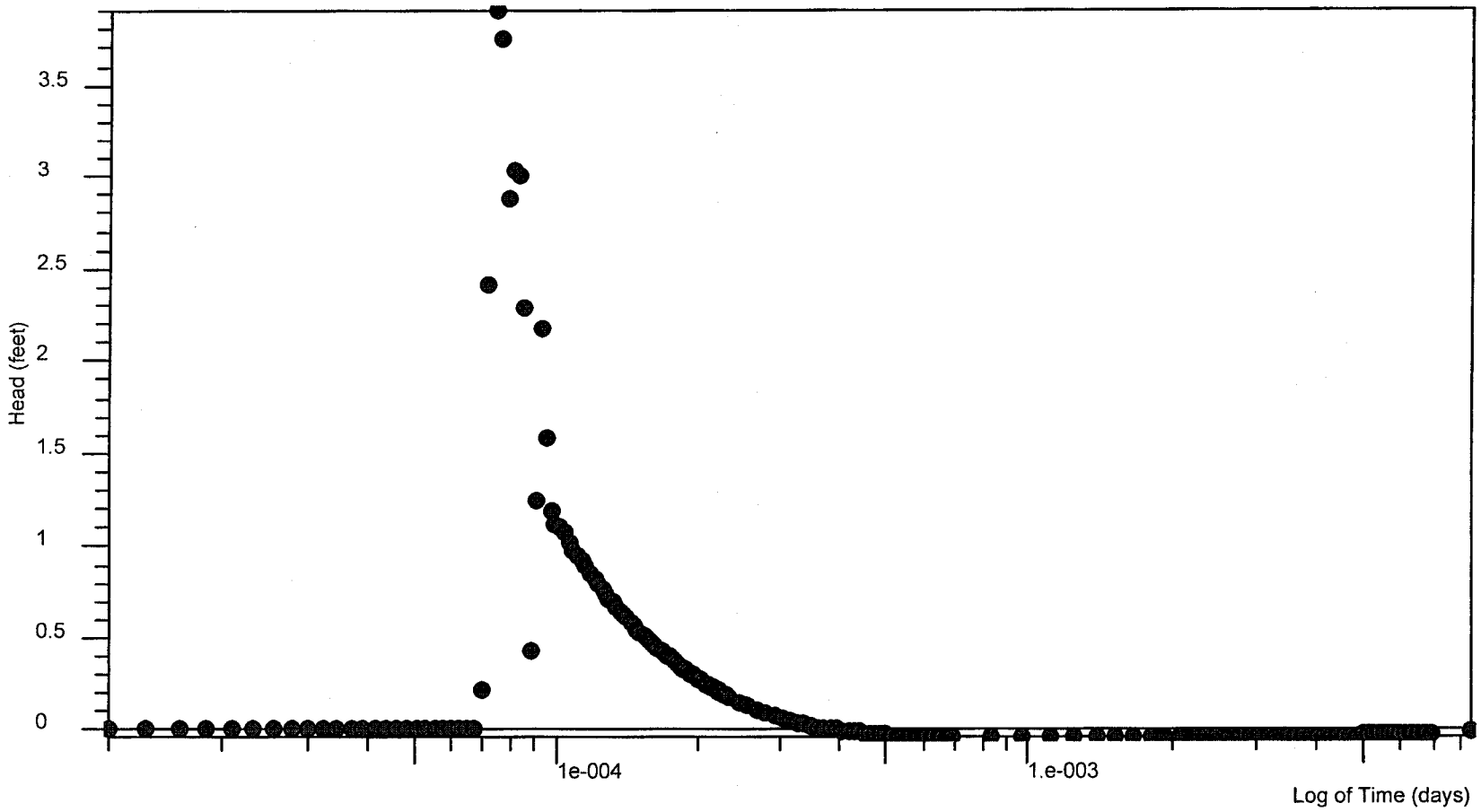
148	2.4	2.293	5.2e-002	-5.2e-002	-1.338e-002
149	2.6	2.493	4.7e-002	-4.7e-002	-1.209e-002
150	2.8	2.693	4.7e-002	-4.7e-002	-1.209e-002
151	3.	2.893	4.7e-002	-4.7e-002	-1.209e-002
152	3.2	3.093	4.7e-002	-4.7e-002	-1.209e-002
153	3.4	3.293	4.7e-002	-4.7e-002	-1.209e-002
154	3.6	3.493	4.7e-002	-4.7e-002	-1.209e-002
155	3.8	3.693	4.7e-002	-4.7e-002	-1.209e-002
156	4.	3.893	4.2e-002	-4.2e-002	-1.081e-002
157	4.2	4.093	4.2e-002	-4.2e-002	-1.081e-002
158	4.4	4.293	4.2e-002	-4.2e-002	-1.081e-002
159	4.6	4.493	4.2e-002	-4.2e-002	-1.081e-002
160	4.8	4.693	4.2e-002	-4.2e-002	-1.081e-002
161	5.	4.893	4.2e-002	-4.2e-002	-1.081e-002
162	5.2	5.093	4.2e-002	-4.2e-002	-1.081e-002
163	5.4	5.293	4.2e-002	-4.2e-002	-1.081e-002
164	5.6	5.493	4.2e-002	-4.2e-002	-1.081e-002
165	5.8	5.693	3.8e-002	-3.8e-002	-9.779e-003
166	6.	5.893	3.8e-002	-3.8e-002	-9.779e-003
167	6.2	6.093	3.8e-002	-3.8e-002	-9.779e-003
168	6.4	6.293	3.8e-002	-3.8e-002	-9.779e-003
169	6.6	6.493	3.8e-002	-3.8e-002	-9.779e-003
170	6.8	6.693	3.8e-002	-3.8e-002	-9.779e-003
171	7.	6.893	3.8e-002	-3.8e-002	-9.779e-003
172	7.2	7.093	3.3e-002	-3.3e-002	-8.492e-003
173	7.4	7.293	3.3e-002	-3.3e-002	-8.492e-003
174	7.6	7.493	3.3e-002	-3.3e-002	-8.492e-003
175	7.8	7.693	3.3e-002	-3.3e-002	-8.492e-003
176	8.	7.893	3.3e-002	-3.3e-002	-8.492e-003
177	8.2	8.093	3.3e-002	-3.3e-002	-8.492e-003
178	8.4	8.293	3.3e-002	-3.3e-002	-8.492e-003
179	8.6	8.493	3.3e-002	-3.3e-002	-8.492e-003
180	8.8	8.693	2.8e-002	-2.8e-002	-7.205e-003
181	9.	8.893	2.8e-002	-2.8e-002	-7.205e-003
182	9.2	9.093	2.8e-002	-2.8e-002	-7.205e-003
183	9.4	9.293	2.8e-002	-2.8e-002	-7.205e-003
184	9.6	9.493	2.8e-002	-2.8e-002	-7.205e-003
185	9.8	9.693	2.8e-002	-2.8e-002	-7.205e-003
186	10.	9.893	2.8e-002	-2.8e-002	-7.205e-003
187	12.	11.89	2.3e-002	-2.3e-002	-5.919e-003

