Walsh
Environmental Scientists and Engineers, LLC
an **ecology and environment** company

October 29, 2009

Chris Clark
David Edwards
OXY USA WTP LP
760 Horizon Drive, Ste 101
Grand Junction CO 81506

Subject: **Fluorometric Study**
15-54 Pad
Walsh Project No. 900248.7830.181

Dear Mr. Clark and Mr. Edwards:

Walsh Environmental Scientists and Engineers, LLC (Walsh) is submitting this proposed scope of work to evaluate connectivity between closed produced water storage pits at the OXY USA WTP LP (OXY) 15-54 well pad and groundwater in the vicinity of Spring 2. The study will involve the use of tracer dyes injected into the soil at the locations of the former production pit and storage pond. It will be coincident with the *Revised Investigation Plan* dated October 13, 2009 and prepared by Walsh.

Two trenches will be excavated in the locations of the former reserve pit and pond 1. The trenches will extend the entire length of each installation. Initially, the excavations will be of sufficient depth to expose at least two vertical feet of native material beneath the bottom of the deepest part of the reclaimed pit and pond. After investigating the soil beneath the base of the pit and pond, this soil will be replaced to bring the base of the excavation to the original pond and pit base elevation. The excavations will be left open for about 48 hours and observed for water. If water collects in a trench, it will be sampled and analyzed as stated in the investigation plan. Once the water is sampled or no water is observed, tracer dye will be placed into the trenches as described below. All fluorometric analyses will be with a Turner Designs brand hand-held fluorometer capable of detecting tens of parts per billion fluorescein or rhodamine.

80 barrels of clean water mixed with five pounds of fluorescein dye will be placed into the reserve pit trench, and 80 barrels of clean water mixed with five pounds of rhodamine dye will be placed into the pond 1 trench. This is equivalent to approximately 190 parts per million (190,000 parts per billion) initial concentration for each dye. The water level will be observed and the infiltration rate will be noted. After the water has completely infiltrated, 80 to 120 barrels of fresh water will be placed into each trench to facilitate flow into the formation. Notes will be kept on the time of placement, concentration, source of the water, time to infiltrate, and any other relevant or unusual observations. Water in spring 2, spring 3 (Donna spring), and the spring located directly west of the pad will be observed for visible indications of dye and sampled for fluorometric analysis the same day as the dye placement.

At least 24 hours after placement of the dye and initial testing of the springs, the three springs, the newly-installed monitoring wells, and monitoring wells 08S, 09S, and 10S (Figure 1) will be sampled for fluorometric measurement. Measurements will either be in the fieldor a sample

from each location will be obtained and analyzed in the office using the fluorometer. This procedure will be repeated approximately two to three times per week, or as obtained data indicate. For example if dye appears in a sampling location, that and adjacent sampling locations may be sampled at a greater frequency for time sufficient to document the flow of the peak concentration past the sampling area. Sampling will cease after four weeks or ten sampling events or as instructed by OXY and COGCC.

