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July 8, 2014

Ms. Addie Walker
South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201

Re: Work Plan and Request for Well Installation Permit
Shakespeare Composite Structures
19845 US Highway 76
Newberry, SC
Site ID # 51025

Dear Ms. Walker:

AECOM Technical Services, Inc. (AECOM) has been retained by Shakespeare Composite Structures (Shakespeare) to perform a subsurface investigation effort at their facility located in Newberry, South Carolina ("Site," **Figure 1**). This additional round of investigation is being performed as a follow-up to previous on-site efforts that detected the presence of chlorinated volatile organic compounds (CVOCs) in shallow groundwater beneath the site. As a result, Shakespeare has retained AECOM to perform additional investigative efforts both on-site and on properties adjacent to the facility.

This document serves as a work plan describing the activities planned for the next round of investigation and a request for a permit from your office for the installation of up to 10 shallow temporary wells and seven bedrock monitoring wells to allow collection of groundwater samples. A brief description of the proposed scope of work for this effort is included below. In addition a copy of the South Carolina Department of Health and Environmental Control (SCDHEC) monitoring well permit request is included as **Attachment A** of this document.

Scope of Work

The investigation will entail the installation of ten (10) shallow temporary monitoring wells and seven shallow permanent wells at locations depicted on **Figure 2**. The intent of the temporary well points is to allow collection of groundwater samples at additional locations to further determine the horizontal extent of CVOCs in groundwater. The permanent wells will be installed at select locations to determine if impacted groundwater is present in shallow fractures within bedrock beneath and/or adjacent to the facility. All monitoring wells will be installed in accordance with procedures described in the Site

Investigation Work Plan, dated April 2014 and the United States Environmental Protection Agency Guidance for Design and Installation of Monitoring Wells (dated February 2008).

Well Installation

Temporary Wells

The shallow temporary wells will be installed to a depth of approximately 25 feet using a Geoprobe™ drill rig. A South Carolina Certified Well Driller will be utilized to perform all well installation procedures.

The intent of the temporary wells is to allow collection of samples that will provide of "snapshot" of groundwater quality at the proposed locations. A Geoprobe™ with a dual tube soil sampling system will be utilized to advance temporary well borings. Each temporary well be constructed of one-inch inside diameter schedule 40 polyvinyl chloride (PVC) riser pipe and a ten foot long section of 0.010 inch slotted screen. Once a well boring has been advanced to the desired depth, the well materials will be inserted through the outer casing to the bottom of the well bore. After the well materials are in place the outer casing will be removed, exposing the well materials to groundwater. A schematic of a typical temporary well is included as **Figure 3.**

Permanent Wells

Seven Type III permanent monitoring wells are to be installed in the bedrock formation underlying the Site area. Four are to be installed on the facility property and three are proposed for private parcels located to the west and southwest (**Figure 2**). Each of these wells will be installed with a surface casing that fully penetrates the weathered residuum and saprolite overlying the bedrock. The casing will be grouted in place and allowed to cure for up to 48 hours before drilling into bedrock will commence.

AECOM will utilize a wireline coring system to obtain samples of the bedrock. Core samples will be collected continuously on five foot intervals from the top of the bedrock to a depth determined in the field by the AECOM geologist. Information obtained from the rock cores will be used to determine the depth at which the bedrock wells will be completed. Ideally, wells will be set to capture groundwater from obvious fracture zones encountered in the bedrock. Once the well boring has been sampled to a desired depth, the borehole will be reamed open to that depth using a 6 inch diameter air hammer.

Once a well boring has been advanced to the desired depth, the well materials will be inserted into the borehole. Well completion materials including the screen and riser pipe will be inserted through the surface casing annulus. Each of the permanent wells will be completed at land surface. A schematic of a typical Type III well is included as **Figure 4.** Each permanent well will be secured with a locking cap and completed at land surface with an eight inch diameter, one foot deep steel well head cover. Each well head cover will be surrounded by a two foot by two foot by four inch deep concrete pad.