MW-1 Rising Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-1



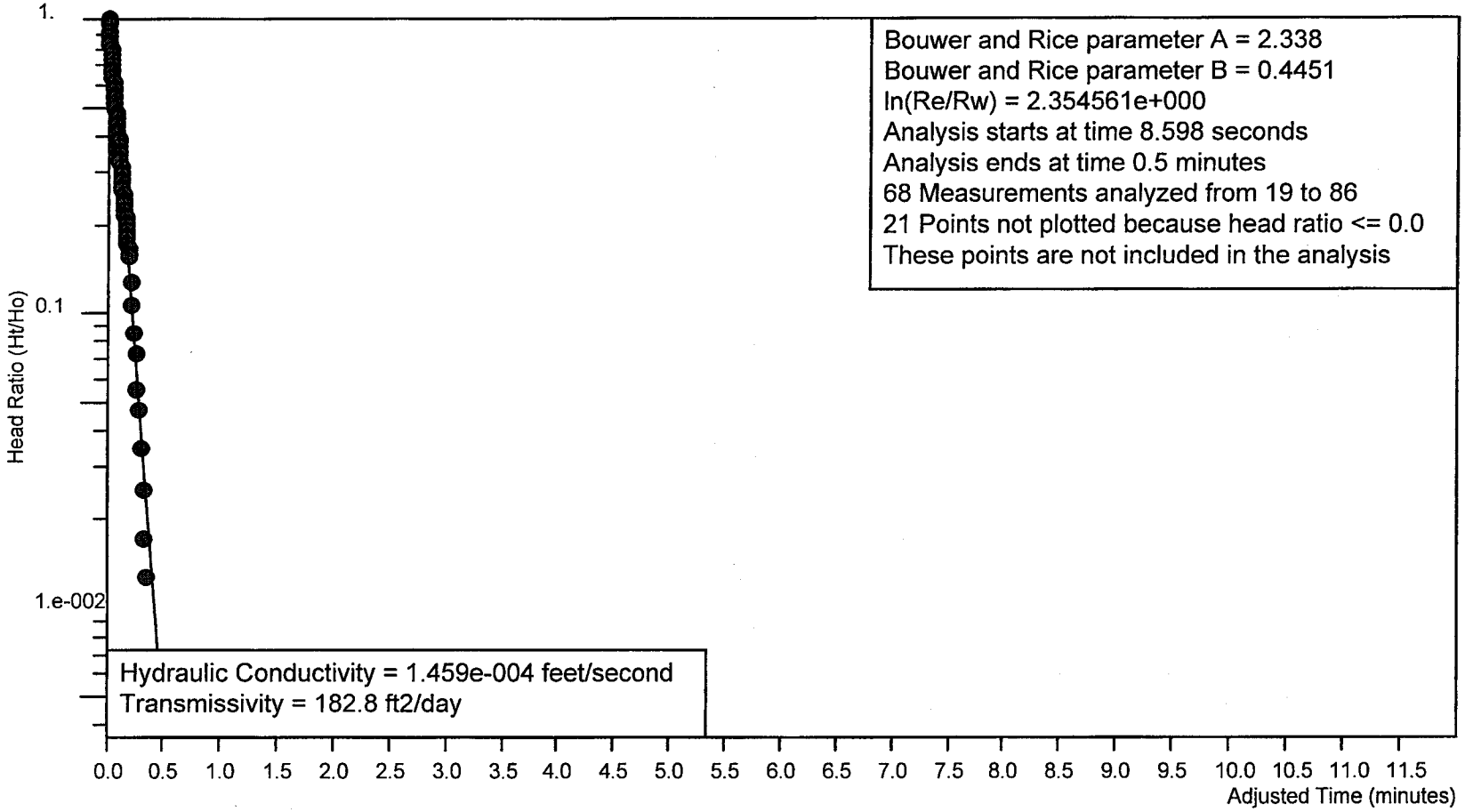
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

MW-1 Rising Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-1



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 1.106 feet at 8.598 seconds

MW-2 Falling Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\MW2FHN

Well Label:	MW-2
Aquifer Thickness:	17.1 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	7.89 feet
Anisotropy Ratio:	2.
Time Adjustment:	0.996 Seconds

Test starts with trial 5
There are 186 time and drawdown measurements
Maximum head is 5.227 feet
Minimum head is -0.118 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.66e-002	0.	0.	0.
2	3.3e-003	-1.33e-002	0.	0.	0.
3	6.6e-003	-1.e-002	0.	0.	0.
4	1.e-002	-6.6e-003	4.e-003	4.e-003	7.653e-004
5	1.33e-002	-3.3e-003	1.4e-002	1.4e-002	2.678e-003
6	1.66e-002	0.	5.227	5.227	1.
7	2.e-002	3.4e-003	4.03	4.03	0.771
8	2.33e-002	6.7e-003	1.034	1.034	0.1978
9	2.66e-002	1.e-002	1.442	1.442	0.2759
10	3.e-002	1.34e-002	0.958	0.958	0.1833
11	3.33e-002	1.67e-002	0.958	0.958	0.1833
12	3.66e-002	2.e-002	1.138	1.138	0.2177
13	4.e-002	2.34e-002	1.157	1.157	0.2214
14	4.33e-002	2.67e-002	1.129	1.129	0.216
15	4.66e-002	3.e-002	1.114	1.114	0.2131
16	5.e-002	3.34e-002	1.095	1.095	0.2095
17	5.33e-002	3.67e-002	1.072	1.072	0.2051
18	5.66e-002	4.e-002	1.048	1.048	0.2005
19	6.e-002	4.34e-002	1.005	1.005	0.1923
20	6.33e-002	4.67e-002	0.977	0.977	0.1869
21	6.66e-002	5.e-002	0.977	0.977	0.1869
22	7.e-002	5.34e-002	0.972	0.972	0.186
23	7.33e-002	5.67e-002	0.948	0.948	0.1814
24	7.66e-002	6.e-002	0.91	0.91	0.1741
25	8.e-002	6.34e-002	0.882	0.882	0.1687
26	8.33e-002	6.67e-002	0.858	0.858	0.1641
27	8.66e-002	7.e-002	0.849	0.849	0.1624
28	9.e-002	7.34e-002	0.83	0.83	0.1588
29	9.33e-002	7.67e-002	0.806	0.806	0.1542
30	9.66e-002	8.e-002	0.782	0.782	0.1496
31	0.1	8.34e-002	0.768	0.768	0.1469
32	0.1033	8.67e-002	0.754	0.754	0.1443
33	0.1066	9.e-002	0.735	0.735	0.1406

