

AP - 094

**STAGE 1
WORKPLAN**

10/30/2008



AP094

10/30/2008

SCRATCH STATE COM No. 1

SECTION 24, TOWNSHIP 18 SOUTH, RANGE 33 EAST
LEA COUNTY, NEW MEXICO

STAGE 1 ABATEMENT PLAN (AP-094)

OCTOBER 2008

MARBOB ENERGY
CORPORATION

ARTESIA, NM

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1.0 INTRODUCTION

The subject site is located southwest of Buckeye, New Mexico in Lea County. The legal description of the site is Unit Letter E, Section 24, Township 18 South, and Range 33 East. The site is a location containing a well that was completed in July of 2005, a tank battery, and an associated pit. Scratch State Com No. 1 (herein referred to as the Site or Site) is currently operated by Marbob Energy Corporation (Marbob). The contamination at the Site is due to a drilling fluid leak that occurred through a rupture in the plastic liner of the associated pit.

In August of 2007, Marbob retained BBC International, Inc. (BBC) to perform field screens of pit bottom soil samples at the Site for chloride content and to submit closing soil samples for laboratory analysis. Groundwater was encountered on August 20, 2007 during the sampling process, and Marbob notified Wayne Price of the Oil Conservation Division (OCD) Energy, Minerals, and Natural Resources Department (EMNRD) by phone and email that afternoon.

Marbob retained BBC to manage further investigation activities at the Site.

2.0 SITE DESCRIPTION

The Site 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. The site is located in the Querecho Plains southwest of the Mescalero Ridge and the Llano Estacado. The region is mostly covered by shifting dune sand sometimes overlying caliche with an uneven surface broken by shallow playa lakes. The climate of the 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 10 to 12 inches per year (Nicholson and Clebsch). According to the New Mexico Office of the State Engineer, depth to groundwater at the Site is greater than 50 feet below ground surface (bgs).

Currently, the site is situated on and surrounded by New Mexico state land.

3.0 EXCAVATION ACTIVITIES AND SITE INVESTIGATION

3.1 Soils – Excavation Activities

Site soil investigation and excavation began on August 9, 2007. BBC screened soil samples from the pit bottom for chloride content. Screen results showed that chloride levels in the south portion of the pit came within New Mexico Oil Conservation Division (NMOCD) guidelines at 12 feet below ground surface (bgs). Chloride in the central part of the excavation dropped to within NMOCD guidelines at 22 feet bgs. However, soil samples in the north portion of the pit continued to exceed NMOCD guidelines. A composite sample, made from the south and central sample points, was submitted for laboratory analysis on August 14, 2007. The sample contained 128 parts per million (ppm or mg/Kg) chlorides. Soil laboratory analytical results can be viewed in **Appendix I**, and a summary of laboratory results can be viewed in **Table 1**.

Excavation and sample screening continued in the north section of the pit. On August 20, 2007, ground water was encountered at approximately 40 feet bgs in the trench of the northeast quarter of the excavation. A trench of the same depth was excavated in the northwest quarter however ground water was not encountered at that location.

3.2 Soils – Ground Water Monitoring Well Installation

On September 10, 2007, BBC contracted Eco/Enviro Drilling to place a monitoring well (MW1) near the northeast corner of the excavation. A Site diagram including position of existing monitoring wells can be viewed in **Figure 1**. A hollow stem auger rig equipped with a continuous core sampling tool was used to drill soil borings, collect soil samples, and complete ground water monitoring wells. The monitoring wells were installed with 15 feet of 0.20 mm well screen with 10 feet of the well screen below the water table.

MW1 was located on the east side of the pit near the north corner. Four (4) soil samples were collected during drilling of MW1. Please see **Table 1** for a summary of laboratory analytical results, and drilling logs can be found in **Appendix III**. At 35 feet bgs chloride content was less than 16 ppm, the 40 foot sample contained 3,919 ppm, the 45 foot sample contained 3,479 ppm, and the 50 foot sample showed 208 ppm. Drilling ceased at 50 feet bgs.

Eco/Enviro Drilling returned on September 27-28, 2007 to install two additional monitoring wells (MW2 and MW3) in order to determine the ground water gradient.

MW2 was placed on the north side of the excavation and toward the east corner. Five soil samples were collected during drilling of MW2. At 35 feet bgs chloride content was 9,800 ppm, the 40 foot sample contained 5,040 ppm, the 45 foot sample contained 3,240 ppm, the 50 foot sample showed 5,040 ppm, and the 55 foot sample contained 528 ppm. Drilling of MW2 ceased at 55 feet bgs.

MW3 was placed on the south side of the excavation directly south of MW2. Five soil samples were collected during drilling of MW3. At 35 feet bgs chloride content was 48 ppm, the 40 foot sample contained 64 ppm, the 45 foot sample contained 192 ppm, the 50 foot sample showed 176 ppm, and the 55 foot sample contained 64 ppm. Drilling ceased at 55 feet bgs.

The bottom of the pit in the north section was lined with plastic, and BBC received permission from Chris Williams of the NMOCD Hobbs office on September 20, 2007 for Marbob to backfill the excavation.

