AP - 40

STAGE 1 & 2 WORKPLANS

DATE: 8/2005

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

AP043
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(FORMERLY

WORKPLAN TO DELINEATE THE HORIZONTAL AND VERTICAL EXTENT OF ANY GROUNDWATER AND SOIL CONTAMINATION

FOR

Richardson Operating
BOB & BLANCHE NO. 1
576 COUNTY ROAD 6100
KIRTLAND, NEW MEXICO

PROJECT #98094-007

August 2005

5796 U.S. HIGHWAY 64 • FARMINGTON, NM 87401 • (505) 632-0615

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

3R0401

August 25, 2005 Project #98094-007

Ms. Patty Davis
Richardson Operating
5600 S. Quebec St., Suite. 130B
Greenwood Village, Colorado 80111 Phone (303) 830-8000

Re: **WORKPLAN TO DELINEATE THE HORIZONTAL AND VERTICAL EXTENT OF ANY GROUNDWATER AND SOIL CONTAMINATION**
BOB AND BLANCHE NO. 1
KIRTLAND, NEW MEXICO

Dear Ms. Davis:

Enclosed, please find the *Workplan to Delineate Horizontal and Vertical Extent of any Groundwater and Soil Contamination* for the Bob and Blanche No. 1 located in Kirtland, New Mexico.

If you have any questions or need additional information, please do not hesitate to contact me at (505) 632-0615.

Respectfully Submitted,
ENVIROTECH INC.

C. Jack Collins

C. Jack Collins
Chief Environmental Scientist / Hydrogeologist
NMCES # 038
jcollins@envirotech-inc.com

Enclosure Work plan and (1) copy

Cc: Tom Bergin – Richardson Operating

Client File No. 98094

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

August 25, 2005 Project #98094-007

Mr. Tom Bergin
Richardson Operating
5600 S. Quebec St., Suite. 130B
Greenwood Village, Colorado 80111 Phone (303) 830-8000

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Cc: Patty Davis – Richardson Operating

Client File No. 98094

WORKPLAN TO DELINEATE THE HORIZONTAL AND VERTICAL EXTENT OF ANY GROUNDWATER AND SOIL CONTAMINATION

SITE NAME:

BOB AND BLANCHE NO. 1
COUNTY ROAD 6100
KIRTLAND, NEW MEXICO

SUBMITTED TO:

Richardson Operating
5600 S. Quebec St., Suite. 130B
Greenwood Village, Colorado 80111
(303) 830-8000

SUBMITTED BY:

ENVIROTECH INC.
5796 U.S. HIGHWAY 64
FARMINGTON, NEW MEXICO 87401
(505) 632-0615

PROJECT NO. 98094-007

AUGUST 25, 2005

WORKPLAN TO DELINEATE THE HORIZONTAL AND VERTICAL EXTENT OF ANY GROUNDWATER AND SOIL CONTAMINATION

Bob and Blanche No. 1

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INTRODUCTION

Envirotech Inc. has been retained by Richardson Operating, the owner and responsible party of a well site known as Bob and Blanche No. 1, to prepare a work plan to delineate the horizontal and vertical extent of any groundwater and soil contamination at the above referenced site. In July 2005, a confirmed release of fluids occurred at the above referenced site. Envirotech, Inc. was contracted by Richardson Operating to provide spill response and remediation services. During the course of remediation activities, it was discovered that groundwater in the area may have been impacted with levels of benzene and xylene that are above New Mexico Groundwater Quality Standards. The site is located on County Road 6100 in Kirtland, New Mexico see ***Figure 1, Vicinity Map.***

Due to the site location and depth to groundwater, the New Mexico Oil Conservation Division has requested an investigation of the area to delineate the horizontal and vertical extent of soil and/or any possible groundwater contamination. This work plan will meet that request.

PURPOSE AND SCOPE OF SERVICES

The purpose of this work plan is to provide the methodology for an investigation consisting of soil borings, monitor well installation, on-site investigation activities, laboratory analysis, and reporting of the on-site activities at the subject site. The following scope of services has been designed to meet this objective.

