

AP - 061

**STAGE 1
WORKPLAN**

12/07/2006

AP 061



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E-MAIL: bbc@bbcinternational.com

December 7, 2006

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DEC 07 2006

Oil Conservation Division
Environment

Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: STAGE 1 ABATEMENT PLAN (AP-061)
HERRADURA NO. 3

Dear Mr. Von Gonten:

On behalf of Chesapeake Operating, Inc., BBC International, Inc. respectfully submits the enclosed Stage 1 Abatement Plan (AP-061).

If you have any questions, please do not hesitate to contact myself at (505) 397-6388 or via e-mail at cbrunson@bbcinternational.com or Bradley Blevins with Chesapeake Operating, Inc. at (505) 391-1462.

Sincerely,

BBC International, Inc.

Cliff P. Brunson, CEI, CRS
President

cc: Chris Williams – NMOCD, Hobbs
Bradley Blevins – Chesapeake, Hobbs
Harlan Brown – Chesapeake, Oklahoma City



HERRADURA NO. 3

(API No. 30-025-35933)

**SECTION 15, TOWNSHIP 19 SOUTH, RANGE 38 EAST
LEA COUNTY, NEW MEXICO**

STAGE 1 ABATEMENT PLAN (AP-061)

DECEMBER 2006

CHESAPEAKE OPERATING, INC.

HOBBS, NM

PREPARED BY:

BBC INTERNATIONAL, INC.
WORLD-WIDE ENVIRONMENTAL SPECIALISTS
1324 W. MARLAND BLVD.
HOBBS, NEW MEXICO 88240
(505)397-6388 • FAX (505)397-0397
EMAIL: cbrunson@bbcinternational.com

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1.0 INTRODUCTION

The subject site is located south of Hobbs, New Mexico in Lea County in Unit Letter I, of Section 15, Township 19 South, and Range 38 East. The site is an active oil well that was drilled in July 2002 and operated by Xeric Oil and Gas Corporation of Midland, Texas. The well utilized a lined drilling pit to contain drilling fluids and solids. The NMOCD visited the site on November 19, 2002 and on January 21, 2003 and noted problems with the drilling pit during the site visits. However, the NMOCD did not issue a formal Notice of Violation at the time and has not since (See **Appendix I**-NMOCD letter, October 4, 2006).

Chesapeake Operating, Inc. (Chesapeake) purchased the Herradura No. 3 on May 7, 2004. The drilling pit was closed at the time of the purchase. Chesapeake was not aware of any problems associated with this well until receiving a letter from the NMOCD on August 8, 2006 (See **Appendix I**-NMOCD letter, August 8, 2006) in which the NMOCD notified Chesapeake that the NMOCD was requiring Chesapeake to submit a Stage 1 Abatement Plan in accordance with NMOCD's regulations found in Rule 19 of the New Mexico Administrative Code, Chapter 15, Part 15.1.19 (19.15.1.19 NMAC) to investigate ground water contamination at the site. The NMOCD stated this requirement was determined by chloride contamination being recently detected at Monitor Well No. 7 at the adjacent Champion Technologies, Inc. site at 4001 South Highway 18 which is located east of the Herradura No. 3.

The site is a level packed caliche well pad approximately the size of 300 feet by 280 feet which is fenced and accessible by driving through Champion Technologies yard (See **Figure 1**).

Chesapeake is unaware of any previous investigations related to this site.

Chesapeake has retained BBC International, Inc. (BBC) to investigate and manage the site activities at the Herradura No. 3.

2.0 SITE DESCRIPTION

The subject property is located in southern Lea County in the southeastern corner of New Mexico. The area is in the Pecos River Valley section of the Great Plains physiographic province and is located in the southern margin of the Llano Estacado. The region is generally a treeless, gently sloping plain, with shallow playa lakes, sand dunes and covered with short prairie grass. The climate of the Hobbs area is classified as semi-arid to arid and is characterized by low annual rainfall, low humidity, and a high average annual temperature. Local precipitation averages approximately 16 inches per year (Nicholson and Clebsch). Evaporation in the region is approximately 79 inches per year and over 95 percent of all precipitation is lost by direct evaporation. The typical recharge to the aquifer is approximately 0.5 inch/year (USGS, 2000).

The site is located in the southeastern quadrant of Section 15, Township 19 South, Range 38 East. The site is within the Hobbs Pool oil and gas field and is approximately 5 miles east of the Monument Pool.

The vadose zone at the site is mostly silty caliche. According to information gathered by Champion Technologies environmental investigation, boring logs and excavations indicate a 5-foot thick hard caliche layer approximately ranging from 20 to 25 feet below ground surface and a second hard caliche layer ranging from 50 to 56 feet below ground surface (ESC, 2006).

Currently, there is a commercial oil field services operation to the northeast; Champion Technologies chemical company to the east; vacant land to the west; a residence to the north; and a residence to the southeast. The residence to the southeast has a water supply well located south of Champion Technologies' fenced yard and several hundreds of feet to the southeast of the Herradura No. 3 well location.

3.0 SITE INVESTIGATION

Chesapeake is submitting this Stage 1 Abatement Plan in accordance with the NMOCD's Rule 19 (19.15.1.19 NMAC) to investigate potential ground water contamination at Chesapeake's Herradura No. 3 well site located in Section 15, Township 19 South, Range 38 East, Lea County, New Mexico.

Chesapeake proposes the following to investigate and delineate the site utilizing the advancement of soil borings and ground water monitoring wells and associated laboratory analyses.