3.3 Ground Water

BBC developed MW1 on the afternoon of September 10, 2007. On September 11, 2007, BBC sampled the ground water for chloride at MW1. The sample contained 396 ppm (mg/L). Please see Table 2 for a summary of ground water laboratory analytical results. To reference the ground water laboratory analytical results summary, please view Appendix II.

BBC developed MW2 on the afternoon of September 28, 2007. MW3 had not yet recharged and development of MW3 was postponed until October 1, 2007.

On October 1, 2007, BBC sampled the ground water for chloride at MW2. The sample contained 45,590 ppm. BBC also developed MW3 the same day. Initial gauging data indicated that only 4.97 feet of water existed in MW3 (0.81 gallons).

BBC returned to collect ground water samples for chloride on October 2, 2007 from both MW1 and MW3 for the purpose of having near simultaneous ground water data for all three monitoring wells. The ground water sample from MW1 contained 708 ppm. The sample from MW3 contained 472 ppm. MW3 contained only 2.94 feet of water in the water column from which 0.5 gallons were purged.

On October 3, 2007, BBC purged MW2 and MW3. MW2 was from this date on, purged as often as possible due to the results of the laboratory data from the samples collected on October 1, 2007. MW3 was purged to encourage recharge of the well. 1.32 feet of water (0.22 gallons) existed in the water column and 0.25 gallons were purged.

All three monitoring wells were set with cement and vaults on October 19, 2007.

On October 22, 2007, the site was surveyed by John West Surveying Company (see Figure 1). In MW3, 1.59 feet of water (0.26 gallons) existed in the water column and 0.25 gallons were purged.

BBC collected ground water samples from all three monitoring wells on October 23, 2007. The sample from MW1 contained 2,260 ppm chloride, the sample from MW2 contained 42,800 ppm, and the sample from MW3 contained 400 ppm. The water level in MW3 remained at less than 0.5 feet in the water column.

On December 4, 2007, BBC purged all monitoring wells however from this date forward BBC only sampled ground water from MW1 and MW2. MW3 was not sampled on this date or again thereafter due to failure of the well to recharge after purging. The sample from MW1 contained 512 ppm chloride and MW2 contained 42,400 ppm.

On January 24, 2008, BBC collected ground water samples from MW1 and MW2. The sample from MW1 contained 35,200 ppm chloride and the sample from MW2 showed 44,400 ppm. Due to laboratory analytical results of these samples, both MW1 and MW2 were purged as often as possible from this date forward.

On April 14, 2008, BBC collected ground water samples from MW1 and MW2. The sample from MW1 contained 14,600 ppm chloride and the sample from MW2 contained 48,800 ppm.

On August 20, 2008, BBC collected ground water samples from MW1 and MW2. The sample from MW1 contained 35,000 ppm chloride and the sample from MW2 contained 52,500 ppm.

4.0 PROPOSED SITE INVESTIGATION

Marbob 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 Marbob Scratch State Com No.1 site

located in the northwest quarter of Section 24, Township 18 South, Range 33 East, Lea County, New Mexico.

Marbob proposes the following to investigate and delineate the site by drilling soil borings for the completion of ground water monitoring wells and the associated analytical data collected from soil and ground water samples.

4.1 Ground Water

A minimum of nine (9) monitoring wells will be drilled at the site. The proposed locations and depths of the ground water monitoring wells are depicted in Figure 2. Six (6) of the monitoring wells will be completed at 60 feet bgs in order to further delineate the vertical and horizontal extent of potential contamination present in the vadose zone and ground water. The remaining (3) monitoring wells will be completed around the outer perimeter of the Site at 100 feet bgs in order to determine whether or not ground water encountered at the Site is perched water.

Based on the current understanding and data from the site, the proposed locations of the 60 foot monitoring wells are needed to confirm the aerial extent of the vadose zone and possible ground water contamination. As depicted in Figure 2, these ground water monitoring wells will be drilled in positions surrounding every side of the former pit focusing on the assumed origin of contamination in the northeast corner of the pit and gradient direction, with:

- One monitor well completed up gradient from the site in an uncontaminated location to confirm the back ground concentrations of constituents of concern (COCs) entering the site, and aid in the development of site specific parameters detailed below;
- One monitor well on the northeast side and one monitor well on the southeast side of the former pit to delineate the eastern and southern boundaries of the plume;
- One monitor well on the south side of the former pit near MW3 to replace the lack of data from MW3 and assist in delineating the southern boundary of the plume;
- One monitor well near the southwest corner of the former pit in the most direct down gradient position of the plume; and
- One monitor well near the northwest corner of the former pit to delineate the western and northern boundaries of the plume

The proposed locations of the 100 foot monitoring wells are required at the greatest distance away from the Site in order to prevent opening a conduit for transfer of COCs.

- One monitor well completed up gradient from the site to locate a confining layer of soil materials and/or ground water;
- One monitor well completed down gradient from the site to locate a confining layer of soil materials and/or ground water; and
- One monitor well completed at the southeast side of the former pit to locate a confining layer of soil materials and/or ground water

Data collected from the associated ground water monitoring wells at these locations will be used confirm the site geology and develop hydrogeology and fate and transport of contaminants at the site. This will include the determination of the hydraulic conductivity, transmissivity, storativity, and rate and direction of contaminant migration for the aquifer on a localized scale. If site conditions warrant the collection of additional data concerning the aquifer characteristics, additional soil borings and ground water monitoring wells may be completed.