Lithological information obtained during temporary and permanent well borehole advancement along with well construction details will be documented on a well construction log. Each well boring will be sampled continuously from land surface to total depth to allow inspection of the lithology encountered by the AECOM field Hydrogeologist. A well construction log will be completed for each well installed during this effort.

Well Sampling

Following their installation, the wells will be developed/purged and then sampled. Each well will be developed and sampled in accordance with applicable USEPA standard operating procedures (SOPs). For temporary wells, this will entail purging with a peristaltic pump, monitoring of water quality parameters

including pH, specific conductivity, temperature, turbidity, dissolved oxygen (DO) and oxidation-reduction potential (ORP). Permanent wells will be developed via a surge and over pump method using a submersible pump.

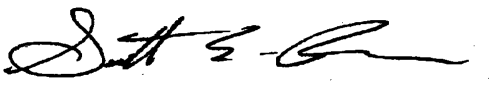
The wells will be purged until water quality parameters including pH, specific conductivity, and temperature have stabilized and turbidity has been reduced to an acceptable level for collection of samples. Once purging is complete, AECOM personnel will sample the wells using low-flow sampling techniques. Well development/purging activities will be documented on appropriate forms and forwarded to DHEC in a summary report.

Sample Analysis

Groundwater samples collected from the wells will be analyzed for Target Compound List Volatile Organic Compounds (TCL VOCs). All samples designated for laboratory analysis will be forwarded to a DHEC certified laboratory. Appropriate chain of custody, sample preservation, shipping, and analytical procedures will be performed in accordance with applicable USEPA SW-846 methodologies.

AECOM would like to initiate the drilling activities associated with this project on Monday July 14, 2014. We appreciate your assistance with this permit request. Should you have any questions regarding this request, please contact Scott Ross at (803)201-9662.

Sincerely,



Scott E. Ross, P.G.
Senior Project Manager

cc: Mr. Mike Senn - Shakespeare
Mr. Jay Smith - Philips

ATTACHMENT A

WELL PERMIT REQUEST

Monitoring Well Application

1. Proposed Location of Monitoring Well(s):

Street Address: **19845 US Highway 76**

City (including Zip): **Newberry, SC 29108**

County: **Newberry**

Please attach Scaled Map or Plat

2. Well Owner's Information:

Name (Last then First): **Mike Senn**

Company: Shakespeare Composite Structures

Complete Address: **Same as above**

Telephone Number: **(803) 276-8940**

3. Property Owner's Information:

☑ Check if same as Well Owner

Name (Last then First):

Company:

Address:

Telephone Number:

4. Proposed Drilling Date: **07/14/2014**

5. Intended Purpose of Well(s):

Pre-Purchase ☐

Investigation ☑

NOTE: If this request is for an existing DHEC project, please enter the Program area and ID number below.

Program Area: **VCP**
Project or Site ID #: **51025**

6. Proposed number of monitoring wells: **17**

7. Proposed parameters to be analyzed (check all that apply), please specify analytical method beside check box:

VOCs	☑
BTEX	☐
MtBE	☐
Naphthalene	☐
PAHs	☐
Metals	☐
Nitrates	☐
Base, Neutral & Acid Ex.	☐
Pesticides/Herbicides	☐
Phenols	☐
Radionuclides	☐
PCBs	☐
Other (specify below)	☐

8. Proposed construction details (complete and attach proposed monitoring well schematics):

See attached Figure 2

South Carolina Department of Health and Environmental Control (SCDHEC) summary of standards for monitoring well construction (per South Carolina Well Standards and Regulations R. 61-71)

Approval and License Requirements

Prior Department approval is required for the installation or abandonment of all monitoring wells including direct push, geoprobe or other temporary type monitoring wells. The attached monitoring well approval document should be completed, submitted and approved prior to construction of any monitoring well. A monitoring well is any well used to obtain water samples for water quality analyses or to measure groundwater levels. There are no fees for approvals. All monitoring wells must be drilled by a driller that is registered in South Carolina with the Board of Certification of the Environmental Systems Operators. If any of the information on the application including the proposed drilling date, well construction details or well placement changes, the Department (i.e. project manager issuing the well approval) must be notified 24 hours prior to well construction.