34	0.11	9.34e-002	0.721	0.721	0.1379
35	0.1133	9.67e-002	0.706	0.706	0.1351
36	0.1166	1.e-001	0.692	0.692	0.1324
37	0.12	0.1034	0.678	0.678	0.1297
38	0.1233	0.1067	0.664	0.664	0.127
39	0.1266	0.11	0.649	0.649	0.1242
40	0.13	0.1134	0.64	0.64	0.1224
41	0.1333	0.1167	0.626	0.626	0.1198
42	0.1366	0.12	0.616	0.616	0.1178
43	0.14	0.1234	0.607	0.607	0.1161
44	0.1433	0.1267	0.597	0.597	0.1142
45	0.1466	0.13	0.588	0.588	0.1125
46	0.15	0.1334	0.573	0.573	0.1096
47	0.1533	0.1367	0.564	0.564	0.1079
48	0.1566	0.14	0.554	0.554	0.106
49	0.16	0.1434	0.54	0.54	0.1033
50	0.1633	0.1467	0.531	0.531	0.1016
51	0.1666	0.15	0.521	0.521	9.967e-002
52	0.17	0.1534	0.512	0.512	9.795e-002
53	0.1733	0.1567	0.502	0.502	9.604e-002
54	0.1766	0.16	0.493	0.493	9.432e-002
55	0.18	0.1634	0.483	0.483	9.24e-002
56	0.1833	0.1667	0.474	0.474	9.068e-002
57	0.1866	0.17	0.464	0.464	8.877e-002
58	0.19	0.1734	0.45	0.45	8.609e-002
59	0.1933	0.1767	0.441	0.441	8.437e-002
60	0.1966	0.18	0.431	0.431	8.246e-002
61	0.2	0.1834	0.422	0.422	8.073e-002
62	0.2033	0.1867	0.412	0.412	7.882e-002
63	0.2066	0.19	0.407	0.407	7.786e-002
64	0.21	0.1934	0.398	0.398	7.614e-002
65	0.2133	0.1967	0.393	0.393	7.519e-002
66	0.2166	0.2	0.388	0.388	7.423e-002
67	0.22	0.2034	0.379	0.379	7.251e-002
68	0.2233	0.2067	0.374	0.374	7.155e-002
69	0.2266	0.21	0.369	0.369	7.059e-002
70	0.23	0.2134	0.365	0.365	6.983e-002
71	0.2333	0.2167	0.36	0.36	6.887e-002
72	0.2366	0.22	0.35	0.35	6.696e-002
73	0.24	0.2234	0.346	0.346	6.619e-002
74	0.2433	0.2267	0.341	0.341	6.524e-002
75	0.2466	0.23	0.336	0.336	6.428e-002
76	0.25	0.2334	0.332	0.332	6.352e-002
77	0.2533	0.2367	0.332	0.332	6.352e-002
78	0.2566	0.24	0.327	0.327	6.256e-002
79	0.26	0.2434	0.322	0.322	6.16e-002
80	0.2633	0.2467	0.317	0.317	6.065e-002
81	0.2666	0.25	0.313	0.313	5.988e-002
82	0.27	0.2534	0.308	0.308	5.892e-002
83	0.2733	0.2567	0.303	0.303	5.797e-002
84	0.2766	0.26	0.303	0.303	5.797e-002
85	0.28	0.2634	0.298	0.298	5.701e-002
86	0.2833	0.2667	0.294	0.294	5.625e-002
87	0.2866	0.27	0.289	0.289	5.529e-002
88	0.29	0.2734	0.289	0.289	5.529e-002
89	0.2933	0.2767	0.284	0.284	5.433e-002
90	0.2966	0.28	0.279	0.279	5.338e-002

91	0.3	0.2834	0.279	0.279	5.338e-002
92	0.3033	0.2867	0.275	0.275	5.261e-002
93	0.3066	0.29	0.27	0.27	5.165e-002
94	0.31	0.2934	0.27	0.27	5.165e-002
95	0.3133	0.2967	0.265	0.265	5.07e-002
96	0.3166	0.3	0.27	0.27	5.165e-002
97	0.32	0.3034	0.26	0.26	4.974e-002
98	0.3233	0.3067	0.256	0.256	4.898e-002
99	0.3266	0.31	0.256	0.256	4.898e-002
100	0.33	0.3134	0.256	0.256	4.898e-002
101	0.3333	0.3167	0.251	0.251	4.802e-002
102	0.35	0.3334	1.636	1.636	0.313
103	0.3666	0.35	1.494	1.494	0.2858
104	0.3833	0.3667	1.366	1.366	0.2613
105	0.4	0.3834	0.616	0.616	0.1178
106	0.4166	0.4	0.583	0.583	0.1115
107	0.4333	0.4167	0.554	0.554	0.106
108	0.45	0.4334	0.521	0.521	9.967e-002
109	0.4666	0.45	0.493	0.493	9.432e-002
110	0.4833	0.4667	0.46	0.46	8.8e-002
111	0.5	0.4834	0.431	0.431	8.246e-002
112	0.5166	0.5	0.407	0.407	7.786e-002
113	0.5333	0.5167	0.384	0.384	7.346e-002
114	0.55	0.5334	0.365	0.365	6.983e-002
115	0.5666	0.55	0.346	0.346	6.619e-002
116	0.5833	0.5667	0.327	0.327	6.256e-002
117	0.6	0.5834	0.313	0.313	5.988e-002
118	0.6166	0.6	0.298	0.298	5.701e-002
119	0.6333	0.6167	0.284	0.284	5.433e-002
120	0.65	0.6334	0.27	0.27	5.165e-002
121	0.6666	0.65	0.26	0.26	4.974e-002
122	0.6833	0.6667	0.246	0.246	4.706e-002
123	0.7	0.6834	0.237	0.237	4.534e-002
124	0.7166	0.7	0.227	0.227	4.343e-002
125	0.7333	0.7167	0.218	0.218	4.171e-002
126	0.75	0.7334	0.213	0.213	4.075e-002
127	0.7666	0.75	0.203	0.203	3.884e-002
128	0.7833	0.7667	0.199	0.199	3.807e-002
129	0.8	0.7834	0.194	0.194	3.711e-002
130	0.8166	0.8	0.184	0.184	3.52e-002
131	0.8333	0.8167	0.18	0.18	3.444e-002
132	0.85	0.8334	0.175	0.175	3.348e-002
133	0.8666	0.85	0.17	0.17	3.252e-002
134	0.8833	0.8667	0.166	0.166	3.176e-002
135	0.9	0.8834	0.161	0.161	3.08e-002
136	0.9166	0.9	0.156	0.156	2.985e-002
137	0.9333	0.9167	0.151	0.151	2.889e-002
138	0.95	0.9334	0.147	0.147	2.812e-002
139	0.9666	0.95	0.147	0.147	2.812e-002
140	0.9833	0.9667	0.137	0.137	2.621e-002
141	1.	0.9834	0.137	0.137	2.621e-002
142	1.2	1.183	9.e-002	9.e-002	1.722e-002
143	1.4	1.383	6.1e-002	6.1e-002	1.167e-002
144	1.6	1.583	3.7e-002	3.7e-002	7.079e-003
145	1.8	1.783	2.3e-002	2.3e-002	4.4e-003
146	2.	1.983	9.e-003	9.e-003	1.722e-003
147	2.2	2.183	0.	0.	0.

