

From: [wayne price](#)
To: [Bratcher, Mike, EMNRD](#)
Subject: Re: Delineation BKE
Date: Wednesday, January 14, 2015 11:53:04 AM
Attachments: [BKE Background Delineation Sample Locations.pdf](#)

Dear Mike,

Please find attached proposed locations to establish vertical background samples, as these locations were selected because the south one is located in an active irrigated crop field and the north one is located in an inactive crop field. This should give us some valid comparison data. We will collect the following samples:

Surface, 3 ft, 5 ft, 8 ft for each hole. We will field sample for chlorides using field test kits and also submit to Lab for confirmation.

Please let me know if this is OK.

Wayne

On Jan 14, 2015, at 11:13 AM, wayne price wrote:

Hi Mike,

It appears we may need to perform a background delineation for chlorides to establish a background soil profile. Is that what you had in mind for (or same depth background)?

Wayne Price-Price LLC

On Jan 14, 2015, at 7:55 AM, Bratcher, Mike, EMNRD wrote:

Wayne,

The delineation target goal for chlorides is going to be 250 mg/kg (or same depth background) no matter what the depth to groundwater is. You will need to argue that with Jim Griswold. I won't argue with your research, as it has been my experience over the past 10 years, that in the area south of Carlsbad, all the way to Malaga, and to some extent, all the way to the Texas line, there are areas of shallow groundwater (less than

50'). These shallow aquifers can vary greatly in relatively short distances, not only in depth, but in the quality of the water. In the area of the BKE, with the lack of hard data in close proximity to the site, and, considering the past two years this area has seen above normal precipitation, with a major flood event in September 2014, I have to be cautiously conservative, and consider the potential for shallow, protectable groundwater. An operator always has the option of installing a monitor well to provide site specific hard data.

Another thing to consider in evaluating site ranking, especially in areas that have the potential for shallow water, is how the current spill guidelines call for determining depth to ground water. Below is a copy of this portion of the guidelines:

A. GENERAL SITE CHARACTERISTICS

1. Depth To Ground Water

The operator should determine the depth to ground water at each site. **The depth to ground water is defined as the vertical distance from the lowermost contaminants to the seasonal high water elevation of the ground water.**

If the exact depth to ground water is unknown, the ground water depth can be estimated using either local water well information, published regional ground water information, data on file with the New Mexico State Engineer Office or the vertical distance from adjacent ground water or surface water.

With this in mind, the site would need to be fully delineated before a site ranking can even be determined. At this time, OCD will consider that the site ranking is potentially 20. If during the investigation phase of the project, data shows differently, that will be considered.

Mike Bratcher
NMOCD District 2
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From: wayne price [<mailto:wayneprice77@earthlink.net>]
Sent: Tuesday, January 13, 2015 11:01 PM
To: Bratcher, Mike, EMNRD
Subject: Fwd: Delineation BKE

Good Morning,

I spent all day going thru several well logs and various historical documents for the area surrounding the BKE well. For the most part it appears that the better quality water is generally found at depths greater than 100 ft, with most of the perfs set at 130-250ft. The quality of this water can vary substantially ranging from 105/952 (Cl/So4) to 1140/2120. Lower on Chlorides, but high in Sulfates from the Gypsum beds. These deeper wells are normally completed in the limestone stringers and are classified as Sandstone/Gravel/Conglomerate.

In addition, it appears that when originally drilled a lot of these wells had Artesian characteristics and rose several feet in the well bores. This partially explains why some of the contours shown by the Chevron Map are probably not totally accurate, as they may not have taken into effect that some of the wells are under confined conditions, while an equal amount is not.

All of the 15-20 wells bores I looked at seem to have this characteristic, but shallow groundwater can be found through out the valley. The Southern Canal basically recharges these very shallow zones with higher Chloride/SO4 water every year. One report I found indicated Irrigation return water can be found at very shallow depths. Some of the well logs I looked at showed an area where water can be found at about 10 ft setting on top of a white clay.

The quality of this water is considered non-potable, as some historical records showed very high Chlorides/Sulfates through out the area. This particular type of water is not good for crops or drinking water, and generally has to be flushed out of the root zone occasional.

So, when we start doing our vertical delineation, I want to make sure we don't go any further than what our contamination went. One way we may be able to differentiate is to run both Chlorides and Sulfates as most produced water is low in Cl/So4 ratio.

It would not surprise me now, if we dig a few feet and hit water, but it won't be the normal usable groundwater in the area.

So, I hope you see our dilemma, and allow us the 500 ppm Cl or background for delineation stop number.

Please let us know your decision.

Begin forwarded message:

From: wayne price <wayneprice77@earthlink.net>

Date: January 13, 2015 11:53:39 AM MST
To: "Bratcher, Mike, EMNRD" <mike.bratcher@state.nm.us>
Subject: Re: Delineation BKE

Hi Mike,

I did notice you included a copy of the map below.

The trend map certainly has some merit, I question where and when they got their data points and the fact the OSE has a study out that groundwater continuity, depth and flow vary seasonally depending upon time of year. In addition, is this map based on cross-sections of like lithology or simply depth to groundwater.

This may be an exercise in futility in me trying to convince you which map or who's data is correct. I do know from studying this area extensively that ground water depth can and does vary tortuously both vertically and horizontally. I would like to point out a delineation number of 600 ppm Cl seams to be the new default number coming out of Santa Fe. The shallow groundwater quality in this area will range from 500-2200 ppm Cl since this is the information given by the Carlsbad Irrigation folks and is well documented. So trying to go below that number just doesn't make sense.

Therefore we would like for you to consider a Cl number of 500 ppm for chloride, and a TPH number of 500 ppm which is halfway. Once we delineate these numbers, then I will send in a clean-up plan for your approval.

Currently we are rebuilding the SWD and any extensive delay in investigation and clean-up will cost a tremendous amount of revenue loss.

Wayne Price-Price LLC

On Jan 13, 2015, at 9:04 AM, Bratcher, Mike, EMNRD wrote:

Wayne,

OSE data is inconclusive for this area, as it shows DTGW at 40' and 120' for almost identical sites. The ChevronTexaco trend map indicates GW may be less than 50'. With that, I think OCD will want to consider that GW is possibly less than 50, unless Key has, or wants to obtain hard data that would prove differently.

At this time, for delineation purposes, the target goal for chlorides will be 250 mg/kg, or background, and 100 mg/kg for TPH.

If you have any questions or concerns, please contact me.

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-----Original Message-----

From: wayne price [<mailto:wayneprice77@earthlink.net>]

Sent: Monday, January 12, 2015 6:20 PM

To: Bratcher, Mike, EMNRD

Subject: Delineation

Hi Mike,

Next week I am going to try and find the vertical extent at our BKE SWD and would like to know if the following parameters will work for you to determine when to stop.

The Groundwater depth is 60 ft, there are no waters wells within 200 ft, and no rivers etc.

Benzene 10 mg/kg 8021
BTEX 50 mg/kg 8021
TPH 1000 mg/kg 8015M
Chlorides 600 mg/kg 300.1

The area is surrounded by out of service farmland where

it was irrigated with river-canal water that ranged from 500-2200 ppm Cl.

Most of the surrounding area has heavy Sulfate and Salt stains from past farming.

Please let me know if this will work?

Wayne Price-PriceLLC

<Key BKE 1.pdf>