An air rotary drilling rig equipped with a core sampling tool will be used to drill soil borings, collect soil samples, and complete ground water monitoring wells. The soil borings drilled at the site will be sampled initially near the surface (0-3 feet bgs), and sampled every five feet there after until the boring reaches the saturated zone.

4.2 QA/QC Sampling Procedures-Soil (Soil Borings)

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 sample collections. The drilling equipment will be decontaminated prior to being brought on the site as well as decontaminated in 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 and head space sampling for volatile organic carbons. The second portion of the sample will be placed in a new, clean, and sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. Each container will be filled to capacity with soil.

All containers will be labeled, individually bagged, and placed on ice in an insulated cooler, and chilled to a temperature of approximately 40°F (4°C). The cooler will be custody 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 Analysis, 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.

4.3 Laboratory Analysis-Soil (Soil Borings)

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

- Metals – EPA Method SW-846 6020
- Total Mercury – EPA Method SW-846 7471A
- Total Petroleum Hydrocarbons (TPH) – EPA Method SW-846 8015C Modified (DRO/GRO)
- Volatile Organic Compounds (VOCs (including BTEX)) – EPA Method SW-846 8260B
- Semi-volatile Organic Compounds (SVOCs) – EPA Method SW-846 8270C
- Chloride – EPA Method 300.0
- Cyanide – EPA Method 335.3
- Nitrogen, Nitrite – EPA Method 354.1
- pH – EPA Method 150.1

4.4 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 monitor wells should be drilled to ten (10) feet below the top of the local ground water aquifer. The monitor wells will be constructed of a minimum of fifteen (15) feet of two-inch (2") PVC well screen with ten (10) feet of well screen below the water table. Blank schedule 40 PVC riser will be extended to a minimum of two (2) feet above the ground surface. The monitor wells shall be drilled and completed with two-inch schedule 40 PVC, and gravel packed with a minimum of two inches of 8/16 Brady gravel or equivalent between the annulus of the drilled hole and the outside of the casing. The well screen should be 0.040-inch, mill-slot PVC, extending through the entire saturated portion of the drilled hole. The gravel pack should extend at least 3 feet above the top of the screen with a minimum of three feet of bentonite on top of the gravel. A steel

locking sleeve should be centered on the PVC casing and set approximately 2 feet below land surface. The annulus of the hole between the drilled hole and the casing should then be grouted with neat cement to ground level. The remaining annulus between the steel sleeve and the casing should be grouted with neat cement to ground level. The surface of the well should contain a 4' X 4' X 1.5' concrete slab, with approximately 12 inches below grade and encasing the steel locking sleeve. The bentonite seal on top of the gravel pack, the annulus cement grout, steel locking sleeve, and concrete slab shall not be placed until the well has been fully developed and the gravel pack has been brought up to the proper level above the screen following completion of the well development to account for any gravel settlement.

The monitor wells shall be developed by bailing or pumping after placement of the well screen, casing and gravel pack. After the well has started clearing, the well shall be developed by jetting or by pump until the water being removed is clear and free of sand.

Following development, the wells will be gauged for depth to ground water. A minimum of twenty-four (24) hours after development, the wells will be gauged, purged, and sampled for the required constituents.

4.5 QA/QC Sampling Procedures-Ground Water

The ground water monitor wells will be developed and purged prior to sampling. A minimum of twenty-four (24) hours after development, monitoring wells with a sufficient recharge will be purged prior to sampling by removing a minimum of three well bore and gravel pack volumes. Monitoring wells that do not recharge sufficiently to allow for the removal of three well bore and gravel pack volumes, will be purged until no additional ground water can be obtained.

Ground water samples will be collected with a clean, new disposable Teflon sampler and polyethylene line by personnel wearing clean, disposable gloves or by low-flow sampling via a submersible bladder-type pump following EPA Method 540/S-95-504. Groundwater sample containers will be filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers filled first, PAH containers second, etc.).

Groundwater samples collected for BTEX analysis will be placed in 40 ml glass VOA vials, with the appropriate preservative, 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, including the appropriate preservative, equipped with Teflon lined caps, as provided by the analytical laboratory.

All containers will be labeled, individually bagged, and placed on ice in an insulated cooler, and chilled to a temperature of approximately 40°F (4°C). The cooler will be custody sealed for delivery to the laboratory for testing utilizing proper chain of custody documentation throughout the sampling process. The samples will be delivered for analysis to Trace Analysis, 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.

4.6 Laboratory Analysis-Ground Water

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 – EPA Method SW-846 6020
- Total Mercury – EPA Method SW-846 7470A
- Total Petroleum Hydrocarbons (TPH) – EPA Method SW-846 8015C Modified (DRO/GRO)
- Volatile Organic Compounds (VOCs (including BTEX)) – EPA Method SW-846 8260B
- Semi-volatile Organic Compounds (SVOCs) – EPA Method SW-846 8270C
- Chloride – EPA Method 300.0
- Cyanide – EPA Method 335.3
- Nitrogen, Nitrite – EPA Method 354.1
- pH – EPA Method 150.1

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 will be determined in consultation with the NMOCD after the initial characterization of the site conducted during

the first sampling event after the installation of the ground water monitoring wells.