Location

Due to the nature and purpose of a monitoring well, the depth and location requirements in respect to surface water bodies, potential contamination sources, etc., are variable, and shall be approved on a case by case basis by the Department.

Construction and Material

Casing should be of sufficient strength to withstand normal forces encountered during and after well installation and be composed of material so as to minimally affect water quality analyses. Casing should have a sufficient diameter to allow for efficient sample collection (i.e., to provide access for sampling equipment). The diameter of the drilled hole needs to be large enough on all sides (1.5 inches of annular space) to allow forced injection of grout through a tremie pipe. All monitoring wells should have a cement pad or aggregate reinforced concrete at the ground surface which extends at least six inches beyond the bore hole diameter and six inches below ground surface to prevent infiltration between the surface casing and the bore hole. All monitoring wells should be grouted from the top of the bentonite seal to the surface with a neat cement, high solids bentonite or neat cement, bentonite mixture approved by the Department. A hydrated bentonite seal with a minimum thickness of 12 inches is to be placed above the filter pack to prevent infiltration of grout if the well has a filter pack. The monitoring well intake or screen design should minimize the amount of formational materials entering the well. The gravel
pack should be utilized opposite the well screen as appropriate so that parameters analyses will be minimally affected. All monitoring wells should have a locking cap or other security device to prevent damage and/or vandalism. Any monitoring well which is destroyed, rendered unusable or is abandoned should be reported to the Department and be properly abandoned, revitalized or replaced as appropriate or required by permit or regulation.

Development

Monitoring wells shall be properly developed. Development shall include the removal of
formation cuttings and drilling fluids from the well bore hole. Development shall be complete when the well produces water typical of the aquifer being monitored.

Reporting Requirements

A monitor well record form (1903) or equivalent to include the following should be completed and submitted to the Department within 30 days after completion of the monitoring wells:

Name and address of facility/owner;
Surveyed or global positioning system location of monitor well(s) on a scaled map or plat;
Driller and certification number;
Date drilled;
Driller's or Geologist's log;
Total depth;
Screened interval;
Diameter and construction details;
Depth to water table with date and time measured;
Surveyed elevation of measuring point with respect to established benchmark;
Monitoring well approval number issued by the Department.

Additionally, the groundwater and soil (if taken) analytical results should be submitted to the Department within 30 days of receipt from the laboratory.

