



S.S. PAPADOPULOS & ASSOCIATES, INC.
ENVIRONMENTAL & WATER-RESOURCE CONSULTANTS



August 29, 2018

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Subject: **Sparton Technology, Inc: Former Coors Road Plant Remedial Program
Work Plan for Plugging and Abandoning Monitoring Well MW-62 and for
Installing Replacement well MW-62R**

Lady and Gentlemen:

On behalf of Sparton Technology, Inc. (Sparton), S.S. Papadopoulos & Associates, Inc. (SSP&A) is pleased to submit the subject Work Plan which describes the procedures that will be used to plug and abandon monitoring well MW-62 and to install a replacement well, MW-62R.

We certify under penalty of law that this document and all attachments were prepared under our direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon our inquiry of either the person or persons who manage the system and/or the person or persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We further certify, to the best of our knowledge and belief, that this

United States Environmental Protection Agency
New Mexico Environment Department
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document is consistent with the applicable requirements of the Consent Decree entered among the New Mexico Environment Department, the U.S. Environmental Protection Agency, Sparton Technology, Inc., and others in connection with Civil Action No. CIV 97 0206 LH/JHG, United States District Court for the District of New Mexico. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

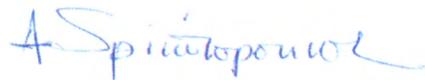
If you have any questions concerning the Work Plan, please contact us.

Sincerely,

S.S. PAPANOPULOS & ASSOCIATES, INC.



Stavros S. Papadopoulos, PhD, PE, NAE
Founder & Senior Principal



Alex Spiliotopoulos, PhD
Associate & Senior Hydrogeologist

cc: Secretary, Sparton Technology, Inc., c/o Mr. Ernesto Martinez
Mr. Joseph G. McCormack, Senior Vice President and Chief
Financial Officer of Sparton Corporation
Mr. Steven M. Korwin, Senior Vice President, Quality & Engineering
of Sparton Corporation
Mr. Ernesto Martinez, EHS Corporate Manager
of Sparton Corporation (2 copies)
Mr. Joseph S. Lerczak, Sparton Corporation
Mr. James B. Harris, Thompson & Knight LLP
Mr. Robert Marley, EA Engineering, Science, and Technology, Inc., PBC

**Sparton Technology, Inc.
Former Coors Road Plant
Remedial Program**

**Work Plan for Plugging and
Abandoning Monitoring Well
MW-62 and for Installing
Replacement Well MW-62R**

Prepared for:

**Sparton Technology, Inc.
Schaumburg, Illinois**

Prepared by:



**S.S. PAPADOPULOS & ASSOCIATES, INC.
Environmental & Water-Resource Consultants**

August 29, 2018

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Introduction

The Sparton Technology Inc. (Sparton) Former Coors Plant Remedial Program is operated in accordance with the terms of a Consent Decree entered in March 3, 2000. Under these terms, Sparton collects water-level and water-quality data from a number monitoring wells. One of these monitoring wells, MW-62 (see Figure 1 for location), could not be sampled since the first quarter of 2018 because sampling equipment that got stuck in the well, and which could not be retrieved after several attempts, prevented the sampling of the well. In April 2018, Sparton requested from the U. S. Environmental Protection Agency (USEPA) and the New Mexico Environment Department (NMED) approval for plugging and abandoning this well and replacing it in the monitoring schedule by well MW-47R which is located closer to the current extent of the contaminant plume (see Figure 1).¹ The Agencies did not approve the replacement of well MW-62 by MW-47-R stating that because of their relative locations and screened intervals “MW-47R is not suitable as a replacement for MW-62,” and requested that Sparton install a (more suitable) replacement well for MW-62.²

The purpose of this Work Plan is to describe briefly the procedures that will be used to plug and abandon MW-62 and to install a replacement well, MW-62R, at a proposed a new location, and to present a schedule for the implementation of this work.

¹ Letter dated April 24, 2018 to Charles Hendrickson of USEPA and Dave Cobrain of NMED from Alex Spiliotopoulos and Stavros S. Papadopoulos of SSP&A with Subject: Sparton Technology, Inc. – Former Coors Road Plant Remedial Program, Request for Replacement of Well MW-62 with Well MW-47R.