6.0 AQUIFER DESCRIPTION

Several aquifers are located near the surrounding area of the Site, the Quaternary alluvium, the Ogallala formation, and the Triassic Dockum Group which is composed of the Chinle formation and the Santa Rosa Sandstone. The area surrounding the Site seems to have an intermittent saturated zone partly due to the fact that the Santa Rosa Sandstone formation lies beneath the Querecho Plains to a great extent and is permeable enough to accept the scant precipitation infiltrating through the surface alluvium (Nicholson and Clebsch). According to the New Mexico Office of the State Engineer (NMOSE), current depth to water in the site vicinity is approximately 195 feet and ground water flow direction in the aquifer is towards the southwest.

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 IV**. These well locations were obtained from the website of the New Mexico Office of the State Engineer.

8.0 SURFACE OWNERSHIP

Marbob 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 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 Marbob Energy Corporation, BBC has submitted this Stage 1 Abatement Plan 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

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/>

FIGURES

SITE DIAGRAM WITH EXISTING MONITOR WELLS

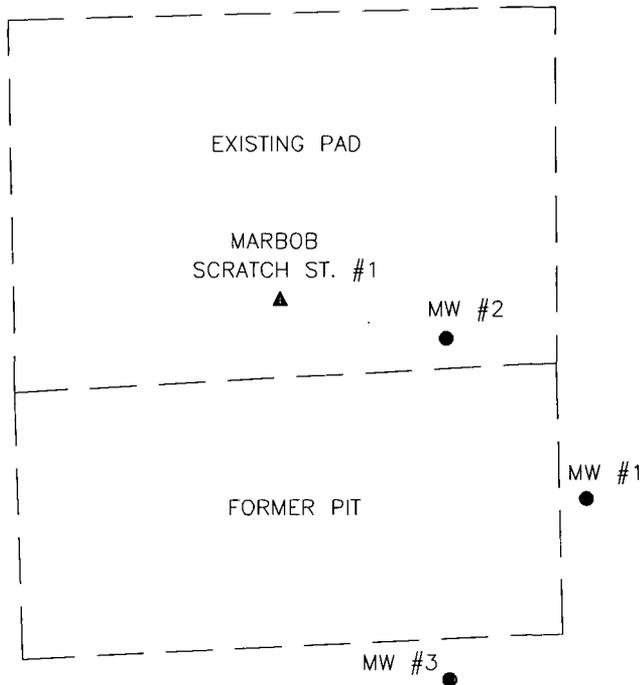
**SITE DIAGRAM WITH GROUND WATER
GRADIENT AND PROPOSED LOCATIONS OF
MONITOR WELLS**

SCRATCH STATE COM NO. 1

October 2008

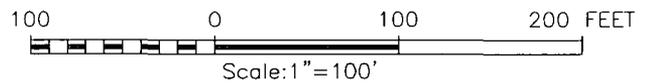
Marbob Energy Corporation
Artesia, NM

Prepared by:
BBC International, Inc.



WELL	COORDINATES	ELEVATIONS
MW #1	631744.7 N 759929.6 E	NATURAL GROUND - 3891.36' TOP OF PVC - 3894.31' TOP OF CONCRETE - 3891.47'
MW #2	631831.0 N 759853.6 E	NATURAL GROUND - 3893.55' TOP OF PVC - 3896.50' TOP OF CONCRETE - 3893.76'
MW #3	631645.9 N 759855.5 E	NATURAL GROUND - 3891.82' TOP OF PVC - 3894.78' TOP OF CONCRETE - 3892.05'

NOTE: COORDINATES SHOWN ARE "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983.





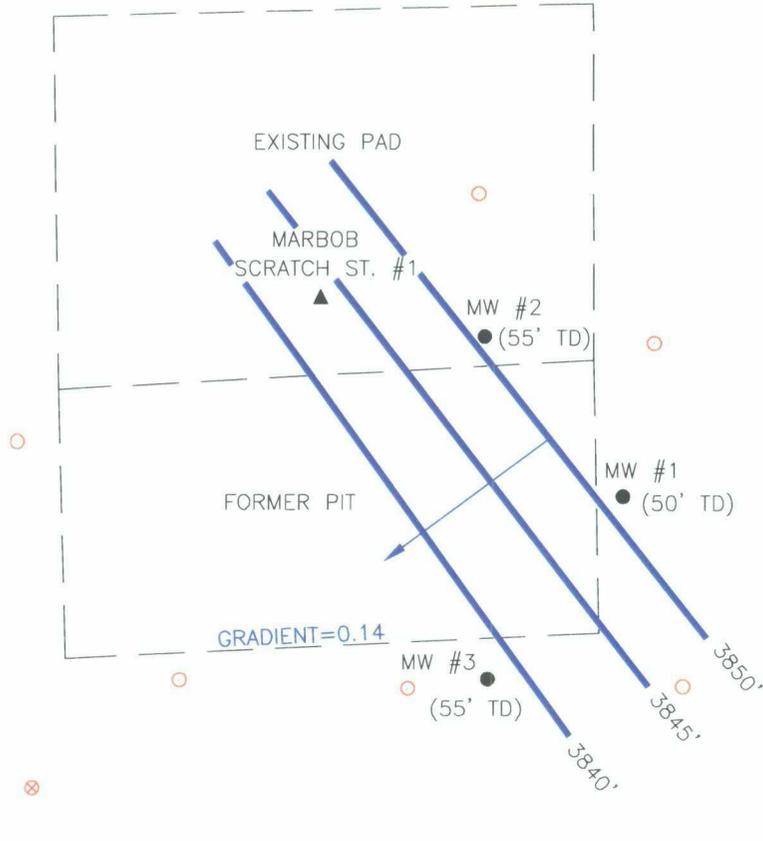
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BBC INTERNATIONAL, INC.

