R. T. HICKS CONSULTANTS, LTD.

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May 15, 2017

Dr. Tomáš Oberding PhD
NMOCD
1220 S. St. Francis Drive
Santa Fe, NM
Via E-mail

RE: Southwest Royalties Flying M Oil Field Additional Characterization
NMOCD Case # 1RP-1696 and 1RP-1958-0

Dr. Oberding:

As we discussed earlier this month, in advance of a voluntary submission of a Stage 1&2 Abatement Plan to address potential impacts to groundwater from both sites referenced above, we plan to install four additional monitoring wells in May 2017. The attached "Instructions to Drilling Contractor" describes the protocols for this effort. We plan to stake the well locations for the one-call during the first week in May and hope to initiate drilling during the week of May 30-June 2. Figures 1a, 1b, 2 and 3 show the locations of the four proposed wells, all of which will be 2-inch PVC casing drilled with air rotary methods.

MW-9 (33.50245, -103.56309), which lies between the Kizer Windmill (120 mg/L chloride) and MW-7 (17,000 mg/L chloride), is placed to determine if the perched groundwater zone beneath Tank Battery #2 and MW-7 exists south of the break in slope observed north of the proposed location. If the perched water exists, the secondary purpose of the well is to determine the quality of the water. Figure 2 shows the location of this proposed well and MW-10 on a larger scale.

MW-10 (33.52052, -103.56341) is proposed to define the eastern boundary of any impacts caused by past oilfield activity. This well is about 2000 feet due east of MW-4 (4400 mg/L chloride).

At the historic release at the Playa in Section 17, we need additional data to confirm the direction of groundwater flow and to provide an estimate of the magnitude and extent of any impairment to the north. From the edge of the playa, wells Playa MW-2 (33.53614, -103.58436) and Playa MW-3 (33.53576, -103.58908) are placed 1000 feet to the northwest and 500 feet to the northeast respectively. Collection of elevation data for the bottom of the perched groundwater zone is also an objective of these wells.

During this same field program, we intend to conduct a low-flow brine (30,000 mg/L chloride) recovery test of RW-2. We conducted a 6 hour recovery test during the well staking day and developed, the protocol for this 3-day test as described below:

1. Measure depth to water and total well depth in MW-1, RW1 and RW2 prior to commencing the test (Figure 5).
2. Use a down-hole probe to measure the conductance profile of these three wells prior to commencing the test
3. Install two low-flow pumps near the bottom of RW-2 and re-measure depth to water.
4. Activate one of the two pumps at maximum rate to initiate low-flow pumping (about 2 liters/minute) of brine with discharge to a tank.
5. During the initial 120 minutes of pumping

   a. Adjust the pump discharge as required such that measured drawdown in RW-2 is less than 1-foot and greater than 2-inches and stable
   b. Measure depth to water and conductance of discharged water at regular intervals and adjust the pump discharge as necessary to maintain a constant drawdown of less than 1-foot.
   c. If the conductance of the discharge decreases by 15% (i.e. the pumped water shows decreased salinity),
      i. Lower the pump in the well while maintaining a clear water discharge and/or
      ii. decrease the pumping rate to until the conductance of pumped water stabilizes or increases
6. Every 60-90 minutes for the first 4-6 hours, measure the depth to water in RW-2, the pump discharge rate, and conductance of pumped water. Make adjustments to the discharge rate to stabilize drawdown in the well to less than 1 foot and maximize the salinity of the pump discharge.
7. Periodically, use a down-hole probe to measure the conductance profile of all three wells during pumping and measure depth to water as well
8. Allow the pump to discharge into a tank overnight at the stable rate established during the initial 6 hours of pumping.
9. On Day 2, activate the second pump and repeat steps 5-8 described above being certain to adjust the pumping rate for the second pump such that
   a. drawdown less than 18 inches and
   b. conductance does not decrease by more than 15% of the initial measurements
10. On Day 3, cease pumping and monitor recovery of the water level for 4-8 hours in the pumping well, RW-1 and MW-1

At a maximum pumping rate of ½ GPM, 2days of pumping will yield less than 50 barrels of brine. The pump discharge will be stored in a tank and periodically sent to the Flying M produced water management system.