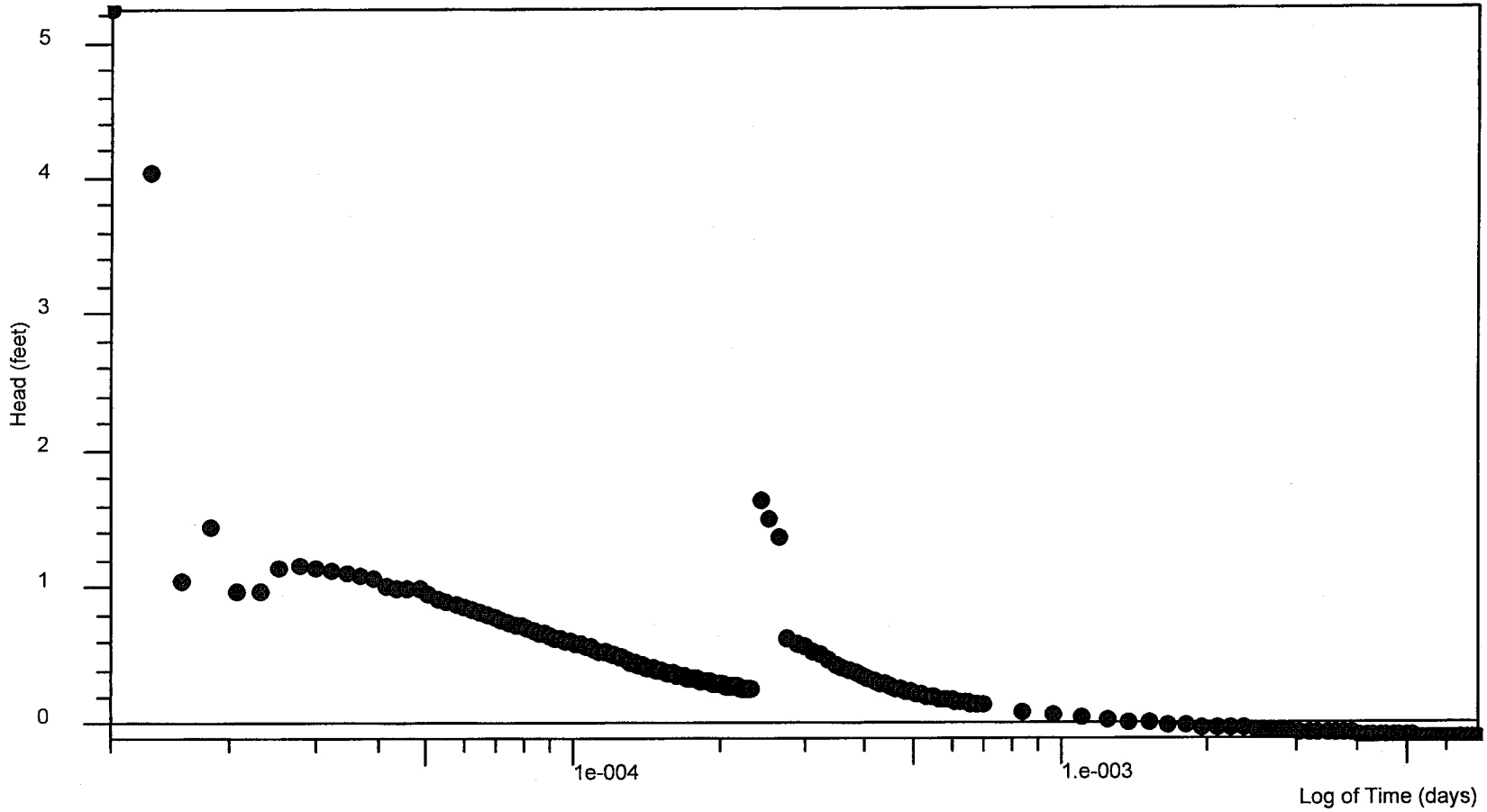
148	2.4	2.383	-9.e-003	-9.e-003	-1.722e-003
149	2.6	2.583	-1.8e-002	-1.8e-002	-3.444e-003
150	2.8	2.783	-2.3e-002	-2.3e-002	-4.4e-003
151	3.	2.983	-2.8e-002	-2.8e-002	-5.357e-003
152	3.2	3.183	-3.3e-002	-3.3e-002	-6.313e-003
153	3.4	3.383	-3.7e-002	-3.7e-002	-7.079e-003
154	3.6	3.583	-4.7e-002	-4.7e-002	-8.992e-003
155	3.8	3.783	-4.7e-002	-4.7e-002	-8.992e-003
156	4.	3.983	-5.2e-002	-5.2e-002	-9.948e-003
157	4.2	4.183	-5.6e-002	-5.6e-002	-1.071e-002
158	4.4	4.383	-6.1e-002	-6.1e-002	-1.167e-002
159	4.6	4.583	-6.1e-002	-6.1e-002	-1.167e-002
160	4.8	4.783	-6.6e-002	-6.6e-002	-1.263e-002
161	5.	4.983	-7.1e-002	-7.1e-002	-1.358e-002
162	5.2	5.183	-7.1e-002	-7.1e-002	-1.358e-002
163	5.4	5.383	-7.5e-002	-7.5e-002	-1.435e-002
164	5.6	5.583	-7.5e-002	-7.5e-002	-1.435e-002
165	5.8	5.783	-8.e-002	-8.e-002	-1.531e-002
166	6.	5.983	-8.e-002	-8.e-002	-1.531e-002
167	6.2	6.183	-8.5e-002	-8.5e-002	-1.626e-002
168	6.4	6.383	-8.5e-002	-8.5e-002	-1.626e-002
169	6.6	6.583	-9.e-002	-9.e-002	-1.722e-002
170	6.8	6.783	-9.e-002	-9.e-002	-1.722e-002
171	7.	6.983	-9.e-002	-9.e-002	-1.722e-002
172	7.2	7.183	-9.4e-002	-9.4e-002	-1.798e-002
173	7.4	7.383	-9.4e-002	-9.4e-002	-1.798e-002
174	7.6	7.583	-9.9e-002	-9.9e-002	-1.894e-002
175	7.8	7.783	-9.9e-002	-9.9e-002	-1.894e-002
176	8.	7.983	-9.9e-002	-9.9e-002	-1.894e-002
177	8.2	8.183	-0.104	-0.104	-1.99e-002
178	8.4	8.383	-0.104	-0.104	-1.99e-002
179	8.6	8.583	-0.104	-0.104	-1.99e-002
180	8.8	8.783	-0.109	-0.109	-2.085e-002
181	9.	8.983	-0.109	-0.109	-2.085e-002
182	9.2	9.183	-0.109	-0.109	-2.085e-002
183	9.4	9.383	-0.113	-0.113	-2.162e-002
184	9.6	9.583	-0.113	-0.113	-2.162e-002
185	9.8	9.783	-0.113	-0.113	-2.162e-002
186	10.	9.983	-0.118	-0.118	-2.258e-002