3.1 Soil

A minimum of three (3) soil borings will be advanced at the site to delineate the vertical and horizontal extent of potential chloride contamination present in the vadose zone. The proposed location of these soil borings are depicted on **Figure 2**.

The location of the proposed soil borings are necessary to locate and delineate the area of the former drilling pit associated with this well. It is unknown if the pit contents still exist on location, therefore, the soil borings will assist in determining if the pit contents still exist and the extent of the area that the drilling pit encompasses along with the potential impact of chloride that may exist in the vadose zone at the site. The soil borings will be placed to drill outside the boundaries of the former drilling pit so the liner will not be punctured and compromised.

Site history information, conditions, and field screening analytical techniques for chloride will dictate the depth and any additional number of soil borings advanced at the site.

An air-rotary rig equipped with split-spoon sampling tools will be used to advance the soil borings and collect the soil samples. The soil borings advanced at the site will be sampled initially in the near surface (0-3 feet below ground surface (bgs)), then sampled every five feet until terminus.

3.2 QA/QC Sampling Procedures-Soil

The soil samples will be obtained by personnel utilizing appropriate sampling tools and wearing clean disposable gloves. The soil samples will be collected using sampling tools that will be decontaminated using an Alconox detergent solution and rinsed with distilled water between sampling events. The drilling equipment will be decontaminated prior to being brought on the site as well as decontaminated between soil borings.

Each soil sampling interval will be split into two equal portions and placed in separate containers. The first portion of the sample will be placed into a container to field screen the soil using chloride titration analysis. The second portion of the sample will be placed in a sterile glass container equipped with a Teflon-lined lid furnished by the testing laboratory. Each container will be filled to capacity with soil. All containers will be labeled, placed on ice in an insulated cooler, and chilled to a temperature of approximately 40⁰F (4⁰C). The cooler will be sealed for delivery to the laboratory for laboratory testing utilizing proper chain of custody documentation throughout the sampling process. The samples will be delivered for analysis to Trace Laboratories, Inc. in Lubbock, Texas. The laboratory will be responsible for proper QA/QC procedures utilized during the analytical process. These procedures are either transmitted with the laboratory reports or are on file at the laboratory.

3.3 Laboratory Analysis-Soil

The soil samples will be analyzed for all constituents contained in the following analytical methods for initial site characterization according to NMOCD requirements:

- Metals – Method SW6020
- Total Mercury – Method 7470
- Total Petroleum Hydrocarbons (TPH) – Method SW 846-8015 Modified DRO/GRO
- Volatile Organic Compounds (VOCs (including BTEX)) – Method SW 846-8260B
- Semi-volatile Organic Compounds (SVOCs) – Method SW 846-8270C
- Chloride – Method E300

- Cyanide – Method E335.3
- Nitrogen, Nitrite – Method E354.1
- pH – Method E150.1

3.4 Ground Water

A minimum of three (3) ground water monitoring wells will be advanced and installed at the site to delineate the vertical and horizontal extent of potential chloride contamination present in the vadose zone and the ground water aquifer. The proposed location of these ground water monitoring wells are depicted on **Figure 2**.

The locations of the proposed ground water monitoring wells are necessary to assist in delineating the impact of the ground water from the former drilling pit associated with this well.

Two up gradient wells and one down gradient of the drilling pit will be installed in order to define the site geology and hydrogeology of potential vadose-zone and ground water contamination, subsurface hydraulic conductivity, transmissivity, storativity, and rate and direction of potential contaminant migration. If site conditions warrant the collection of additional data concerning ground water, additional ground water monitoring wells may be installed.

An air-rotary rig equipped with split-spoon sampling tools will be used to advance the ground water monitoring wells and collect the soil samples. The ground water monitoring wells advanced at the site will be sampled initially in the near surface (0-3 feet below ground surface (bgs)), then sampled every five feet until terminus.

3.5 QA/QC Sampling Procedures-Soil (Ground Water Monitoring Wells)

The soil samples will be obtained by personnel utilizing appropriate sampling tools and wearing clean disposable gloves. The soil samples will be collected using sampling tools that will be decontaminated using an Alconox detergent solution and rinsed with distilled water between sampling events. The drilling equipment will be decontaminated prior to being brought on the site as well as decontaminated between soil borings.

Each soil sampling interval will be split into two equal portions and placed in separate containers. The first portion of the sample will be placed into a container to field screen the soil using chloride titration analysis. The second portion of the sample will be placed in a sterile glass container equipped with a Teflon-lined lid furnished by the testing laboratory. Each container will be filled to capacity with soil. All containers will be labeled, placed on ice in an insulated cooler, and chilled to a temperature of approximately 40⁰F (4⁰C). The cooler will be sealed for delivery to the laboratory for laboratory testing utilizing proper chain of

custody documentation throughout the sampling process. The samples will be delivered for analysis to Trace Laboratories, Inc. in Lubbock, Texas.

The laboratory will be responsible for proper QA/QC procedures utilized during the analytical process. These procedures are either transmitted with the laboratory reports or are on file at the laboratory.

3.6 Laboratory Analysis-Soil (Ground Water Monitoring Wells)

The soil samples will be analyzed for all constituents contained in the following analytical methods for initial site characterization according to NMOCD requirements:

- Metals – Method SW6020
- Total Mercury – Method 7470
- Total Petroleum Hydrocarbons (TPH) – Method SW 846-8015 Modified DRO/GRO
- Volatile Organic Compounds (VOCs (including BTEX)) – Method SW 846-8260B
- Semi-volatile Organic Compounds (SVOCs) – Method SW 846-8270C
- Chloride – Method E300
- Cyanide – Method E335.3
- Nitrogen, Nitrite – Method E354.1
- pH – Method E150.1

3.7 Ground Water Monitor Well Construction and Development

The proposed ground water monitor wells will be completed in the locations as depicted in **Figure 2**. The wells will be constructed of a minimum of fifteen (15) feet of 2 inch (2") PVC well screen with ten (10) feet of well screen below the water table. Blank PVC riser will be extended to the surface. Filter sand will be installed to two-three (2-3) feet above the well screen followed by a bentonite plug and cement grout to the surface with a cement pad and locking vault put in place.