The purpose of this low-flow pumping test is to determine if brine removal from RW-2 and some additional wells (e.g. RW-1, MW-1) can provide any meaningful improvement of water quality and protection of groundwater for beneficial use. We know that a pumping rate of 1.5 GPM results in loss of pump suction and cessation of discharge. Thus, low-flow pumping is the only source removal option appears that appears to be viable.

Please contact me if you have any questions or comments concerning this proposed work.

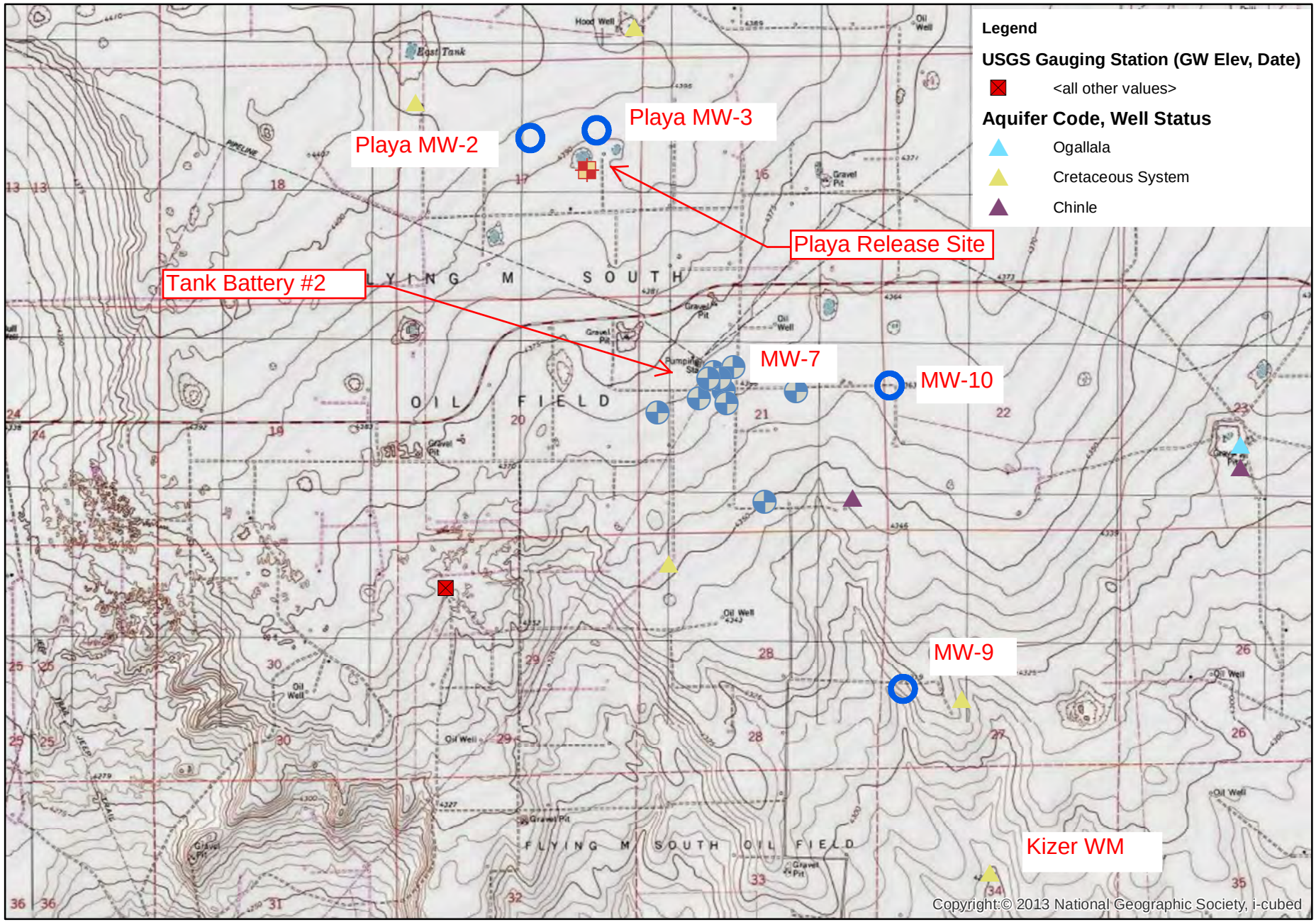
Sincerely,
R.T. Hicks Consultants

Randall Hicks
Principal

Instructions for Drilling Contractor

1. Obtain permits from the Office of the State Engineer
2. Mobilize to MW-9 as this is the first well to be drilled (33.50245, -103.56309)
3. Using air rotary methods, drill to the top of obvious water. Collect cuttings samples at 5-foot intervals. You may proceed through this zone as quickly as you wish. A hard caliche zone may be present from ground surface to a depth of about 20 feet.
4. When the bit penetrates the water table, we slow down the penetration rate and do what may be necessary to obtain the highest quality samples of cuttings at 5-foot increments.
5. Between 40-50 feet below grade, we anticipate penetrating a bedrock unit that underlies the alluvium or re-worked Ogallala sediments that are beneath any caliche layer. With good cuttings samples and a good log of the bit penetration rate, we should be able to pick the contact between the top of the bedrock and base of the alluvium/re-worked Ogallala. Drilling needs to stop at this contact or several feet below the contact.