MW-2 Falling Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-2



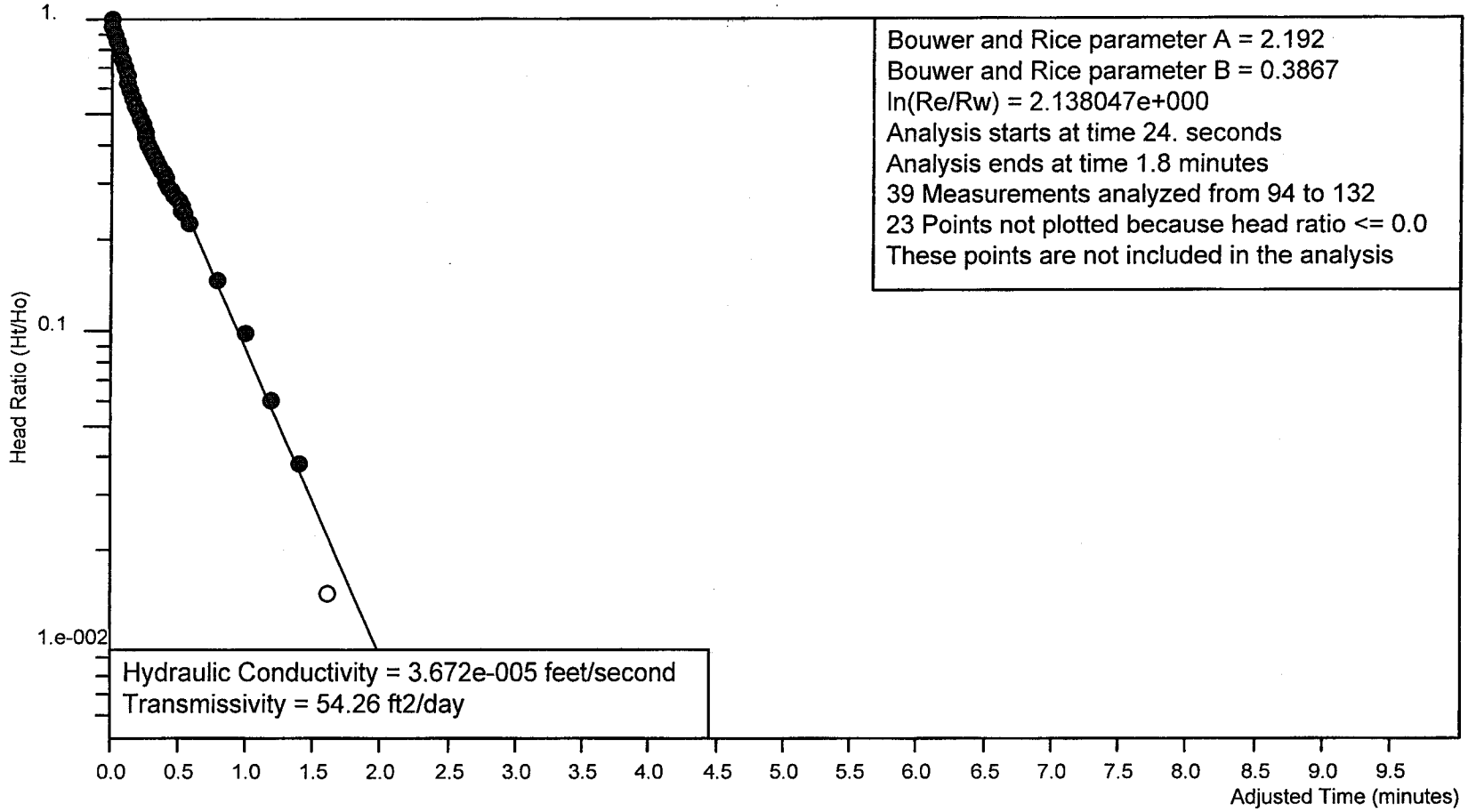
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

MW-2 Falling Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-2



Project Number 478.04.01 for International Paper

Analysis by Starpoint Software

Ho is 0.616 feet at 24. seconds

MW-2 Rising Head Test

Site Name:	International Paper- Riegelwood Plant
Location:	Riegelwood, North Carolina
Test Date:	7/3/01
Client:	International Paper
Project Number:	478.04.01
Import File:	P:\International Paper\North Carolina\Riegelwood Mill\Environmental\Slug test\MW2RHN

Well Label:	MW-2
Aquifer Thickness:	17.1 feet
Screen Length:	10. feet
Casing Radius:	8.3e-002 feet
Effective Radius:	0.34 feet
Static Water Level:	0. feet
Water Table to Screen Bottom:	7.89 feet
Anisotropy Ratio:	2.
Time Adjustment:	1.2 Seconds

Test starts with trial 6
There are 191 time and drawdown measurements
Maximum head is 3.213 feet
Minimum head is -2.8e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-2.e-002	0.	0.	0.
2	3.3e-003	-1.67e-002	0.	0.	0.
3	6.6e-003	-1.34e-002	4.e-003	-4.e-003	-1.245e-003
4	1.e-002	-1.e-002	0.	0.	0.
5	1.33e-002	-6.7e-003	0.	0.	0.
6	1.66e-002	-3.4e-003	-8.5e-002	8.5e-002	2.646e-002
7	2.e-002	0.	-3.213	3.213	1.
8	2.33e-002	3.3e-003	-2.469	2.469	0.7684
9	2.66e-002	6.6e-003	-1.82	1.82	0.5664
10	3.e-002	1.e-002	-2.739	2.739	0.8525
11	3.33e-002	1.33e-002	-1.711	1.711	0.5325
12	3.66e-002	1.66e-002	-0.128	0.128	3.984e-002
13	4.e-002	2.e-002	-2.256	2.256	0.7021
14	4.33e-002	2.33e-002	-1.346	1.346	0.4189
15	4.66e-002	2.66e-002	-1.464	1.464	0.4556
16	5.e-002	3.e-002	-1.521	1.521	0.4734
17	5.33e-002	3.33e-002	-1.483	1.483	0.4616
18	5.66e-002	3.66e-002	-1.464	1.464	0.4556
19	6.e-002	4.e-002	-1.431	1.431	0.4454
20	6.33e-002	4.33e-002	-1.403	1.403	0.4367
21	6.66e-002	4.66e-002	-1.389	1.389	0.4323
22	7.e-002	5.e-002	-1.36	1.36	0.4233
23	7.33e-002	5.33e-002	-1.337	1.337	0.4161
24	7.66e-002	5.66e-002	-1.318	1.318	0.4102
25	8.e-002	6.e-002	-1.303	1.303	0.4055
26	8.33e-002	6.33e-002	-1.284	1.284	0.3996
27	8.66e-002	6.66e-002	-1.265	1.265	0.3937
28	9.e-002	7.e-002	-1.242	1.242	0.3866
29	9.33e-002	7.33e-002	-1.218	1.218	0.3791
30	9.66e-002	7.66e-002	-1.204	1.204	0.3747
31	0.1	8.e-002	-1.185	1.185	0.3688
32	0.1033	8.33e-002	-1.166	1.166	0.3629
33	0.1066	8.66e-002	-1.147	1.147	0.357