² Letter dated June 13, 2018 from Chuck Hendrickson of USEPA and Dave Cobrain of NMED to Ernesto Martinez of Sparton, Re: Disapproval, Request for Replacement of Well MW-62 with Well MW-47R, Sparton Technology, Inc., EPA ID No. NMD 083212332.

Plugging and Abandonment of Well MW-62

Monitoring well MW-62 is located on Congress Avenue NW between Bryan Avenue NW and Buckeye Street NW (see Figure 1). The well was installed on the public right-of-way between the northern sidewalk and the curb along Congress Avenue within a 12-inch manhole whose cover is flush with a 2 feet by 4 feet concrete slab that was installed next to the sidewalk (see Figure 2). The well is about 114 feet deep and completed with 2-inch diameter PVC casing and 15 feet of screen at the bottom. The well will be plugged and abandoned in a manner that will prevent migration of surface runoff or ground water along the length of the well casing.

To plug and abandon the well, the concrete slab adjacent to the sidewalk will be broken down and the manhole around the well will be removed; the broken-down concrete will be hauled away for disposal. The locking steel well head around the well casing will also be removed, and an attempt will be made to remove the casing from the well. If this is successful, then the well will be plugged by placing into the borehole 5 percent bentonite-cement grout consisting of 5 lbs of powdered bentonite, 94 lbs of Portland cement, and 6.5 to 8.5 gallons of clean water. The bentonite-cement grout will be placed using a tremie pipe, from the bottom of the borehole to about one foot below ground surface. If the attempt to remove the casing is not successful, the upper three feet of the casing will be drilled out, and the bentonite-cement grout will be placed into the well, again using a tremie pipe from the bottom of the well to about one foot below ground surface. Under both grouting approaches, after the grout has set, the upper one foot of the hole will be filled with soil and/or gravel, as appropriate, to blend with the surrounding right-of-way.

Installation of Replacement Well MW-62R

Proposed Location and Design of MW-62R

The proposed location for the replacement well MW-62R is about 12 feet to the east of MW-62, as shown in Figure 2.³ Well MW-62 is about 114 feet deep with a 15-foot screen at the bottom, between elevations 4,960.1 and 4,975.1 feet MSL; the 2017 elevation of the water table at the well location was about 4,965 feet MSL, that is, about 10 below the top of the screen and about 5 feet above the bottom of the screen. The water level in the well (see Figure 3), however, has been rising for the last several years. In general, during the last several years water levels have been rising throughout the Albuquerque area, and it appears that this trend may continue. Based on this observation, the replacement well, MW-62R, will be 120 feet deep with a 15-foot screen at the bottom, between elevations 4,954 and 4,969 feet MSL.

Installation of MW-62R

To install the well, a 5-7/8-inch hole will be drilled to a depth of 125 feet⁴ using a rotary mud drilling rig. All spent drilling mud will be hauled to the on-site area and stored in a storage tank that will be installed near the source containment well (CW-2) treatment facility. All drill cuttings will also be hauled to the CW-2 treatment facility. During drilling, cutting samples will be obtained every 5 feet and examined for color, sorting, and texture; these data will be used after the completion of drilling to prepare a boring log showing the lithology encountered at the well site; an example of the information that will be included in the boring log is presented in Figure 4.

A 2-inch diameter screen and casing assembly consisting of a 15-foot screen with a plug or cap at the bottom, and casing extending to the ground surface will then be lowered into the hole. The casing will be made of 2-inch, flush-joint-threaded (FJT), Schedule 40 PVC pipe; the screen will be made of 2-inch, FJT, Schedule 40 slotted PVC pipe with 0.020-inch slots.⁵ Centralizers will be installed on the bottom of the screen, and at 6 and 20 feet above the top of the screen.⁶ A sand-pack consisting of 10-20 sand will be placed by tremie into the annular space between the screen and the hole and into any vacant space that may have remained at the bottom of the hole; this sand-pack will extend to 2 feet above the top of the screen, and an additional 2 feet of finer 20-40 sand will be placed on the top to prevent the downward seepage of the grout that will be placed into the remainder of the annular space to the ground surface also by tremie. The tremie will be of 1-inch or 1-1/4-inch galvanized steel with external couplings, and the grout will consist of 5 percent bentonite-cement; the grout will be installed in two stages of about 50 feet each with

³ The actual location of the well will be verified in the field to avoid any conflicts with any existing utility lines.