The ground water monitor wells will be developed by surging and bailing or pumping to facilitate ground water flow into the well bore. Following development, the wells will be gauged for depth to ground water and to determine if free hydrocarbons are present. A minimum of twelve (12) hours after installation, the wells will be gauged, purged, and sampled for the required constituents.

3.8 QA/QC Sampling Procedures-Ground Water

The ground water monitor wells will be developed and purged prior to sampling. Monitoring wells with a sufficient recharge will be purged by removing a minimum

of three well volumes. Monitoring wells that do not recharge sufficiently will be purged until no additional ground water can be obtained.

After purging the newly installed wells, groundwater samples will be collected with a disposable Teflon sampler and polyethylene line by personnel wearing clean, disposable gloves. Groundwater sample containers will be filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers filled first and PAH containers second).

Groundwater water samples collected for BTEX analysis will be placed in 40 ml glass VOA vials equipped with Teflon lined caps that will be provided by the analytical laboratory. The vials will be filled to a positive meniscus, sealed, and visually checked to ensure the absence of air bubbles.

Ground water samples collected for PAH analysis will be filled to capacity in sterile, one (1) liter glass containers equipped with Teflon lined caps. Ground water samples collected for metals analysis will be filled to capacity in sterile, one (1) liter plastic containers equipped with Teflon lined caps. All of the sampling containers will be provided by the analytical laboratory.

All containers will be labeled, placed on ice in an insulated cooler, and chilled to a temperature of approximately 40⁰F (4⁰C). The cooler will be sealed for delivery to the laboratory for laboratory testing utilizing proper chain of custody documentation throughout the sampling process. The samples will be delivered for analysis to Trace Laboratories, Inc. in Lubbock, Texas.

The laboratory will be responsible for proper QA/QC procedures utilized during the analytical process. These procedures are either transmitted with the laboratory reports or are on file at the laboratory.

3.9 Laboratory Analysis-Ground Water Monitoring Wells

The ground water samples will be analyzed for all constituents contained in the following analytical methods for initial site characterization according to NMOCD requirements:

- Metals – Method SW6020
- Total Mercury – Method 7470
- Volatile Organic Compounds (VOCs (including BTEX)) – Method SW 846-8260B
- Semi-volatile Organic Compounds (SVOCs) – Method SW 846-8270C
- Chloride – Method E300
- Cyanide – Method E335.3
- Nitrogen, Nitrite – Method E354.1
- pH – Method E150.1
- Total Dissolved Solids – E160.1

4.0 ADDITIONAL GROUND WATER SAMPLING AND ANALYSIS

In addition to the sampling of the installed ground water monitoring wells, Chesapeake proposes to obtain permission from Champion Technologies, Inc. to gain access to gauge and sample two of Champion's ground water monitoring wells. These well are MW-7 and MW-15. These wells are located off of the Herradura No. 3 site with MW-15 located to the north (up gradient) and MW-7 located to the east of the site (down gradient). These wells will be sampled for chloride using the method referenced above in Section 2.9. Additionally, permission will be sought to sample the domestic water well that is located south of Champion's property and to the south east of the Herradura No. 3 well location. This well will be sampled for chloride as well.

5.0 MONITORING PLAN

All site ground water monitoring wells will be gauged and sampled on a quarterly basis during the life of the abatement process. The constituents analyzed for will be determined in consultation with the NMOCD after the initial characterization of the first sampling event after the installation of the ground water monitoring wells.

6.0 AQUIFER DESCRIPTION

Several aquifers are located in the Hobbs area, the Quaternary alluvium, the Ogallala formation, and the Triassic Dockum Group which is composed of the Chinle formation and the Santa Rosa Sandstone (Nicholson and Clebsch). The City of Hobbs obtains ground water for domestic use from the Ogallala formation which is the major fresh water aquifer in the area. According to the New Mexico Office of the State Engineer (NMOSE), current depth to water in the site vicinity is approximately 50 to 60 feet and ground water flow direction in the Ogallala aquifer is towards the east southeast.

The site is within the limits of the Lea County Basin as declared by the New Mexico Office of the State Engineer (NMOSE). In the Lea County Basin, the sole source of drinking water is the Ogallala Aquifer. NMOSE records indicate the depth to groundwater generally decreases to the west. In the Southern High Plains area, which includes the Ogallala, approximately 95 percent of the groundwater recharge occurs in playas that cover approximately 5 percent of the land surface; within the playas, up to 80 percent of the recharge occurs through macropores, such as cracks and burrow holes, and the remaining 20 percent, through interstitial spaces in the soil (Wood, et al, 1997 and USGS, 2000). Based on these data, the estimated infiltration rate for the general land area is approximately 360 times slower than that which occurs in playas, and the typical infiltration rate through the vast majority of the land would be approximately 0.03 inch per year.

According to information collected by Champion Technologies, the hydraulic conductivity at the Champion site, which is east of the Herradura No. 3, is approximately 3×10^{-3} cm/s and the hydraulic gradient has been consistent at approximately 0.003 feet/foot, toward the east (ESC, 2006).