6. Using compressed air, a dart bailer or other methods, clean out the boring of slough and make a determination if the boring will remain open. We will collect a water sample from the boring to determine the specific conductance of this fluid.
7. At this depth, we need to understand if the material on the bottom of the boring is bedrock clay/silt (low permeability) or bedrock sand (more permeable). At this time we may also wait for the groundwater level to recover to static conditions in the boring.
8. Based upon the data from steps 5-7, we may advance the bit 5- more feet or terminate the boring.
9. At total depth, we will ask that the contractor attempt to obtain a split spoon sample of the bedrock that underlies the saturated material.
10. Finally, the 2-inch PVC monitoring well casing and screen will be installed in the well with filter pack adjacent to the screened interval plus 2-feet. The bottom of the screen will be set into the bedrock unit and the top of the screen is 3-5 feet above the measured static water level. Bentonite chips are set above the filter pack and the annular space from the top of the bentonite to ground surface is neat cement grout. The well is completed with an above-grade steel, locking well head.
11. The second well to be drilled is Playa MW-2 (33.53614, -103.58436) and will follow the same protocols outlined above
12. The third well is Playa MW-3 (33.53576, -103.58908) and will follow the same protocols outlined above
13. The last well is MW-10 (33.52052, -103.56341) and will follow the same protocols outlined above

M:\SW Royalty\FlyingM-General\correspondence\F1a-NewMW May 2017.mxd



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Proposed Monitoring Wells - May 2017