⁴ The hole will be drilled to 5 feet below the planned screened interval to allow for the storage of debris that may fall into the hole during the casing/screen assembly installation.

⁵ A screen with 0.010-inch slots will be used if the formation across the screened interval has a large percentage of fine-grained materials.

⁶ Due to difficulties usually encountered in installing casing with centralizers into an open hole, centralizers beyond these three are not proposed for the remainder of the casing; the three centralizers at the bottom and above the screen will insure that the screen is centered in the hole and that the bentonite-cement grout above the sand-pack forms a complete seal in the lower 20 or more feet of the casing to isolate the screened interval from the upper parts of the hole.

a minimum of 12 hours of drying time between stages. After the grout has set, the well will be developed using the development procedures described in Procedure P-6 of Attachment A to the Consent Decree⁷ for 2-inch wells. Water produced during development will also be stored in the storage tank at the on-site treatment facility to allow for the settlement of most of the suspended materials. Water from the tank will be later filtered and routed to the treatment facility for treatment and return to the aquifer through the infiltration ponds. The settled materials will be sampled, and appropriately disposed based on the sampling results.

After development, the well will be completed by cutting the casing below ground surface, and installing an 6-inch diameter locking well head and a 12-inch manhole with cover to protect the well head. A 2 ft by 4 ft concrete slab, similar to the one that now exists at MW-62, will be placed around the manhole, adjacent to the sidewalk and extending to both sides of the manhole to match sidewalk markings. The well will then be surveyed by a New Mexico licensed surveyor to determine its location coordinates and the elevation of its "measuring point" to the accuracy standards specified in Procedure P-9 of Attachment A to the Consent Decree.⁶ A completion diagram showing the construction details of the well will be then prepared; an example of the information that will be included in the completion diagram is presented in Figure 5.

After completion, the well will be equipped with a permanent bladder sampling pump. This will provide for the efficient purging and sampling of the well and avoid the use of sampling equipment that may cause issues similar to those encountered in MW-62.

⁷ Consent Decree, City of Albuquerque and the Board of County Commissioners of the County of Bernalillo v. Sparton Technology, Inc., U.S. District Court for the District of New Mexico, CIV 97 0206, entered on March 3, 2000.

Required Permits and Schedule for The Work

The plugging and abandonment of MW-62 requires Well Plugging Plan of Operations permit from the New Mexico State Engineer's Office. Because the well is a monitoring well, the State Engineer's Office usually requires proof that their plugging has been approved by the regulatory agencies. Approval of this Work Plan will provide this proof which will be used in applying for this permit upon Agency approval of the Work Plan.

In the next few weeks, Sparton will start the process of obtaining a permit from the City of Albuquerque for the installation of the replacement well MW-62R at the proposed location on the right-of-way between the sidewalk and the curb. Installation of this well will also require a Monitoring Well Drilling Permit from the New Mexico State Engineer's office. Upon approval of this Work Plan by USEPA and NMED, Sparton will also apply to the New Mexico State Engineer's office for this permit.

A schedule for the plugging and abandonment of well MW-62 and for the installation of well MW-62R is presented in Figure 6.⁸

⁸ Sparton has been using the services of Rogers & Co., Inc. of Albuquerque for plugging, deepening, or installing monitoring wells associated with the site. Rogers & Co. has indicated that they will need an 8-week lead time to start the work. Although this is reflected in the schedule of Figure 6, upon approval of the Work Plan, Sparton will be contacting other drillers to assess whether the process can be expedited.