34	0.11	9.e-002	-1.133	1.133	0.3526
35	0.1133	9.33e-002	-1.118	1.118	0.348
36	0.1166	9.66e-002	-1.099	1.099	0.342
37	0.12	0.1	-1.081	1.081	0.3364
38	0.1233	0.1033	-1.066	1.066	0.3318
39	0.1266	0.1066	-1.052	1.052	0.3274
40	0.13	0.11	-1.033	1.033	0.3215
41	0.1333	0.1133	-1.019	1.019	0.3171
42	0.1366	0.1166	-1.005	1.005	0.3128
43	0.14	0.12	-0.991	0.991	0.3084
44	0.1433	0.1233	-0.976	0.976	0.3038
45	0.1466	0.1266	-0.962	0.962	0.2994
46	0.15	0.13	-0.948	0.948	0.2951
47	0.1533	0.1333	-0.934	0.934	0.2907
48	0.1566	0.1366	-0.919	0.919	0.286
49	0.16	0.14	-0.905	0.905	0.2817
50	0.1633	0.1433	-0.891	0.891	0.2773
51	0.1666	0.1466	-0.881	0.881	0.2742
52	0.17	0.15	-0.867	0.867	0.2698
53	0.1733	0.1533	-0.858	0.858	0.267
54	0.1766	0.1566	-0.844	0.844	0.2627
55	0.18	0.16	-0.829	0.829	0.258
56	0.1833	0.1633	-0.82	0.82	0.2552
57	0.1866	0.1666	-0.806	0.806	0.2509
58	0.19	0.17	-0.796	0.796	0.2477
59	0.1933	0.1733	-0.787	0.787	0.2449
60	0.1966	0.1766	-0.772	0.772	0.2403
61	0.2	0.18	-0.763	0.763	0.2375
62	0.2033	0.1833	-0.753	0.753	0.2344
63	0.2066	0.1866	-0.744	0.744	0.2316
64	0.21	0.19	-0.735	0.735	0.2288
65	0.2133	0.1933	-0.725	0.725	0.2256
66	0.2166	0.1966	-0.715	0.715	0.2225
67	0.22	0.2	-0.706	0.706	0.2197
68	0.2233	0.2033	-0.697	0.697	0.2169
69	0.2266	0.2066	-0.687	0.687	0.2138
70	0.23	0.21	-0.678	0.678	0.211
71	0.2333	0.2133	-0.668	0.668	0.2079
72	0.2366	0.2166	-0.663	0.663	0.2063
73	0.24	0.22	-0.654	0.654	0.2035
74	0.2433	0.2233	-0.644	0.644	0.2004
75	0.2466	0.2266	-0.635	0.635	0.1976
76	0.25	0.23	-0.625	0.625	0.1945
77	0.2533	0.2333	-0.621	0.621	0.1933
78	0.2566	0.2366	-0.611	0.611	0.1902
79	0.26	0.24	-0.606	0.606	0.1886
80	0.2633	0.2433	-0.597	0.597	0.1858
81	0.2666	0.2466	-0.588	0.588	0.183
82	0.27	0.25	-0.583	0.583	0.1815
83	0.2733	0.2533	-0.573	0.573	0.1783
84	0.2766	0.2566	-0.564	0.564	0.1755
85	0.28	0.26	-0.559	0.559	0.174
86	0.2833	0.2633	-0.55	0.55	0.1712
87	0.2866	0.2666	-0.545	0.545	0.1696
88	0.29	0.27	-0.535	0.535	0.1665
89	0.2933	0.2733	-0.526	0.526	0.1637
90	0.2966	0.2766	-0.521	0.521	0.1622

91	0.3	0.28	-0.516	0.516	0.1606
92	0.3033	0.2833	-0.507	0.507	0.1578
93	0.3066	0.2866	-0.502	0.502	0.1562
94	0.31	0.29	-0.493	0.493	0.1534
95	0.3133	0.2933	-0.488	0.488	0.1519
96	0.3166	0.2966	-0.483	0.483	0.1503
97	0.32	0.3	-0.474	0.474	0.1475
98	0.3233	0.3033	-0.469	0.469	0.146
99	0.3266	0.3066	-0.46	0.46	0.1432
100	0.33	0.31	-0.455	0.455	0.1416
101	0.3333	0.3133	-0.45	0.45	0.1401
102	0.35	0.33	-0.422	0.422	0.1313
103	0.3666	0.3466	-0.388	0.388	0.1208
104	0.3833	0.3633	-0.365	0.365	0.1136
105	0.4	0.38	-0.341	0.341	0.1061
106	0.4166	0.3966	-0.317	0.317	9.866e-002
107	0.4333	0.4133	-0.294	0.294	9.15e-002
108	0.45	0.43	-0.275	0.275	8.559e-002
109	0.4666	0.4466	-0.256	0.256	7.968e-002
110	0.4833	0.4633	-0.237	0.237	7.376e-002
111	0.5	0.48	-0.218	0.218	6.785e-002
112	0.5166	0.4966	-0.203	0.203	6.318e-002
113	0.5333	0.5133	-0.189	0.189	5.882e-002
114	0.55	0.53	-0.18	0.18	5.602e-002
115	0.5666	0.5466	-0.165	0.165	5.135e-002
116	0.5833	0.5633	-0.156	0.156	4.855e-002
117	0.6	0.58	-0.147	0.147	4.575e-002
118	0.6166	0.5966	-0.137	0.137	4.264e-002
119	0.6333	0.6133	-0.128	0.128	3.984e-002
120	0.65	0.63	-0.123	0.123	3.828e-002
121	0.6666	0.6466	-0.113	0.113	3.517e-002
122	0.6833	0.6633	-0.109	0.109	3.392e-002
123	0.7	0.68	-9.9e-002	9.9e-002	3.081e-002
124	0.7166	0.6966	-9.4e-002	9.4e-002	2.926e-002
125	0.7333	0.7133	-9.e-002	9.e-002	2.801e-002
126	0.75	0.73	-8.5e-002	8.5e-002	2.646e-002
127	0.7666	0.7466	-8.e-002	8.e-002	2.49e-002
128	0.7833	0.7633	-7.5e-002	7.5e-002	2.334e-002
129	0.8	0.78	-7.1e-002	7.1e-002	2.21e-002
130	0.8166	0.7966	-7.1e-002	7.1e-002	2.21e-002
131	0.8333	0.8133	-6.6e-002	6.6e-002	2.054e-002
132	0.85	0.83	-6.1e-002	6.1e-002	1.899e-002
133	0.8666	0.8466	-6.1e-002	6.1e-002	1.899e-002
134	0.8833	0.8633	-5.6e-002	5.6e-002	1.743e-002
135	0.9	0.88	-5.2e-002	5.2e-002	1.618e-002
136	0.9166	0.8966	-5.2e-002	5.2e-002	1.618e-002
137	0.9333	0.9133	-4.7e-002	4.7e-002	1.463e-002
138	0.95	0.93	-4.7e-002	4.7e-002	1.463e-002
139	0.9666	0.9466	-4.2e-002	4.2e-002	1.307e-002
140	0.9833	0.9633	-3.7e-002	3.7e-002	1.152e-002
141	1.	0.98	-3.7e-002	3.7e-002	1.152e-002
142	1.2	1.18	-9.e-003	9.e-003	2.801e-003
143	1.4	1.38	0.	0.	0.
144	1.6	1.58	9.e-003	-9.e-003	-2.801e-003
145	1.8	1.78	1.4e-002	-1.4e-002	-4.357e-003
146	2.	1.98	1.8e-002	-1.8e-002	-5.602e-003
147	2.2	2.18	2.3e-002	-2.3e-002	-7.158e-003