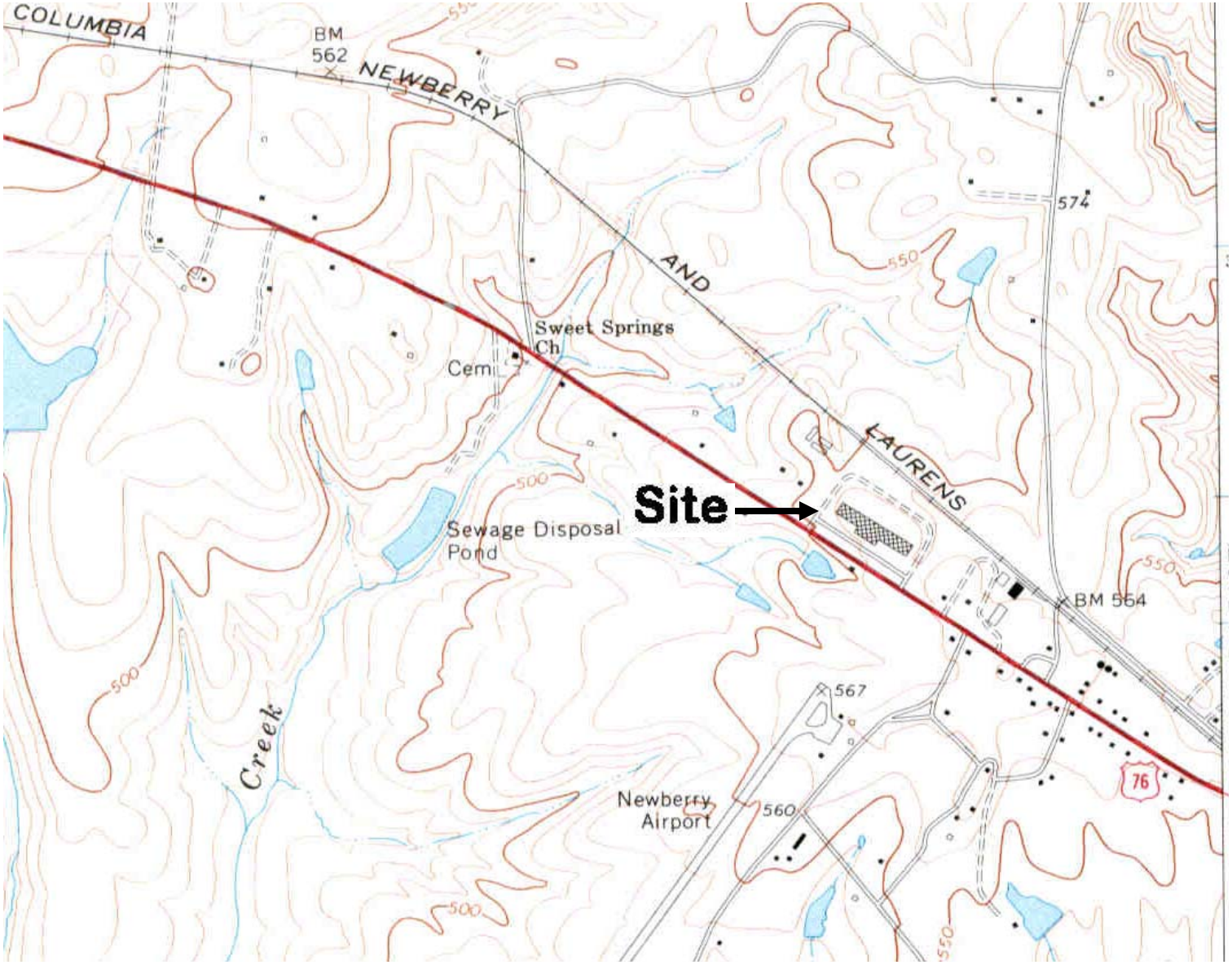
Abandonment

All monitoring wells shall be properly abandoned, when deemed appropriate by the Department. Any well that acts as a source of contamination shall be repaired or permanently abandoned immediately after receipt of notice from the Department. Abandonment shall be by forced injection of grout or pouring through a tremie pipe starting at the bottom of the well and proceeding to the surface in one continuous operation. The well shall be filled with either neat cement, bentonite-cement, or 20% high solids sodium bentonite grout, from the bottom of the well to the land surface.

* This summary of standards for monitoring well construction may not include a listing of all information necessary to obtain an approval to install monitoring wells. Final approval of monitoring well installation will be dependant upon the regulatory requirements for the Department program area for which the monitoring wells are to be installed.

* Some areas of the Department may require a detailed justification of the placement of monitoring wells and the depth of monitoring well screened zones prior to granting installation approval.

FIGURES



Modified from: USGS, Newberry West Quadrangle, 1969

Figure 1
Site Location
Shakespeare Composite Structures, LLC, Newberry, SC

Legend

- Permanent Monitoring Well Location
- Temporary Monitoring Well Location
- Temporary Monitoring Well Replaced by Permanent Monitoring Well
- Proposed location for shallow temporary well
- Proposed location for bedrock well

Map Projection:
NAD 83
South Carolina State Plane, Feet
Fips3900

Datum:
North American 1983

N
W E
S

200 100 0 200
Feet
1:2,400

AECOM
10 Patewood Drive, Building 6, Suite 500
Greenville, SC 29615
T: (864) 234-3000 F: (864)234-3069

Permanent Monitoring Well and Temporary Monitoring Well Locations

Shakespeare Composite Structures
Newberry, South Carolina

PROJECT NO.	PREPARED BY:	DATE:	
60164311	RJS	6/17/2014	**Figure** 2

Document Path: L:\Group\earth\60318382 Shakespeare Composites\GIS\Maps\60318382_002 Monitoring Well Locations.mxd