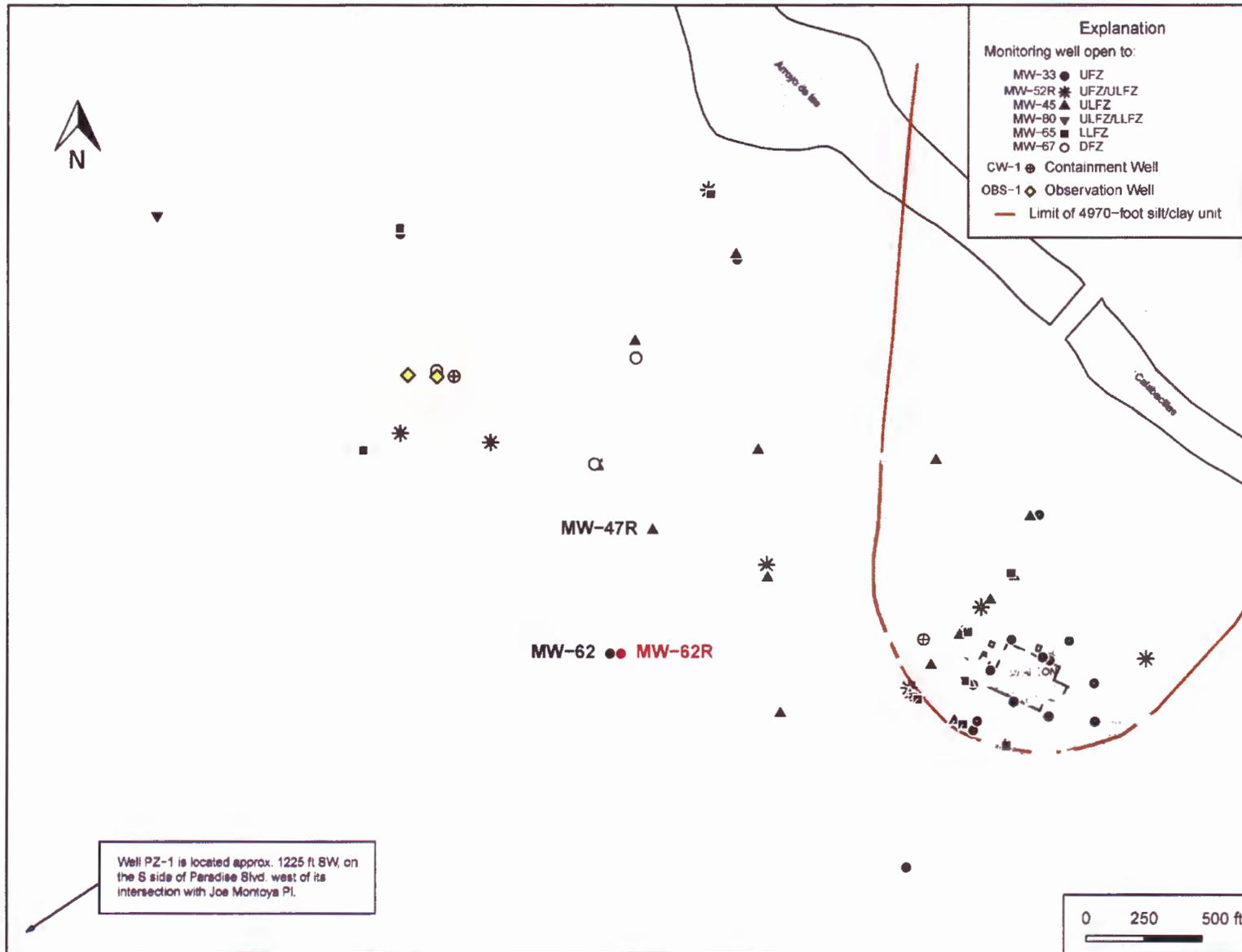


Figure 1. Well Location Map



Figure 2. Location of Existing Monitoring Well MW-62 and Proposed Location of Replacement Well MW-62R