SCRATCH STATE COM #1

SECTION 24, TOWNSHIP 18 SOUTH, RANGE 33 EAST,
N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 10/22/07	Sheet 1 of 1 Sheets
W.O. Number: 07.11.1397	Drawn By: L.A.
Date: 10/26/08	07111397 REV:8/24/08



WELL	COORDINATES	ELEVATIONS
MW #1	631744.7 N 759929.6 E	NATURAL GROUND - 3891.36' TOP OF PVC - 3894.31' TOP OF CONCRETE - 3891.47'
MW #2	631831.0 N 759853.6 E	NATURAL GROUND - 3893.55' TOP OF PVC - 3896.50' TOP OF CONCRETE - 3893.76'
MW #3	631645.9 N 759855.5 E	NATURAL GROUND - 3891.82' TOP OF PVC - 3894.78' TOP OF CONCRETE - 3892.05'

LEGEND

- - DENOTES EXISTING MONITOR WELL
- - DENOTES PROPOSED 60' DEPTH MONITOR WELLS
- ⊗ - DENOTES PROPOSED 100' DEPTH MONITOR WELLS

NOTE: COORDINATES SHOWN ARE "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983.



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BBC INTERNATIONAL, INC.

SCRATCH STATE COM #1

SECTION 24, TOWNSHIP 18 SOUTH, RANGE 33 EAST,
N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 10/22/07	Sheet 1 of 1 Sheets
W.O. Number: 08.13.1776	Drawn By: L.A.
Date: 10/7/08	REL:07111397 08131776

TABLES

**SOIL LABORATORY ANALYTICAL RESULTS
SUMMARY**

**GROUND WATER LABORATORY ANALYTICAL
RESULTS SUMMARY**

SCRATCH STATE COM NO. 1

October 2008

Marbob Energy Corporation
Artesia, NM

Prepared by:
BBC International, Inc.

Table 1. Soil Laboratory Analytical Results Summary

		Sample	Pit Bottom
Analyte	Method	Date	
			mg/Kg
Chloride	4500-Cl ⁻ B	08/14/07	128

		Sample	MW1 @ 35'	MW1 @ 40'	MW1 @ 45'	MW1 @ 50'
Analyte	Method	Date				
			mg/Kg	mg/Kg	mg/Kg	mg/Kg
Chloride	4500-Cl ⁻ B	09/10/07	<16	3,919	3,479	208

		Sample	MW2 @ 35'	MW2 @ 40'	MW2 @ 45'	MW2 @ 50'	MW2 @ 55'
Analyte	Method	Date					
			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Chloride	4500-Cl ⁻ B	09/27/07	9,800	5,040	3,240	5,040	528

		Sample	MW3 @ 35'	MW3 @ 40'	MW3 @ 45'	MW3 @ 50'	MW3 @ 55'
Analyte	Method	Date					
			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Chloride	4500-Cl ⁻ B	09/28/07	48	64	192	176	64

Note: Analyses performed on 1:4 w:v aqueous extracts

Table 2. Ground Water Laboratory Analytical Results Summary

Analyte	Method	Sample Date	MW1
			mg/L
Chloride	4500-Cl ⁻ B	09/11/07	396

Analyte	Method	Sample Date	MW2
			mg/L
Chloride	4500-Cl ⁻ B	10/01/07	45,590

Analyte	Method	Sample Date	MW1	MW3
			mg/L	mg/L
Chloride	4500-Cl ⁻ B	10/02/07	708	472

Analyte	Method	Sample Date	MW1	MW2	MW3
			mg/L	mg/L	mg/L
Chloride	4500-Cl ⁻ B	10/23/07	2,260	42,800	400

Analyte	Method	Sample Date	MW1	MW2
			mg/L	mg/L
Chloride	4500-Cl ⁻ B	12/04/07	512	42,400

Analyte	Method	Sample Date	MW1	MW2
			mg/L	mg/L
Chloride	4500-Cl ⁻ B	01/24/08	35,200	44,400

Analyte	Method	Sample Date	MW1	MW2
			mg/L	mg/L
Chloride	4500-Cl ⁻ B	04/14/08	14,600	48,800

Analyte	Method	Sample Date	MW1	MW2
			mg/L	mg/L
Chloride	4500-Cl ⁻ B	08/22/08	35,000	52,500

APPENDIX I

SOIL LABORATORY ANALYTICAL RESULTS

SCRATCH STATE COM NO. 1

October 2008

Marbob Energy Corporation
Artesia, NM

Prepared by:
BBC International, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES, INC.