Figure 1a

Southwest Royalties: Flying M

April 2017

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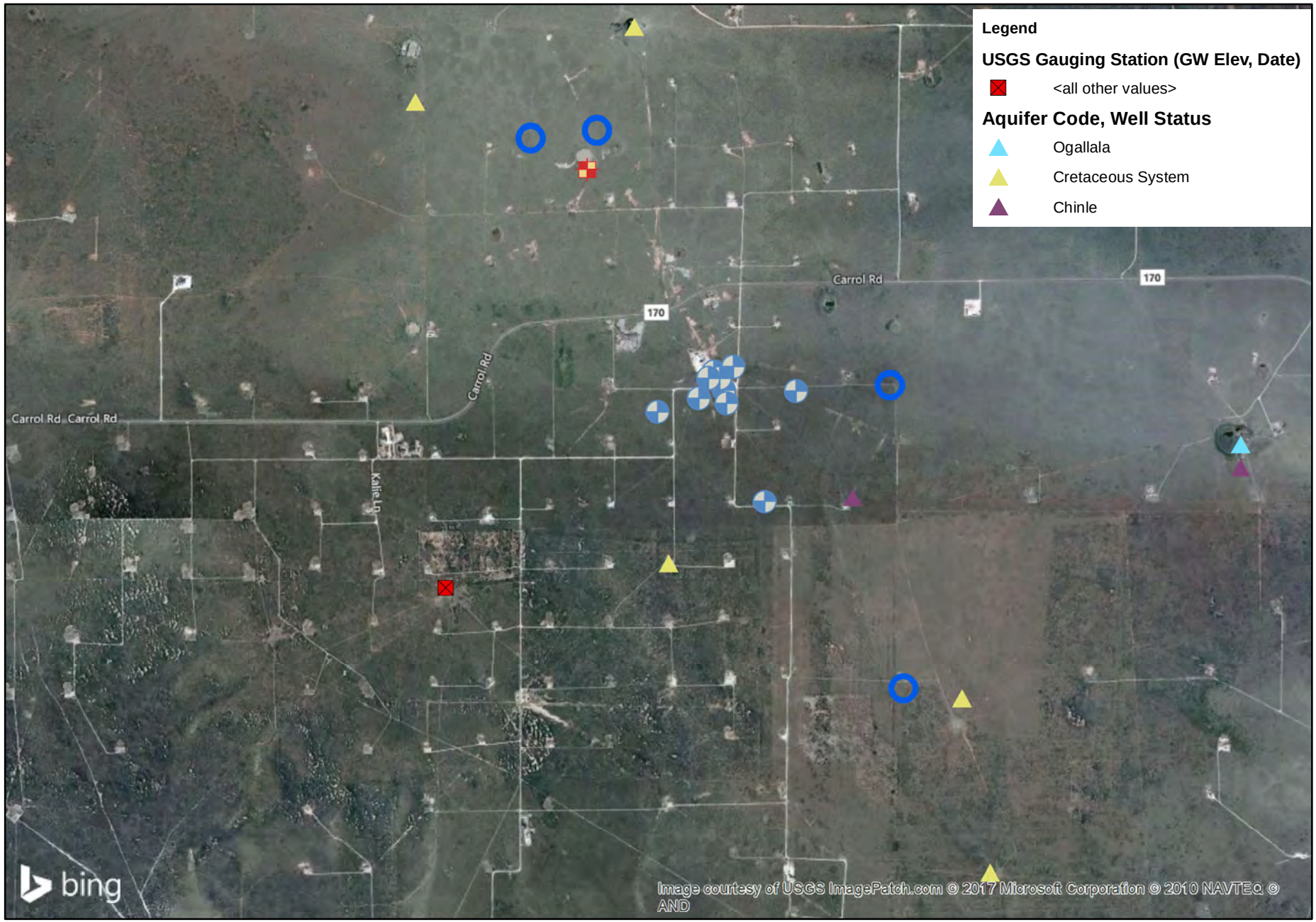

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Proposed Monitoring Wells and Chloride in Groundwater