FIGURE 3 TEMPORARY WELL CONSTRUCTION DETAIL

AECOM

Shakespeare Composite Structures, LLC/ Newberry, SC

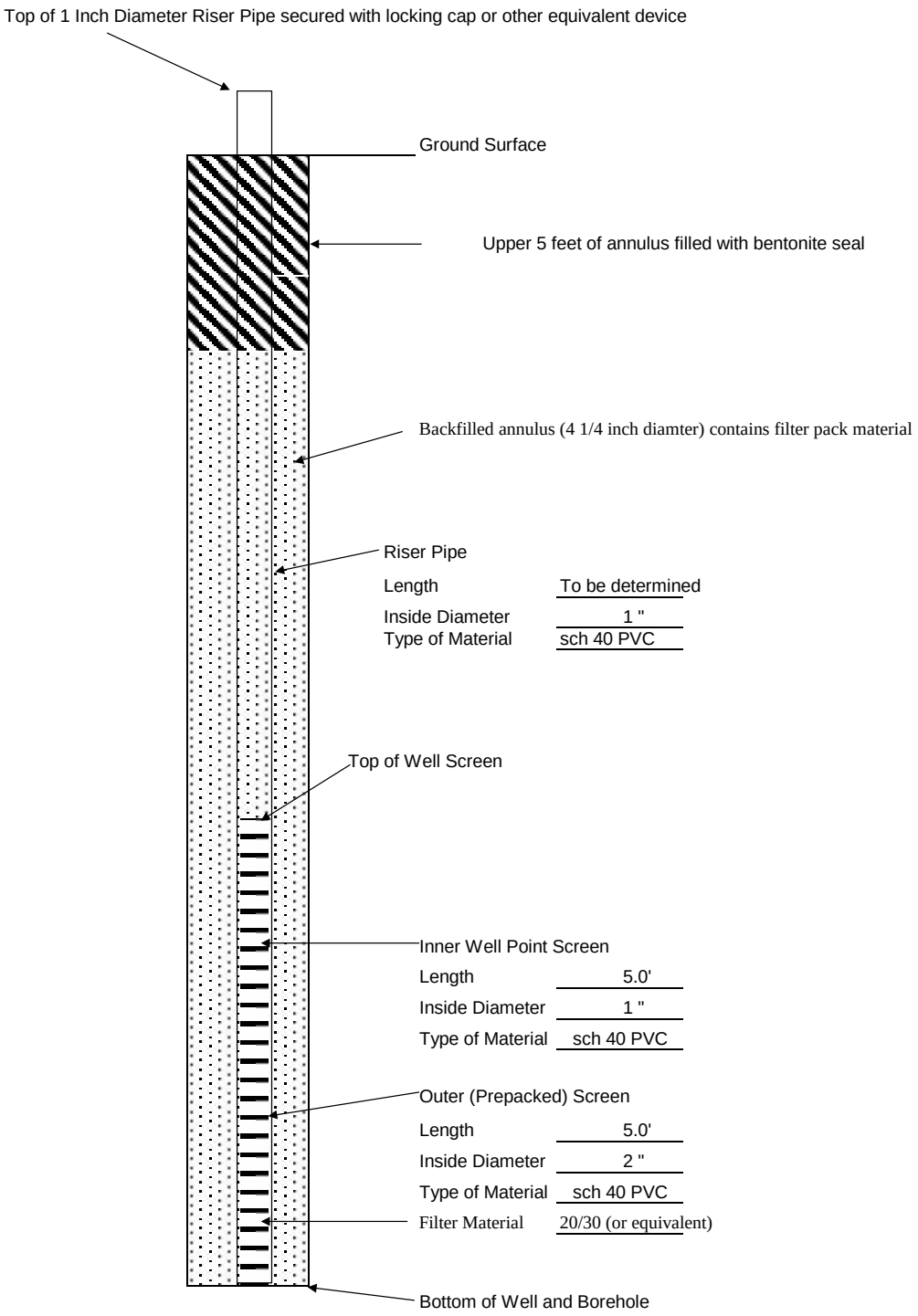