It is assumed at this time, before data collection, that this trend would be similar at the Chesapeake Herradura No. 3 site.

7.0 INVENTORY OF WATER WELLS WITHIN ONE MILE

An inventory of water wells located within one mile of the site can be found in **Appendix II**. These well locations were obtained from the website of the New Mexico Office of the State Engineer.

8.0 SURFACE OWNERSHIP

Chesapeake will conduct a one-mile radius search from the site of all known and registered surface owners. A review of the public tax rolls of Lea County, NM will identify the name and addresses of the surface owners within one mile of the site and a list will be generated. A diagram depicting the one-mile radius search will be furnished.

9.0 SCHEDULE OF ACTIVITIES

All Stage 1 Abatement Plan activities will commence within 30 days of the final approval of the Stage 1 Abatement Plan following the public notice period and approval from the NMOCD. A schedule of site activities will be submitted to the NMOCD upon final approval of the Stage 1 Abatement Plan along with follow up quarterly progress reports then a final report upon completion of investigative Stage 1 Abatement activities.

10.0 DELIVERABLES

A Stage 1 Abatement Plan Site Investigation Report will be submitted within 60 days upon completion of investigative activities which will include, but not limited to, a description and history of the site, site map, a description of site investigative activities, summary data tables, laboratory analytical data, ground water gradient map, isoconcentration maps and cross sections that depict any identified contamination that may have been released from the former drilling pit, and any data necessary to select and design an effective abatement option under NMOCD Rule 19 Stage 2 Abatement requirements.

A paper and electronic copy of all work plans and/or reports will be submitted to both the Santa Fe, New Mexico and Hobbs, New Mexico offices of the NMOCD.

11.0 ABATEMENT PROCESS

On behalf of Chesapeake, BBC has submitted this Stage 1 Abatement Plan (AP-061) in accordance with NMOCD Rule 19 NMAC 15.1.19.

Upon NMOCD approval of the Stage 1 Abatement Plan, all public notice and participation requirements under Rule 19 (19.15.1.19 NMAC), specifically Rule 19G, will be followed.

12.0 REFERENCES

ESC, 2006. *Supplemental Investigation Report, Champion Technologies Inc. Site Abatement (AP-14)*. Environmental Strategies Consulting LLC. July 12, 2006.

Nicholson, Jr., Alexander and Clebsch, Jr. Alfred, 1961, *Geology and Ground-Water Conditions in Southern Lea County, New Mexico, Ground-Water Report 6*, New Mexico Bureau of Mines and Mineral Resources, Socorro, New Mexico, 120pp.

NMOSE – New Mexico Office of the State Engineer, iWaters website:
<http://iwaters.ose.state.nm.us:7001/iWATERS/>

USGS, 2000. *Groundwater Recharge in the Southern High Plains of Texas and New Mexico, FS-127-99*. United States Geological Survey. 2000.

Wood, et al, 1997. *Quantifying macropore recharge: examples from a semi-arid area*. W.W. Wood, K.A. Rainwater, and D.B. Thompson. *Ground Water*, vol. 35, no. 6. pgs 1,097-1,106. November 1, 1997.

FIGURES

SITE DIAGRAM

SITE DIAGRAM WITH SOIL BORINGS AND MONITOR WELLS

HERRADURRA NO. 3

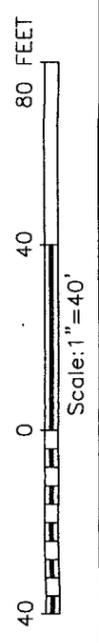
December 2006

Chesapeake Operating, Inc.
Hobbs, NM

Prepared by:
BBC International, Inc.