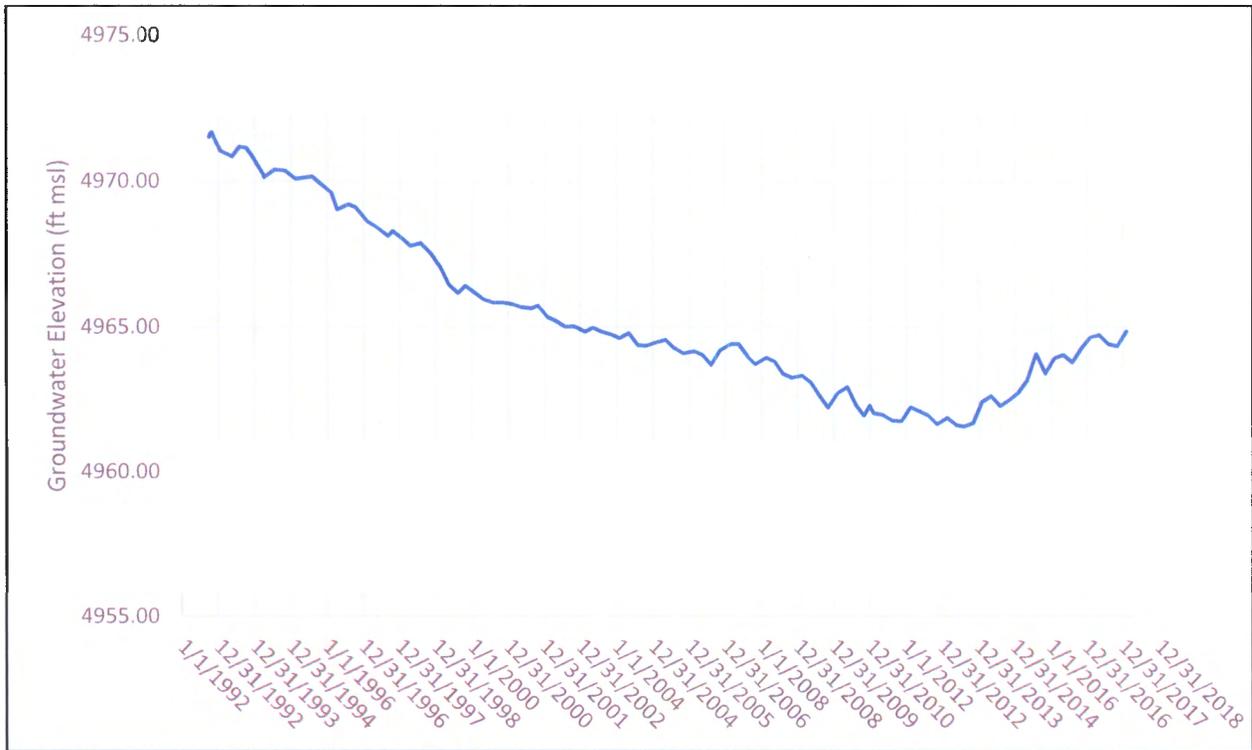


Figure 3. Hydrograph of Monitoring Well MW-62



SAMPLE LOG		
Borehole Number	<u>MW-77</u>	Borehole Location <u>N. 1524374.2, E. 377754.9</u>
Property Owner	<u>Sparton Technology, Inc.</u>	
Sample Logger	<u>Joe Sandoval & Peter Metzner, METRIC Corporation</u>	
Driller	<u>Rodgers Environmental Services</u>	
Drilling Medium	<u>Hollow stem auger</u>	
Date of Completion	<u>June 2001</u>	Ground Elevation <u>5045.5 ft.</u>
Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 60	60	Pale yellowish brown (10YR 6/2), medium sorted, subangular to subrounded, very fine to medium sand with some pebble gravel.
60 - 68	8	Grayish orange (10YR 7/4), poorly sorted, subangular to subrounded, very fine to coarse sand.
68 - 70.5	2.5	Grayish orange (10YR 7/4), poorly sorted, subangular to subrounded, very fine sand to pebble gravel.
70.5 - 73	2.5	Pale yellowish orange (10YR 6/6) very fine silty sand.
73 - 90	17	Sandy (no recovery).