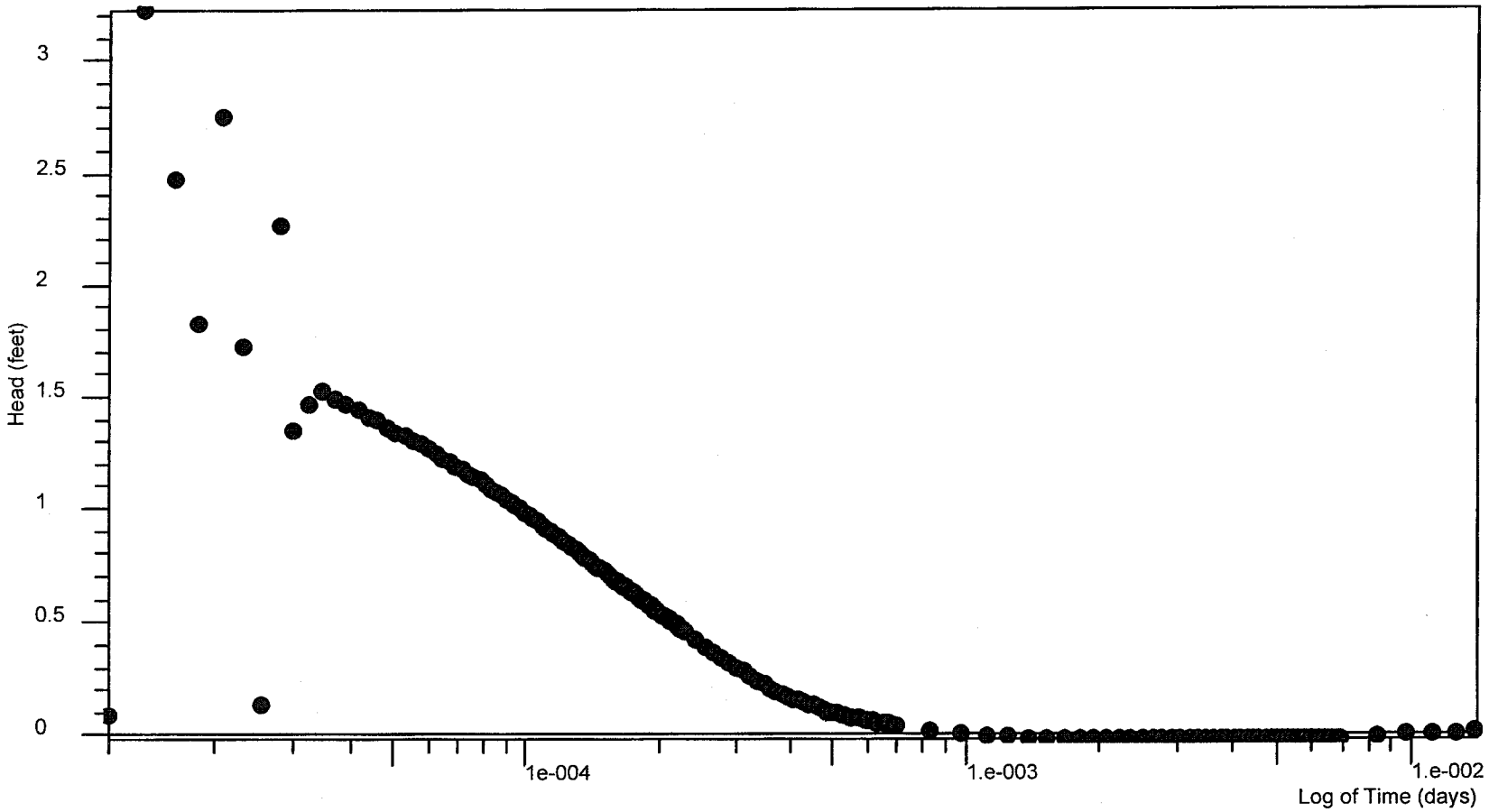
148	2.4	2.38	2.3e-002	-2.3e-002	-7.158e-003
149	2.6	2.58	2.8e-002	-2.8e-002	-8.715e-003
150	2.8	2.78	2.8e-002	-2.8e-002	-8.715e-003
151	3.	2.98	2.8e-002	-2.8e-002	-8.715e-003
152	3.2	3.18	2.8e-002	-2.8e-002	-8.715e-003
153	3.4	3.38	2.8e-002	-2.8e-002	-8.715e-003
154	3.6	3.58	2.8e-002	-2.8e-002	-8.715e-003
155	3.8	3.78	2.8e-002	-2.8e-002	-8.715e-003
156	4.	3.98	2.8e-002	-2.8e-002	-8.715e-003
157	4.2	4.18	2.8e-002	-2.8e-002	-8.715e-003
158	4.4	4.38	2.8e-002	-2.8e-002	-8.715e-003
159	4.6	4.58	2.8e-002	-2.8e-002	-8.715e-003
160	4.8	4.78	2.8e-002	-2.8e-002	-8.715e-003
161	5.	4.98	2.8e-002	-2.8e-002	-8.715e-003
162	5.2	5.18	2.8e-002	-2.8e-002	-8.715e-003
163	5.4	5.38	2.8e-002	-2.8e-002	-8.715e-003
164	5.6	5.58	2.8e-002	-2.8e-002	-8.715e-003
165	5.8	5.78	2.8e-002	-2.8e-002	-8.715e-003
166	6.	5.98	2.8e-002	-2.8e-002	-8.715e-003
167	6.2	6.18	2.8e-002	-2.8e-002	-8.715e-003
168	6.4	6.38	2.8e-002	-2.8e-002	-8.715e-003
169	6.6	6.58	2.3e-002	-2.3e-002	-7.158e-003
170	6.8	6.78	2.3e-002	-2.3e-002	-7.158e-003
171	7.	6.98	2.3e-002	-2.3e-002	-7.158e-003
172	7.2	7.18	2.3e-002	-2.3e-002	-7.158e-003
173	7.4	7.38	2.3e-002	-2.3e-002	-7.158e-003
174	7.6	7.58	2.3e-002	-2.3e-002	-7.158e-003
175	7.8	7.78	2.3e-002	-2.3e-002	-7.158e-003
176	8.	7.98	2.3e-002	-2.3e-002	-7.158e-003
177	8.2	8.18	2.3e-002	-2.3e-002	-7.158e-003
178	8.4	8.38	2.3e-002	-2.3e-002	-7.158e-003
179	8.6	8.58	2.3e-002	-2.3e-002	-7.158e-003
180	8.8	8.78	1.8e-002	-1.8e-002	-5.602e-003
181	9.	8.98	2.3e-002	-2.3e-002	-7.158e-003
182	9.2	9.18	1.8e-002	-1.8e-002	-5.602e-003
183	9.4	9.38	1.8e-002	-1.8e-002	-5.602e-003
184	9.6	9.58	1.8e-002	-1.8e-002	-5.602e-003
185	9.8	9.78	1.8e-002	-1.8e-002	-5.602e-003
186	10.	9.98	1.8e-002	-1.8e-002	-5.602e-003
187	12.	11.98	9.e-003	-9.e-003	-2.801e-003
188	14.	13.98	4.e-003	-4.e-003	-1.245e-003
189	16.	15.98	0.	0.	0.
190	18.	17.98	-4.e-003	4.e-003	1.245e-003
191	20.	19.98	-9.e-003	9.e-003	2.801e-003