2111 Dechwood, Abilene, TX 79603 (505) 393-2326 Fax (505) 393-2476

BBQ International, Inc.

Project Manager: Cliff Brunson

Address: 1324 W. Maryland

City: Hobbs State: NM Zip: 88240

Phone #: 505-397-6388 Fax #: 505-397-0397

Project #: Project Owner: Max Dob

Project Name: Scratch St. Cam #1

Project Location: Maljamar, NM

Sampler Name: Amy Ruth

Page 1 of 1

ANALYSIS REQUEST

BILL TO

P.O. #
Company:
Attn: GAME
Address:
City:
State:
Phone #:
Fax #:

PRESERV. SAMPLING

MATRIX	ICE/COOL	ACID/PAGE	OTHER:	DATE	TIME
GROUNDWATER				9/10/07	1345
WASTEWATER				9/10/07	1410
SOIL				9/10/07	1438
SLUDGE				9/10/07	1457

LABORATORY	DATE	TIME
1	9/10/07	1345
2	9/10/07	1410
3	9/10/07	1438
4	9/10/07	1457

Sample I.D.

- #1324-1 MW1 @ 35'
- 2 MW1 @ 40'
- 3 MW1 @ 45'
- 4 MW1 @ 50'

30 days per day x 24 hrs = 720 hrs per year from the effective date of transfer.

PLEASE NOTE: Lacey and Dumbauld, Cardex's ability and ability to comply with the contract to test, that be linked to the amount paid by the client for the contract. All other liability shall be the responsibility of the client. In the event of a breach of contract, the client shall be liable for the amount of the contract. In the event of a breach of contract, the client shall be liable for the amount of the contract. In the event of a breach of contract, the client shall be liable for the amount of the contract.

Received By: [Signature]

Date: 9/12/07 Time: 10:20

Relinquished By: [Signature]

Time: 9/12/07

Delivered By: [Signature]

Time: 10:20

Sampler: UPS - Bus - Other:

Checked By: [Signature]

Initials: [Signature]

Remarks:

Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.



ARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
BBC INTERNATIONAL, INC.
ATTN: CLIFF BRUNSON
P.O. BOX 805
HOBBS, NM 88241
FAX TO: (505) 397-0397

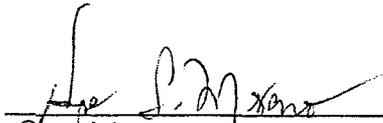
Receiving Date: 09/27/07
Reporting Date: 09/28/07
Project Owner: MARBOB
Project Name: SCRATCH ST. COM #1
Project Location: MALJAMAR, NM

Analysis Date: 09/28/07
Sampling Date: 09/27/07
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: KS
Analyzed By: HM

LAB NUMBER	SAMPLE ID	Cl ⁻ (mg/Kg)
H13393-1	MW2 35'	9,800
H13393-2	MW2 40'	5,040
H13393-3	MW2 45'	3,240
H13393-4	MW2 50'	5,040
H13393-5	MW2 55'	528
Quality Control		490
True Value QC		500
% Recovery		98.0
Relative Percent Difference		2.0

METHOD: Standard Methods 4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.


Chemist

09-28-07
Date

H13393 BBC

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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ANALYTICAL RESULTS FOR
BBC INTERNATIONAL, INC.
ATTN: CLIFF BRUNSON
P.O. BOX 805
HOBBS, NM 88241
FAX TO: (505) 397-0397

Receiving Date: 10/02/07
Reporting Date: 10/02/07
Project Owner: MARBOB
Project Name: SCRATCH ST. COM #1
Project Location: MALJAMAR, NM

Analysis Date: 10/02/07
Sampling Date: 09/28/07
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: NF
Analyzed By: KS

LAB NUMBER	SAMPLE ID	Cl ⁻ (mg/Kg)
H13410-1	MW3 35'	48
H13410-2	MW3 40'	64
H13410-3	MW3 45'	192
H13410-4	MW3 50'	176
H13410-5	MW3 55'	64
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods	4500-Cl ⁻ B
--------------------------	------------------------

Note: Analyses performed on 1:4 w:v aqueous extracts.