Figure 1b

Southwest Royalties: Flying M

April 2017

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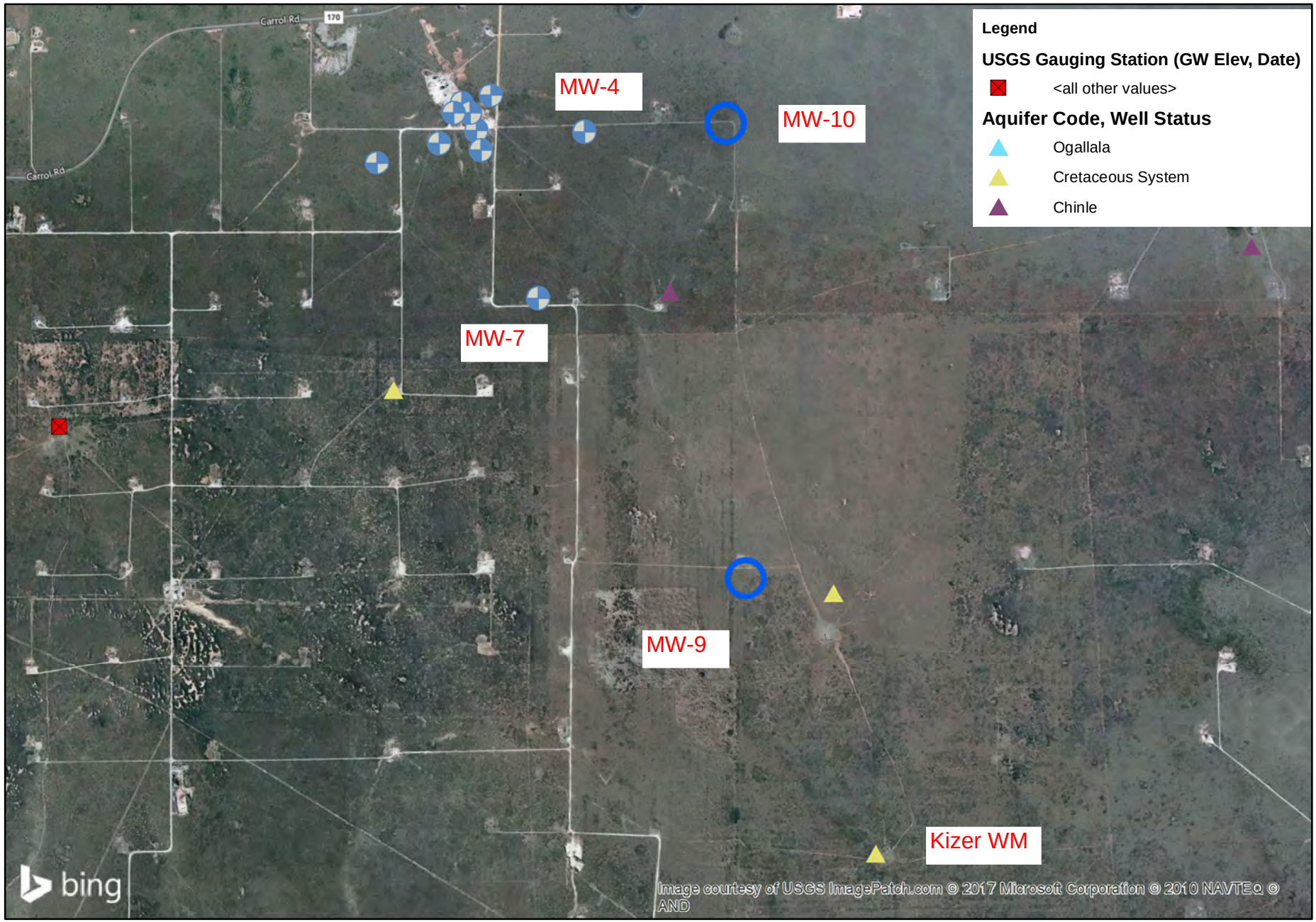

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Proposed Southern Monitoring Wells - May 2017