Figure 4. Example of Well Boring Log

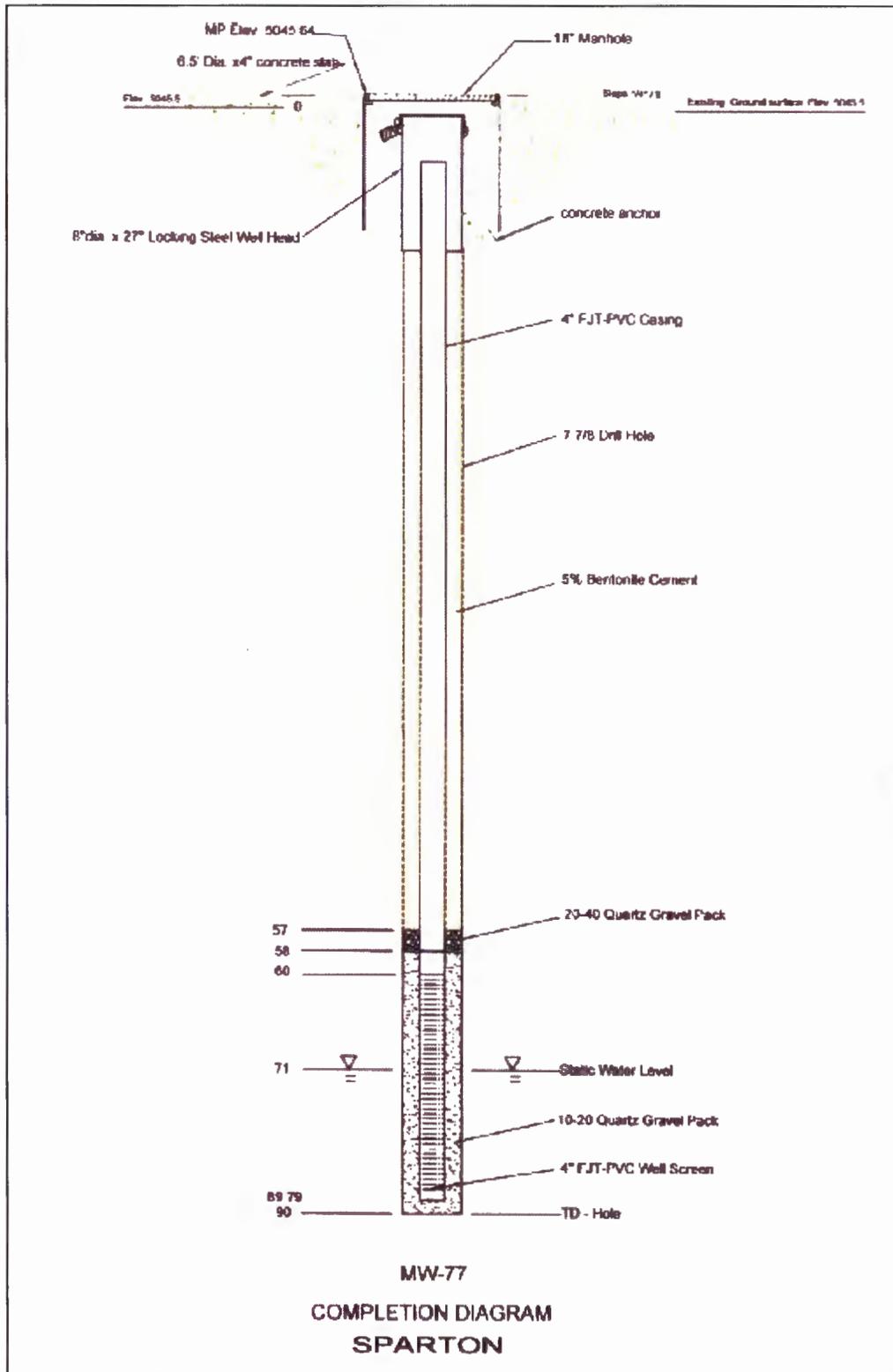


Figure 5. Example of Well Completion Diagram