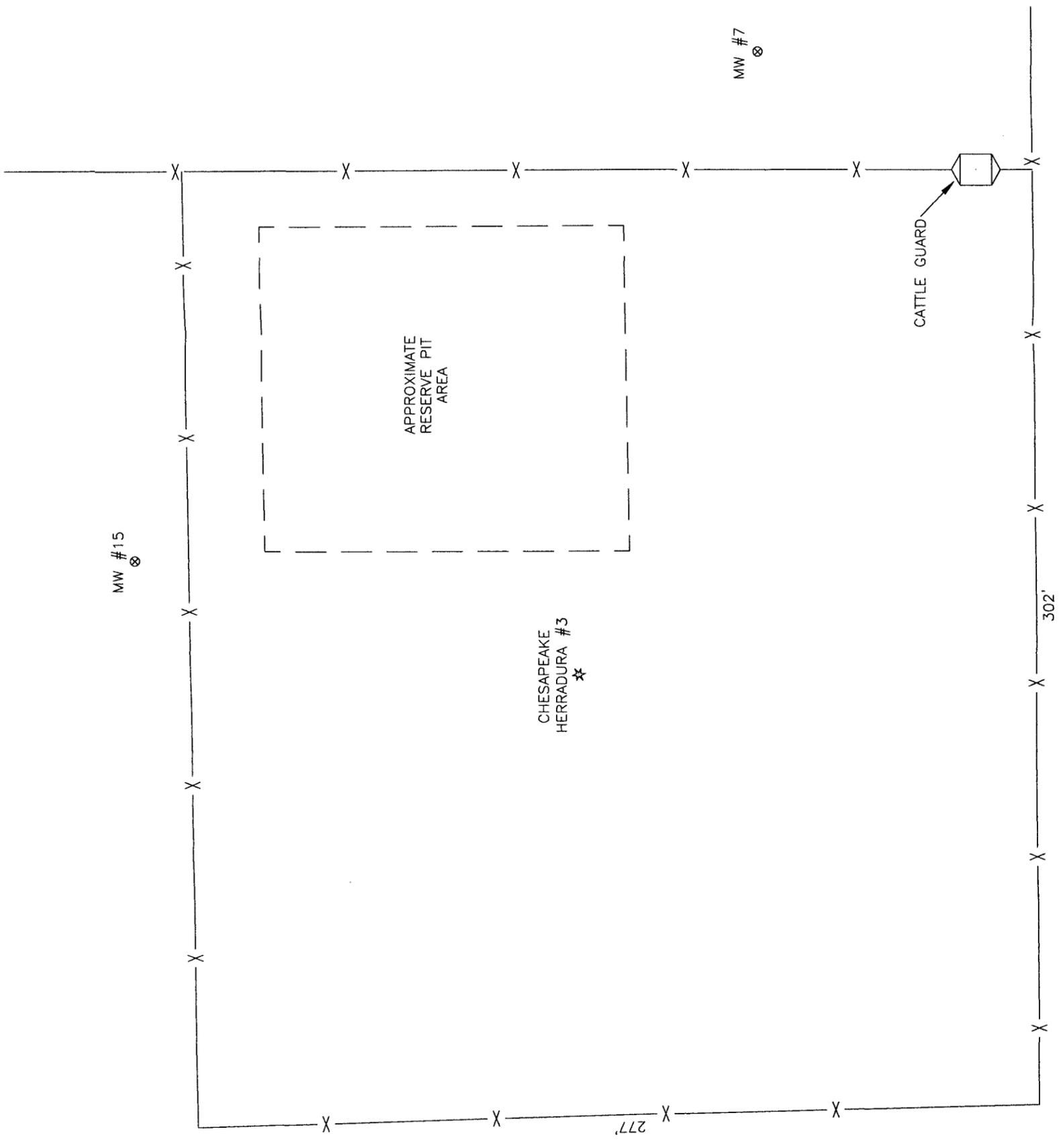
- LEGEND**
- ⊗ - DENOTES CHAMPION TECHNOLOGIES MONITOR WELL
 - ★ - DENOTES EXISTING WELL HEAD
 - X—X—X— DENOTES FENCE LINE



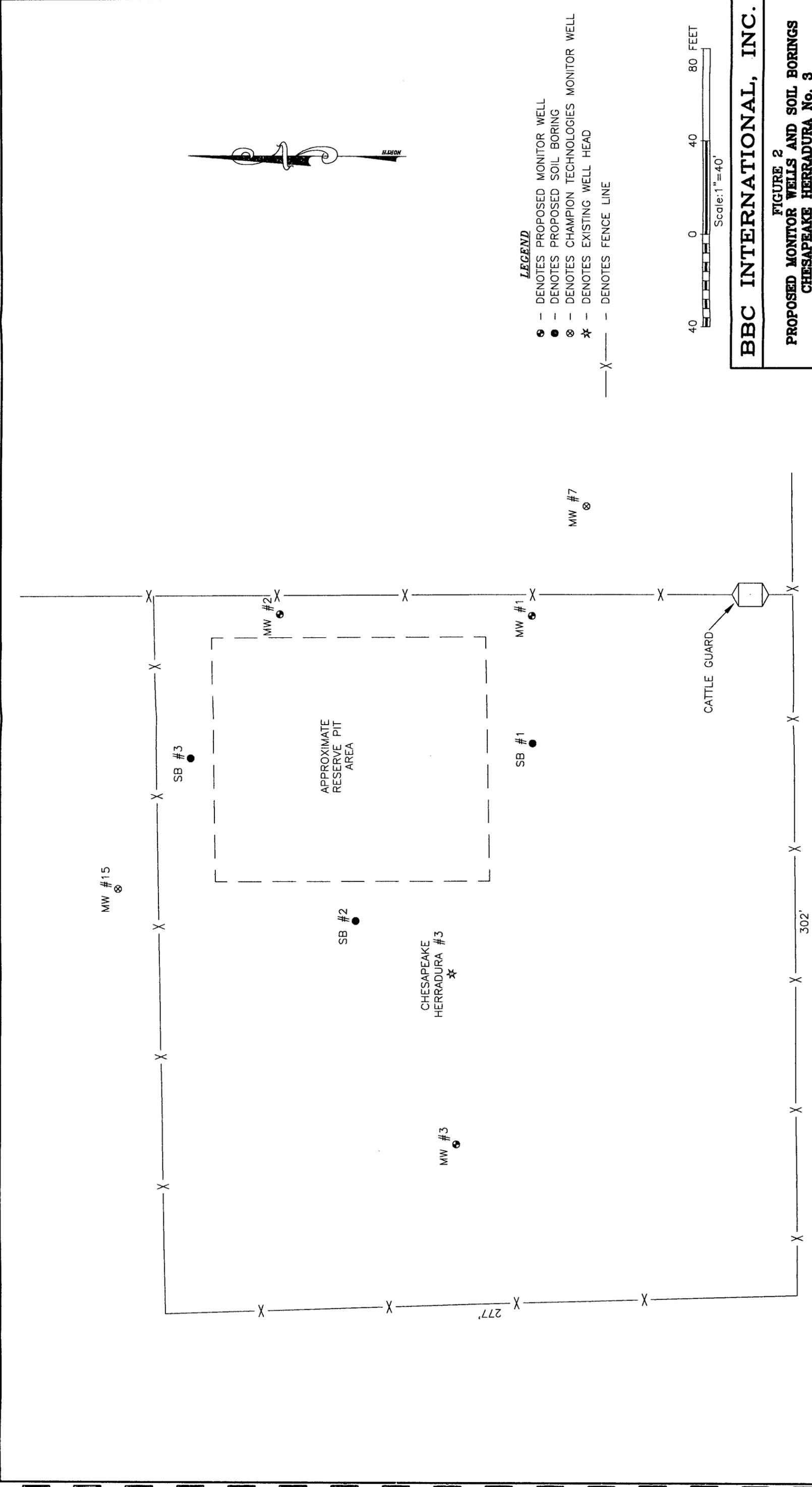
BBC INTERNATIONAL, INC.