1) Initially five (5) soil borings will be completed to determine the horizontal extent of contamination on-site. All five (5) of these soil borings will be completed as monitor wells. Proposed monitor wells will be located down gradient, south and southwest, of the former release, and one (1) up gradient near the source area. In addition, four (4) existing shallow water wells near the site will be sampled with the monitor wells to provide additional information. Proposed monitor well locations (PMW-1 thru PMW-5) and water wells (WW-1 thru WW-4) are shown on ***Figure 2, Site Map.*** Final monitor well locations will be negotiated with the NMOCD. Additional step out monitor wells will be constructed as required to complete the investigation.

2) A report documenting the results of on-site activities will be prepared and submitted to Richardson Operating and the NMOCD.

WORKPLAN TO DELINEATE THE HORIZONTAL AND VERTICAL EXTENT OF ANY GROUNDWATER AND SOIL CONTAMINATION

The following task oriented work plan has been prepared to meet the requirements set forth by the NMOCD.

Task 1: Project Management

Sundry and diverse duties are associated with management, maintenance, and reporting. This includes project scheduling, conference with the NMOCD and Responsible Party, work plan development, cost estimating, field and laboratory data review, management of operation and maintenance, and review of all reports and specifications. Administrative and secretarial time is included for project file research and maintenance as well as project administrative duties.

Task 2: Soil Borings and Monitor Well Installation

a. Initially, a total of five (5) soil borings will be completed to determine the horizontal and vertical extent of groundwater contamination underlying the site. Four (4) proposed monitor wells will be located down gradient, south and southwest, of the former release, and one (1) up gradient near the source area. Soil boring locations will need to be modified in the field so as to minimize the impact on the land owner's agricultural actives. This may result in some locations being moved to the edge of the field which may not be the optimal location, but should still achieve the same result.

   Soil borings will be advanced to a minimum depth of approximately 5 feet below the air water interface using a hollow stem auger drill rig and will be continuously sampled using a split spoon sampler. All drilling and sampling tools will be thoroughly decontaminated between samples. Field personnel will conduct field screening continuously to evaluate, describe, and record lithology, hydrocarbon vapors, odor, and all other observations pertinent to the geology of the site. Any contamination detected during drilling activities will be noted. Proposed soil boring locations (PMW-1 thru PMW-5) are shown on ***Figure 2.*** Final soil boring locations will be negotiated with the NMOCD Environmental Officer and the landowner. If it is found that 5 monitor wells have not fully delineated the soil and any groundwater contamination, additional monitor wells may be required. If it is determined that seasonal variations in water levels are greater than 5 feet, additional monitor wells with longer screens may be required to account for these variations.

b. A minimum of one (1) soil sample will be collected for laboratory analysis from immediately above the water level, or the highest visual or PID headspace reading or at every major change of lithology, or at the total depth of the soil boring if no contamination is encountered. The sample location and number of samples would be made in the field so as to best characterize the extent of the soil contamination. Samples to be analyzed for volatile organic constituents using EPA method 8021 (formally EPA Method 8020) for BTEX and EPA method 8015 modified for TPH. All soil samples will be preserved on ice in a chilled, insulated cooler until delivered to the analyzing laboratory. All sample collection, screening, and preservation protocols will adhere to the 1993 OCD Soil and Water Sampling and Disposal Guidelines. Soil boring lithologic logs and monitor well completion logs will be prepared for each monitor well.

c. In order to determine where groundwater has been impacted, all five (5) soil borings will be completed across the air/water interface. Monitor wells will be constructed of 2-inch Schedule 40 PVC threaded flush joint casing with 0.010 slot screen. The screens will be gravel packed with #10–20 Colorado silica sand to one (1) foot above the screened interval, followed by two (2) feet of bentonite chips. Above ground steel well protector completions will be cemented in place at the surface. The screened interval will be placed to allow a minimum of five (5) feet of screen below and above the static water level. Monitor well Cuttings resulting from the soil borings will be drummed and removed for off-site disposal in accordance with all local, state, and federal statutes and regulations.