Kristen Dupont
Chemist

10/02/07
Date

H13410 BBC

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APPENDIX II

GROUND WATER LABORATORY ANALYTICAL RESULTS

SCRATCH STATE COM NO. 1

October 2008

Marbob Energy Corporation
Artesia, NM

Prepared by:
BBC International, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ARDINAL LABORATORIES, INC.
 2111 Belchwood, Abilene, TX 79603 (506) 393-2476
 (915) 673-7001 Fax (915) 673-7020

Company Name: BBC International, Inc.
 Project Manager: Cliff Brunson
 Address: 1324 W. Marland State: NM Zip: 88240
 City: Hobbs Phone #: 505-397-6388 Fax #: 505-397-0397
 Project #: _____ Project Owner: Marbop
 Project Name: Scratch St. Cor #
 Project Location: Majamar
 Sampler Name: Amy Ruth

Company: _____
 Attn: SAPE
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone #: _____
 Fax #: _____

Lab I.D.	Sample I.D.	DATE	TIME	PRESERV.		SAMPLING	
				ICE/COOL	OTHER:	MATRIX	MATRIX
H13411-1	MW 2	10/16/07	1200	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	GROUNDWATER
							WASTEWATER
							SLUDGE
							GRUDE OIL
							SOIL
							GROUNDWATER
							# CONTAINERS
							(GRAB OR C) COMP.

Lab I.D. _____
 Sample I.D. _____
 DATE _____ TIME _____
 OTHER: _____
 ACID/BASE: _____
 OTHER: _____
 ICE/COOL: OTHER: _____
 MATRIX: _____
 MATRIX: _____
 SLUDGE: _____
 GRUDE OIL: _____
 SOIL: _____
 GROUNDWATER: WASTEWATER: _____
 # CONTAINERS: _____
 (GRAB OR C) COMP.: _____

These and Custodian of Property are to be returned to the sender in a sealed bag within 30 days of the date of this request. The sender is responsible for the return of the property.

Received By: Amy Ruth Date: 10/2/07 Time: 8:30
 Received By: Lab Staff Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____
 Delivered By: (Circle One) Date: _____ Time: _____

Sample Condition: Cool Intact YBB No YBB No
 Checked By: MR (Initials)

Phone Result: Yes No No No
 Add'l Phone #: _____
 Fax Result: Yes No No No
 Add'l Fax #: _____

REMARKS: _____

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.



ARDINAL LABORATORIES

PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
BBC INTERNATIONAL, INC.
ATTN: CLIFF BRUNSON
P.O. BOX 805
HOBBS, NM 88241
FAX TO: (575) 397-0397

Receiving Date: 08/21/08
Reporting Date: 08/22/08
Project Owner: MARBOB
Project Name: SCRATCH STATE COM #1
Project Location: MALJAMAR, NM

Analysis Date: 08/22/08
Sampling Date: 08/20/08
Sample Type: GROUNDWATER
Sample Condition: INTACT
Sample Received By: ML
Analyzed By: HM

LAB NUMBER	SAMPLE ID	Cl ⁻ (mg/L)
H15782-1	MW1	35,000
H15782-2	MW2	52,500
Quality Control		520
True Value QC		500
% Recovery		104
Relative Percent Difference		3.9
METHOD: Standard Methods		4500-Cl ⁻ B

Hope S. Moreno

Chemist

08-22-08
Date

H15782 BBC

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APPENDIX III

DRILLING LOGS

SCRATCH STATE COM NO. 1

October 2008

Marbob Energy Corporation
Artesia, NM

Prepared by:
BBC International, Inc.



RECORD OF SUBSURFACE EXPLORATION

Project Name: Marbob Energy / Scratch State Com #1
 Borehole Number: MWI
 Drilled by: Eco/Enviro Drilling
 Date/Time Started: 9/10/07
 Air Monitoring Type: _____

Project No.: _____
 Logged by: _____
 Drilling/Rig Method(s): Hollow Stem Auger
 Date/Time Completed: 9/10/07
 GWL Depth: _____

Depth (feet)	Sample Number	Sample Interval	Sample Type	Sample Description	PID Readings (ppm)	USCS Symbol	Comments
--0		0' - 1'		Tan Sand w/ Caliche			
--10		1' - 30'		Caliche w/ Tan Sand			
--20							
--30		30' - 40'		Reddish sandy clay w/ caliche			
--40							
--50		40' - 50'		Red Bed Clay			
--60							
--70							

Comments: _____

Technician Signature: _____



RECORD OF SUBSURFACE EXPLORATION

Project Name: Marbob Energy / Scratch State Com #1
 Borehold Number: MW2
 Drilled by: Eco/Enviro Drilling
 Date/Time Started: 9/27/07
 Air Monitoring Type: _____

Project No.: _____
 Logged by: _____
 Drilling/Rig Method(s): Hollow Stem Auger
 Date/Time Completed: 9/27/07
 GWL Depth: _____

Depth (feet)	Sample Number	Sample Interval	Sample Type	Sample Description	PID Readings (ppm)	USCS Symbol	Comments
--0		0' - 1'		Tan Sand w/ Caliche			
--10		1' - 30'		Caliche w/ Tan Sand			
--20		30' - 45'		Reddish sandy clay w/ caliche			
--30		45' - 55'		Red Bed Clay			
--40							
--50							
--60							
--70							

Comments: _____

Technician Signature: _____



RECORD OF SUBSURFACE EXPLORATION

Project Name: Marbob Energy / Scratch State Com #1
 Borehold Number: MW3
 Drilled by: Eco/Enviro Drilling
 Date/Time Started: 9/28/07
 Air Monitoring Type: _____