FIGURE 1
SITE DIAGRAM
CHESAPEAKE HERRADURA No. 3
SECTION 15, TOWNSHIP 19 SOUTH, RANGE 38 EAST,
N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 11/18/06	Sheet 1 of 1	Sheets
W.O. Number: 06.11.1891	Drawn By: LA	
Date: 11/20/06	DISK:CD#5	06111891



PROVIDING SURVEYING SERVICES
SINCE 1948
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117



- LEGEND**
- - DENOTES PROPOSED MONITOR WELL
 - - DENOTES PROPOSED SOIL BORING
 - ⊗ - DENOTES CHAMPION TECHNOLOGIES MONITOR WELL
 - ★ - DENOTES EXISTING WELL HEAD
 - X— - DENOTES FENCE LINE



BBC INTERNATIONAL, INC.

FIGURE 2
PROPOSED MONITOR WELLS AND SOIL BORINGS
CHESAPEAKE HERRADURA No. 3
 SECTION 15, TOWNSHIP 19 SOUTH, RANGE 38 EAST,
 N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 11/18/06	Sheet 1 of 1	Sheets
W.O. Number: 06.11.1891	Drawn By: LA	
Date: 11/20/06	DISK:CD#5	06111891

FIGURE 2

PROVIDING SURVEYING SERVICES
 SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO
 HOBBS, N.M. 88240
 (505) 393-3117

APPENDIX I

NMOCD CORRESPONDENCE

HERRADURRA NO. 3

December 2006

Chesapeake Operating, Inc.
Hobbs, NM

Prepared by:
BBC International, Inc.



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

October 4, 2006

Mr. Harlan Brown
Chesapeake Energy Corporation
P.O. Box 18496
Oklahoma, OK 73154-0496

**RE: REQUIREMENT TO SUBMIT ABATEMENT PLAN
CHESAPEAKE HERRADURA NO. 3
SECTION 15, TOWNSHIP 19 SOUTH, RANGE 38 EAST
LEA COUNTY, NEW MEXICO**

Dear Mr. Brown:

In response to your letter of September 22, 2006, Chesapeake Operating, Inc. (Chesapeake) may inspect the New Mexico Oil Conservation Division (OCD) files on the Champion Technologies, Inc. site and our field inspectors photographs during normal business hours. OCD noted problems with the Herradura No. 3 drilling pit during site visits on November 19, 2002 and January 21, 2003, but did not issue a formal Notice of Violation at that time. As previously noted, OCD has determined based on monitoring data from Monitor Well No. 7 at the Champion Technologies, Inc. site that the recent increase in the chlorides concentration at the Champion site is most likely due to a chloride plume migrating from the former Herradura No. 3 drilling pit onto the Champion site. OCD rejects your assertion that the requirement for Chesapeake to submit a Stage 1 Abatement Plan is "*without merit.*" The implications of the monitoring data are clear and unambiguous; therefore, as the "*responsible person*" of record, Chesapeake must submit a Stage 1 Abatement Plan.

As per Mr. Hagemeyer's verbal request, OCD hereby extends the due date for Chesapeake's submission of its Stage 1 Abatement Plan from October 16, 2006, until November 1, 2006. OCD

Mr. Harlan Brown

October 4, 2006

Page 2

is also attaching photos of the Herradura No. 3 drilling pit taken on January 21, 2003.
If you have any questions, please contact Glenn von Gonten of my staff at (505) 476-3488.

Sincerely,



Wayne Price
Environmental Bureau Chief
Oil Conservation Division

Attachment (Photos)

cc: Chris Williams, OCD Hobbs District Supervisor





NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

CERTIFIED MAIL
RETURN RECEIPT NO: 3929 4757

August 8, 2006

Mr. Brad Blevins
Chesapeake Operating, Inc.
5014 W Carlsbad Hwy
Hobbs, NM 88240 - 9229

RE: REQUIREMENT TO SUBMIT ABATEMENT PLAN
CHESAPEAKE HERRADURA NO. 3
SECTION 15, TOWNSHIP 19 SOUTH, RANGE 38 EAST
LEA COUNTY, NEW MEXICO

Dear Mr. Blevins:

The New Mexico Oil Conservation Division (OCD) has determined that Chesapeake Operating, Inc. (Chesapeake) must submit a Stage I Abatement Plan in accordance with OCD's Rule 19 (19.15.1.19 NMAC) to investigate ground water contamination at its Herradura No. 3 lease located in Section 15, Township 19 South, Range 38 East, Lea County, New Mexico. OCD is requiring this abatement plan at this time because it has determined that the chloride contamination recently detected at Monitor Well No. 7 at the adjacent Champion Technologies, Inc. site at 4001 South Highway 18 is coming from the former drilling pit associated with the Herradura No. 3. OCD noted several problems with the drilling pit during a site inspection in November 2002.