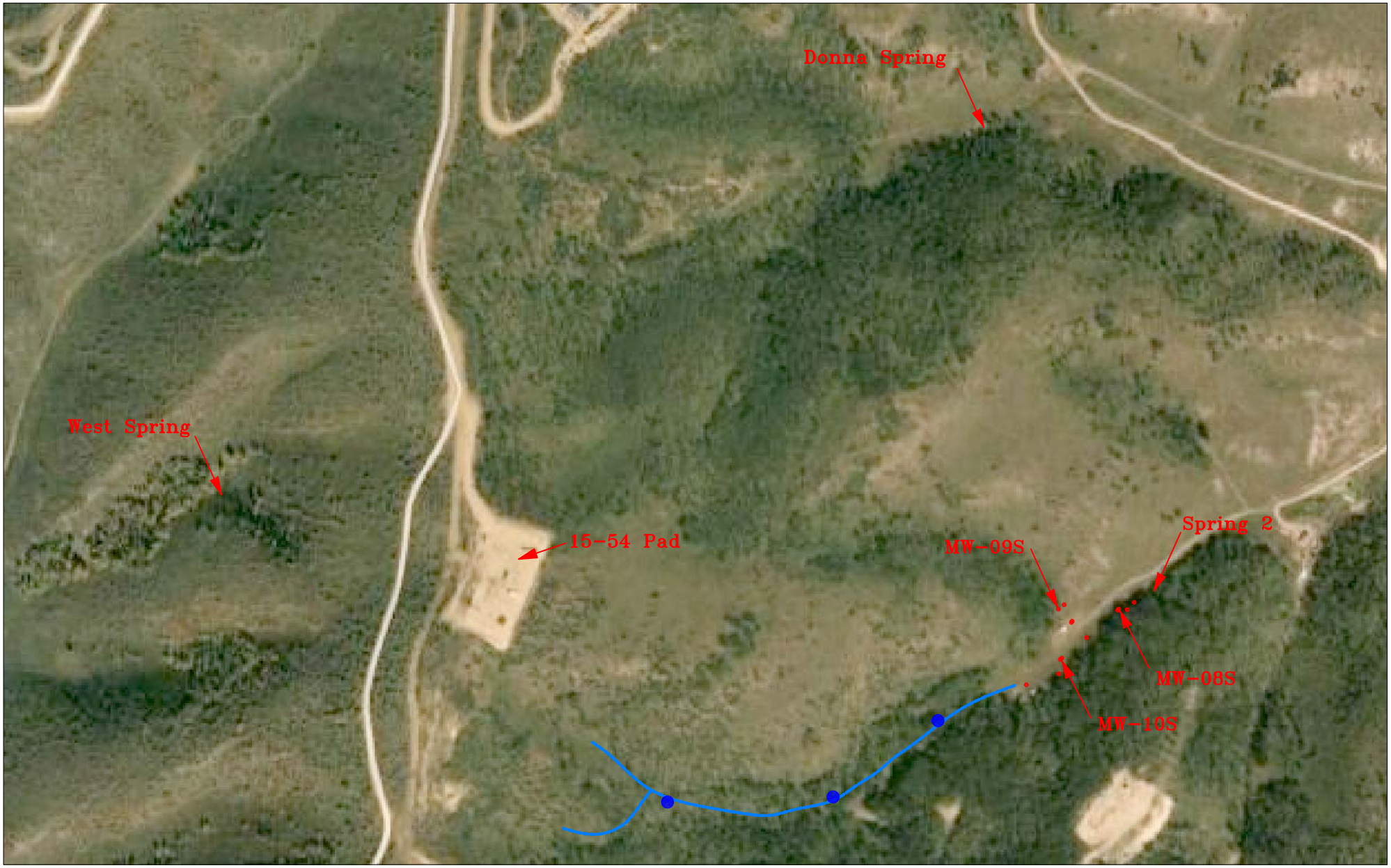
After receipt of analytical data, Walsh will prepare a report describing field observations, field and analytical data, and conclusions based on those results. Figures will be included that will show trench locations, sampling locations, isolines, concentration charts at relevant sampling points (if needed), and photographs. Analytical results will be tabulated.

Please contact me if you have comments to this proposed plan or wish to pursue this investigation. Walsh recommends that you obtain concurrence from the COGCC prior to implementing this plan. Thank you for the opportunity to present this proposed scope of work, and for considering Walsh for your project.

Sincerely,
Walsh Environmental Scientists & Engineers, LLC

Edward M. Baltzer, CHMM, CPG
Project Manager

Figure 1



Explanation

- Existing Monitoring Well
- Proposed Monitoring Well
- Valley Floor & Presumed Alluvial Aquifer

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Proposed Sampling Locations
Fluoromertic Study
OXY 697-15-54 NOAV
Garfield County, Colorado

0 500
Approximate Scale (Feet)

N

Job 900248.7830.181	Date 10/09	Figure 1