Project No.: _____
 Logged by: _____
 Drilling/Rig Method(s): Hollow Stem Auger
 Date/Time Completed: 9/28/07
 GWL Depth: _____

Depth (feet)	Sample Number	Sample Interval	Sample Type	Sample Description	PID Readings (ppm)	USCS Symbol	Comments
--0		0' - 1'		Tan Sand w/ Caliche			
--10		1' - 30'		Caliche w/ Tan Sand			
--20		30' - 45'		Reddish sandy clay w/ caliche			
--30		45' - 55'		Red Bed Clay			
--40							
--50							
--60							
--70							

Comments: _____

Technician Signature: _____

APPENDIX IV

INVENTORY OF WATER WELLS WITHIN ONE MILE RADIUS

SCRATCH STATE COM NO. 1

October 2008

Marbob Energy Corporation
Artesia, NM

Prepared by:
BBC International, Inc.

New Mexico Office of the State Engineer
POD Reports and Downloads

Township: 18S Range: 33E Sections: 24,13,14,23,26,25

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

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

POD / Surface Data Report Avg Depth to Water Report
Water Column Report

Clear Form iWATERS Menu Help

AVERAGE DEPTH OF WATER REPORT 09/29/2008

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
CP	18S	33E	13				1	60	60	60
CP	18S	33E	24				1	195	195	195

Record Count: 2

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

Township: 18S Range: 34E Sections: 18,19,30

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

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

POD / Surface Data Report Avg Depth to Water Report

Water Column Report

Clear Form iWATERS Menu Help

AVERAGE DEPTH OF WATER REPORT 09/29/2008

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
L	18S	34E	18				2	125	125	125
L	18S	34E	19				1	105	105	105

Record Count: 3

APO94

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Form C-144
June 1, 2004

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

For drilling and production facilities, submit to appropriate NMOCD District Office.
For downstream facilities, submit to Santa Fe office

Pit or Below-Grade Tank Registration or Closure

Is pit or below-grade tank covered by a "general plan"? Yes No

Type of action: Registration of a pit or below-grade tank Closure of a pit or below-grade tank

Operator: Maebob Energy Corp Telephone: 505-748-3303 e-mail address: wildlife@maebob.com
Address: P.O. Box 227 Artesia Nm 88211-0227
Facility or well name: Scratch State Com #1 API #: 30-025-36996 U/L or Qtr/Qtr SUNW Sec 24 T 18s R 33E
County: Lea Latitude _____ Longitude _____ NAD: 1927 1983
Surface Owner: Federal State Private Indian

Pit	Below-grade tank	
Type: Drilling <input checked="" type="checkbox"/> Production <input type="checkbox"/> Disposal <input type="checkbox"/> Workover <input type="checkbox"/> Emergency <input type="checkbox"/> Lined <input checked="" type="checkbox"/> Unlined <input type="checkbox"/> Liner type: Synthetic <input type="checkbox"/> Thickness <u>12</u> mil Clay <input type="checkbox"/> Pit Volume _____ bbl	Volume: _____ bbl Type of fluid: _____ Construction material: _____ Double-walled, with leak detection? Yes <input type="checkbox"/> If not, explain why not.	
Depth to ground water (vertical distance from bottom of pit to seasonal high water elevation of ground water.)	<input checked="" type="checkbox"/> Less than 50 feet <input type="checkbox"/> 50 feet or more, but less than 100 feet <input type="checkbox"/> 100 feet or more	(20 points) (10 points) (0 points)
Wellhead protection area: (Less than 200 feet from a private domestic water source, or less than 1000 feet from all other water sources.)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(20 points) (0 points)
Distance to surface water: (horizontal distance to all wetlands, playas, irrigation canals, ditches, and perennial and ephemeral watercourses.)	<input type="checkbox"/> Less than 200 feet <input type="checkbox"/> 200 feet or more, but less than 1000 feet <input checked="" type="checkbox"/> 1000 feet or more	(20 points) (10 points) (0 points)
Ranking Score (Total Points)		<u>20</u>

If this is a pit closure: (1) Attach a diagram of the facility showing the pit's relationship to other equipment and tanks. (2) Indicate disposal location: (check the onsite box if you are burying in place) onsite offsite If offsite, name of facility _____. (3) Attach a general description of remedial action taken including remediation start date and end date. (4) Groundwater encountered: No Yes If yes, show depth below ground surface _____ ft. and attach sample results.

(5) Attach soil sample results and a diagram of sample locations and excavations.

Additional Comments: As per Chris Williams, Pit Sampling, delineation of chlorides and removed pit material. liner has been placed in bottom of reserve pit for backfilling. complete

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that the above-described pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines , a general permit , or an (attached) alternative OCD-approved plan .

Date: 9-21-07
Printed Name/Title Rand French / Biologist Signature Rand French

Your certification and NMOCD approval of this application/closure does not relieve the operator of liability should the contents of the pit or tank contaminate ground water or otherwise endanger public health or the environment. Nor does it relieve the operator of its responsibility for compliance with any other federal, state, or local laws and/or regulations.

Approval:
Printed Name/Title CHRIS WILLIAMS / DIST. SUPERVISOR Signature Chris Williams Date: 9/28/07