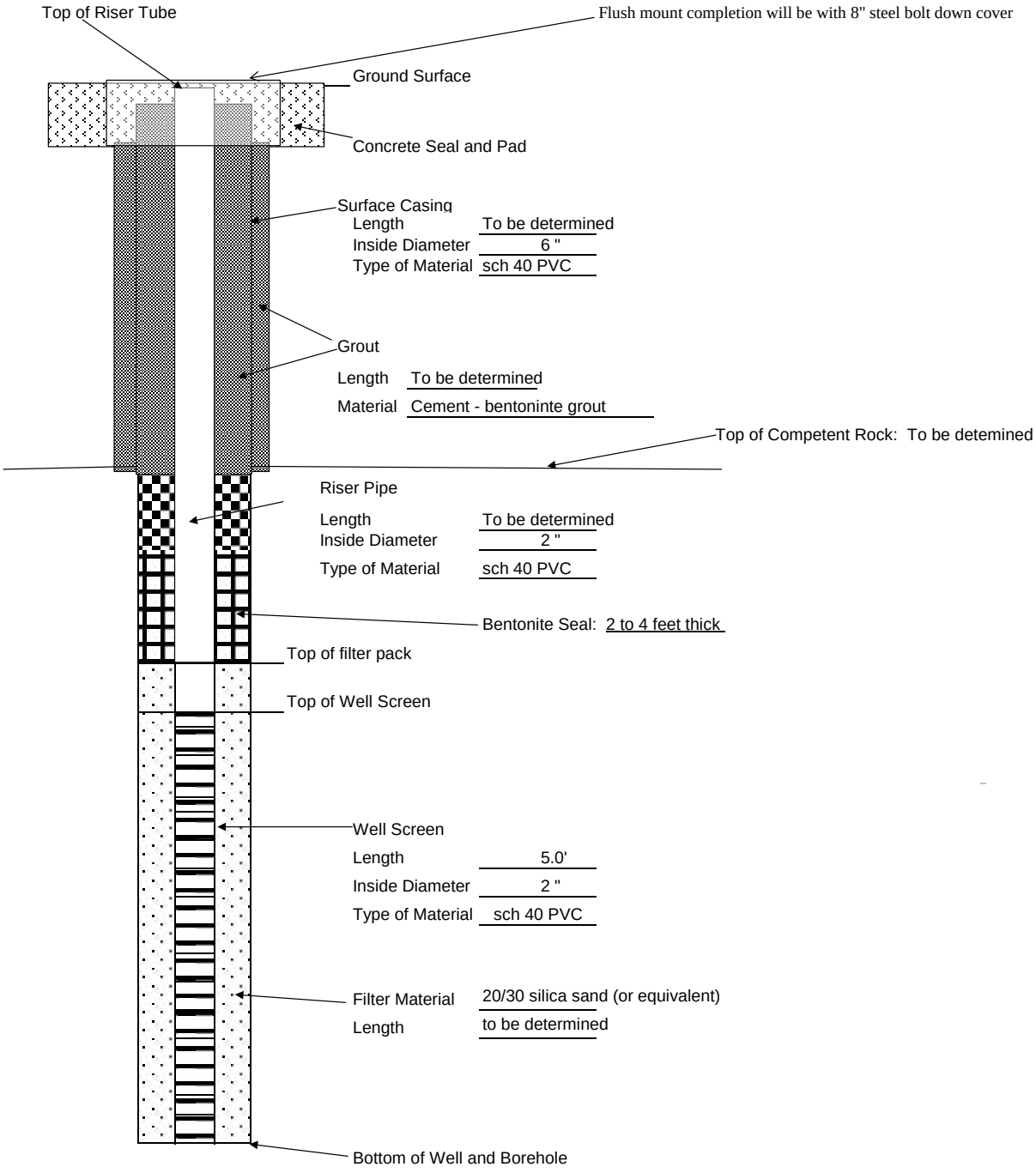


FIGURE 4 PERMANENT DEEP (ROCK) MONITORING WELL CONSTRUCTION DETAIL

SHAKESPEARE COMPOSITE STRUCTURES - NEWBERRY, SC



Not to Scale