Task 3: Monitor Well Development and Survey

Each monitor well will be surveyed to provide control for latitude, longitude, and U.S.G.S. elevation. Upon completion of the monitor wells, the top of casing elevations will be surveyed into the site benchmark in order to provide 0.01 foot vertical control and 0.1 foot horizontal control. The site benchmark will be established, identified, documented, and referenced to latitude, longitude, and the appropriate U.S.G.S. 7.5 minute topographic map. Each well casing will be permanently marked to indicate the point from which the depth to groundwater is determined. The survey will include all monitor wells.

The newly completed monitor wells will be developed by purging with a new disposable bailer or pump until the produced water is clear and the pH, conductivity, and temperature have stabilized pursuant to the most recent OCD Sampling and Disposal Guidelines. Within 48 hours of development the monitor wells will be sampled. Water generated from the development and sampling of these monitor wells will be disposed of at permitted disposal facility in accordance with the OCD Sampling and Disposal Guidelines.

Task 4: Groundwater Monitoring and Analysis

Water samples will be submitted to the laboratory for determination of VOCs analysis including benzene, toluene, ethylbenzene, and total xylenes (BTEX). The sample procedures will follow USEPA SW-846 protocol. Water levels will be measured prior to bailing each well. A minimum of three (3) well volumes will be removed from each well prior to sampling using a new disposable bailer. Conductivity, pH, and temperature will be measured and recorded. Samples will be collected into 40 ml VOA vials with Teflon closures, preserved with $HgCl_2$, capped headspace free, labeled and stored on ice in an ice chest. Samples will be delivered to Envirotech Laboratory for analysis by USEPA Method 8021B, Major Cations and Anions, Heavy Metals by USEPA Method 6010, and Polynuclear Aromatic Hydrocarbons by EPA Method 8100.

In addition, water from the four (4) existing water wells near the area of interest will be sampled and analyzed by the above methods following the protocol previously outlined in this section.

Purge water and development water will be disposed of at Envirotech's NMOCD Permitted Facility

Task 5: Report Preparation

A report will be prepared upon completion of drilling, development, survey, and sampling activities. The report will address the methods and procedures, analytical results, survey calculations, and other information related to the on-site activities. The report will include geologic cross sections and iso-concentration maps of each contaminate of concern above WQCC Abatement Standards. One (1) copy of the report will be submitted to Richardson Operating and one (1) copy will be submitted to the NMOCD. The final ground water investigation report will be submitted to the NMOCD with 90 days of OCD's approval of the work plan.

CLOSURE AND LIMITATIONS

The scope of Envirotech's services will be limited to project management, monitor well installation, sampling, laboratory analysis, and reporting at the Richardson's Bob and Blanche No. 1 on County Road 6100, Kirtland, New Mexico. All work will be performed in accordance with accepted practices in geotechnical, environmental and petroleum engineering, and hydrogeology.

Envirotech will not perform work beyond the Scope of Services outlined herein without first obtaining approval from Richardson Operating.

We appreciate the opportunity to be of service. For additional information or to schedule the services outlined in this work plan, please contact us at (505) 632-0615.

Sincerely,

ENVIROTECH INC.

C. Jack Collins, PG #1822
Chief Environmental Scientist/Hydrogeologist
NMCES #038
jcollins@envirotech-inc.com

Reviewed by:

Morris D. Young
President
NMCES #098
myoung@envirotech-inc

FIGURES

750 ft Scale: 1 : 25,000 Detail: 13-0 Datum: NAD27

Bob & Blanche No. 1
Richardson Operating
Kirtland, New Mexico

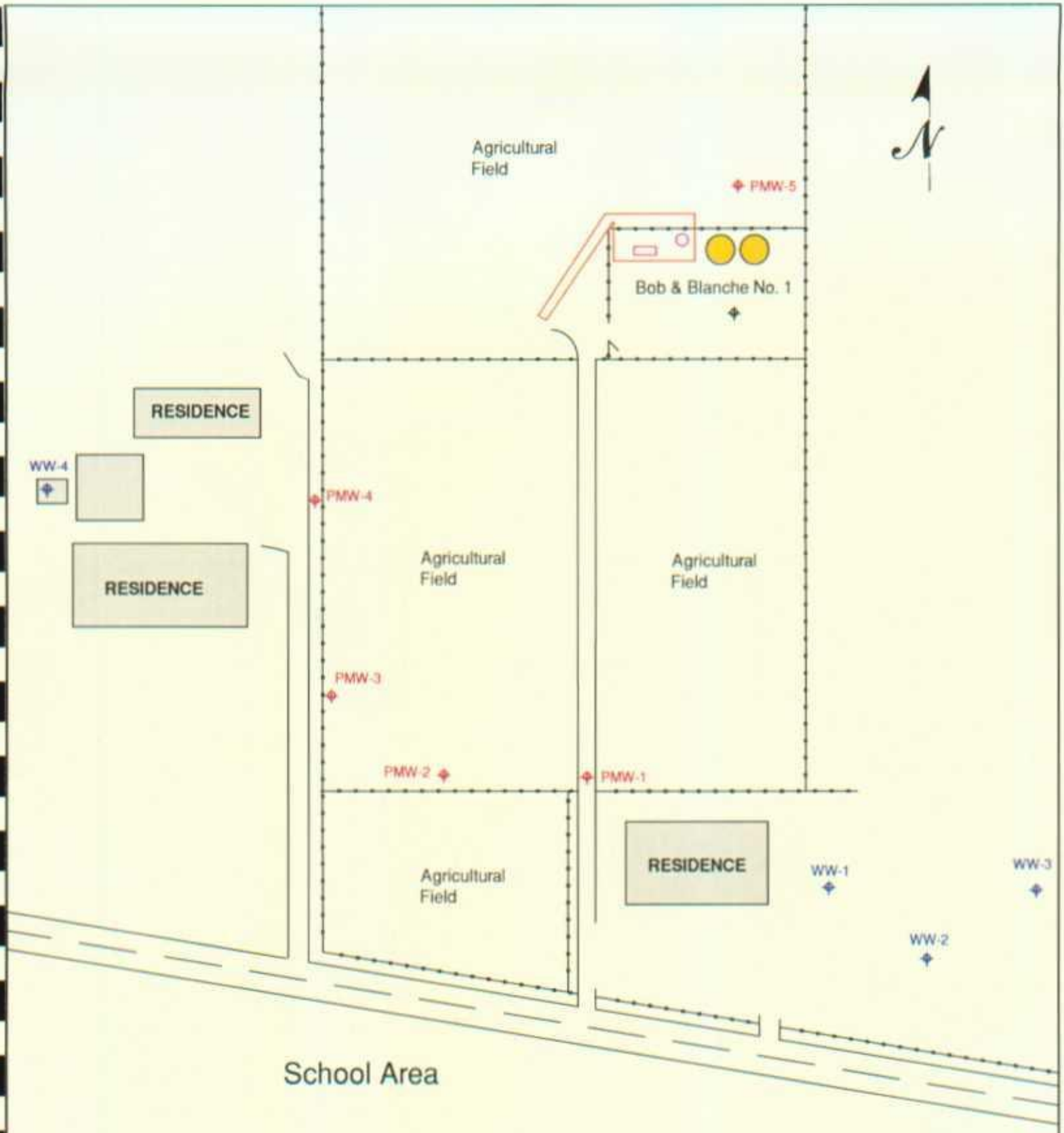
PROJECT No: 98094-007 | Date Drawn: 07/31/05

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64
FARMINGTON, NEW MEXICO 87401
PHONE (505) 632-0615

Vicinity Map

Figure 1

DRAWN BY: DMY | PROJECT MANAGER:



Richardson Operating
Bob and Blanche No.1
Proposed Monitor Wells

REVISIONS
BY XXX DATE XX/XX/XX
BY XXX DATE XX/XX/XX

JOB/PROJECT #

ENVIROTECH INC.

ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
(505) 632-0615

SITE MAP

DATE 07/31/05 DRAWN DMY
SCALE 1cm = 67' APPROVED MDY

FIGURE 2