The Stage I Abatement Plan proposal must be submitted to the OCD Santa Fe Office with a copy provided to the OCD Hobbs District Office and must meet of all the requirements specified in Rule 19 (19.15.1.19 NMAC), including, but not limited to, the public notice and participation requirements specified in Rule 19G. The Stage I Abatement Plan is due sixty (60) days from the receipt by Chesapeake of this written notice.

Mr. Brad Blevins
August 8, 2006
Page 2

Chesapeake's Stage 1 Abatement Plan must meet all of the requirements specified in Rule 19E.3, including, but not limited to, a site investigation work plan and monitoring program that will enable it to characterize the chloride release using an appropriate number of isoconcentration maps and cross sections that depict the contamination that has been released from the former pit and to provide the data necessary to select and design an effective abatement option.

Chesapeake should submit one paper copy and one electronic copy of all future workplans and/or reports. If you have any questions, please contact Glenn von Gonten of my staff at (505) 476-3488.

Sincerely,

A handwritten signature in cursive script, appearing to read "Wayne Price".

Wayne Price
Environmental Bureau Chief

cc: Chris Williams, OCD Hobbs District Supervisor

APPENDIX II

INVENTORY OF WATER WELLS

HERRADURRA NO. 3

December 2006

Chesapeake Operating, Inc.
Hobbs, NM

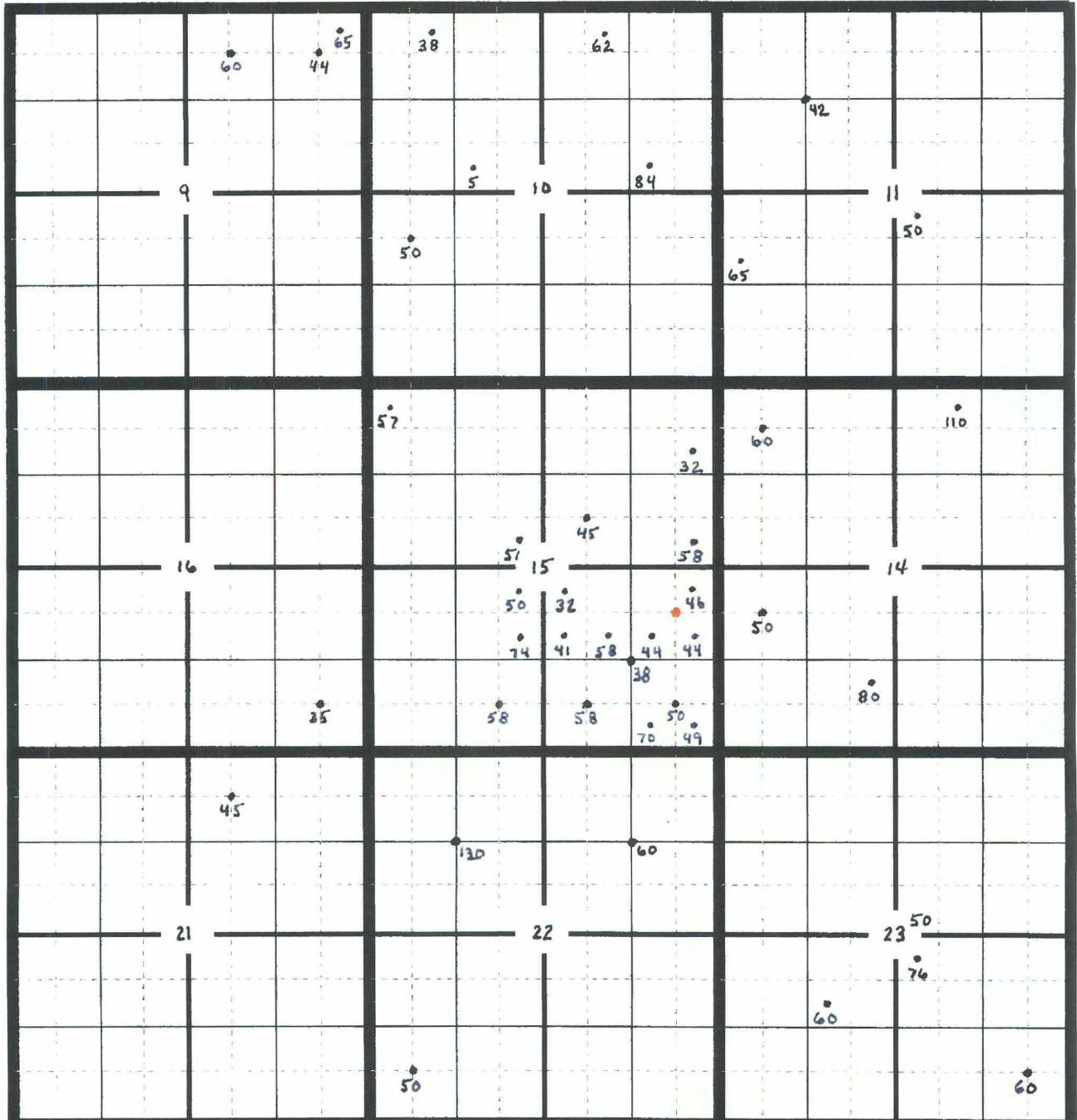
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E-MAIL: cbrunson@bbcinternational.com

Groundwater Plot

Oil/Gas Well Name: *Herradura No. 3* • - Well location



**New Mexico Office of the State Engineer
POD Reports and Downloads**

Township: 19S Range: 38E Sections: 15,9,10,11,16,14,21,22,23

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

Owner Name: (First) (Last) Non-Domestic Domestic All

WATER COLUMN REPORT 12/04/2006

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are biggest to smallest)