Figure 2

Southwest Royalties: Flying M

April 2017

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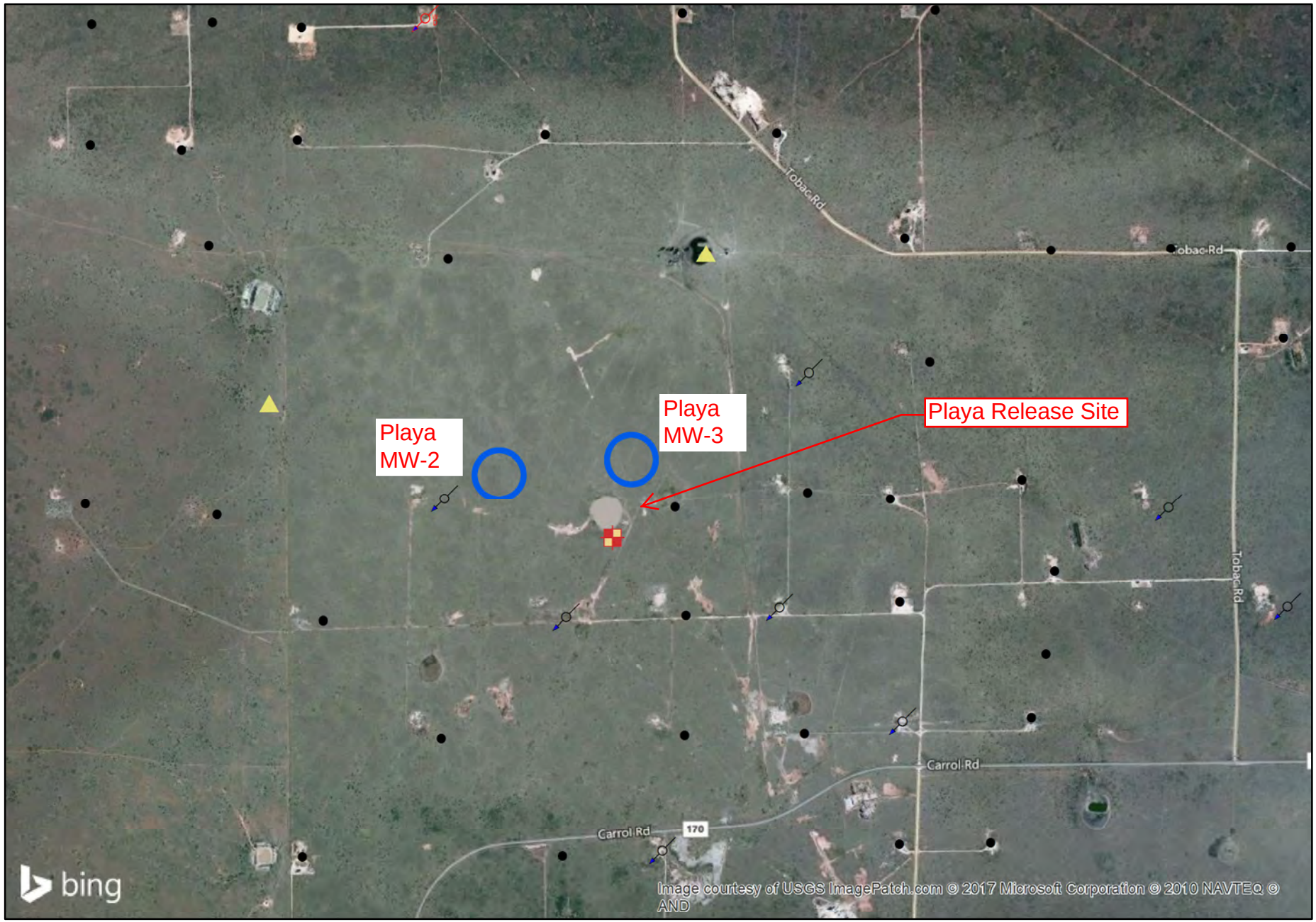

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Proposed Playa Monitoring Wells - May 2017

Figure 3

Southwest Royalties: Flying M

April 2017

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Monitoring and Recovery Wells

Southwest Royalties: Flying M

Figure 5

April 2017