MW-2 Rising Head Test 7/3/01

Head vs. Log Time

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-2



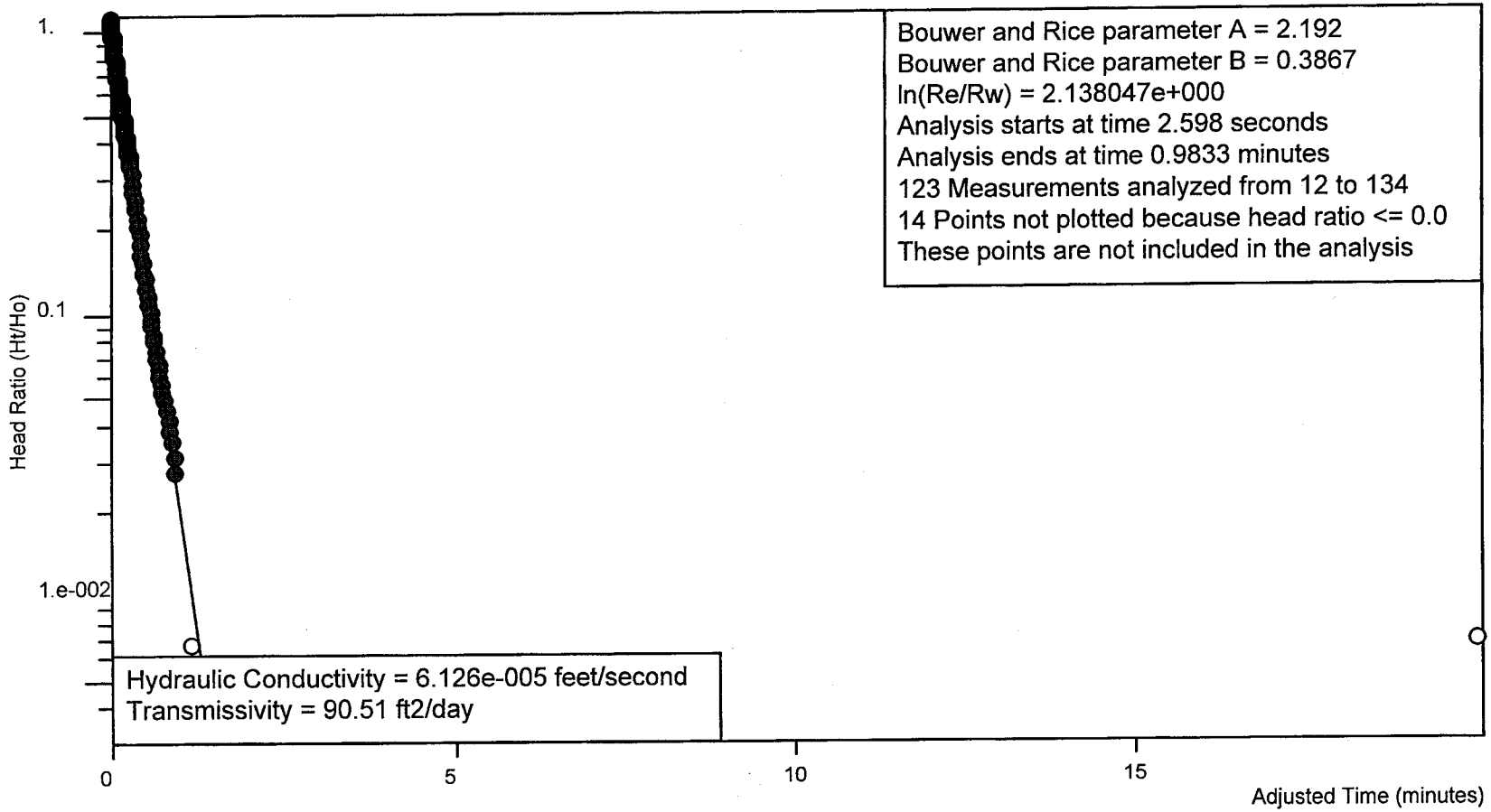
Project Number 478.04.01 for International Paper
Analysis by Starpoint Software

MW-2 Rising Head Test 7/3/01

Bouwer and Rice Graph

International Paper- Riegelwood Plant Riegelwood, North Carolina

MW-2



Ho is 1.346 feet at 2.598 seconds

Project Number 478.04.01 for International Paper
Analysis by Starpoint Software