POD Number	Tws	Rng	Sec	q	q	q	Zone	X	Y	Depth Well	Depth Water	Water (in feet) Column
L 07242	19S	38E	09	2	1					130	60	70
L 02411 APPRO	19S	38E	09	2	2					92	44	48
L 02411	19S	38E	09	2	2					92	44	48
L 07242 CLW	19S	38E	09	2	2	2				141	65	76
L 08167	19S	38E	10	1	1	2				130	38	92
L 01292 APPRO	19S	38E	10	1	4	3				80	5	75
L 03342 APPRO	19S	38E	10	2	1	2				100	42	58
L 07238	19S	38E	10	2	1	2				120	48	72
L 03342	19S	38E	10	2	1	2				150	62	88
L 03342 CLW	19S	38E	10	2	1	2				150	62	88
L 03342 CLW204345	19S	38E	10	2	1	2				100	42	58
L 08375	19S	38E	10	2	4	3				150	84	66
L 02640 APPRO	19S	38E	10	3	1					95	50	45
L 02640	19S	38E	10	3	1					95	50	45
L 08740	19S	38E	11	1						110	42	68
L 11409	19S	38E	11	3	1	3				175		
L 08422	19S	38E	11	3	1	3				150	65	85
L 03467	19S	38E	11	4	1	1				100	50	50
L 03467 APPRO	19S	38E	11	4	1	1				100	50	50
L 10011	19S	38E	14	1	1					140	60	80
L 10544	19S	38E	14	1	1	3				120	54	66
L 11300	19S	38E	14	1	3	4				138		
L 00345 S 6	19S	38E	14	2	1	2				187	110	77
L 03658 APPRO	19S	38E	14	3	1					120	50	70
L 03658	19S	38E	14	3	1					120	50	70
L 11060	19S	38E	14	3	1	3				158		
L 08250	19S	38E	14	3	4	2				125	80	45
L 06759	19S	38E	15							100	45	55
L 07359	19S	38E	15	1	1	1				117	57	60
L 03575	19S	38E	15	1	4	4				110	51	59
L 03575 APPRO	19S	38E	15	1	4	4				100	51	49
L 11074	19S	38E	15	2						200		

L 04612	19S	38E	15	2	2	4	100	32	68
L 06858	19S	38E	15	2	3		100	45	55
L 08046	19S	38E	15	2	4	4	130	58	72
L 06922	19S	38E	15	3	2	2	100	50	50
L 09052	19S	38E	15	3	2	3	120	58	62
L 11376	19S	38E	15	3	2	3	200		
L 09486	19S	38E	15	3	2	4	132	74	58
L 08279	19S	38E	15	3	4		130	58	72
L 09896	19S	38E	15	4			100	38	62
L 07512	19S	38E	15	4			100	32	68
L 06101 CLW	19S	38E	15	4			100	38	62
L 09821	19S	38E	15	4			100	51	49
L 02667	19S	38E	15	4			105	70	35
L 07882	19S	38E	15	4	1	1	100	32	68
L 04489 APPRO	19S	38E	15	4	1	3	100	41	59
L 09310	19S	38E	15	4	1	4	120	58	62
L 09018	19S	38E	15	4	1	4	100	32	68
L 05013	19S	38E	15	4	2		100	47	53
L 09720	19S	38E	15	4	2		100	45	55
L 04622	19S	38E	15	4	2	2	70	46	24
L 04622 APPRO	19S	38E	15	4	2	2	70	46	24
L 04107	19S	38E	15	4	2	2	122	60	62
L 07379	19S	38E	15	4	2	3	120	44	76
L 04539	19S	38E	15	4	2	4	100	48	52
L 10322	19S	38E	15	4	2	4	133	44	89
L 04539 APPRO	19S	38E	15	4	2	4	100	48	52
L 08280	19S	38E	15	4	3		130	58	72
L 08363	19S	38E	15	4	3		130	58	72
L 11015	19S	38E	15	4	3	3	120	45	75
L 08352	19S	38E	15	4	4		118	50	68
L 06792	19S	38E	15	4	4		100	51	49
L 07357	19S	38E	15	4	4		101		
L 10503	19S	38E	15	4	4	3	100	70	30
L 02689 APPRO	19S	38E	15	4	4	4	83	49	34
L 02689	19S	38E	15	4	4	4	83	49	34
L 11714	19S	38E	16	1	1	2	43	20	23
L 04978	19S	38E	16	2	2		102	46	56
L 04335	19S	38E	16	4	4		110	35	75
L 04335 APPRO	19S	38E	16	4	4		110	35	75
L 03424 APPRO	19S	38E	21	2	1		102	45	57
L 03424	19S	38E	21	2	1		102	45	57
L 08890	19S	38E	22	1			130	130	
L 11593	19S	38E	22	1	2	1	125		
L 11587	19S	38E	22	1	4	2	136		
L 02746 APPRO	19S	38E	22	2			110	60	50
L 02746	19S	38E	22	2			110	60	50
L 04833	19S	38E	22	3	3		115	50	65
L 11127	19S	38E	22	3	3	3	108		
L 03054 APPRO	19S	38E	23				95	50	45
L 03054	19S	38E	23				95	50	45
L 11276	19S	38E	23	3	2	2	134		
L 03913	19S	38E	23	3	2	3	100	60	40
L 03913 APPRO	19S	38E	23	3	2	3	100	60	40
L 11413	19S	38E	23	4	1	1	135	76	59
L 10466	19S	38E	23	4	1	1	100	100	
L 08212	19S	38E	23	4	4			60	

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